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**PROJECT AGREEMENT
(EXECUTION VERSION)**

**TRILLIUM LINE EXTENSION
OTTAWA STAGE 2 LRT PROJECT**

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Schedule 28	- Insurance Trust Agreement
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Schedule 30	- [REDACTED]
Schedule 31	- Works Report Requirements
Schedule 32	- City Permits, Licences, Approvals and Authorizations
Schedule 33	- Lands
Schedule 34	- [Intentionally Deleted]
Schedule 35	- Intellectual Property
Schedule 36	- System Extension
Schedule 37	- [Intentionally Deleted]
Schedule 38	- [Intentionally Deleted]
Schedule 39	- Revenue Vehicle Supply Contract
Schedule 40	- Utility Baseline Report
Schedule 41	- Lenders' Direct Agreement

THIS PROJECT AGREEMENT is made as of the 28th day of March, 2019

BETWEEN:

CITY OF OTTAWA

(the “City”)

AND:

TRANSITNEXT GENERAL PARTNERSHIP

(“Project Co”)

WHEREAS:

A. The City wishes to develop a new light rapid transit system which includes the following elements:

- (a) Expanding the Existing Trillium Line with approximately 11.5 km of new single track (with passing sidings) from the existing terminus at Greenboro Station to the proposed new Limebank Station, the majority of which follows the existing City-owned (former CPR) railway corridor;
- (b) An additional extension of the Existing Trillium Line by way of a 4.5 km-long Airport Link to the Airport that will connect to the mainline at the proposed South Keys Station;
- (c) Extension of passing sidings within the Existing Trillium Line (at the Gladstone, Brookfield and Carleton locations) to enhance operational reliability;
- (d) Extension of the five (5) existing station platforms (at the Bayview, Carling, Mooney’s Bay, Carleton and Greenboro locations) to accommodate longer train consists;
- (e) Addition of new stations at Gladstone and Walkley;
- (f) Addition of proposed stations on the Trillium Line Extension at the South Keys, Leitrim, Bowesville and Limebank locations;
- (g) Proposed Stations on the Trillium Line Extension for the proposed connection to the Ottawa MacDonald-Cartier International Airport at the Uplands and Airport Terminal locations;
- (h) Upgrade of existing bridge structures on the Existing Trillium Line and upgrade of the existing Dow’s Lake tunnel structure and mechanical ventilation system;
- (i) Expansion of the pedestrian underpasses at Carleton University, new underpass north of Hunt Club Rd and new underpass under the South Keys Station;
- (j) Construction of rail, pedestrian or other overpass structures at Bayview Station, over the Rideau River, Ellwood Diamond, Hunt Club Road, Lester Road, Leitrim Road, Earl

Armstrong Road, Bowesville Road, Mosquito Creek, Limebank Road, Airport Parkway and Uplands Drive, and ecological overpass (at High Road);

- (k) Construction of the New Walkley Yard to be constructed west of Albion Road, across the street from the Existing Walkley Yard;
 - (l) Improved connectivity for pedestrians and cyclists parallel to the Existing Trillium and Trillium Line Extension and in the vicinity of stations, including construction of a new multi-use path (MUP) system;
 - (m) Extension of and upgrades to the Communications Systems and Signalling and Train Control Systems; and
 - (n) Provisions of a New Vehicle Fleet.
- B. Project Co will provide the Project Operations, which Project Operations include the elements set out in Recital A and (i) the design, construction, financing, maintenance and rehabilitation of the System Infrastructure and the New Municipal Infrastructure, (ii) the procurement, financing, maintenance and rehabilitation of the New Vehicle Fleet, and, (iii) the maintenance and rehabilitation of the Existing Vehicle Fleet (the “**Project**”).
- C. The City and Project Co wish to enter into this project agreement (the “**Project Agreement**”), which sets out the terms and conditions upon which Project Co shall perform the Project Operations.
- D. With a view to ensuring that the Parties are able to properly and effectively discharge their respective duties, functions, and responsibilities under Applicable Law, it is the intent that the City and Project Co work collaboratively, responsibly and cooperatively throughout the Project Term.

NOW THEREFORE in consideration of the mutual covenants and agreements of the Parties hereinafter contained and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties covenant and agree as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 Definitions and Interpretation

- (a) This Project Agreement shall be interpreted in accordance with Schedule 1 – Definitions and Interpretation.
- (b) This Project Agreement is comprised of this executed agreement and the following documents, all of which are hereby incorporated by reference into and form part of this Project Agreement.

Schedule No.	Description
Schedule 1	- Definitions and Interpretation
Schedule 2	- Completion Documents
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Schedule 6	-	Independent Certifier Agreement
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Schedule 38	-	[Intentionally Deleted]
Schedule 39	-	Revenue Vehicle Supply Contract
Schedule 40	-	Utility Baseline Report
Schedule 41	-	Lenders' Direct Agreement

- (c) The documents comprising this Project Agreement are complementary and what is called for by any one of them shall be interpreted as if called for by all, except in the event of ambiguities, conflicts or inconsistencies, in which case Section 1.2 shall apply.
- (d) Except for those parts of Project Co's proposal which are incorporated by explicit reference into this Project Agreement by the Project Co Proposal Extracts, on Financial Close, the Request for Proposals and Project Co's proposal shall be superseded entirely by this Project Agreement and

rendered null and void, and shall not be relied upon or used by Project Co, the City or anyone else (including anyone pursuant to Schedule 26 - Dispute Resolution Procedure or any arbitral body or any court) in any way to interpret or qualify the scope of the Project Operations, any obligations or liabilities of Project Co, or anything else contained in this Project Agreement.

- (e) Unless it is specifically provided that a consent, approval or satisfaction is in the sole discretion of the City, no consent, approval, opinion or satisfaction of the City or the City Representative shall be unreasonably withheld or delayed.
- (f) Unless it is specifically provided that a consent, approval or satisfaction is in the sole discretion of Project Co, no consent, approval, opinion or satisfaction of Project Co or the Project Co Representative shall be unreasonably withheld or delayed.
- (g) The organization of the Output Specifications into divisions, sections and parts shall not control Project Co in dividing the Works or the Maintenance and Rehabilitation Services among the Project Co Parties or in establishing the extent of the Works or the Maintenance and Rehabilitation Services to be performed by a trade.

1.2 Conflict of Terms

- (a) In the event of ambiguities, conflicts or inconsistencies between or among any of the provisions of this Project Agreement, the provisions shall govern in the following order of precedence with each taking precedence over those listed subsequently:
 - (i) the provisions of amendments in writing to this Project Agreement signed by the Parties and Variation Confirmations shall govern and take precedence only over those specific provisions of this Project Agreement expressly amended thereby;
 - (ii) any provision establishing a higher standard of safety, reliability, durability, performance or service shall take precedence over a provision establishing a lower standard of safety, reliability, durability, performance or service;
 - (iii) the body of this Project Agreement;
 - (iv) Schedule 1 - Definitions and Interpretation;
 - (v) Schedule 32 - City Permits, Licences, Approvals and Authorizations;
 - (vi) Schedule 33 - Lands;
 - (vii) Schedule 26 - Dispute Resolution Procedure;
 - (viii) Schedule 20 - Construction Period Payments;
 - (ix) Schedule 19 - Payment Mechanism;
 - (x) Schedule 15 - Output Specifications;
 - (xi) Schedule 17 - Environmental Obligations;

- (xii) Schedule 24 - Insurance and Performance Security Requirements;
 - (xiii) Schedule 21 - Variation Procedure;
 - (xiv) Schedule 10 - Review Procedure;
 - (xv) Schedule 14 - Testing and Commissioning;
 - (xvi) Schedule 11 - Integrated Management System Requirements
 - (xvii) Schedule 27 - Refinancing;
 - (xviii) Schedule 22 - Compensation on Termination;
 - (xix) Schedule 25 - Record Provisions;
 - (xx) Schedule 23 - Expiry Transition Procedure;
 - (xxi) the other Schedules in the order in which they are listed in Section 1.1(b); and
 - (xxii) Schedule 13 - Project Co Proposal Extracts.
- (b) Subject to Section 1.2(a), if the ambiguity, conflict or inconsistency is between a provision of general application and a provision that applies only to a specific part of the Project Operations, the provision that applies to the specific part of the Project Operations shall govern for that specific part of the Project Operations.
- (c) If any ambiguity, conflict or inconsistency is not readily resolved by the foregoing provisions of this Section 1.2, then Project Co or the City, upon discovery of same, shall immediately give Notice to the City Representative. The City Representative shall, within 10 Business Days after such Notice, make a determination of which provision governs and give Notice of such determination, in writing, to Project Co.
- (d) The City and Project Co shall comply with the determination of the City Representative pursuant to this Section 1.2 unless Project Co disputes the decision of the City Representative in which event such Dispute may be referred for resolution in accordance with Schedule 26 - Dispute Resolution Procedure.

1.3 Conflict of Documents

- (a) In the event of any ambiguity, conflict or inconsistency between the provisions of this Project Agreement and the Lenders' Direct Agreement, the provisions of the Lenders' Direct Agreement shall prevail and govern to the extent of such ambiguity, conflict or inconsistency. Notwithstanding the forgoing, if there is any right or remedy in favour of the City set out in the Lenders' Direct Agreement or any part thereof which is not set out or provided for in the Project Agreement, such additional right or remedy shall not constitute an ambiguity, conflict or inconsistency.

1.4 Legal Requirements

- (a) Whenever standards of Applicable Law differ (after giving effect to any applicable conflict of law rules), the most stringent standards shall govern.

1.5 Early Works Agreement and Enabling Works

- (a) Upon achievement of Financial Close, this Project Agreement shall supersede and replace the early works agreement in respect of the Project executed by the Parties on or about March 7, 2019 (the “**Early Works Agreement**”). Without prejudice to the generality of the foregoing, any part of the Works performed by Project Co under and in accordance with the Early Works Agreement shall be treated as having been performed under and in accordance with this Project Agreement, and the City’s payment obligations related to that part of the Early Works will be those under this Project Agreement and not under this Early Works Agreement, and shall be accounted for and paid for as part of the Mobilization Credit in accordance with Schedule 20 – Construction Period Payments of the Project Agreement.
- (b) Upon achievement of Financial Close, Project Co shall assume responsibility for all Enabling Works, and all Enabling Works shall be deemed to be Works hereunder and treated as having been performed under the terms of the Project Agreement. The purchase order for Enabling Works shall be assigned to Project Co on Financial Close, and all amounts paid by the City under and in accordance with such purchase order shall be credited by Project Co to the City and set-off against the first Construction Period Payment(s) becoming payable by the City to Project Co hereunder.

2. COMMERCIAL CLOSE AND FINANCIAL CLOSE

2.1 Effective Date

- (a) The provisions of Sections 1 to 11, 15 to 24, 27 to 29, 33, 35 to 37 and 49 to 62, and Schedule 1 – Definitions and Interpretation, Schedule 2 – Completion Documents, Schedule 3 – Custody Agreement, Schedule 9 – Key Individuals, Schedule 10 – Review Procedure, Schedule 11 – Integrated Management System Requirements, Schedule 12 – Works Scheduling Requirements, Schedule 13 – Project Co Proposal Extracts, Schedule 16 – Encumbrances, Schedule 17 – Environmental Obligations, Schedule 18 – Communications and Stakeholder Engagement Obligations, Schedule 21 – Variation Procedure, Schedule 24 – Insurance and Performance Security Requirements, Schedule 25 – Record Provisions, Schedule 26 – Dispute Resolution Procedure, Schedule 32 – City Permits, Licences, Approvals and Authorizations, Schedule 33 – Lands, Schedule 35 – Intellectual Property and Schedule 36 – System Extension will come into effect on Commercial Close. All other provisions of this Project Agreement will come into effect only on Financial Close. The provisions of this Project Agreement will terminate on the Termination Date.

2.2 Letter of Credit

- (a) Unless a Letter of Credit is drawn by the City in accordance with the provisions of this Project Agreement, the City shall release and deliver the Letter of Credit to Project Co on Financial Close.

- (b) Project Co shall ensure that the Letter of Credit (and any replacement therefor) is renewed prior to its expiry date if, as at such date, Financial Close will not, or may reasonably be expected not to, have occurred.
- (c) If Project Co delivers one or more Letter(s) of Credit from one or more Letter of Credit Provider(s) in accordance with Section 9.1(2) of the Request for Proposals, Project Co acknowledges and agrees that:
 - (i) the City may draw upon any Letter of Credit provided by any Letter of Credit Provider in any specified ratable amount in accordance with the terms of this Project Agreement;
 - (ii) the City may draw on any Letter of Credit provided by any Letter of Credit Provider in a disproportionate amount to such Letter of Credit Provider's contribution to security;
 - (iii) the City may draw upon any Letter of Credit provided by any Letter of Credit Provider even in the event that such Letter of Credit Provider is no longer a Project Co Party; and
 - (iv) the provision of a Letter of Credit shall not in any way prejudice or adversely affect the rights of the City to draw on the Letter of Credit in accordance with this Project Agreement, including in a circumstance where the default giving rise to the City's right to draw on the Letter of Credit is not the result of any act or omission of the Letter of Credit Provider whose Letter of Credit is drawn upon.

2.3 Financial Close

- (a) No later than 30 days prior to the Financial Close Target Date, Project Co will deliver to the City drafts of all documents referred to in Section 1 of Schedule 2 - Completion Documents.
- (b) On or before the date of Financial Close:
 - (i) Project Co shall deliver to the City the documents referred to in Section 1 of Schedule 2 - Completion Documents; and
 - (ii) the City shall deliver to Project Co the documents referred to in Section 2 of Schedule 2 - Completion Documents.
- (c) If Project Co fails to deliver to the City any of the documents referred to in Section 1 of Schedule 2 - Completion Documents by the date of Financial Close (other than as a direct result of a breach by the City of its obligations under Section 2.3(b)(ii)) and the City does not waive such requirement, the City will be entitled to draw on the Letter of Credit to retain the proceeds thereof as liquidated damages and may terminate this Project Agreement in its entirety by written Notice having immediate effect. The Parties agree that such liquidated damages are not a penalty but represent a genuine and reasonable pre-estimate of the damages that the City will suffer as a result of the happening of the specified event. Such payment shall constitute full and final settlement of any and all damages that may be claimed by the City as a result of Project Co not achieving Financial Close. The Parties agree that such liquidated damages shall be payable whether or not the City incurs or mitigates its damages, and that the City shall not have any obligation to mitigate any such damages.

- (d) If the City fails to deliver to Project Co any of the documents referred to in Section 2 of Schedule 2 - Completion Documents by the date of Financial Close (other than as a direct result of a breach by Project Co of its obligations under Section 2.3(b)(i)) and Project Co does not waive such requirement, Project Co will be entitled to the return of the Letter of Credit and to terminate this Project Agreement in its entirety by written Notice having immediate effect.

2.4 Disruption in Financial Markets

- (a) If Financial Close cannot be achieved by the Financial Close Target Date by reason solely of a Severe Market Disruption, subject to Project Co's obligation to renew the Letter of Credit pursuant to Section 2.2(b), the Financial Close Target Date will be extended until the date falling 10 Business Days (or such other period as the Parties agree, acting reasonably) after the date on which such Severe Market Disruption ceases.
- (b) If a Severe Market Disruption exists, then, at any time before such Severe Market Disruption ceases and prior to Financial Close, the City may in its sole discretion either:
- (i) terminate this Project Agreement in its entirety by written Notice having immediate effect; or
 - (ii) direct Project Co to assign to a designee of the City which has agreed to assume:
 - (A) the Project Agreement, and all of Project Co's right, title and interest in the Project Data, the Intellectual Property Rights and the Project Co Permits, Licences, Approvals and Authorizations; and
 - (B) those contracts between Project Co and any Project Co Party which the City elects to be assigned.

- (c) If the City exercises its rights pursuant to Section 2.4(b), and, provided Project Co has, if directed, delivered the assignments provided for in Section 2.4(b)(ii)(A) and (B), Project Co will be entitled to the return of its Letter of Credit and to payment of an amount equal to the Design and Bid Fee pursuant to Section 10.3.2 of the Request for Proposals plus [REDACTED]% of the Design and Bid Fee, plus any applicable HST. The City's obligation to return the Letter of Credit and to pay such fee shall be contingent on the receipt of a waiver, in form and substance satisfactory to the City, that such fee represents full and final satisfaction of any obligation or liability of the City to Project Co and any Project Co Parties in connection with the Project Agreement and the Request for Proposals.

3. SCOPE OF AGREEMENT

3.1 Scope of Agreement

- (a) Project Co shall undertake the Project and perform the Project Operations in accordance with and subject to the provisions of this Project Agreement.
- (b) Project Co shall exercise its rights and perform its obligations at its own cost and risk without recourse to the City, except as otherwise provided in this Project Agreement.

4. BUSINESS OPPORTUNITIES, ADVERTISING AND PUBLIC EVENTS

4.1 Business Opportunities

- (a) Project Co acknowledges that the City: (i) may from time to time develop, or permit the development of, commercial and other opportunities on or associated with the System Infrastructure, including, for greater certainty, the addition of retail facilities, kiosks, and newsstands, the erection of billboards and other forms of advertising, the granting of naming rights associated with the System Infrastructure, wifi, radio and public television on the System Infrastructure (“**Business Opportunities**”); (ii) reserves the right to all Business Opportunities; and (iii) may, as set out in this Project Agreement, grant rights in the Business Opportunities to Project Co or other parties.
- (b) For clarity, and subject to Section 4.1(d) below, Project Co acknowledges and agrees that the addition of retail facilities, kiosks, or newsstands, the erection of billboards and other forms of advertising by the City or the implementation of other Business Opportunities by the City shall not entitle Project Co to any additional compensation or extension of time in relation thereto.
- (c) Project Co shall cooperate with the City in the City’s implementation of Business Opportunities.
- (d) To the extent that the development of a Business Opportunity or any other activities referenced in (b) above by the City (or any third party authorized by the City) interferes with Project Co’s license rights hereunder or interferes with Project Co’s ability to perform the Project Operations, such development shall, subject to and in accordance with Schedule 22 – Variation Procedure, result in a Variation.
- (e) To encourage the development of Business Opportunities, Project Co may, from time to time, propose Business Opportunities for the City’s consideration. All such proposals shall describe the Business Opportunity in full with the expected financial and other advantages to both the City and Project Co. The City may accept any such proposal in its sole discretion and subject to such terms and conditions as the City may require.
- (f) Notwithstanding that Project Co has proposed a Business Opportunity to the City for its consideration, Project Co acknowledges and agrees that:
 - (i) the City reserves the right to proceed with such Business Opportunity or any similar Business Opportunity with Project Co or with any third party;
 - (ii) the City may initiate a separate procurement process for the development of such Business Opportunity; and
 - (iii) Project Co shall not be entitled to receive any payment or compensation from the City (in any form) on the basis that Project Co proposed such Business Opportunity to the City, even if the City proceeds with such Business Opportunity or any similar Business Opportunity with Project Co or with any third party.

5. REPRESENTATIONS AND WARRANTIES

5.1 Project Co Representations and Warranties

(a) Project Co represents and warrants to the City that as of Commercial Close:

- (i) Project Co is [REDACTED] formed and validly existing under the laws of the Province of Ontario and has all the requisite corporate power and authority to own its properties and assets, to carry on its business as it is currently being conducted, and to enter into this Project Agreement and to perform its obligations hereunder:
 - (A) [REDACTED] under the laws of Canada, is in good standing with Corporations Canada with respect to the filing of annual reports, and has all the requisite power and authority to own its properties and assets, to carry on its business as it is currently being conducted and to enter into this Project Agreement and to duly observe and perform its obligations hereunder in its capacity as a partner of Project Co;
 - (B) [REDACTED] under the laws of Canada, is in good standing with Corporations Canada with respect to the filing of annual reports, and has all the requisite power and authority to own its properties and assets, to carry on its business as it is currently being conducted and to enter into this Project Agreement and to duly observe and perform its obligations hereunder in its capacity as a partner of Project Co;
- (ii) all partnership interests in Project Co as of Commercial Close have been disclosed to the City;
- (iii) Project Co and the Project Co Parties, collectively, have extensive experience and are knowledgeable in the design, construction, maintenance and rehabilitation of light rail transit projects, including the maintenance of light rail vehicles, similar to the Project in scale, scope, type and complexity and have the required ability, experience, skill and capacity to perform the Project Operations in a timely and professional manner as set out in this Project Agreement;
- (iv) Project Co, and [REDACTED] in its capacity as partner of Project Co have the requisite power, authority and capacity to execute, deliver and perform this Project Agreement, and to do all acts and things, and execute, deliver and perform all other agreements, instruments, undertakings and documents as are required by this Project Agreement to be done, executed, delivered or performed by Project Co or [REDACTED] in its capacity as partner of Project Co;
- (v) no steps or proceedings have been taken or are pending to supersede or amend:
 - (A) the constating or formation documents of Project Co, including the partnership agreement governing Project Co; or
 - (B) the constating documents, articles or by-laws of [REDACTED],

- in each case, in a manner that would impair or limit Project Co's ability to perform its obligations under this Project Agreement;
- (vi) this Project Agreement has been duly authorized, executed, and delivered by Project Co and by [REDACTED] in its capacity as partner of Project Co and constitutes a legal, valid, and binding obligation of Project Co, [REDACTED] enforceable against each of them in accordance with its terms, subject only to:
- (A) limitations with respect to the enforcement of remedies by bankruptcy, insolvency, moratorium, winding-up, arrangement, reorganization, fraudulent preference and conveyance and other laws of general application affecting the enforcement of creditors' rights generally; and
 - (B) general equitable principles and the fact that the availability of equitable remedies is in the discretion of a court and that a court may stay proceedings or the execution of judgments;
- (vii) the execution, delivery, and performance by Project Co, and by [REDACTED] in its capacity as partner of Project Co, of this Project Agreement does not and will not violate or conflict with, or constitute a default under:
- (A) its constating, formation or organizational documents, including any by-laws or partnership agreements;
 - (B) any Applicable Law; or
 - (C) any covenant, contract, agreement, or understanding to which it is a party or by which it or any of its properties or assets is bound or affected;
- (viii) no Project Co Event of Default has occurred and is continuing;
- (ix) all of the information regarding [REDACTED] set out in Schedule 29 - Project Co Information is true and correct in all material respects;
- (x) there are no actions, suits, proceedings, or investigations pending or threatened against Project Co, [REDACTED] or, to Project Co's knowledge, any Project Co Party at law or in equity before any Governmental Authority or arbitral body (whether or not covered by insurance) that individually or in the aggregate could result in any material adverse effect on the business, properties, or assets, or the condition, financial or otherwise, of Project Co or in any impairment of its ability to perform its obligations under this Project Agreement, and Project Co has no knowledge of any violation or default with respect to any order, writ, injunction, or decree of any Governmental Authority or arbitral body that could result in any such material adverse effect or impairment;
- (xi) Project Co has conducted its own investigations and has carefully reviewed the whole of this Project Agreement, and all other documents made available to Project Co by or on behalf of the City and, to Project Co's knowledge, nothing contained herein or therein inhibits or prevents Project Co from completing the Works or performing the Maintenance and Rehabilitation Services in accordance with this Project Agreement in a

- good and safe manner so as to achieve and satisfy the requirements of this Project Agreement;
- (xii) Project Co, and [REDACTED] in its capacity as partner of Project Co, is able to meet its obligations as they generally become due;
 - (xiii) Project Co is registered under Division V of Part IX of the *Excise Tax Act* (Canada);
 - (xiv) the Scheduled Substantial Completion Date is a realistic date and is achievable by Project Co performing the Works in accordance with this Project Agreement;
 - (xv) each of Project Co, [REDACTED] is not a Non-Resident;
 - (xvi) no Restricted Person has Direct or Indirect Power or Control over any member of the Project Co Group in relation to the decisions, management, actions or policies of Project Co or in relation to the operation, management and ownership of the Project;
 - (xvii) to the knowledge of Project Co, no Restricted Person has directly or indirectly, an Economic Interest in Project Co or the Project;
 - (xviii) either:
 - (A) the COR-Certified Construction Project Co Party is in possession of its COR Certification in good standing as required under this Project Agreement and has the ability to maintain such COR Certification in good standing at all times during the performance of the Works in accordance with its terms, provisions and conditions; or
 - (B) the COR-Qualified Construction Project Co Party:
 - (I) is in possession of its OHSAS 18001 Accreditation which remains in good standing and has the ability to maintain such OHSAS 18001 Accreditation in good standing at all times during the performance of the Works until such COR-Qualified Construction Project Co Party receives its COR Certification as required under this Project Agreement; and
 - (II) has made an application to the IHSA for its COR Certification as required under this Project Agreement (or has made an application to IHSA for its Health and Safety Certificate as required under this Project Agreement) and has the ability to maintain such Health and Safety Certification until the Final Completion Date in accordance with its terms, provisions and conditions.

5.2 Representations and Warranties of the City

- (a) The City represents and warrants to Project Co that as of Commercial Close:
 - (i) the execution and delivery of this Project Agreement and all documents, instruments and agreements required to be executed and delivered by the City pursuant to this Project

Agreement, and the completion of the transactions contemplated by this Project Agreement, have been duly authorized, and this Project Agreement has been duly executed and delivered by the City and constitutes a legal, valid and binding obligation of the City enforceable in accordance with its terms, except as may be limited by laws of general application affecting the enforceability of remedies and rights of creditors and except that equitable remedies such as specific performance and injunction are in the discretion of a court and except as may be subject to the special jurisdiction and powers of the Ontario Municipal Board over defaulting municipalities under the *Municipal Affairs Act*, R.S.O. 1990 c. M.46, as amended;

- (ii) the City is a municipal corporation duly and validly constituted and subsisting under the laws of the Province of Ontario and has full power and capacity to execute and deliver this Project Agreement and carry out the transactions contemplated by and duly observe and perform all of its obligations contained in this Project Agreement and all documents, instruments and agreements required to be executed and delivered by the City pursuant to this Project Agreement;
- (iii) the execution, delivery, and performance by the City of this Project Agreement does not and will not violate or conflict with, or constitute a default under:
 - (A) any Applicable Law (including, for greater certainty, the *City of Ottawa Act 1999* (Ontario) and any by-laws issued in accordance therewith; or
 - (B) any covenant, contract, agreement, or understanding relating to the Project or the Lands to which it is a party or by which it or any of its properties or assets is bound or affected;
- (iv) the City has obtained all consents and approvals required for the execution by the City of, and performance of its obligations under this Project Agreement;
- (v) other than any proceeding under the *Expropriations Act*, (Ontario) which could delay the acquisition by the City of the Lands therein, there are no current and, to the knowledge of the City, there are no pending or threatened actions, claims, demands, lawsuits, assessments, arbitrations, judgments, awards, decrees, orders, injunctions, prosecutions, or other proceedings of, by, against, or relating to, the City which, individually or in the aggregate, could have a material adverse effect on the Project or the ability of the City to perform its obligations under this Project Agreement and the City does not Have Knowledge of any basis for any such action, claim, demand, lawsuit, assessment, arbitration, judgment, award, decree, order, injunction, prosecution or other proceeding;
- (vi) the City has (or, in the case of the Additional Property Interests, will have) acquired the Lands and Additional Property Interests sufficient to enable to City to grant or to cause to be granted to Project Co the license rights contemplated in Section 14.2;
- (vii) the Project is permitted by the existing official plan, zoning and other land use restrictions applicable to the City and the Project; and
- (viii) the City is able to meet its obligations as they generally become due.

- (b) The City represents and warrants to Project Co that as of Commercial Close, no City Event of Default has occurred and is continuing.
- (c) The representations and warranties contained in Sections 5.2(a)(i), 5.2(a)(ii), 5.2(a)(iii), 5.2(a)(iv), 5.2(a)(v), 5.2(a)(vi) and 5.2(a)(vii) shall survive the Financial Close and shall not be deemed to be merged thereon. The remaining representations and warranties contained in Section 5.2(a) shall be deemed to have merged on the Financial Close.

6. BACKGROUND INFORMATION

6.1 No Liability

- (a) Except as expressly provided in Sections 6.4, 16.1, 16.2, 16.3, 16.4 and 16.5 neither the City nor any other City Party shall be liable to Project Co or any Project Co Party for, and Project Co or any Project Co Party shall not seek to recover from the City or any other City Party, any damages, losses, costs, liabilities or expenses which may arise (whether in contract, tort or otherwise) from the adoption, use or application of the Background Information by, or on behalf of, Project Co or any Project Co Party.

6.2 No Warranty

- (a) Except as expressly provided in this Project Agreement, including Sections 6.4, 16.1, 16.2, 16.3, 16.4 and 16.5:
 - (i) neither the City nor any other City Party gives any warranty or undertaking of whatever nature in respect of the Background Information and, specifically (but without limitation), neither the City nor any other City Party warrants that the Background Information represents all of the information in its possession or control (either during the conduct of the procurement process for the Project or at the time of execution and delivery of this Project Agreement) relevant or material to or in connection with the Project or the obligations of Project Co under this Project Agreement or under any of the Project Documents; and
 - (ii) neither the City nor any other City Party shall be liable to Project Co or any Project Co Party in respect of any failure, whether before, on or after the execution and delivery of this Project Agreement:
 - (A) to disclose or make available to Project Co or any Project Co Party any information, documents or data;
 - (B) to review or update the Background Information; or
 - (C) to inform Project Co or any Project Co Party of any inaccuracy, error, omission, defect or inadequacy in the Background Information.

6.3 No Claims

- (a) Project Co acknowledges and confirms that:

- (i) it has conducted its own analysis and review of the Background Information and has, before the execution and delivery of this Project Agreement, satisfied itself as to the accuracy, completeness and fitness for purpose of any such Background Information upon which it places reliance; and
 - (ii) except as expressly provided in Sections 6.4, 16.1, 16.2, 16.3, 16.4 and 16.5, it shall not be entitled to and shall not, and shall ensure that no Project Co Party shall, make any claim against the City or any City Party (whether in contract, tort or otherwise), including any claim in damages, for extensions of time or for additional payments under this Project Agreement on the grounds:
 - (A) of any misunderstanding or misapprehension in respect of the Background Information; or
 - (B) that the Background Information was incorrect or insufficient,
- nor shall Project Co be relieved from any of its obligations under this Project Agreement on any such grounds.

6.4 Technical Reports

- (a) The City agrees that, if as of Commercial Close, except as disclosed in any Background Information or as otherwise disclosed by the City or any City Party, or known by Project Co or any Project Co Party, in each case prior to the date that is 30 days prior to the RFP Technical Submission Deadline, any of the information in the Technical Reports is, to the actual knowledge of the City, incorrect or there is relevant information in the possession or control of the City that would make any of the information in the Technical Reports incorrect, then, to the extent that such incorrect information materially adversely interferes with Project Co's ability to perform the Project Operations or materially adversely affects Project Co's cost of performing the Project Operations, such incorrect information shall, subject to and in accordance with Schedule 21 - Variation Procedure, result in a Variation.
- (b) For the purposes of Section 6.4(a), "to the actual knowledge of the City" means to the actual knowledge of the City Project Manager.

7. PROJECT DOCUMENTS

7.1 Project Documents

- (a) Project Co shall perform its obligations under, and observe all of the provisions of, each of the Project Documents to which it is a party, and shall ensure that each Project Co Party shall perform its obligations under, and observe all of the provisions of, each of the Project Documents to which such Project Co Party is a party, so as to ensure that other parties to such Project Documents shall not be entitled to terminate same. In the event that Project Co receives a notice of default under any of the Project Documents, it shall promptly, and, in any event, no later than 2 Business Days after receipt thereof, deliver a copy of such notice of default to the City.

7.2 Ancillary Documents

- (a) Project Co shall not:
- (i) terminate or agree to the termination of all or part of any Ancillary Document, except pursuant to Sections 31.3, 43.5, 57.3 and 58.2 or otherwise to prevent or cure a Project Co Event of Default (provided that commercially reasonable alternative measures would not prevent or cure such Project Co Event of Default);
 - (ii) make or agree to any amendment, restatement or other modification of any Ancillary Document that materially adversely affects Project Co's ability to perform its obligations under this Project Agreement or that has the effect of increasing any liability of the City, whether actual or potential;
 - (iii) breach its obligations (or waive or allow to lapse any rights it may have) or permit others to breach their obligations (or waive or allow to lapse any rights they may have) under any Ancillary Document, that materially adversely affect Project Co's ability to perform its obligations under this Project Agreement or that have the effect of increasing any liability of the City, whether actual or potential; or
 - (iv) enter into, or permit the entry into by any other person of, any agreement replacing all or part of any Ancillary Document, except in the circumstances referenced in Section 7.2(a)(i),

without the prior written consent of the City, provided that, where consent is requested pursuant to Section 7.2(a)(i) or 7.2(a)(iv), such consent shall not be withheld, and shall be provided within a reasonable time, where the relevant matter referred to in Section 7.2(a)(i) or 7.2(a)(iv) will not materially adversely affect Project Co's ability to perform its obligations under this Project Agreement or have the effect of increasing any liability of the City, whether actual or potential. In the event of termination or agreement to the termination of all or part of any Ancillary Document as described in Section 7.2(a)(i) or any agreement replacing all or part of any Ancillary Document as described in Section 7.2(a)(iv), Project Co shall, to the extent applicable, comply with all provisions herein applicable to changes in Project Co Parties, including Section 57.3.

7.3 Changes to Lending Agreements and Refinancing

- (a) Subject to the terms of the Lenders' Direct Agreement, Project Co shall not terminate, amend or otherwise modify the Lending Agreements, or waive or exercise any of its rights under the Lending Agreements, if at the time such action is contemplated and effected, it would materially adversely affect Project Co's ability to perform its obligations under this Project Agreement or the Project Documents or have the effect of increasing the liability of the City whether actual or potential, unless such action is a Permitted Borrowing or a Refinancing effected in accordance with the provisions of Schedule 27 – Refinancing.

7.4 Compliance with Lending Agreements

- (a) Project Co shall keep the Lending Agreements in good standing to the extent necessary to perform its obligations under this Project Agreement and the Project Documents, and shall ensure that none of the terms and conditions of the Lending Agreements shall prevent Project Co from performing its obligations under this Project Agreement or the Project Documents.

8. CITY RESPONSIBILITIES

8.1 General

- (a) The City shall, at its own cost and risk:
- (i) perform all of its obligations under, and observe all provisions of, this Project Agreement in compliance with Applicable Law;
 - (ii) cooperate with Project Co in the fulfillment of the purposes and intent of this Project Agreement, provided, however, that the City shall not be under any obligation to perform any of Project Co's obligations under this Project Agreement;
 - (iii) acquire and give access to the Lands described in Schedule 33 – Lands, as amended from time to time, in accordance with the Commencement Dates and duration specified in the said Schedule;
 - (iv) make such payments to Project Co as are specifically provided for in this Project Agreement; and
 - (v) perform those additional obligations specifically provided for in this Project Agreement.
- (b) Nothing in this Project Agreement shall in any way fetter the right, authority and discretion of the City or any other counselor, officer, employee or official thereof in fulfilling its statutory or other functions under Applicable Law, and Project Co understands and agrees that nothing in this Project Agreement shall preclude the City from performing, discharging or exercising its duties, responsibilities, and powers under Applicable Law. Project Co further agrees that, subject to Section 37.1(b), it shall comply, and shall cause all relevant Project Co Parties to comply, with all written directions issued by or on behalf of the City from time to time.
- (c) The City shall, and shall cause all the City Parties to, take reasonable steps to minimize undue interference with the provision of the Project Operations by Project Co or any Project Co Party.
- (d) [Intentionally deleted].
- (e) The City shall provide for the attendance of the requisite number of suitably qualified employees for the employee training to be provided by Project Co in accordance with the requirements of Schedule 15-2 – Design and Construction Requirements.
- (f) The City shall provide suitably qualified drivers and controllers to support the required commissioning activities in accordance with the requirements of this Project Agreement.

8.2 City Permits, Licences, Approvals and Authorizations

- (a) The City shall, at its own cost and risk:
- (i) except as otherwise provided in Schedule 32 – City Permits, Licences, Approvals and Authorizations, obtain on or before Financial Close, and, maintain, and, as applicable,

- renew all City Permits, Licences, Approvals and Authorizations which may be required for the performance of the Project Operations;
- (ii) comply with all City Permits, Licences, Approvals and Authorizations, in accordance with their terms, and other Permits, Licences, Approvals and Authorizations to the extent obligations thereunder attributable to the City are not otherwise required be undertaken or assumed by Project Co hereunder; and
- (iii) execute all documents which, under Applicable Law, only the City as a land owner or as a counterparty to a Third Party Access Agreement is entitled to execute and which are required to obtain, maintain or renew any City Permits, Licences, Approvals and Authorizations.
- (b) The City shall, at its own cost, provide or cause to be provided such information, documentation, and administrative assistance as Project Co may request and as the City may reasonably be able to provide, and shall execute such applications as are required to be in its name, to enable Project Co or any Project Co Party to obtain, maintain or renew any Project Co Permits, Licences, Approvals and Authorizations or to demonstrate compliance with any Permits, Licences, Approvals and Authorizations, provided that the City shall not be responsible for obtaining or for any delay in obtaining or for the failure of Project Co or any Project Co Party to obtain any Project Co Permits, Licences, Approvals and Authorizations, unless such delay or failure is caused by any act or omission of the City, any City Party or any other person for whom the City is responsible at law. For greater certainty, the City shall not be obligated to:
- (i) exercise any other of its legal rights in order to avoid or eliminate the requirement to obtain any Permits, Licences, Approvals and Authorizations; and
- (ii) automatically grant Project Co Permits, Licences, Approvals and Authorizations for which it is the authorizing entity and will apply its usual procedures and criteria in considering applications from Project Co or any Project Co Party for such Project Co Permits, Licences, Approvals and Authorizations.
- (c) Notwithstanding the provisions of Section 9.4(a)(i), the City shall be responsible for all designations, assumptions, road closures, transfers and any other applicable requirements relating to the System which can only be effected by the City pursuant to the *Municipal Act, 2001* (Ontario), subject to receipt by the City of any required consent(s) from the Crown in right of Canada and subject to Project Co having, at its own cost, providing or causing to be provided such information, documentation, and technical or administrative assistance, as the City may request and as Project Co may reasonably be able to provide to enable the City to effect such requirements.

9. PROJECT CO RESPONSIBILITIES

9.1 Other Business

- (a) Project Co shall not engage in any activities which are not specifically related to, required by and conducted for the purpose of the Project without the prior written consent of the City, in its sole discretion.

9.2 General

- (a) Project Co shall, at its own cost and risk:
- (i) perform all of its obligations under, and observe all provisions of, this Project Agreement in compliance with Applicable Law;
 - (ii) perform all Project Operations:
 - (A) in compliance with Applicable Law;
 - (B) in compliance with all Permits, Licences, Approvals and Authorizations and so as to preserve the existence and continued effectiveness of any such Permits, Licences, Approvals and Authorizations;
 - (C) so as to satisfy the Output Specifications;
 - (D) in accordance with Good Industry Practice;
 - (E) in a manner consistent with the Integrated Management Systems and Integrated Management Plans, and the Project Co Proposal Extracts;
 - (F) in a timely and professional manner;
 - (G) with due regard to the health and safety of persons and property;
 - (H) subject to the other provisions of this Project Agreement, in a manner which will not impair the ability of the City or any City Party to comply with Applicable Law;
 - (I) subject to the other provisions of this Project Agreement, including as required to enable performance of the Project Operations, in a manner which will not impair the performance of the Governmental Activities; and
 - (J) in accordance with all other terms of this Project Agreement;
 - (iii) cooperate with the City in the fulfillment of the purposes and intent of this Project Agreement, provided however that Project Co shall not be under any obligation to perform any of the City's obligations under this Project Agreement;
 - (iv) cooperate with the City in respect of the City's consultations with Third Party Land Interest Holders in relation to the Project and the Project Operations;
 - (v) [intentionally deleted];
 - (vi) immediately notify the City Representative to the extent that Project Co becomes aware of any defect in the Lands, the Existing Revenue Vehicles or the System Infrastructure;
 - (vii) enter into any Utility Agreements that may be required to complete the Works;

- (viii) coordinate with the City all Construction Activities relating to New Municipal Infrastructure forming part of the Works on those parts of the Lands affected by Third Party Access Agreements, including the provision of the Works Schedule, Progress Works Schedule and any updates to the Works Schedule or Progress Works Schedule relating to such New Municipal Infrastructure, so as to minimize, to the extent reasonably possible, the impact of Construction Activities on the City operations and services provided by the City to the public; and
- (ix) immediately notify the City upon the receipt or notice of (and provide the City with copies of any correspondence received in relation to), any incident report, investigation report or similar correspondence (in each case, whether in draft or final form) issued by the Ministry of Labour or any other Governmental Authority in respect of the Project Operations.

9.3 Project Co Parties

- (a) Project Co shall not be relieved of any liability or obligation under this Project Agreement by the appointment of any Project Co Party, and Project Co shall cause each Project Co Party, to the extent such Project Co Party performs or is specified hereunder to perform the Project Operations, to comply with the obligations of Project Co hereunder in the same manner and to the same extent as Project Co.

9.4 Project Co Permits, Licences, Approvals and Authorizations

- (a) Project Co shall, at its own cost and risk:
 - (i) obtain, maintain, and, as applicable, renew all Project Co Permits, Licences, Approvals and Authorizations which may be required for the performance of the Project Operations;
 - (ii) except for those obligations which are identified as the City obligations in Schedule 32 – Permits, Licences, Approvals and Authorizations, during the Project Term, perform all of the obligations of the City under the City Permits, Licences, Approvals and Authorizations (and for greater certainty, the Development Approvals) relating to the Project Operations;
 - (iii) comply with all Permits, Licences, Approvals and Authorizations in accordance with their terms; and
 - (iv) provide all security, including all letters of credit, that may be required in connection with any Project Co Permits, Licences, Approvals and Authorizations, provided that, if the City is able to obtain an exemption from such security on behalf of Project Co and with respect to the Project,
 - (A) Project Co shall provide to the City an accurate accounting of the costs and expenses avoided by Project Co as a result of any such exemption; and
 - (B) the City shall be permitted to deduct an amount equal to all costs and expenses that were avoided by Project Co as a result of any such exemption from the Substantial Completion Payment.

- (b) Where Project Co Permits, Licences, Approvals and Authorizations have requirements that may impose any conditions, liabilities or obligations on the City or any City Party, Project Co shall not obtain, amend or renew (other than upon the same or better terms and conditions) such Project Co Permits, Licences, Approvals and Authorizations without the prior written consent of the City, provided that, and subject to the City's compliance with its obligations under Section 8.2(b), neither the City nor any City Party shall be responsible for obtaining or for the failure of Project Co to obtain any Project Co Permits, Licences, Approvals and Authorizations. The City shall comply, or shall require compliance, with any conditions, liabilities or obligations as are imposed on the City or any City Party by the requirements of any Project Co Permits, Licences, Approvals and Authorizations obtained with the City's consent under this Section 9.4(b).
- (c) The City shall provide Project Co with such information and administrative assistance as Project Co may reasonably request in relation to the Permits, Licences, Approvals and Authorizations. In respect of Section 9.4(a)(ii), the City shall, in a timely manner,
 - (i) provide Project Co with relevant information and copies of notices received under the applicable City Permits, Licences, Approvals and Authorizations; and
 - (ii) subject to the provisions of this Project Agreement relating to Permits, Licences, Approvals and Authorizations, execute and renew any documents under the applicable City Permits, Licences, Approvals and Authorizations which Applicable Law dictates that only the City can execute and renew.
- (d) Project Co shall, at its own cost, provide or cause to be provided such information, documentation, and administrative assistance as the City may request and as Project Co may reasonably be able to provide, and shall execute such applications as are required to be in its name, to enable the City to obtain, maintain or renew any City Permits, Licences, Approvals and Authorizations or to demonstrate compliance with any Permits, Licences, Approvals and Authorizations, provided that Project Co shall not be responsible for obtaining or for any delay in obtaining or for the failure of the City to obtain any City Permits, Licences, Approvals and Authorizations, unless such delay or failure is caused by any act or omission of Project Co, any Project Co Party or any other person for whom Project Co is responsible at law.
- (e) With respect to the NCC FLUDA:
 - (i) the City shall obtain the NCC FLUDA, but can only do so with Project Co's performance of the obligations set out in Section 9.4(e)(ii);
 - (ii) Project Co shall use commercially reasonable efforts to assist the City in obtaining the NCC FLUDA as required from time to time including, without limitation:
 - (A) the preparation and delivery of all Design Data in respect of the NCC FLUDA pursuant to Schedule 10 – Review Procedure;
 - (B) the preparation and delivery of Design Development Submittals and/or Construction Development Submittals pursuant to Section 20.3 that are reasonably necessary to obtain the NCC FLUDA;

- (C) the preparation and delivery of such other plans, specifications, agreements, documents and instruments in respect of the Design and Construction Works and/or the Maintenance Services and amendments thereto that are reasonably necessary to obtain the NCC FLUDA; and
 - (D) Project Co shall make changes to the Design Data as required by NCC to further assist the City in obtaining the NCC FLUDA and Project Co shall take such other actions as may be reasonably directed by the City from time to time with respect thereto; and
- (iii) if, following Commercial Close:
- (A) NCC requires a change to the Design Data or any other additional obligation to be assumed in respect of the NCC FLUDA pursuant to Section 9.4(a); and
 - (B) the City, in a timely manner, requires Project Co to make such change or to assume such additional obligation,
- provided the change or other obligation is not otherwise a responsibility or obligation of Project Co under this Project Agreement, then such change or obligation shall result in a Variation subject to and in accordance with Schedule 21 – Variation Procedure.
- (f) If, prior to the Scheduled Substantial Completion Date, the City fails to issue to Project Co a final determination (a granting, conditional granting, or refusal) in respect of a Listed Project Co PLAA prior to the expiration of [REDACTED] per cent of the number of Business Days (rounding up to Business Days if such calculation results in a certain number of Business Days plus a fraction of a Business Day) designated for a final determination by the City in Appendix A to Schedule 32 – Permits, Licences, Approvals and Authorizations for the applicable Listed Project Co PLAA (the “**City PLAA Deadline**”), then any delay in the Works or additional costs in respect of the Works caused by the failure to make a final determination by the City PLAA Deadline shall, subject to and in accordance with Section 38, be treated as a Delay Event and, subject to and in accordance with Section 39, be treated as a Compensation Event, provided that:
- (i) the applicable Project Co Permit, Licence, Approval or Agreement is a Listed Project Co PLAA;
 - (ii) Project Co has fulfilled all obligations pursuant to Applicable Law, in accordance with any deadline applicable to the Listed Project Co PLAA imposed by this Project Agreement or the City, including providing timely and thorough responses to questions or concerns posed by the City in respect of the Listed Project Co PLAA;
 - (iii) Project Co submitted the applicable Listed Project Co PLAA in accordance with the timing for such submission in the Works Schedule or Recovery Schedule, as applicable (in each case, as such submission date may be extended on account of any Delay Event); and
 - (iv) Project Co’s application for the Listed Project Co PLAA and Project Co’s responses to all questions or concerns posed by the City were in accordance with Good Industry Practice.

- (g) For clarity, Section 9.4(f) does not entitle Project Co to a Delay Event or a Compensation Event,
- (i) in the event that the City's final determination on a Listed Project Co PLAA is made in a timely way, pursuant to the applicable City PLAA Deadline, but is not favourable to Project Co or Project Co disagrees with the substance of the final determination;
 - (ii) in the event that the City fails to issue to Project Co a final determination in respect of a Permit, Licence, Approval or Authorization that is not explicitly listed as a Listed Project Co PLAA; or
 - (iii) with respect to,
 - (A) Permits, Licences, Approvals or Agreements that are related to, but not explicitly included on, the Listed Project Co PLAAs; or
 - (B) the Traffic and Transit Management Plan.
- (h) Project Co shall, at its own cost and risk, provide to the City a system to track the status of each Listed Project Co PLAA through every stage of preparation, submission and approval (the "**Listed PLAA Tracking System**"). More specifically, such Listed PLAA Tracking System shall:
- (i) be kept updated on a daily basis and be available to the City in real time through a web-based interface which would include functionality to provide automated email alerts to a customizable frequency and set of email addresses;
 - (ii) be operational no later than the date upon which the first Listed Project Co PLAA application is submitted; and
 - (iii) include a feature that highlights to the City each outstanding applicable Listed Project Co PLAA when it reaches the following milestone triggers:
 - (A) [REDACTED]% of the number of Business Days designated for a final determination by the City in Appendix A to Schedule 32 – Permits, Licences, Approvals and Authorizations for the applicable Listed Project Co PLAA;
 - (B) [REDACTED]% of the number of Business Days designated for a final determination by the City in Appendix A to Schedule 32 – Permits, Licences, Approvals and Authorizations for the applicable Listed Project Co PLAA; and
 - (C) 5 Business Days prior to the expiration of the City PLAA Deadline.
- (i) Project Co shall submit documentation on the proposed design, functionality, and usage of the Listed PLAA Tracking System to the City Representative in accordance with Schedule 10 – Review Procedure no later than 60 days after Financial Close.
- (j) In addition, Project Co shall provide written notice to the City Representative with respect to any outstanding Listed Project Co PLAA when it reaches the milestone triggers outlined in Section 9.4(h)(iii) above.

- (k) With respect to any failure to issue to Project Co a final determination in respect of a Listed Project Co PLAA prior to the expiration of the relevant City PLAA Deadline, Project Co shall not be entitled to the Delay Event or Compensation Event pursuant to Section 38.1(a)(xx) unless the Listed PLAA Tracking System as described in Section 9.4(g) is functional and available to the City, provides notice to the City of the milestone described in Section 9.4(h)(iii), and contains accurate information as to the status of the applicable Listed Project Co PLAA at all material times.

9.5 Safety and Security

- (a) During the Construction Period and following Final Completion solely in relation to Construction Activities, Project Co shall:
- (i) comply with the health and safety requirements in Schedule 11 – Integrated Management System and the Construction Safety Management Plan;
 - (ii) keep the Site, the New Municipal Infrastructure and the System Infrastructure in a safe and orderly state, as appropriate in accordance with the Construction Safety Management Plan and Good Industry Practice, to avoid danger to persons on the Site (including occupants and users of Lands affected by Third Party Access Agreements), on the New Municipal Infrastructure and on the System Infrastructure, and in the immediate vicinity of the Site (including New Municipal Infrastructure on those parts of the Lands affected by Third Party Access Agreements) and System Infrastructure;
 - (iii) take such measures as are reasonable in accordance with Good Industry Practice to maintain and secure the Site, New Municipal Infrastructure and System Infrastructure to prevent access of any persons or creatures not entitled to be there once Project Co has been granted access to the Site or has commenced Works on the New Municipal Infrastructure and System Infrastructure;
 - (iv) comply, and cause each Project Co Party to comply, with Applicable Law relating to health and safety, including the *Occupational Health and Safety Act* (Ontario) and all regulations thereto;
 - (v) with respect to the Works, cause a COR-Certified Construction Project Co Party or, prior to receipt of COR Certification, a COR-Qualified Construction Project Co Party, to perform, all of the obligations of the "constructor", and indemnify the City and each City Party against any and all of the liabilities of the "constructor", under the *Occupational Health and Safety Act* (Ontario) and all regulations thereto;
 - (vi) provide the City with a certificate of good standing from WSIB or any successor thereto once every 90 days from Financial Close until Final Completion, and from Final Completion until the Termination Date, at the request of the City Representative from time to time; and
 - (vii) For clarity, subject to Project Co warranty obligations relating to New Municipal Infrastructure as set out in the Output Specifications and Project Co obligations relating to the condition of the Lands within or upon which the New Municipal Infrastructure has

been constructed, following the delivery of the Final New Municipal Infrastructure Works Acceptance Certificate, Project Co's obligations under this Section 9.5 with respect to the New Municipal Infrastructure shall terminate and be of no further force or effect.

- (b) During the Maintenance Period, Project Co shall:
- (i) cooperate with the City, the Operator, and any Governmental Authority, as appropriate, with a view to securing and protecting the security of the System Infrastructure and protecting the security of System Users;
 - (ii) notify the City of any breach of security or potential breach of security on or off the System Infrastructure of which Project Co is aware;
 - (iii) cooperate with the City, the Operator, any Governmental Authority and the Emergency Service Provider in relation to the planning, organisation and control of extraordinary Passenger movements resulting from the holding of special events as contemplated pursuant to the Output Specifications;
 - (iv) cooperate with any special enquiries or investigations carried out by the City, the Operator, Emergency Service Providers or any Governmental Authority as a result of accidents, incidents or changes in Applicable Law and shall promptly provide to the City, the Emergency Service Providers and any Governmental Authority (as the case may be) all information, resources and facilities within its control which are reasonably required for such enquiries or investigations;
 - (v) comply with the Safety Management Plan and Emergency Response Plan;
 - (vi) cooperate with the Operator and follow the safety and security instructions set out in the Capital Railway Rules and the Standard Operating Procedures, including any verbal instructions by individuals authorized in accordance with the LRT Rules and Standard Operating Procedures, and comply with all requirements set out in the Output Specifications related to safety and security;
 - (vii) in an Emergency situation or when an urgent security matter arises in respect of the safety or security of the System Infrastructure or the System Users, take instruction from the Operator and the City with respect to maintaining the security and safety of the System Infrastructure and the System Users; and
 - (viii) with respect to the Maintenance and Rehabilitation Services, cause a Maintenance and Rehabilitation Project Co Party with an accredited ISO 45001 safety management system or, prior to receipt of accreditation, a Maintenance and Rehabilitation Project Co Party with a safety management system compliant with ISO 45001, to perform all Maintenance and Rehabilitation Services and indemnify the City and each City Party against any and all of the liabilities of the "constructor", under the *Occupational Health and Safety Act* (Ontario) and all regulations thereto at any time that Project Co is acting as a "constructor" on the Site following Substantial Completion.

9.6 Health and Safety Certification

- (a) Project Co shall, at its own cost and risk, at all times during the performance of the Works cause a COR-Qualified Construction Project Co Party or COR-Certified Construction Project Co Party, as the case may be, to:
- (i) to the extent a COR-Qualified Construction Project Co Party has not obtained COR Certification prior to Financial Close,
 - (A) use best efforts to obtain its COR Certification no later than eighteen months following Financial Close. In the event that the City is satisfied, in its sole discretion, that the COR-Qualified Construction Project Co Party has used best efforts to obtain its COR Certification in accordance with this Section 9.6 and the COR-Qualified Construction Project Co Party has not obtained COR Certification by the end of such eighteen month period, then the City shall establish a time period during which the COR-Qualified Construction Project Co Party shall obtain its COR Certification, which time period shall not be less than 30 days, and
 - (B) maintain in good standing and, as applicable, renew its ISO 45001 Accreditation or OHSAS 18001 Accreditation until such time as the COR-Qualified Construction Project Co Party has obtained its COR Certification,
 - (ii) once the COR-Qualified Construction Project Co Party is certified (thereafter referred to as a “**COR-Certified Construction Project Co Party**”), maintain in good standing, and as applicable, renew its COR Certification; and
 - (iii) comply with all requirements of its ISO 45001 Accreditation or OHSAS 18001 Accreditation (if a COR-Qualified Construction Project Co Party) or COR Certification (if a COR-Certified Construction Project Co Party), in accordance with its terms.
- (b) Project Co shall, at its own cost and risk, at all times beginning on the date the Substantial Completion Countdown Notice is issued until the end of the Project Term cause the ISO 45001 Compliant Maintenance and Rehabilitation Project Co Party or ISO 45001 Accredited Maintenance and Rehabilitation Project Co Party to:
- (i) to the extent a ISO 45001 Compliant Maintenance and Rehabilitation Project Co Party has not obtained its ISO 45001 Accreditation prior to the date the Substantial Completion Countdown Notice is issued, use best efforts to obtain its ISO 45001 Accreditation no later than twelve months following the date the Substantial Completion Countdown Notice is issued. In the event that the City is satisfied, in their sole discretion, that the ISO 45001 Compliant Maintenance and Rehabilitation Project Co Party has used best efforts to obtain its ISO 45001 Accreditation in accordance with this Section 9.6 and the ISO 45001 Compliant Maintenance and Rehabilitation Project Co Party has not obtained its ISO 45001 Accreditation by the end of such twelve month period, then the City shall establish a time period during which the ISO 45001 Compliant Maintenance and Rehabilitation Project Co Party shall obtain its ISO 45001 Accreditation, which time period shall not be less than six months;

- (ii) once the ISO 45001 Compliant Maintenance and Rehabilitation Project Co Party is accredited (thereafter referred to as a “**ISO 45001 Accredited Maintenance and Rehabilitation Project Co Party**”), maintain in good standing, and, as applicable, renew its ISO 45001 Accreditation; and
 - (iii) comply with all requirements of its ISO 45001 Accreditation in accordance with its terms.
- (c) Without limiting any other provision of this Project Agreement, if at any time during the performance of the Project Operations:
- (i) a COR-Qualified Construction Project Co Party or a ISO 45001 Compliant Maintenance and Rehabilitation Project Co Party fails to obtain its COR Certification or ISO 45001 Accreditation in accordance with this Project Agreement and the City determines that the failure to obtain the COR Certification or ISO 45001 Accreditation is as a result of such COR-Qualified Construction Project Co Party or such ISO 45001 Compliant Maintenance and Rehabilitation Project Co Party, as the case may be, not using best efforts to obtain such certification or accreditation and the City delivers a Notice to Project Co indicating that a COR-Qualified Construction Project Co Party or a ISO 45001 Compliant Maintenance and Rehabilitation Project Co Party, as the case may be, has failed to obtain its COR Certification or ISO 45001 Accreditation in accordance with this Project Agreement; or
 - (ii) a COR-Qualified Construction Project Co Party fails to maintain its ISO 45001 Accreditation or OHSAS 18001 Accreditation in good standing in accordance with its terms or in accordance with this Project Agreement; or
 - (iii) a COR-Certified Construction Project Co Party or an ISO 45001 Accredited Maintenance and Rehabilitation Project Co Party, as the case may be, fails to maintain its COR Certification or its ISO 45001 Accreditation in good standing in accordance with its terms or in accordance with this Project Agreement;
- (each, an “**H&S Certification Default Event**”); or
- (iv) the City delivers a Notice to Project Co indicating that the City has reasonable cause to believe that a COR-Qualified Construction Project Co Party will fail to maintain its ISO 45001 Accreditation or OHSAS 18001 Accreditation in good standing in accordance with its terms or in accordance with this Project Agreement; or
 - (v) the City delivers a Notice to Project Co indicating that the City has reasonable cause to believe that a COR-Certified Construction Project Co Party or ISO 45001 Accredited Maintenance and Rehabilitation Project Co Party, as the case may be, will fail to maintain its COR Certification or ISO 45001 Accreditation in good standing in accordance with its terms or in accordance with this Project Agreement,

Project Co shall:

- (vi) immediately upon the occurrence of a H&S Certification Default Event, notify the City that a H&S Certification Default Event has occurred, and:
 - (A) produce and deliver to the City a report identifying the reasons for the failure to obtain or maintain in good standing the COR Certification, ISO 45001 Accreditation or OHSAS 18001 Accreditation, as the case may be;
 - (B) produce and deliver to the City a plan showing the steps that are to be taken to have the COR Certification or ISO 45001 Accreditation or OHSAS 18001 Accreditation, as the case may be, obtained or reinstated in good standing within a period of not more than 90 days (the "**H&S Certification Reinstatement Plan**"), which H&S Certification Reinstatement Plan shall be subject to review and approval by the City and, to the extent the City requires any amendments or revisions to be made to the H&S Certification Reinstatement Plan, Project Co shall take, and shall cause the COR-Qualified Construction Project Co Party, the COR-Certified Construction Project Co Party, the ISO 45001 Compliant Maintenance and Rehabilitation Project Co Party, or the ISO 45001 Accredited Maintenance and Rehabilitation Project Co Party, as the case may be, to take, all reasonable steps as may be necessary to make all such required amendments and revisions and deliver to the City an amended H&S Certification Reinstatement Plan not more than 5 Business Days from the date on which such request is made by the City;
 - (C) no later than 5 Business Days after the H&S Certification Default Event occurs, arrange to have conducted a complete H&S Construction Inspection or H&S Maintenance Inspection, as the case may be, in accordance with Section 13(b); and
 - (D) arrange to have conducted an H&S Construction Re-Inspection or H&S Maintenance Re-Inspection, as the case may be in accordance with Section 13(d), if required, or
- (vii) within 10 Business Days of receipt of the Notice from the City under 9.6(c)(iv) or 9.6(c)(v):
 - (A) produce and deliver to the City Representative a report identifying the manner in which the COR Certification or ISO 45001 Accreditation or OHSAS 18001 Accreditation, as the case may be, shall be maintained in good standing or obtained, as applicable;
 - (B) produce and deliver to the City Representative a plan showing the steps that are to be taken to ensure that the COR Certification or ISO 45001 Accreditation or OHSAS 18001 Accreditation, as the case may be, will be maintained in good standing without interruption (the "**H&S Certification Maintenance Plan**"), which H&S Certification Maintenance Plan shall be subject to review and approval by the City and, to the extent the City require any amendments or

revisions to be made to the H&S Certification Maintenance Plan, Project Co shall take all reasonable steps as may be necessary to make all such required amendments and revisions and deliver to the City an amended H&S Certification Maintenance Plan not more than 10 Business Days from the date on which such request is made by the City;

- (C) arrange to have conducted a complete H&S Construction Inspection or H&S Maintenance Inspection, as the case may be, in accordance with Section 13(b); and
- (D) arrange to have conducted an H&S Construction Re-Inspection or H&S Maintenance Re-Inspection, as the case may be, in accordance with Section 13(e)(ii), if required.

9.7 Protest and Trespass

- (a) Except as otherwise provided in this Project Agreement, the City shall not be responsible for the presence of any persons participating in civil disobedience, demonstration or protest action (“**Protesters**”) or any other persons otherwise not entitled to be on or around the Lands (“**Trespassers**”). For greater certainty, the presence of, or interference by, any Protesters or Trespassers on or around the Lands shall not be a breach of the obligation of the City to grant license rights of use and access to Project Co on and over the Lands pursuant to Section 14 nor a breach of any other obligation, representation or warranty under this Project Agreement.
- (b) Except as set out in this Project Agreement, throughout the Construction Period, the management of any Protesters or Trespassers shall be the responsibility of Project Co in respect of the Site, to the extent such management is not otherwise the responsibility of the Police Service.
- (c) During the Maintenance Period, if Protesters or Trespassers occupy the System or access to the System is prevented or interfered with by Protesters or Trespassers, Project Co shall use all appropriate measures reasonable in the circumstances to assist the City in managing such Protesters or Trespassers and promptly notify the City Representative of such occurrence. For clarity, during the Maintenance Period, Project Co shall be responsible for the management of any Protesters or Trespassers on the New Walkley Yard to the extent such management is not otherwise the responsibility of the Police Service.
- (d) Project Co may exercise any legal remedy available to it to remove Protesters or Trespassers from the Site, and/or the New Walkley Yard, provided that if Project Co does elect to exercise any such legal remedy, Project Co shall give the City Representative at least 24 hours' Notice prior to commencing any such legal proceeding (except in a case of Emergency, danger to persons or material destruction or material damage to property where, in such circumstances, such Notice may be given to the City less than 24 hours prior to the commencement of such legal proceeding) and shall continually update the City Representative as to the status of any such legal proceeding in reasonable detail and at reasonable intervals, and provided further that:
 - (i) Project Co shall not give directly or indirectly to any Protester or Trespasser any inducement, monetary or otherwise, with a view to avoiding, limiting or influencing the

- manner of protest activities by that Protester or Trespasser or by other Protesters or Trespassers; and
- (ii) Project Co shall not by virtue of this Section 9.7(d) be prevented from entering into bona fide settlements of claims brought against it by Protesters or Trespassers which provide for reasonable payments in satisfaction of such claims or agreeing to any reasonable cost orders in any proceedings.
- (e) Project Co may request the assistance of the City (at the cost of Project Co) to remove Protesters or Trespassers during the periods, and for the Site, facilities or infrastructure set out in Section 9.7(b) if Project Co demonstrates to the City's reasonable satisfaction that:
- (i) Project Co is pursuing legal remedies available to it to remove the Protesters or Trespassers (provided that for this purpose Project Co may, but shall not be obligated to, prosecute injunctive or other judicial remedies beyond the court of first instance); and
- (ii) the continued presence of the Protesters or Trespassers is having a material adverse effect on the conduct of the Works or the Maintenance and Rehabilitation Services (as the case may be) that Project Co is unable to mitigate.

Following such request, the City shall notify Project Co whether the City can lawfully provide any assistance in relation to the removal of the Protesters or Trespassers that is not independently available to Project Co and, to the extent that such assistance can be lawfully provided, the City shall provide such assistance (at the cost of Project Co) to the extent it is, in the discretion of the City, reasonable and appropriate in the circumstances to do so.

9.8 Additional Works and Third Party Works

- (a) Project Co shall, having regard to Project Co's obligations set out in Section 15, arrange and carry out all coordination of the Project Operations with the Third Party Works directly with the applicable Third Party Contractor.
- (b) The City may, in its sole discretion, carry out Additional Works.
- (c) The City may assign the methods and manner of construction (where applicable) of the Additional Works, the coordination and scheduling of the Additional Works and the safety training in respect of the Additional Works to Project Co. For clarity, the City may, in its sole discretion, assign such responsibilities to Project Co during either or both of the Construction Period or Maintenance Period.
- (d) In connection with the Additional Works, the City shall,
- (i) cause Additional Contractors to comply with the instructions of Project Co relating to matters of health and safety on the Site, methods and manner of construction (where applicable), and coordination and scheduling of the Additional Works with,
- (A) the Works during the Construction Period; and
- (B) the Maintenance and Rehabilitation Services during the Maintenance Period;

- (ii) enter into separate contracts with Additional Contractors,
 - (A) under conditions of contract which are compatible with the conditions of this Project Agreement;
 - (B) that require Additional Contractors to comply with Section 9.8(e) and all directions of Project Co in respect of any matter regarding health and safety on the Site, and methods and manner of construction (where applicable); and
 - (C) that require Additional Contractors to comply with Project Co's coordination and scheduling of the Additional Works; and
 - (iii) ensure that insurance coverage is provided by each Additional Contractor as would be required by a prudent owner similarly situated and coordinate such insurance with the insurance coverage of Project Co and in any event, such insurance shall provide for liability insurance of not less than \$[REDACTED].
- (e) In connection with the Additional Works, if the City has assigned responsibilities to Project Co pursuant to this Section 9.8, Project Co shall,
- (i) provide for the methods and manner of construction (where applicable) of the Additional Works and the coordination and scheduling of the Additional Works with the Works or Maintenance and Rehabilitation Services, as applicable, to be performed under this Project Agreement;
 - (ii) assume overall responsibility for compliance with all aspects of Applicable Law relating to health and safety at the Site, including all the responsibilities of the 'constructor' under the *Occupational Health and Safety Act* (Ontario), prior to Substantial Completion and, exercised in a manner consistent with the said Act, at any time that Project Co is acting as a 'constructor' on the Site following Substantial Completion;
 - (iii) provide Additional Contractors reasonable opportunity to introduce and store their products and use their construction machinery and equipment to execute the Additional Works, as applicable;
 - (iv) participate with the City and Additional Contractors in reviewing the construction schedules of Additional Contractors, when directed to do so by the City; and
 - (v) if part of the Works is affected by or depends upon, for its proper execution, the Additional Works, promptly report to the City in writing and prior to proceeding with that part of the Works any readily apparent deficiencies in the Additional Works. Failure by Project Co to so report shall invalidate any claims against the City by reason of such readily apparent deficiencies.
- (f) In the case of Additional Works carried out prior to Substantial Completion, if:
- (i) any Additional Contractors cause any damage to the Works;

- (ii) Project Co incurs any additional costs or there is any delay in the Works Schedule as a result of any Additional Contractors not complying with the coordination, scheduling and safety instructions of Project Co; or
- (iii) subject to the performance by Project Co of its obligations under this Section 9.8, if Project Co incurs any additional costs or there is any delay in the Works Schedule as a result of any such Additional Works,

then any such delay in the Works Schedule or additional costs in respect of the Works shall, subject to and in accordance with Section 38 be treated as a Delay Event and, subject to and in accordance with Section 39, be treated as a Compensation Event.

- (g) Claims, disputes, and other matters in question between Project Co and Additional Contractors shall be dealt with in substantially the same manner as contemplated in Schedule 26 - Dispute Resolution Procedure provided that the Additional Contractors and the City have made commercially reasonable efforts to ensure that provisions similar to Schedule 26 – Dispute Resolution Procedure have been included in the contracts between the City and the Additional Contractors. Project Co shall be deemed to have consented to arbitration of any dispute with any Additional Contractor whose contract with the City contains a similar agreement to arbitrate.
- (h) In connection with the Additional Works, Project Co may request a Variation as follows:
 - (i) Project Co shall have a period of 10 Business Days following Notice from the City of the City's intention to carry out such Additional Works, including a reasonable description of such Additional Works, to request a Variation if such Additional Works are,
 - (A) reasonably expected to make void a warranty made in favour of Project Co from a Project Co Party or equipment supplier and given in accordance with Good Industry Practice; or
 - (B) reasonably expected to have a material negative consequence on Project Co's ability to perform any of the Project Operations;
 - (ii) If the City assigns responsibilities to Project Co pursuant to Section 9.8(c) and Section 9.8(e) after Substantial Completion, and Project Co demonstrates to the City, acting reasonably, that it is unable to carry out such responsibilities without adding additional resources to the resources providing the Maintenance and Rehabilitation Services at the relevant time, Project Co shall have a period of 10 Business Days following Notice from the City of such an assignment of responsibilities to request a Variation in respect of the cost of such additional resources;
 - (iii) If Project Co has made a request for a Variation in accordance with Section 9.8(h)(i) or Section 9.8(h)(ii), the City shall, within 10 Business Days of such request, either issue a Variation Enquiry or give Notice to Project Co that they do not agree that a Variation is required;
 - (iv) Either Party may refer the question of whether a Variation is required as the result of a warranty risk or risk in the performance of the Project Operations or, whether Project Co

has to add additional resources to the resources providing the Maintenance and Rehabilitation Services at the relevant time for resolution in accordance with Schedule 26 - Dispute Resolution Procedure; and

- (v) If the City has, under Section 9.8(h)(iii), given Notice to Project Co that it does not agree that a Variation is required, the City shall, within 10 Business Days of a subsequent agreement or of a determination that a Variation is required, issue a Variation Enquiry and the relevant provisions of Schedule 21 - Variation Procedure shall apply except that:
 - (A) the City shall not be entitled to withdraw any such Variation Enquiry unless the City determines not to proceed with the Additional Works or to proceed only in a manner that the Additional Works will not result in a warranty becoming void or will not result in any material negative consequence on Project Co's ability to perform any of the Project Operations and Project Co has agreed with such conclusion, or the Parties otherwise agree; and
 - (B) the Parties shall, without prejudice to their respective general obligations to comply with the terms of this Project Agreement, use commercially reasonable efforts to mitigate the adverse effects with respect to any void or voidable warranty and take commercially reasonable steps to minimize any increase in costs arising from any void warranty.

- (i) Placing, installing, applying or connecting the Additional Works performed by Additional Contractors on and to the Works performed by Project Co shall not relieve Project Co from its obligations under the Project Agreement with respect to the Works, except to the extent expressly described in any Variation Confirmation.

9.9 Adjacent Developments

- (a) Project Co shall having regard to this Section 9.9, review all planning and development applications received from the City in connection with proposed Adjacent Developments.
- (b) Project Co shall permit the developer of an Adjacent Development to post or affix signage as and if required by the City and in locations required by the City, in connection with such Adjacent Development application.
- (c) At the City's request, Project Co shall provide to the developer of an Adjacent Development all relevant Project documentation in respect of the design and construction of elements of the System Infrastructure that may be impacted by the proposed Adjacent Development, subject to the developer of the Adjacent Development executing a confidentiality agreement and a waiver of liability, each in a form and substance satisfactory to the City and Project Co, each acting reasonably.
- (d) All work and activities undertaken by Project Co or any Project Co Party pursuant to this Section 9.9 shall be at Project Co's own cost, provided that in the event that more than [REDACTED] Adjacent Development applications are referred to Project Co by the City in a calendar year, then Project Co shall be entitled to a Variation in respect of the review of such development applications in excess of [REDACTED] applications per calendar year referred to them.

9.10 System Extension

- (a) The City shall be entitled to carry out or procure the carrying out of any System Extension at any time during the Project Term and Project Co shall not be entitled to object or prevent the carrying out of any such System Extension.
- (b) Project Co shall make available those parts of the System Infrastructure to enable an Extension Contractor to connect the System Infrastructure with the System Extension.
- (c) Project Co and the City shall comply with Schedule 36 – System Extension in connection with any System Extension considered by the City at any time during the Project Term.

9.11 Revenue Vehicle Supply Contract

- (a) On Financial Close, Project Co shall cause the Construction Contractor to execute the Revenue Vehicle Supply Contract substantially in the form attached as Schedule 39 hereto (“**Revenue Vehicle Supply Contract**”) and thereafter shall execute and deliver such supporting documentation as may be reasonably required by the City from time to time with respect to the Revenue Vehicle Supply Contract. For clarity, Project Co acknowledges and agrees that:
 - (i) Subject to Section 9.11(b), any and all costs associated with the performance of the obligations under the Revenue Vehicle Supply Contract shall be at Project Co’s cost; and
 - (ii) any and all obligations under the Revenue Vehicle Supply Contract are included in and form part of the Works.
- (b) The RVSC Fixed Cost Amount shall be reviewed, certified, financed and paid for in accordance with this Section 9.11. Project Co shall not obtain financing for the RVSC Fixed Cost Amount.
- (c) The City shall open the RVSC Cash Allowance Account on or before Financial Close and shall manage the RVSC Cash Allowance Account in accordance with this Section 9.11.
- (d) The cash flow process applicable to the RVSC Cash Allowance Account will be as follows:
 - (i) the City will deposit the applicable portion of the RVSC Fixed Cost Amount relating to the particular RVSC Milestone to be achieved into the RVSC Cash Allowance Account five (5) Business Days prior to the dates and in the amounts set out in the RVSC Cash Flow at Financial Close;
 - (ii) the City will hold and manage all monies in the RVSC Cash Allowance Account;
 - (iii) without derogating from the City’s obligations pursuant to Section 47.1(a), if, at the earlier to occur of (i) Final Completion, (ii) the Termination Date or (iii) the City’s exercise of its termination right under Section 43.6, there exists a positive balance in the RVSC Cash Allowance Account, such balance will be the property of the City; and
 - (iv) the Parties, together with the Construction Contractor and the Revenue Vehicle Supplier shall review the operation of the RVSC Cash Allowance Account on a regular basis and make any appropriate modifications to ensure its efficient operation.

- (e) Upon the achievement of any RVSC Milestone, Project Co shall provide to the City Representative and the Independent Certifier a copy of the request for payment approval (each, an “**RVSC Request for Payment Approval**”) prepared by the Revenue Vehicle Supplier that includes the following information:
 - (i) details of all invoices and certifications relating to any RVSC Milestone that are due for payment, including relevant supporting documentation; and
 - (ii) evidence that all deliverables (including without limitation, the applicable Revenue Vehicles) which are required to have been provided in accordance with the Revenue Vehicle Supply Contract have, as of the RVSC Milestone, been duly delivered in accordance with the Revenue Vehicle Supply Contract.
- (f) The Independent Certifier shall, within 10 Business Days of receipt of a RVSC Request for Payment Approval, advise Project Co, in writing, whether or not payment of the applicable RVSC Milestone set out in such RVSC Request for Payment Approval is approved.
- (g) The Independent Certifier shall only be permitted to withhold its approval if the Independent Certifier determines that the RVSC Request for Payment Approval does not contain the information that the Independent Certifier requires, acting reasonably, under Section 9.11(e).
- (h) If the Independent Certifier withholds its approval pursuant to Section 9.11(f) in respect of any invoice submitted as part of any RVSC Request for Payment Approval and the Independent Certifier subsequently receives the information that the Independent Certifier requires under Section 9.11(e), the Independent Certifier shall, within 10 Business Days of its receipt of such information, provide to Project Co, in writing, the Independent Certifier’s approval of the applicable RVSC Milestone set out in the subject RVSC Request for Payment Approval.
 - (i) If the Independent Certifier approves the payment of the invoices set out in an RVSC Request for Payment Approval pursuant to Section 9.11(f) and each of Project Co and the Construction Contractor approves the RVSC Request for Payment Approvals, acting reasonably, the City shall release (and Project Co and the Construction Contractor shall be deemed to have directed the release of) the applicable portion of the RVSC Fixed Cost Amount from the RVSC Cash Allowance Account for payment to the Revenue Vehicle Supplier in accordance with Part 1, Section 12.2 of the Revenue Vehicle Supply Contract.
 - (j) To the extent payment for any invoice set out in a RVSC Request for Payment Approval, which is approved by the Independent Certifier pursuant to Section 9.11(f), is not made and received by Project Co due to a Delay Event occurring after the Revenue Vehicle Supplier has achieved the relevant RVSC Milestone but prior to invoicing or payment, or a Delay Event which generally does not prevent or delay achievement of the relevant RVSC Milestone by Revenue Vehicle Supplier, such payment requested by Project Co, shall be due and payable for all purposes of this Project Agreement on the relevant date, otherwise provided for and that non-payment of the amount that would have been required to be paid, but for this Section 9.11(j), will be a non-payment for purposes of Section 44.1(a)(i).

10. REPRESENTATIVES

10.1 The City Representative

- (a) Subject to the limitations set out in Section 10.1(d), the City Representative shall exercise the functions and powers identified in this Project Agreement as functions or powers to be performed by the City Representative and such other functions and powers of the City under this Project Agreement as the City may notify Project Co from time to time.
- (b) The City may, from time to time by written Notice to Project Co, change the City Representative. Such change shall have effect on the later of the date of delivery of such Notice and the date specified in such Notice.
- (c) During any period when no City Representative has been appointed, or when the City Representative is unable, through illness, incapacity or any other reason whatsoever, to perform the City Representative's functions under this Project Agreement, the City shall perform or may, by written Notice to Project Co, promptly appoint an alternative City Representative to perform the functions which would otherwise be performed by the City Representative. Upon receipt of such written Notice, Project Co and the Project Co Representative shall be entitled to treat any act of such alternative City Representative which is permitted by this Project Agreement as being authorized by the City, and Project Co and the Project Co Representative shall not be required to determine whether authority has in fact been given.
- (d) The City Representative shall not, except as otherwise provided in this Project Agreement, be entitled to modify or waive any provision of this Project Agreement or to authorize a Variation.
- (e) Subject to the limitations set out in Sections 10.1(a) and 10.1(d), unless otherwise notified in writing, Project Co and the Project Co Representative shall be entitled to treat any act of the City Representative which is explicitly authorized by this Project Agreement as being authorized by the City, and Project Co and the Project Co Representative shall not be required to determine whether authority has in fact been given.

10.2 The Project Co Representative

- (a) Subject to the limitations set out in Section 10.2(d), the Project Co Representative shall have full authority to act on behalf of Project Co for all purposes of this Project Agreement.
- (b) Project Co may change the Project Co Representative with the prior written consent of the City.
- (c) During any period when the Project Co Representative is unable, through illness, incapacity or any other reason whatsoever, to perform the Project Co Representative's functions under this Project Agreement, Project Co shall perform or may, by written Notice to the City, promptly appoint an alternative Project Co Representative to perform the functions which would otherwise be performed by the Project Co Representative, provided that, Project Co must seek the City's consent in accordance with Section 10.2(b) if such alternative Project Co Representative is in place for more than 180 days. Upon receipt of such written Notice, the City and the City Representative shall be entitled to treat any act of such alternative Project Co Representative which is permitted by this Project Agreement as being authorized by Project Co, and the City and the City Representative shall not be required to determine whether authority has in fact been given.

- (d) The Project Co Representative shall not, except as otherwise provided in this Project Agreement, be entitled to modify or waive any provision of this Project Agreement.
- (e) Subject to the limitations set out in Section 10.2(d), unless otherwise notified in writing, the City and the City Representative shall be entitled to treat any act of the Project Co Representative which is explicitly authorized by this Project Agreement as being authorized by Project Co, and the City and the City Representative shall not be required to determine whether authority has in fact been given.

10.3 Communications to Representatives

- (a) At the time that a Party appoints or changes the appointment of the City Representative or the Project Co Representative, as applicable, that Party shall also provide the other Party with contact information for delivery of communications to such representative. Communications to such representative shall not constitute Notices to the Party appointing such representative.

10.4 Key Individuals

- (a) The individuals who are critical to the performance of the Works are identified in Schedule 9 - Key Individuals. Project Co shall use commercially reasonable efforts to ensure that such persons remain involved in the Works in the capacity set out in Schedule 9 - Key Individuals (unless such Key Individuals are not available for reasons beyond the control of Project Co or a Project Co Party) for the whole of, but not subsequent to the Construction Period. Project Co or a Project Co Party shall not, for the duration of the Works, require or request any such person to be involved in any other project, if, in the reasonable opinion of the City such involvement would have a material adverse effect on the Works. If Project Co fails to comply with this Section 10.4(a), Project Co shall pay to the City the liquidated damages amount, if any, ascribed for such Key Individual in Schedule 9 – Key Individuals. The Parties agree that the liquidated damages set out Schedule 9 – Key Individuals are not a penalty but represent a genuine and reasonable pre-estimate of the damages that the City will suffer as a result of Project Co's failure to provide the applicable Key Individual. For clarity, Project Co and the Project Co Parties' reasonable commercial efforts, in accordance with this Section 10.4(a), shall include the denial of promotions or relocations of a Key Individual, to the extent such denial is permitted by the Applicable Law. For the purposes of this section, only the following reasons will be considered beyond the control of Project Co or a Project Co Party: death; short term disability; or long term disability or any other reason in the opinion of the City, acting reasonably (Project Co shall provide to the City any further documentation as may be reasonably requested by the City to assess any reason beyond the control of Project Co).
- (b) The individuals who are critical to the performance of the Maintenance and Rehabilitation Services are identified in Schedule 9 - Key Individuals. Project Co shall use commercially reasonable efforts to ensure that such persons are involved in the Maintenance and Rehabilitation Services in the capacity set out in Schedule 9 - Key Individuals at the outset of the Maintenance Period (unless such Key Individuals are not available for reasons beyond the control of Project Co or a Project Co Party). Project Co shall ensure that such Key Individuals are replaced over the duration of the Maintenance Period in a planned and orderly fashion and in consultation with the City and with explicit identification of each Key Individual's length of time as a Key Individual during the Maintenance Period. Once a Key Individual has been identified and approved by the

City as part of the planned and orderly replacement of Key Individuals pursuant to this Section 10.4(b), Project Co or a Project Co Party shall not, for the planned period of the Maintenance and Rehabilitation Services, require or request any such person to be involved in any other project if, in the reasonable opinion of the City, such involvement would have a material adverse effect on the Maintenance and Rehabilitation Services. For the purposes of this section, only the following reasons will be considered beyond the control of Project Co or a Project Co Party: death; short term disability; or long term disability or any other reason determined in the opinion of the City, acting reasonably (Project Co shall provide to the City any further documentation as may be reasonably requested by the City to assess any reason beyond the control of Project Co).

- (c) Subject to Project Co's obligations to ensure that Key Individuals remain involved in the Works and in the Maintenance and Rehabilitation Services as set out in Sections 10.4(a) and 10.4(b), if it becomes necessary for Project Co to replace any individual identified in Schedule 9 - Key Individuals, Project Co shall nominate a competent suitably qualified and experienced permanent replacement or replacements as soon as practicable and provide the City with relevant information on the proposed replacement and shall consult with the City before finalizing the appointment of such replacement. Project Co shall not replace any of the individuals identified in Schedule 9 - Key Individuals without the prior written consent of the City, which consent shall not be withheld or delayed where Project Co is compliant with Sections 10.4(a), 10.4(b) and 10.4(d) and the proposed replacement is suitably qualified and experienced. For those Key Individual's in respect of whom liquidated damages amounts are ascribed in Schedule 9 – Key Individuals, in the event Project Co fails to nominate a competent suitably qualified and experienced permanent replacement or replacements for a period of greater than 60 days from the date it became necessary for Project Co to replace any such Key Individual, Project Co shall pay to the City the liquidated damages ascribed in Schedule 9 – Key Individuals. The Parties agree that the liquidated damages set out in this 10.4(c) are not a penalty but represent a genuine and reasonable pre-estimate of the damages that the City will suffer as a result of Project Co's failure to provide the applicable Key Individual.
- (d) If the City determines, acting reasonably, that it is in the best interests of the City that any individual identified in Schedule 9 - Key Individuals be replaced, the City shall notify Project Co (including a detailed explanation of the reasons for such determination), and, within 60 days after receipt by Project Co of such Notice, Project Co shall provide the City with relevant information on the proposed replacement and shall consult with the City before finalizing the appointment of such replacement.

11. WORKS COMMITTEE

11.1 Establishment

- (a) The Parties shall, within 30 days following Financial Close, establish a committee (the “**Works Committee**”) consisting of:
 - (i) six representatives appointed by the City from time to time, one of whom will be the City Representative; and
 - (ii) the following five representatives appointed by Project Co:

- (A) the Project Co Representative;
 - (B) one representative of the Construction Contractor;
 - (C) the Design Build Director;
 - (D) the Director of Communications and Stakeholder Engagement; and
 - (E) such other representative appointed by Project Co from time to time.
- (b) The Independent Certifier shall be entitled, but not required, to attend meetings as a non-voting member of the Works Committee. Members of the Works Committee may invite, on prior Notice to all members, such advisors and consultants as they require from time to time to attend meetings and to provide briefings to the Works Committee.
- (c) The City Representative shall be the chairperson of the Works Committee.

11.2 Function and Role

- (a) The Works Committee shall assist the Parties by promoting cooperative and effective communication with respect to matters related to the Works. The Works Committee shall interface with the Maintenance Committee as and when required.
- (b) The Works Committee shall be responsible for receiving and reviewing all matters related to the Works, including:
- (i) any design, construction and commissioning issues;
 - (ii) the Works Schedules;
 - (iii) any issues arising from reports or documents provided by Project Co or the Independent Certifier;
 - (iv) any quality assurance and safety and security issues, including any design, configuration control, interfacing, training, testing, operational impact and other matters creating or giving rise to a safety or security issue or otherwise requiring attention and oversight;
 - (v) the Works Reports;
 - (vi) any special matters referred to the Works Committee by Project Co;
 - (vii) any Proceeding At Risk Matters referred to the Works Committee in accordance with Section 11.6.
 - (viii) any community and media relations issues in accordance with Schedule 18 - Communications and Stakeholder Engagement Obligations;
 - (ix) any issues related to Schedule 7 – Mobility Matters; and

- (x) any other issues pertaining to the Works.
- (c) Subject to Section 11.2(d), any unanimous decision of the Works Committee shall be final and binding on the Parties. If the Works Committee is unable to reach a unanimous decision, either Party may refer the matter for resolution in accordance with Schedule 26 - Dispute Resolution Procedure.
- (d) The Works Committee shall not have authority to make decisions with respect to or approve:
 - (i) any amendment to or waiver of any provision of this Project Agreement;
 - (ii) any change to Key Works Milestones set out in the Works Schedule, the Scheduled Substantial Completion Date or the Scheduled Final Completion Date;
 - (iii) any Variation;
 - (iv) any change that may materially adversely affect Project Co's ability to achieve Substantial Completion by the Scheduled Substantial Completion Date or Final Completion by the Scheduled Final Completion Date; or
 - (v) any matter with respect to which the City has a right of consent or in respect of which the City may exercise discretion pursuant to this Project Agreement.

11.3 Term of Works Committee

- (a) Unless otherwise agreed by the Parties, the Works Committee shall operate only until the Final Completion Date.

11.4 Replacement of Committee Members

- (a) The City shall be entitled to replace any of its respective representatives on the Works Committee by written Notice to Project Co. The City will use commercially reasonable efforts to deliver prior written Notice of any such replacements to Project Co. Project Co may replace any of its representatives on the Works Committee with the prior written consent of the City.

11.5 Procedures and Practices

- (a) The members of the Works Committee may:
 - (i) adopt such procedures and practices for the conduct of the activities of the Works Committee as they consider appropriate from time to time;
 - (ii) invite to any meeting of the Works Committee such other persons as the members of the Works Committee may agree;
 - (iii) exclude from any meeting of the Works Committee such persons as the members of the Works Committee may agree; and

- (iv) receive and review reports from any person or organization agreed to by the members of the Works Committee.
- (b) Once established, the Works Committee shall meet at least once each month from Financial Close until the Final Completion Date, unless otherwise agreed by the members of the Works Committee or the Parties.
- (c) Any one of the Project Co Representative or the City Representative may convene a special meeting of the Works Committee at any time. Special meetings of the Works Committee may be convened on not less than five Business Days' Notice to all members of the Works Committee identifying the agenda items to be discussed at the special meeting, provided that, in an Emergency, a meeting may be called at any time on such Notice as may be reasonable in the circumstances.
- (d) Unless otherwise agreed by the members of the Works Committee, the Works Committee shall meet at the Site in the City of Ottawa or in any other location in Ontario. Meetings of the Works Committee may be held by means of such telephonic, electronic or other communication facilities as permit all persons participating in the meeting to communicate with each other simultaneously and instantaneously. A person participating in a meeting by such means will be deemed to be present at such meeting, provided that each member of the Works Committee must attend in person at least once each calendar quarter.
- (e) Four representatives of the City (one of whom shall be the City Representative) and the three representatives of Project Co shall constitute a quorum at any meeting of the Works Committee. A quorum of members may exercise all the powers of the Works Committee. The members shall not transact business at a meeting of the Works Committee unless a quorum is present.
- (f) Minutes of all meetings, recommendations and decisions of the Works Committee, including those made by telephone or other form of communication, shall be recorded and maintained by Project Co. Project Co shall circulate copies of such minutes within five Business Days of the holding of the meeting or the making of the recommendation or decision. Unless the City notifies Project Co within five Business Days of receipt of the minutes that the City disagrees with the contents of the minutes, the City and Project Co shall be deemed to have approved such minutes. Project Co shall maintain a complete set of all minutes of the meetings of the Works Committee and shall make such minutes available for inspection by the City during regular business hours.

11.6 Proceeding At Risk

- (a) If at any time:
 - (i) in the reasonable opinion of the City, Project Co is performing the Works (excluding for greater certainty, the supply of the New Revenue Vehicles) in a manner that may result in Project Co becoming unable to satisfy the requirements for Substantial Completion; or
 - (ii) the City Representative has noted a Works Submittal as "CRITICAL COMMENT" in accordance with Schedule 10 – Review Procedure (each of the matters described in clauses (i) and (ii) of this Section 11.6(a), a "**Proceeding At Risk Matter**");

then the City may issue to Project Co (with a copy to the Independent Certifier) a notice (the “**Proceeding At Risk Notice**”) identifying the City’s reasons for issuing the Proceeding At Risk Notice and requesting Project Co to deliver any relevant Design Data and any other information reasonably required by the City from Project Co to review the Proceeding At Risk Matter.

- (b) Following the issuance of a Proceeding At Risk Notice, the City Representative and the Project Co Representative, together with the other members of the Works Committee, shall each promptly and diligently make a reasonable *bona fide* effort to resolve the Proceeding At Risk Matter. The Independent Certifier shall be required to attend all meetings and deliberations of the Works Committee at which the Proceeding At Risk Matter is considered, but shall not be entitled to participate in any decisions of the Works Committee.
- (c) Within 10 Business Days after receipt by Project Co of a Proceeding At Risk Notice, Project Co shall deliver a response to the City and each member of the Works Committee, which shall include:
 - (i) the Design Data and any other information reasonably requested by the City in the Proceeding At Risk Notice;
 - (ii) Project Co’s opinion confirming agreement with, or disputing the opinion of, the City regarding the Proceeding At Risk Matter;
 - (iii) any additional Design Data and other information in support of Project Co’s opinion regarding the Proceeding At Risk Matter; and
 - (iv) Project Co’s proposal to rectify the Proceeding at Risk Matter.
- (d) Within 5 Business Days after receipt by the City of the response from Project Co pursuant to Section 11.6(c), the City shall notify Project Co if the City requires any additional information from Project Co. Project Co shall provide such additional information to the City, each member of the Works Committee and the Independent Certifier within 5 Business Days after receipt of such notice.
- (e) The Independent Certifier shall, within 30 Business Days of the Proceeding At Risk Notice, deliver to each of the City and Project Co its written opinion as to whether the City acted reasonably in delivering the Proceeding At Risk Notice.
- (f) Within 15 Business Days after receipt by the City of all deliverables contemplated by Section 11.6(c) and, if applicable, Section 11.6(d), and in any event, no later than 35 Business Days after receipt by Project Co of the Proceeding At Risk Notice, the Works Committee shall meet in person (the “**PAR Meeting**”), to attempt to resolve the Proceeding At Risk Matter.
- (g) Within 5 Business Days after the PAR Meeting and, in any event, no later than 40 Business Days after receipt by Project Co of the Proceeding At Risk Notice (the “**PAR Meeting Expiry Date**”), the Works Committee shall attempt to reach a final decision with respect to the Proceeding At Risk Matter. If the Works Committee is unable to reach a final decision, and the Independent Certifier’s opinion delivered pursuant to Section 11.6(e) confirms that the City acted reasonably in delivering the Proceeding At Risk Notice, Project Co shall be deemed to be “**Proceeding At**

Risk" and the City may, in its sole discretion, give notice to the Lenders' Agent pursuant to Section 15 of the Lenders' Direct Agreement, that Project Co is Proceeding At Risk, together with the relevant information supporting the City's opinion that Project Co is Proceeding at Risk.

- (h) Regardless of the Independent Certifier's opinion, if the Works Committee fails to reach a final decision with respect to the Proceeding At Risk Matter by the PAR Meeting Expiry Date, either Party may refer the Proceeding At Risk Matter for resolution in accordance with Schedule 26 – Dispute Resolution Procedure.
- (i) The Proceeding At Risk Notice, review, and comments made during the process set out in this Section 11.6 are for general conformity to the obligations and requirements of this Project Agreement, and any such notice, review and comment shall not relieve Project Co of the risk and responsibility for the Project Operations and for meeting all of its obligations under and the requirements of this Project Agreement, and shall not create any new or additional obligations or liabilities for the City
- (j) If it is determined in accordance with Schedule 26 – Dispute Resolution Procedure that Project Co should not have been deemed to be Proceeding at Risk under Section 11.6(g), the City shall (i) promptly notify the Lender's Agent that it is withdrawing its notice given pursuant to Section 11.6(g), if applicable, and (ii) reimburse Project Co for its reasonable costs incurred in connection with responding to a Proceeding at Risk Notice and for its participation in the Proceeding at Risk Matter.

12. MAINTENANCE COMMITTEE

12.1 Establishment

- (a) The Parties shall, not later than 18 months prior to the Scheduled Substantial Completion Date, establish a committee (the "**Maintenance Committee**") to serve until the Termination Date consisting of:
 - (i) 4 representatives appointed by the City from time to time, one of whom may be the Operator;
 - (ii) 1 senior representative of Project Co; and
 - (iii) 1 senior representative of the Maintenance and Rehabilitation Contractor.

- (b) Members of the Maintenance Committee may invite, on prior Notice to all members, such advisors and consultants as they require from time to time to attend meetings and provide briefings to the Maintenance Committee.
- (c) One of the representatives of the City shall be the chairperson of the Maintenance Committee.

12.2 Function and Role

- (a) The Maintenance Committee shall assist the Parties by promoting cooperative and effective communication with respect to matters related to the Project Operations, both prior to and during

the Maintenance Period. The Maintenance Committee shall interface with the Works Committee as and when required.

- (b) The Maintenance Committee shall be responsible for receiving and reviewing all matters related to the System Infrastructure, both prior to and during the Maintenance Period, including:
 - (i) any joint review of the System Infrastructure and the Output Specifications;
 - (ii) any performance issues;
 - (iii) any special matter referred to the Maintenance Committee by the City or Project Co;
 - (iv) any community and media relations issues in accordance with Schedule 18 - Communications and Stakeholder Engagement Obligations; and
 - (v) any other issues pertaining to the Project Operations (excluding the Works).
- (c) Subject to Section 12.2(d), any unanimous decision of the Maintenance Committee shall be final and binding on the Parties. If the Maintenance Committee is unable to reach a unanimous decision, either Party may refer the matter for resolution in accordance with Schedule 26 - Dispute Resolution Procedure.
- (d) The Maintenance Committee shall not have authority to make decisions with respect to or approve:
 - (i) any amendment to or waiver of any provision of this Project Agreement;
 - (ii) any Variation;
 - (iii) any change that may materially adversely affect Project Co's ability to perform the Maintenance and Rehabilitation Services or the performance by the relevant parties of any Governmental Activities; or
 - (iv) any matter with respect to which the City has a right of consent or in respect of which the City may exercise discretion pursuant to this Project Agreement.

12.3 Replacement of Committee Members

- (a) The City shall be entitled to replace any of its representatives on the Maintenance Committee by written Notice to Project Co. The City will use commercially reasonable efforts to deliver prior written Notice of any such replacement to Project Co. Project Co may replace any of its representatives on the Maintenance Committee with the prior written consent of the City.

12.4 Procedures and Practices

- (a) The members of the Maintenance Committee may:
 - (i) adopt such procedures and practices for the conduct of the activities of the Maintenance Committee as they consider appropriate from time to time;

- (ii) invite to any meeting of the Maintenance Committee such other persons as the members of the Maintenance Committee may agree;
 - (iii) exclude from any meeting of the Maintenance Committee such persons as the members of the Maintenance Committee may agree; and
 - (iv) receive and review reports from any person or organization agreed to by the members of the Maintenance Committee.
- (b) Once established, the Maintenance Committee shall meet at least once each month during the Maintenance Period, unless otherwise agreed by the members of the Maintenance Committee or the Parties.
- (c) Any member of the Maintenance Committee may convene a special meeting of the Maintenance Committee at any time. Special meetings of the Maintenance Committee may be convened on not less than 5 Business Days' Notice to all members of the Maintenance Committee identifying the agenda items to be discussed at the special meeting, provided that, in an Emergency, a meeting may be called at any time on such Notice as may be reasonable in the circumstances.
- (d) Unless otherwise agreed by the members of the Maintenance Committee, the Maintenance Committee shall meet at the Site in the City of Ottawa or in any other location in Ontario. Meetings of the Maintenance Committee may be held by means of such telephonic, electronic or other communication facilities as permit all persons participating in the meeting to communicate with each other simultaneously and instantaneously. A person participating in a meeting by such means will be deemed to be present at such meeting, provided that each member of the Maintenance Committee must attend in person at least once each calendar quarter.
- (e) One representative of Project Co, one representative of the Maintenance and Rehabilitation Contractor, and two representatives of the City shall constitute a quorum at any meeting of the Maintenance Committee. A quorum of members may exercise all the powers of the Maintenance Committee. The members shall not transact business at a meeting of the Maintenance Committee unless a quorum is present.
- (f) Minutes of all meetings, recommendations and decisions of the Maintenance Committee, including those made by telephone or other form of communication, shall be recorded and maintained by the City. The City shall circulate copies of such minutes within 5 Business Days of the holding of the meeting or the making of the recommendation or decision. Unless Project Co notifies the City within 5 Business Days of receipt of the minutes that Project Co disagrees with the contents of the minutes, the City and Project Co shall be deemed to have approved such minutes. The City shall maintain a complete set of all minutes of the meetings of the Maintenance Committee and shall make such minutes available for inspection by Project Co during regular business hours.

13. INTEGRATED MANAGEMENT SYSTEM

- (a) Project Co shall comply with the provisions of Schedule 11 – Integrated Management System Requirements.

- (b) Project Co shall cause (A) the Construction Contractor, at its sole cost and expense, to conduct an inspection of its facilities and of its health and safety management systems on an annual basis until Final Completion or as otherwise required in accordance with Sections 9.6(c)(vi)(C) or 9.6(c)(vii)(C) (each, an “**H&S Construction Inspection**”), and (B) cause the Maintenance and Rehabilitation Contractor, at its sole cost and expense, to conduct an inspection of its facilities and its health and safety management systems on an annual basis commencing on the first anniversary of the Substantial Completion Date and thereafter until the end of the Project Term or as otherwise required in accordance with Sections 9.6(c)(vi)(C) or 9.6(c)(vii)(C), (each, an “**H&S Maintenance Inspection**”), which H&S Construction Inspection and H&S Maintenance Inspection shall:
- (i) be conducted by a Certified H&S Inspector;
 - (ii) during the performance of the Works, include, at a minimum (A) a review of general compliance with all applicable *Occupational Health and Safety Act* (Ontario) requirements, compliance with all safety manuals applicable to the Site at which the Works are being conducted and (B) a review of the Construction Contractor’s job hazard analysis documentation on any portion of the Lands which could endanger or put at risk the safety of any Person working at the Site; and
 - (iii) during the performance of the Maintenance and Rehabilitation Services, include, at a minimum (A) a review of general compliance with all applicable Occupational Health and Safety Act (Ontario) requirements, and compliance with all safety manuals applicable to the provision of the Maintenance and Rehabilitation Services and (B) a review of the Maintenance and Rehabilitation Contractor’s job hazard analysis documentation relating to the provision of Maintenance and Rehabilitation Services.
- (c) Project Co shall cause the results of each H&S Construction Inspection (such results referred to as the “**H&S Construction Inspection Report**”) to be delivered to the City and the Works Committee not more than 10 Business Days from the date on which a H&S Construction Inspection is completed. An H&S Construction Inspection Report arising from an H&S Construction Inspection shall be tabled and presented by Project Co for discussion by the Works Committee at the next meeting of the Works Committee that follows the date on which such H&S Construction Inspection Report was issued.
- (d) Project Co shall cause the results of each H&S Maintenance Inspection (such results referred to as the “**H&S Maintenance Inspection Report**”) to be delivered to the City and the Maintenance Committee not more than 10 Business Days from the date on which a H&S Maintenance Inspection is completed. Any H&S Maintenance Inspection Report arising from an H&S Maintenance Inspection shall be tabled and presented by Project Co for discussion by the Maintenance Committee at the next meeting of the Maintenance Committee that follows the date on which such H&S Maintenance Inspection Report was issued.
- (e) To the extent an H&S Construction Inspection Report or H&S Maintenance Inspection Report, as the case may be, discloses any non-compliance by the COR-Qualified Construction Project Co Party, the COR-Certified Construction Project Co Party, the ISO 45001 Certified Maintenance and Rehabilitation Project Co Party, or the COR-Qualified Maintenance and Rehabilitation Project Co Party, as the case may be, with the terms of the COR Certification or OHSAS 18001

Accreditation, as the case may be, the City shall have the right to require Project Co to cause the COR-Qualified Construction Project Co Party, the COR-Certified Construction Project Co Party, the COR-Qualified Maintenance and Rehabilitation Project Co Party and the ISO 45001 Certified Maintenance and Rehabilitation Project Co Party, as the case may be, at its sole cost and expense:

- (i) to take any corrective and remedial action required by the H&S Construction Inspection Report or H&S Maintenance Inspection Report, as the case may be, to correct any such non-compliance, and Project Co shall cause the COR-Qualified Construction Project Co Party, the COR-Certified Construction Project Co Party, the COR-Qualified Maintenance and Rehabilitation Project Co Party and the ISO 45001 Certified Maintenance and Rehabilitation Project Co Party, as the case may be, to comply with all instructions given by the Certified H&S Inspector in respect of actions required to be taken to correct any such non-compliance;
- (ii) to arrange to have conducted by a Certified H&S Inspector such follow-up H&S Construction Inspections and H&S Maintenance Inspections, as the case may be, of those facilities and health management systems associated with the non-compliances identified in the relevant H&S Construction Inspection Report (each, an "**H&S Construction Re-Inspection**") or in the relevant H&S Maintenance Inspection Report (each an "**H&S Maintenance Re-Inspection**"), in each case, within 10 Business Days from the date on which any such request is made by the City, until any and all corrective and remedial actions required by the Certified H&S Inspector with respect to the correction of each identified non-compliance is completed to the satisfaction of the Certified H&S Inspector;
- (iii) to cause the results of each H&S Construction Re-Inspection (such results referred to as the "**H&S Construction Re-Inspection Report**") to be delivered to the City and the Works Committee not more than 10 Business Days from the date on which an H&S Construction Re-Inspection is completed. An H&S Construction Re-Inspection Report arising from an H&S Construction Re-Inspection shall be tabled and presented by Project Co for discussion by the Works Committee at the next meeting of the Works Committee that follows the date on which such H&S Construction Re-Inspection Report was issued; and
- (iv) to cause the results of each H&S Maintenance Re-Inspection (such results referred to as the "**H&S Maintenance Re-Inspection Report**") to be delivered to the City and the Maintenance Committee not more than 3 Business Days from the date on which an H&S Maintenance Re-Inspection is completed. An H&S Maintenance Re-Inspection Report arising from an H&S Maintenance Re-Inspection shall be tabled and presented by Project Co for discussion by the Maintenance Committee at the next meeting of the Maintenance Committee that follows the date on which such H&S Maintenance Re-Inspection Report was issued.

14. ACCESS TO THE LANDS

14.1 Access to Lands

- (a) Subject to this Section 14 and the provisions of Schedule 33 – Lands, including any restrictions on use and access set out in Schedule 33 – Lands, the City shall grant or have caused to be granted, and shall continuously grant or cause to be granted, to Project Co and Project Co Parties, non-exclusive license right of use and access to the Lands as are required by Project Co and Project Co Parties sufficient (subject to Project Co performing its obligations described in the Project Co Permits, Licences, Approvals and Authorizations and subject to the timing and extent of the grant of use and access to the Lands set out in Schedule 33 – Lands) to allow Project Co and Project Co Parties to perform those Project Operations to be performed on the Lands. The rights granted to Project Co pursuant to this Section 14.1(a) shall be effective on the later of,
- (i) the date of Financial Close; and
 - (ii) the commencement date for access to individual parcels of the Lands as set out in Schedule 33 – Lands.
- (b) Subject to Project Co’s obligation to comply with the other terms and conditions set forth in this Project Agreement and the other Project Documents, Project Co shall ensure that each Project Co Party shall at all times, when entering the Lands, act in a manner consistent with the obligations of Project Co under the Project Agreement.
- (c) In consideration for the use and access granted pursuant to Section 14.1(a), Project Co shall provide the Project Operations subject to and in accordance with this Project Agreement.
- (d) Without derogating from any of the City’s rights hereunder, in particular, its rights of access to the Lands prior to the Substantial Completion Date for the purposes of any City Commissioning, and subject to any restrictions set out in Schedule 33 – Lands, the City acknowledges that, in respect of the Project Operations, Project Co and the Project Co Parties require, and the City shall provide access to the Lands without material interference by the City or any City Party for such period of time identified in Sections 14.1(a) applicable thereto.
- (e) None of the rights granted pursuant to this Section 14.1 shall:
- (i) grant access to any lands beyond the boundaries of the Lands, or to any lands other than the Lands, other than easements and similar interests of the City which are obtained after Commercial Close and which are intended to benefit the Lands, to the extent the same are necessary for the Project Operations or exceed any restrictions set out in Schedule 33 - Lands;
 - (ii) grant access to any facilities or infrastructure of the City, Utility Companies or any other third parties, except as set out in Schedule 33 – Lands (which access, if any, is subject to Section 14.2); or
 - (iii) except as otherwise expressly provided in this Project Agreement, be interpreted as permitting Project Co to alter, damage, remove or destroy any structure that may be extending over or encroaching upon the Lands from adjoining properties without the prior written consent of the City, such consent not to be unreasonably withheld it being acknowledged that Project Co will be required to provide the City with reasonable prior written notice of any such interference or encroachment encountered during the course of

the Works and to achieve a consensus with the City as to the means to address such interference or encroachment.

- (f) The use and access rights provided in this Section 14.1 shall automatically terminate as of the Termination Date, save and except for the earlier termination of the use and access rights specified in Schedule 33 – Lands.
- (g) For greater certainty, the use and access rights provided in this Section 14.1 shall not entitle Project Co or any Project Co Party to extract any mineral from the Lands for use in the Project Operations.
- (h) The City shall acquire use of and access to the Lands described in Schedule 33 – Lands on or prior to the applicable commencement date for access set out in Schedule 33 – Lands. The City shall provide Notice to Project Co of the commencement of access rights to the Lands as such access is obtained by the City.

14.2 Non-exclusive License to Lands / Development of Lands

- (a) Project Co acknowledges and agrees that the rights granted to Project Co and the Project Co Parties hereunder to the Lands shall be non-exclusive and that the City and any person authorized by the City may occupy and possess the Lands, the System Infrastructure and the New Municipal Infrastructure (in each case on the Lands) without the prior consent of Project Co, including for the purposes of carrying out the Governmental Activities and the Other Works. In exercising its rights Project Co shall not, and shall require that the Project Co Parties shall not, except as permitted under this Project Agreement, disrupt the performance of the Governmental Activities or the Other Works.
- (b) Without limiting Section 14.2(a), Project Co acknowledges that the City may, from time to time, use or develop (including by way of subdivision), or permit the use or development of, or dispose of, portions of the Lands (or interests in the Lands), other than those portions of the Lands (or interests in the Lands) necessary for the performance of the Project Operations. To the extent that such use, development or disposition materially adversely interferes with Project Co's license rights hereunder or materially adversely interferes with Project Co's ability to perform the Project Operations, such use, development or disposition shall, subject to and in accordance with Schedule 21 - Variation Procedure, result in a Variation. For greater certainty, but without limiting the generality of the foregoing, Project Co acknowledges and agrees that certain of the Lands, shall be subject to the restrictions set out in Schedule 33 – Lands.
- (c) Project Co shall be solely responsible to arrange all access to lands that it requires to access System Infrastructure or New Municipal Infrastructure not otherwise provided for in accordance with Schedule 33 – Lands and any Permits, Licences, Approvals and Authorizations. Project Co shall observe, perform and comply with all terms and conditions in Third Party Access Agreements applicable to the access, use and occupation of those parts of the Lands affected by Third Party Access Agreements and the performance of Project Operations on New Municipal Infrastructure or any component thereof.

14.3 Naming and Signage

- (a) Project Co acknowledges that the City reserves and retains,
- (i) all rights to designate the name for the System Infrastructure, or any part thereof, and the New Municipal Infrastructure and to retain all revenues derived from the sponsorship of such names;
 - (ii) all rights to signage in relation to the Lands and any part of the System Infrastructure and the New Municipal Infrastructure; and
 - (iii) all rights, Trade-Marks, naming or branding regarding the System Infrastructure, or any parts thereof and the New Municipal Infrastructure.
- (b) Without limiting the City's rights pursuant to Section 14.3(a), with the prior written consent of the City, which may take into consideration any applicable governmental guidelines, including guidelines set out in Schedule 18 - Communications and Stakeholder Engagement Obligations and Schedule 33 – Lands, Project Co, the Project Co Parties and the Lenders may, for the period prior to Substantial Completion, erect and maintain signage (which may include such parties' logos and trade names) at or on the Lands identifying their respective roles in connection with the development and construction of the Project provided that such signage is erected and maintained in accordance with the requirements and restrictions set out in this Project Agreement, including Schedule 15 – Output Specifications and Schedule 18 – Communication and Stakeholder Engagement Obligations.

14.4 No Interest in Land, Facilities or Infrastructure

- (a) Project Co acknowledges and agrees that neither Project Co nor the Lenders shall acquire any estate, right, title or ownership interest in the Lands or any part of the System Infrastructure or the New Municipal Infrastructure or any other interest in land, facilities or infrastructure pursuant to this Project Agreement or otherwise. Notwithstanding any provision herein or in any of the Project Documents to the contrary, all fee simple interest in and freehold title to the Lands, or any part thereof, shall at all times remain unencumbered by any interest of Project Co or the Lenders. Project Co and the Lenders shall have access to the Lands and the New Municipal Infrastructure under and subject to the licences and access rights granted under this Section 14 and the Lenders' Direct Agreement, respectively.

14.5 Non-Disturbance Agreement

- (a) If the City mortgages, charges or otherwise encumbers the Lands, the City shall notify Project Co and, at the request of Project Co, provide Project Co with an agreement, in form satisfactory to Project Co, acting reasonably, executed by the mortgagee of the Lands permitting Project Co and the Lenders' Agent to access and use the Lands under the use and access granted pursuant to this Section 14 and the Lenders' Direct Agreement, respectively, free from interference from such mortgagee or any person claiming by or through such mortgagee. This Section 14.5 shall not apply in respect of any portion of such Lands used or developed pursuant to Section 14.2(b) if neither the license granted pursuant to this Section 14 nor the Project Operations pertain to such portion of the Lands.

14.6 Adjustments to Lands Available to Project Co

- (a) [REDACTED]
- (b) [REDACTED]
- (c) Project Co shall be entitled to obtain any properties (or obtain temporary access to any properties) at its own cost and expense, however, such properties shall not, for the purposes of this Project Agreement, be Lands and no System Infrastructure or New Municipal Infrastructure shall be located on, or rely in any way upon, on any properties which Project Co acquires pursuant to this Section 14.6(c).

15. ENCUMBRANCES

15.1 Project Co Shall Perform Obligations Under Encumbrances

- (a) Project Co's access to and use of the Lands or any part thereof granted in Article 14 shall be subject to the Encumbrances.
- (b) Subject to Section 15.2, Project Co shall perform all obligations of the City under all Encumbrances for or on behalf of the City, other than:
 - (i) obligations which Project Co is not legally capable of performing for or on behalf of the City; and
 - (ii) obligations which the applicable counterparty to such Encumbrance formally relieves or waives Project Co from performing, with the consent of the City, in its sole discretion (and if such relief or waiver is not consented to by the City, and subject to Section 15.1(b)(i), Project Co shall perform such obligations in accordance with this Section 15).
- (c) Project Co, whether before, during or after the completion of the Works, shall not in any manner breach the Encumbrances.

15.2 No Encumbrances

- (a) Project Co shall not create, incur, permit or suffer to exist any Encumbrance to be created, filed, issued or registered upon or against the Lands or any part of them or any interest therein due to an act or omission of Project Co or any Project Co Party.
- (b) Project Co does not have title to the Lands or any interest therein, and no act or omission by Project Co or any Project Co Party shall give rise to a right for any person to obtain title to or any interest in the Lands or any part thereof, except:
 - (i) as may be expressly agreed to in writing by the City;
 - (ii) as may be expressly permitted by the terms of this Project Agreement; or
 - (iii) as may be permitted under Applicable Law, but without limiting Project Co's obligations under Sections 15.2(c)(i) and 15.3(a).

- (c) In the event that the Lands or any part thereof or any interest therein becomes subject to any Encumbrance following Financial Close:
- (i) due to an act or omission of Project Co or any Project Co Party (which has not been consented to in writing by the City), Project Co shall immediately take all steps necessary to terminate, remove, vacate or discharge such Encumbrance. If such Encumbrance is not terminated, removed, vacated or discharged within ten (10) Business Days of Project Co becoming aware of the creation, filing, issuance or registration of such Encumbrance, then, without prejudice to any other rights or remedies it may have, the City may take whatever steps it deems necessary and appropriate (in its sole discretion) to terminate, remove, vacate or discharge the Encumbrance, including payment of any amount owing or claimed thereunder, and seek immediate recovery from Project Co of the amount of any such payment and any associated costs, including legal costs (on a full indemnity basis), all of which shall be payable on demand, and Project Co hereby appoints the City as Project Co's attorney to execute any termination or discharge of an Encumbrance referred to in this Section 15.2(c)(i), which appointment is coupled with an interest and shall be irrevocable for the Project Term and thereafter so long as any of Project Co's obligations under this Section 15.2(c)(i) are outstanding;
 - (ii) due to an act or omission of Project Co or any Project Co Party (which has been consented to in writing by the City), Project Co shall perform all obligations under such Encumbrance in accordance with Sections 15.1 and 15.3 (as is applicable) and at its sole cost and expense; or
 - (iii) which is not due to an act or omission of Project Co or any Project Co Party, prior to performing obligations under any such Encumbrance, Project Co shall promptly notify the City of any such Encumbrance and the City may elect, in its sole discretion, to:
 - (A) have such Encumbrance be removed, vacated or discharged at the City's sole cost and expense;
 - (B) perform the required obligations thereunder; or
 - (C) instruct Project Co to perform the required obligations thereunder.

the City shall be entitled to the same election as set out in Section 15.2(c)(iii), subject to Section 15.2(e). Project Co shall promptly notify the City of any such encumbrance upon Project Co becoming aware of such encumbrance.

- (e) If Project Co is instructed to perform obligations under an Encumbrance pursuant to Section 15.2(c)(iii) or Section 15.2(d), which performance imposes costs or delays in the performance of Project Operations, such performance,
 - (i) prior to Substantial Completion shall, subject to and in accordance with Section 38, be treated as a Delay Event and, subject to and in accordance with Section 39, be treated as a Compensation Event; and
 - (ii) following Substantial Completion shall, subject to and in accordance with Schedule 21 - Variation Procedure, result in a Variation.
- (f) In the event that any portion of the Lands becomes subject to any encumbrance following Financial Close due to an act or omission of Project Co or any Project Co Party, Project Co acknowledges and agrees that it will be required to remove, vacate or discharge such encumbrance. For the purposes of the foregoing, “encumbrance” includes those matters included in Encumbrances, insofar as they relate to or affect the Lands.
- (g) In respect of Encumbrances that are contained in Third Party Access Agreements, Project Co shall, as part of the Project Operations, at its own cost and risk and in a manner compliant with and so as not to cause a default by the City under the terms of the Third Party Access Agreement, (i) observe, comply with, perform and complete all obligations of the City contained in all Third Party Access Agreements, and (ii) schedule the performance of the Project Operations in accordance with the requirements set out in the Third Party Access Agreements and in Schedule 15-Output Specifications. In the event that any act or omission of Project Co or any Project Co Party causes a default under a Third Party Access Agreement, Project Co shall indemnify, save harmless and pay all costs (including legal costs), damages (including liquidated damages), penalties, fines, charges and other amounts payable under the Third Party Access Agreement as a result of such act or omission.
- (h) Unless expressly stated in Schedule 15 – Output Specifications that the Third Party Access Agreement is to be fully and formally assigned to and assumed by Project Co as part of its obligations under this Project Agreement, the City shall continue to maintain the contractual interface with the counterparties to the Third Party Access Agreements, to pay all amounts required to be paid under the applicable Third Party Access Agreement, and continue to collect all payments, rents, fees, costs, charges and other amounts payable under the applicable Third Party Access Agreement. Without diminishing the responsibility of Project Co under this Section 15.2, the City and Project Co will discuss and coordinate the performance of their respective roles and responsibilities under each of the Third Party Access Agreements with a view to minimizing the potential for default thereunder.

15.3 Construction Lien Act (Ontario)

- (a) The Parties acknowledge that Section 15.2 shall apply to claims for liens made against the Lands pursuant to the CLA and shall also apply to claims made against the City or the holdback under the CLA as though such a claim were an Encumbrance against the Lands as referred to therein.

- (b) Project Co shall withhold from each Subcontractor the holdbacks required under the CLA and shall deal with such holdbacks in accordance with the CLA.
- (c) Project Co shall, as a condition of final payment under any Subcontract for which lien rights or rights in respect of the holdback may be claimed under the CLA, require that a certificate of completion under Section 33(1) of the CLA for such Subcontract be issued and the relevant Subcontractor provide statutory declarations or other assurances confirming that all those engaged by the Subcontractor have been paid in accordance with Applicable Law.
- (d) Project Co shall follow the requirements of the CLA and Good Industry Practice for posting and advertising certificates of completion when issued.
- (e) Project Co shall promptly provide the City with a copy of any materials which are provided to the Lenders to evidence compliance with the CLA.
- (f) Upon request by the City, Project Co shall perform and deliver to the City a sub-search of title on the Lands or any part thereof. The City shall pay the reasonable costs of any such search except (i) a search that reveals Encumbrances that are not permitted by this Project Agreement, (ii) a search requested based on a reasonable suspicion that an Encumbrance that is not permitted by this Project Agreement has been registered on title to the Lands, and (iii) a search requested for the purpose of confirming that an Encumbrance that is not permitted by this Project Agreement has been discharged from title to the Lands.
- (g) Project Co shall cause a Payment Certifier to be appointed under the Construction Contract and shall cause such Payment Certifier to certify the substantial performance of the Construction Contract in accordance with the CLA.
- (h) The City shall provide Project Co with any notice of lien that is delivered to the City in connection with the Works promptly (and in any event within 5 Business Days) following receipt thereof.

16. SITE CONDITION

16.1 Acceptance of Site Condition

- (a) Subject to Sections 6.4, 16.1(b), 16.2, 16.3, 16.4, 16.5, 16.7, 16.8, 16.9 and 16.10, Project Co acknowledges and agrees that it has inspected or investigated the Lands, the Existing Trillium Line Assets and the Site Conditions, including the Background Information, prior to executing this Project Agreement and agrees to accept the Lands, the Existing Trillium Line Assets and the Site Conditions on an “as is, where is” basis. Without limiting the generality of the foregoing, but subject to Sections 6.4, 16.1(b), 16.2, 16.3, 16.4, 16.5 16.7, 16.8 16.9 and 16.10, Project Co shall not be entitled to make any claim of any nature whatsoever against the City or any City Party on any grounds relating to the Lands, the Existing Trillium Line Assets or the Site Conditions, including the fact that incorrect or insufficient information on any matter relating to the Lands, the Existing Trillium Line Assets or the Site Conditions was given to it by any person, whether or not a City Entity or a City Party.

- (b) Section 16.1(a) is not intended to prohibit Project Co from relying upon information that has been provided by a person or other entity who has given Project Co an express written entitlement to rely on that information, provided, however, that, subject to Sections 6.4, 16.2, 16.3, 16.4, 16.5, 16.7, 16.8, 16.9 and 16.10, Project Co shall not be entitled to make any claim of any nature whatsoever against the City or any City Party on any grounds relating to the information provided by that person. For clarity, subject to Sections 6.4, 16.2, 16.3, 16.4, 16.5, 16.7, 16.8, 16.9 and 16.10, Project Co's legal recourse shall be against the person or other entity that provided the express written entitlement to rely on the information and not the City or any City Party.
- (c) Subject to Sections 6.4, 16.1(b), 16.2, 16.3, 16.4, 16.5, 16.7, 16.8, 16.9 and 16.10 Project Co acknowledges and agrees that it has and shall be deemed to have:
- (i) performed all necessary due diligence and investigation or inspection on the Lands and examined the Lands and their surroundings and the Existing Trillium Line Assets;
 - (ii) performed all necessary due diligence and investigation or inspection on Existing Trillium Line Assets and satisfied itself prior to executing this Project Agreement as to the structural, environmental and general condition of such Existing Trillium Line Assets;
 - (iii) satisfied itself as to the presence of any Contamination on, in or under the Lands, or migrating to or from the Lands in accordance with Good Industry Practice, taking into account all matters relating to the Lands, including any Existing Trillium Line Assets, and any other buildings, structures and works, on, over and under the Lands existing on the date hereof;
 - (iv) satisfied itself as to the adequacy of the rights of access to, from and through the Lands and any accommodation it may require for the purposes of fulfilling its obligations under this Project Agreement;
 - (v) satisfied itself as to the possibility of interference by persons of any description whatsoever with access to or use of, or rights in respect of, the Lands;
 - (vi) satisfied itself as to the precautions, times and methods of working necessary to prevent any nuisance or interference, whether public or private, being caused to any third parties; and
 - (vii) in accordance with Good Industry Practice, taking into account all matters relating to the Lands, including the presence of any Existing Trillium Line Assets and any other buildings, structures and works, on over and under the Lands existing on the date hereof satisfied itself as to the nature of the Site Conditions, the ground and the subsoil, the level and quantity of groundwater, the form and nature of the Lands, the loadbearing and other relevant properties of the Lands, the risk of injury or damage to property affecting the Lands, the nature of the materials (whether natural or otherwise) to be excavated and the nature of the design, work and materials necessary for the execution and delivery of the Works.
- (d) Project Co further acknowledges and agrees that, other than as referred to or contained in this Project Agreement, no representations or warranties have been made, nor documentation

delivered to Project Co or any Project Co Party, which would indicate that Project Co would be unable to perform the Project Operations in a lawful manner.

16.2 Contamination

- (a) To the extent required to complete the Works, at all times throughout the Project Term, Project Co shall be responsible for managing, remediating and/or removing, in accordance with Section 4.5(a) of Schedule 17 – Environmental Obligations, any Contamination located on, in or under the Lands which was described in, or was properly inferable, readily apparent or readily discoverable from, the Environmental Reports or the Geotechnical Reports (“**Existing Contamination**”). Notwithstanding the forgoing or anything else to the contrary contained in this Agreement, Project Co shall have no responsibility for any Contamination that is migrating to or from the Lands, except (I) to the extent that Project Co or any Project Co Party Released such Contamination in a manner which does not comply with Applicable Law or (II) Project Co or any Project Co party is causing the migration of Existing Contamination.
- (b) Project Co shall be responsible for removing or remediating, in accordance with Section 4.5(g) of Schedule 17 – Environmental Obligations:
 - (i) any Contamination which Project Co or any Project Co Party has brought onto the Lands and caused or permitted to be Released in a manner which does not comply with Applicable Law; or
 - (ii) any Existing Contamination which was harmless or stored, contained or otherwise dealt with in accordance with Applicable Law which Project Co or any Project Co Party causes or permits to be Released in a manner which does not comply with Applicable Law.

In addition, and without limiting any other obligation of Project Co under the Project Agreement, Project Co shall be responsible for all Direct Losses associated with the Releases of Contamination or Existing Contamination described in Sections b(i) and b(ii) above.

- (c) Contamination which is not the responsibility of Project Co pursuant to Sections 16.2(a) and 16.2(b) shall be the responsibility of the City.
- (d) [Intentionally Deleted].
- (e) Upon the discovery of any Contamination, Project Co shall immediately inform the City Representative and shall comply, and ensure compliance by all Project Co Parties, with all Applicable Law and Schedule 17 - Environmental Obligations in respect thereof:
 - (i) at the City’s cost pursuant to Section 16.2(h), in respect of Contamination for which the City is responsible pursuant to Section 16.2(c); and
 - (ii) at its own cost in respect of Contamination for which it is responsible pursuant to Section 16.2(a) or 16.2(b).
- (f) Except to the extent required to prevent or mitigate an Emergency or to comply with Applicable Law, Project Co shall not undertake any significant work pursuant to Section 16.2(e) in respect of

Contamination for which the City is responsible pursuant to Section 16.2(c) until the City Representative has been given a reasonable opportunity to review the nature and extent of the Contamination and has instructed Project Co to proceed with such work.

- (g) In the event that the City wish Project Co to perform actions in respect of any Contamination which are in addition to any required pursuant to Section 16.2(e), then the City shall issue an instruction to Project Co specifying what action the City requires Project Co to take and Project Co shall promptly and diligently comply with all such instructions at the City's cost pursuant to Section 16.2(h).
- (h) If Sections 16.2(e), 16.2(f) or 16.2(g) require Project Co to perform any alteration, addition, demolition, extension or variation in the Project Operations as a result of Contamination for which the City is responsible pursuant to Section 16.2(c) or as a result of any instructions given by the City pursuant to Section 16.2(f) and which would not otherwise be required under this Project Agreement, then any such alteration, addition, demolition, extension or variation:
 - (i) prior to Substantial Completion, shall, subject to and in accordance with Section 38, be treated as a Delay Event and, subject to and in accordance with Section 39, be treated as a Compensation Event; and
 - (ii) following Substantial Completion, shall, subject to and in accordance with Schedule 21 - Variation Procedure, result in a Variation.
- (i) In the event that the City and Project Co do not agree as to the nature or extent of Contamination, or in the event of a disagreement as to whether Project Co. is responsible for Contamination pursuant to either Sections 16.2(a) or 16.2(b), or the actions to be performed by Project Co pursuant to Section 16.2(d) or Schedule 17 - Environmental Obligations, such disagreement shall be referred for determination to the Independent Certifier, and if the Independent Certifier is unable to make the determination, then he or she shall appoint an independent and suitably qualified and experienced person to make such determination (and the costs and expenses of retaining such person shall be borne by the unsuccessful Party). Such person's decision shall be final and binding on the Parties only in respect of the nature or extent of the Contamination and any action to be performed by Project Co pursuant to Section 16.2(e) and Schedule 17 – Environmental Obligations, except to the extent that either Party alleges that such decision would result in non-compliance with Applicable Law or this Project Agreement, in which event either Party may refer the disagreement for resolution in accordance with Schedule 26 - Dispute Resolution Procedure.

16.3 Items of Geological, Historical Heritage or Archaeological Interest or Value

- (a) As between the Parties, all fossils, artifacts and other objects having artistic, historic, archaeological or monetary value, including human remains and burial sites, which may be found on or at the Lands are or shall be the sole and absolute property and responsibility of the City or the owner of the relevant property, as applicable.
- (b) The City shall be responsible for items referred to in Section 16.3(a) except for any such items that were described in, or were properly inferable, readily apparent or readily discoverable from,
 - (i) the Archaeological Reports; or

- (ii) any Cultural Heritage Reports.
- (c) Upon the discovery of any item referred to in Section 16.3(a), Project Co shall:
 - (i) immediately inform the City Representative of such discovery; and
 - (ii) take all steps not to disturb the item and, if necessary, cease any Project Operations in so far as performing such Project Operations would endanger the item or prevent or impede its excavation, take all necessary steps to preserve and ensure the preservation of the item in the same position and condition in which it was found, and comply, and ensure compliance by all Project Co Parties, with Applicable Law and all requirements of Governmental Authorities with respect to such discovery, including the *Funeral, Burial and Cremations Services Act, 2002* (Ontario) and the *Standards & Guidelines for Conservation of Provincial Heritage Properties* issued under the *Ontario Heritage Act* (Ontario) and the *Standards and Guidelines for the Conservation of Historic Places in Canada*:
 - (A) at the City's cost pursuant to Section 16.3(e), in respect of any such discovery for which the City is responsible pursuant to Section 16.3(b); and
 - (B) at its own cost in respect of any such discovery for which it is responsible pursuant to Section 16.3(b),
- (iii) comply with all requirements set out in Part 6 of Schedule 17-Environmental Obligations.
- (d) In the event that the City wishes Project Co to perform actions in respect of any discovery of any item referred to in Section 16.3(a) which are in addition to any required pursuant to Section 16.3(c), then the City shall issue an instruction to Project Co specifying what action the City requires Project Co to take and Project Co shall promptly and diligently comply with all such instructions at the City's cost pursuant to Section 16.3(e).
- (e) If Sections 16.3(c) or 16.3(d) require Project Co to perform any alteration, addition, demolition, extension or variation in the Project Operations as a result of any such discovery for which the City is responsible pursuant to Section 16.3(b) or as a result of any instructions given by the City pursuant to Section 16.3(d) and which would not otherwise be required under this Project Agreement, then any such alteration, addition, demolition, extension or variation shall,
 - (i) prior to Substantial Completion (but in the case of Section 16.3(c), only to the extent it directly results in the interruption of the Works), subject to and in accordance with Section 38, be treated as a Delay Event and, subject to and in accordance with Section 39, be treated as a Compensation Event; and
 - (ii) following Substantial Completion, subject to and in accordance with Schedule 21 – Variation Procedure, result in a Variation.
- (f) In the event that the City and Project Co do not agree as to the nature or extent of the actions required to be performed by Project Co pursuant to Section 16.3(c)(ii), such disagreement shall be referred for determination to the Independent Certifier, and if the Independent Certifier is unable to make the determination, then he or she shall appoint an independent and suitably qualified and

experienced person to make such determination (and the costs and expenses of retaining such person shall be borne by the unsuccessful Party). Such person's decision shall be final and binding on the Parties except to the extent that either Party alleges that such decision would result in non-compliance with Applicable Law or this Project Agreement, in which event either Party may refer the disagreement for resolution in accordance with Schedule 26 - Dispute Resolution Procedure.

16.4 Species-at-Risk

- (a) Project Co shall be responsible for any Species-at-Risk which may be found on, in or at the Site, the occurrence of which, in the location in which it is found was described in the Environmental Assessments. The City shall be responsible for any Species-at-Risk which may be found on, in or at the Site, except for any Species-at-Risk the occurrence of which, in the location in which it is found was described in the Environmental Assessments
- (b) In respect of Species-at-Risk for which Project Co is responsible pursuant to Section 16.4(a), Project Co shall, at its own cost, comply, and ensure compliance by all Project Co Parties, with all Applicable Law and the provisions of Schedule 17 – Environmental Obligations. Upon the discovery of any Species-at-Risk for which the City is responsible pursuant to Section 16.4(a), Project Co shall:
 - (i) immediately inform the City Representative of such discovery; and
 - (ii) comply, and ensure compliance by all Project Co Parties, with all Applicable Law and the provisions of Schedule 17 - Environmental Obligations in respect thereof, including taking all necessary steps to preserve the respective habitat and relocate the Species-at-Risk at the City's cost pursuant to Section 16.4(d).
- (c) In the event that the City wishes Project Co to perform actions which are in addition to any required pursuant to Section 16.4(b), then the City shall issue an instruction to Project Co specifying what action the City requires Project Co to take and Project Co shall promptly and diligently comply with all such instructions at the City's cost pursuant to Section 16.4(d).
- (d) If Sections 16.4(b) or 16.4(c) require Project Co to perform any alteration, addition, demolition, extension or variation in the Project Operations as a result of the discovery of any Species-at-Risk for which the City is responsible pursuant to Section 16.4(a) or as a result of any instructions given by the City pursuant to Section 16.4(c) and which would not otherwise be required under this Project Agreement, then any such alteration, addition, demolition, extension or variation:
 - (i) prior to Substantial Completion shall, subject to and in accordance with Section 38, be treated as a Delay Event and, subject to and in accordance with Section 39, be treated as a Compensation Event; and
 - (ii) following Substantial Completion shall, subject to and in accordance with Schedule 21 - Variation Procedure, result in a Variation.

16.5 Defects – Existing Vehicle Fleet

- (a) From Financial Close to the commencement of the Shutdown Period, the City agrees (i) to

continue to use and operate the Existing Vehicle Fleet in a manner and at service levels consistent with the manner and service levels with which the Existing Vehicle Fleet was used prior to Financial Close, and (ii) to cause the maintenance, repair, refurbishment and replacement of the components of the Existing Vehicle Fleet in accordance with Existing Vehicle Maintenance Standard.

- (b) As at 9:00 a.m. on the commencement date of the Shutdown Period, the City shall hand over, and Project Co shall assume, full care, custody, control, risk and responsibility for the Existing Vehicle Fleet, including any Defects or Latent Defects in the Existing Vehicle Fleet, and, for greater certainty, notwithstanding that Project Co may be disputing, in accordance with this Section 16.5, that the Existing Vehicle Maintenance Standard has not been observed and complied with by the City. The City shall, concurrent with the hand over, prepare a report summarizing the status of all outstanding Defects in the Existing Vehicle Fleet which have been identified to the City as at that time.
- (c) Project Co acknowledges having been provided with Background Information relating to, and several opportunities prior to Financial Close to inspect, the Existing Vehicle Fleet. Following Financial Close, and on a monthly basis thereafter until the commencement of the Shutdown Period, the City shall, with reasonable promptness, provide to Project Co (i) written confirmation from the City that the maintenance requirements prescribed in the Existing Vehicle Maintenance Standard have been performed, together with copies of the maintenance records relating to the Existing Vehicle Fleet (collectively, the “**Vehicle Maintenance Records**”), (ii) the schedule of future dates and proposed major maintenance activities to be performed in connection with the Existing Vehicle Fleet (the “**Major Maintenance Schedule**”), and (iii) 5 Business Days’ notice and the opportunity to have a competent representative present to observe the planned major maintenance and repair activities relating to the Existing Vehicle Fleet (a “**Planned Major Maintenance Activity**”). Project Co shall provide to the City written notice of its intention to attend and observe a Planned Major Maintenance Activity and the persons who will be attending and observing such event at least 3 Business Days prior to the applicable date stipulated in the Major Maintenance Schedule. The City shall make reasonable efforts to accommodate such requests, but Project Co acknowledges and agrees that on occasion, unscheduled and emergency maintenance or repair items are required to be performed, and that on such occasions, it may be expedient to attend to upcoming scheduled maintenance or repair activities while the emergency maintenance or repair item is addressed. In these circumstances, the City will not be able to provide 5 Business Days notice of the event to allow for observation of such activities, but will provide as much notice to Project Co as is reasonably practicable in the circumstances.
- (d) The City shall be deemed to have complied with its obligations to maintain the Existing Vehicle Fleet to the Existing Vehicle Maintenance Standard as detailed in the applicable Vehicle Maintenance Records and Project Co shall be deemed to have accepted that the Existing Vehicle Maintenance Standard as reflected by the applicable Vehicle Maintenance Records has been observed and complied with by the City unless it provides to the City, within 10 Business Days of (i) each delivery of copies of Vehicle Maintenance Records from time to time, or (ii) each Planned Major Maintenance Activity in accordance with the Major Maintenance Schedule (or each unscheduled emergency maintenance or repair activity as set out in Section 16.5(c)) written notice of any failures of the City to meet the Existing Vehicle Maintenance Standard revealed by the relevant Vehicle Maintenance Records or, subject as aforesaid, such Planned Major Maintenance Activity.

- (e) The City shall consider the contents of any notice provided by Project Co pursuant to Section 16.5(d), and shall advise Project Co within a reasonable time of receipt of such notice as to whether it agrees with the contents of the notice and, if applicable, what steps the City proposes to take to comply with the Existing Vehicle Maintenance Standard. In the event that the City and Project Co do not agree as to the nature or extent of the actions required to be performed by the City to meet the requirements of the Existing Vehicle Maintenance Standard, such disagreement shall be referred for determination to the Independent Certifier, and if the Independent Certifier is unable to make the determination, then he or she shall appoint an independent and suitably qualified and experienced person acceptable to Project Co and the City, each acting reasonably, to make such determination (and the costs and expenses of retaining such person shall be borne by the unsuccessful Party). Such person's decision shall be final and binding on the Parties except to the extent that either Party alleges that such decision would result in non-compliance with Applicable Law or this Project Agreement, in which event either Party may refer the disagreement for resolution in accordance with Schedule 26 - Dispute Resolution Procedure.

16.6 Defects – Existing Trillium Line Assets

- (a) As of and from Financial Close, save and except for the City Retained Existing Structures Latent Defect Responsibility, Project Co shall assume full responsibility for any Latent Defects in the Existing Trillium Line Assets. From Financial Close to the commencement of the Shutdown Period, the City agrees to continue to operate the Existing Trillium Line in a manner and at service levels consistent with the operation of the Existing Trillium Line prior to Financial Close. For clarity, Project Co shall not be responsible for any costs or expenses related to the operation and maintenance of the Existing Trillium Line at any time prior to the commencement of the Shutdown Period except for any damages, costs, expenses, losses or claims arising from any acts or omissions of Project Co or any Project Co Party in respect of the Existing Trillium Line.
- (b) As at 9:00 a.m. on the commencement date of the Shutdown Period the City shall hand over, and Project Co shall assume full care, custody, control, risk and responsibility for the Existing Trillium Line Assets, including without limitation (but subject as hereinafter provided), any Defects or Latent Defects in the Existing Trillium Line Assets. Such assumption of responsibility and liability in respect of the Existing Trillium Line Assets by Project Co is subject only to (i) the City Retained Dow's Lake Latent Defect Responsibility, and, (ii) the City Retained Existing Structures Latent Defect Responsibility.
- (c) Project Co shall maintain the Existing Trillium Line Assets in accordance with the Shutdown Period Transition and Maintenance Plan.

16.7 Latent Defects – Dow's Lake Tunnel Structure

- (a) At the commencement of the Shutdown Period, Project Co shall, subject to Section 16.7(b), undertake and assume responsibility and liability for (i) performing the maintenance and repairs to the Dows Lake Tunnel Structure described in section 4.8(c)(xxvi) of Part 2 of Schedule 15-2 to the Project Agreement; (ii) performing the installation, maintenance, repair and replacement of the structural or other component within or on the Dows Lake Tunnel Structure affixed, installed or constructed by Project Co; and (iii) the repair of any damage to the Dows Lake Tunnel Structure caused by or resulting from the performance, or any failure by Project Co to perform,

the Project Operations in accordance with the provisions of this Project Agreement (the “**Project Co Assumed Responsibilities for the Dow’s Lake Tunnel Structure**”).

- (b) The City shall retain the City Retained Dow’s Lake Latent Defect Responsibility. In the event that any Latent Defect in the Dows Lake Tunnel Structure is demonstrated by Project Co to impact the ability of Project Co to perform and complete the Project Operations in accordance with the requirements of this Project Agreement, such event shall:
- (i) prior to Substantial Completion, subject to and in accordance with Section 38, be treated as a Delay Event and, subject to and in accordance with Section 39, be treated as a Compensation Event; and,
 - (ii) following Substantial Completion, subject to and in accordance with Schedule 21 - Variation Procedure, result in a Variation,

provided that any failure by the City in fulfilling this City Retained Dow’s Lake Latent Defect and Maintenance Responsibility or any such Latent Defect in the Dow’s Lake Tunnel Structure was not caused or contributed to by Project Co or a Project Co Party.

16.8 Latent Defects – Existing City Retained Latent Defect Structures

- (a) Project Co shall, subject to Section 16.8(b), be responsible for the maintenance and repair of the Existing City Retained Latent Defect Structures throughout the Project Term, subject only to the City Retained Existing Structures Latent Defect Responsibility.
- (b) In the event that Project Co is able to demonstrate to the reasonable satisfaction of the City that a Latent Defect exists in the Existing City Retained Latent Defect Structures that:
- (i) was not within the actual knowledge of Project Co or a Project Co Party, as of Financial Close;
 - (ii) was not referenced or described in, or was not properly inferable, readily apparent or readily discoverable from the Background Information; or
 - (iii) was not caused or contributed to by Project Co or a Project Co Party,

such event shall:

- (A) prior to Substantial Completion, subject to and in accordance with Section 38, be treated as a Delay Event and, subject to and in accordance with Section 39, be treated as a Compensation Event; and,
- (B) following Substantial Completion, subject to and in accordance with Schedule 21 - Variation Procedure, result in a Variation.

16.9 Defects Correction – General Provisions

- (a) Upon the discovery of a matter that Project Co alleges is a City Retained Dow’s Lake Latent Defect Responsibility or a City Retained Existing Structures Latent Defect Responsibility

(collectively, a “**City Retained Latent Defect Responsibility**”), Project Co shall immediately provide written notice to the City Representative.

- (b) Project Co shall not undertake any work in respect of any alleged City Retained Latent Defect Responsibility until the City Representative has been given a reasonable opportunity to review the nature and extent of the issue and has instructed Project Co to proceed with such work.
- (c) In the event that the City wishes Project Co to remedy any City Retained Latent Defect Responsibility, then the City shall issue an instruction to Project Co specifying what action the City requires Project Co to take and Project Co shall promptly and diligently comply with all such instructions at the City’s cost, subject to and in accordance with Section 16.9(d).
- (d) If the City requires Project Co to perform any alteration, addition, demolition, extension or variation in the Works as a result of instructions given by the City pursuant to Section 16.9(c) and which would not otherwise be required to be performed by Project Co under this Project Agreement, then, if such request is made prior to Substantial Completion, any such alteration, addition, demolition, extension or variation in the Works shall, subject to and in accordance with Section 38, be treated as a Delay Event and, subject to and in accordance with Section 39, be treated as a Compensation Event, and if such request is made following Substantial Completion shall, subject to and in accordance with Schedule 21 - Variation Procedure, result in a Variation.

16.10 Mislocated or Unknown Utilities

- (a) Project Co shall be responsible for Utility Infrastructure on the Site pursuant to Schedule 15 – Output Specifications, except for any Utility Infrastructure that is Mislocated Utility Infrastructure within the study area limits represented by the Subsurface Utility Engineering Reports, or is Utility Infrastructure that:
 - (i) was not within the actual knowledge of Project Co or a Project Co Party, as of the date which is 30 days prior to the RFP Technical Submission Deadline; and
 - (ii) was not referenced or described in, or was not inferable, readily apparent or readily discoverable, from the Background Information.
- (b) For the purposes of Section 16.10(a)(i), “actual knowledge” shall mean knowledge that is actually held by the person who was identified as the project manager (or analogous position) for the Project in Project Co’s proposal in response to the Request for Proposals.
- (c) If Utility Infrastructure on the Site that is not the responsibility of Project Co pursuant to Section 16.10(a) delays Project Co’s performance of the Works then any such delay or additional costs in respect of the Works shall, subject to and in accordance with Section 38 be treated as a Delay Event and, subject to and in accordance with Section 39, be treated as a Compensation Event.

17. GOVERNMENTAL AND THIRD PARTY FINANCIAL OBLIGATIONS

17.1 Governmental and Utility Company Fees

- (a) Project Co shall be responsible for,

- (i) all Financial Obligations under or in respect of all Project Co Permits, Licences, Approvals and Authorizations; and
- (ii) all Financial Obligations in respect of the City Permits, Licences, Approvals and Authorizations that are set out as being Project Co's responsibility in Schedule 15 – Output Specifications, Schedule 17 – Environmental Obligations or Schedule 32 – City Permits, Licences, Approvals and Authorizations.

For clarity, and notwithstanding the foregoing, Project Co shall not be responsible for payment of any development charges relating to the Works, System Infrastructure or the New Municipal Infrastructure.

- (b) Subject to Section 17.1(a)(ii), the City shall be responsible for all Financial Obligations under or in respect of all the City Permits, Licences, Approvals and Authorizations, including to the City, any Utility Company, any Governmental Authority or any third party in respect of the Project Operations, including:
 - (i) any engineering administration and inspection fees required in respect of works or services required to be performed;
 - (ii) any security deposits required under any City Permits, Licences, Approvals and Authorizations; and
 - (iii) any other amounts payable under any City Permits, Licences, Approvals and Authorizations.
- (c) The Parties agree that any refund, partial rebate or credit granted by the City, any applicable Utility Company, any applicable Governmental Authority or any other third party relating to the Financial Obligations referred to in Sections 17.1(a) and 17.1(b) shall be for the benefit of the City to the extent such Financial Obligations were paid by the City and shall be for the benefit of Project Co to the extent such Financial Obligations were paid by Project Co. Without limiting the generality of the foregoing, to the extent that the City enters into any cost sharing arrangements with the City, any Utility Company, any Governmental Authority or any third party, Project Co acknowledges and agrees that the City shall be the sole beneficiary of any such cost sharing arrangements and Project Co shall have no entitlement whatsoever to any benefit arising from any such cost sharing arrangements.

18. CHANGE IN STANDARDS

- (a) Where this Project Agreement requires Project Co to comply with a technical standard in respect of the Project Operations, and that standard has changed between the date of this Project Agreement (or in respect of the Revenue Vehicle Supplier only, November 2, 2017) and the date that such compliance is required, then Project Co shall give Notice to the City of such change. If, after such Notice, the City requires compliance with the changed standard (rather than the standard applicable as of the date of this Project Agreement), then, to the extent such change impacts the Project Operations and would not have otherwise been taken into account by compliance with Good Industry Practice, such changed standard shall, subject to and in accordance with Schedule 21 - Variation Procedure, result in a Variation. If the City does not

require compliance with the changed standard, then Project Co shall continue to comply with the standard applicable as of the date of this Project Agreement (or in respect of the Revenue Vehicle Supplier only, November 2, 2017), without a Variation therefor. This Section 18 shall not apply where a change in a technical standard is also a Change in Law.

19. COORDINATION AND NO DISRUPTION

- (a) Project Co shall perform the Project Operations so as to coordinate with,
- (i) subject to and in accordance with Section 9.8 (to the extent applicable), the operations of and the performance of any services by the City, any City Party, any Governmental Authority, any Railway Company, any counterparty to a Third Party Access Agreement and any Utility Company including the performance of the Governmental Activities and the Other Works;
 - (ii) the construction, operation and maintenance of the System Extension in accordance with Schedule 36 – System Extension;
 - (iii) the construction of the interface, connection or inter-connection between the System Infrastructure and the existing City network, including any existing transit systems, highway systems, railway systems, railway networks and any other Ontario or City of Ottawa road or roadway;
 - (iv) Future Known Expansions; and
 - (v) the performance of any services by any Operator.
- (b) Project Co shall use commercially reasonable efforts to minimize:
- (i) any interference with the operations, construction and maintenance of:
 - (A) the City, any City Party, any Governmental Authority, Fare Control Service Provider, any Other Contractor or Utility Company, including the performance of the Governmental Activities and the Other Works;
 - (B) the existing City network; and
 - (C) the existing City road network;
 - (ii) any lane closures, traffic diversions or restrictions or other impairment of the public's use and enjoyment of the System Infrastructure.

20. DESIGN AND CONSTRUCTION OBLIGATIONS

20.1 Overall Responsibility

- (a) Project Co shall perform and complete the Works:
- (i) so as to satisfy the Output Specifications;

- (ii) in accordance with the Project Co Proposal Extracts;
 - (iii) in accordance with the Design Data;
 - (iv) in accordance with the Works Schedule; and
 - (v) in accordance with the other terms and conditions of this Project Agreement.
- (b) Without prejudice to Section 20.1(a), but subject to the provisions of the Maintenance and Rehabilitation Requirements, Schedule 19 - Payment Mechanism and Schedule 23 - Expiry Transition Procedure, if, at any time during the Project Term, any of the Works, the System Infrastructure, the New Municipal Infrastructure or any parts thereof do not fully satisfy the Output Specifications and/or any other term or condition of this Project Agreement (other than the Project Co Proposal Extracts) Project Co shall, at its own cost and expense, rectify the Works, the System Infrastructure, the New Municipal Infrastructure and any part thereof so that:
- (i) the Works, the System Infrastructure, the New Municipal Infrastructure and all parts thereof shall, at all times, comply with and satisfy in full the Output Specifications and the other terms and conditions of this Project Agreement (other than the Project Co Proposal Extracts); and
 - (ii) the Works, the System Infrastructure, the New Municipal Infrastructure and all parts thereof will, at all times, be able to meet all safety and performance standards and other requirements set out in the Output Specifications and the Project Agreement.

20.2 Completion of System Infrastructure and New Municipal Infrastructure

- (a) Project Co shall design, engineer, construct and commission the System Infrastructure and the New Municipal Infrastructure so as to provide the City complete and operational System Infrastructure the New Municipal Infrastructure in accordance with the Output Specifications and the Project Co Proposal Extracts, and that will allow Project Co to perform the Works and the Maintenance and Rehabilitation Services, all in accordance with and subject to the terms of this Project Agreement.

20.3 Development of Design

- (a) Project Co shall, at its own cost, develop and complete the design of the System Infrastructure, the New Municipal Infrastructure and all Design Data in accordance with the requirements of this Project Agreement, including Schedule 10 - Review Procedure and this Section 20.3.
- (b) The further development of the design of the System Infrastructure and New Municipal Infrastructure and the process by which such design is progressed must fully comply with the requirements of this Project Agreement.
- (c) In order to develop the detailed design of the System Infrastructure and the New Municipal Infrastructure, Project Co shall consult with the Stakeholders (which consultation requirements pursuant to the Environmental Assessments are further described in Schedule 17 - Environmental Obligations) the City Representative and the City Design Team in an interactive process. If the result of any consultation with Stakeholders is a change to the scope, configuration or size of any

System Infrastructure, the New Municipal Infrastructure or a change in the Construction Activities, or a change in the Maintenance and Rehabilitation Services, then such change shall, subject to and in accordance with Schedule 21 - Variation Procedure, result in a Variation.

- (d) The Parties agree that Appendix A to Schedule 10 - Review Procedure is an initial list of Design Data and other items that will require design review, which Design Data and other items shall include (to a scale required by the City Representative):
- (i) design development drawings, reports, schedules and specifications progressed from Commercial Close with extensive user group input, showing all architectural, engineering and landscape design information sufficient to allow for the development of working drawing documentation, submitted at
 - (A) Pre-Final Design Development (PFDD); and
 - (B) Final Design Development (FDD);

(collectively, the “**Design Development Submittals**”);
 - (ii) working drawing documentation, being construction drawings, reports, schedules and specifications progressed from the Design Development Submittals, showing all architectural, engineering and landscape design information in accordance with the requirements of this Project Agreement, submitted upon completion thereof and as required in accordance with Schedule 10 - Review Procedure (collectively, the “**Construction Document Submittals**”); and
 - (iii) all other reports, studies, plans and documentation required pursuant to Schedule 10 - Review Procedure or otherwise identified in the Project Agreement.
- (e) Project Co shall submit to the City Representative for review in accordance with Schedule 10 - Review Procedure all Design Data and other items listed in Section 20.3(d).
- (f) The Design Data and other items listed in Section 20.3(d) must contain, at a minimum, the information required pursuant to Article 3 of Schedule 10 – Review Procedure, and must identify where changes have been submitted, an indication of how the changes meet the requirements of this Project Agreement.
- (g) The Design Data and other items listed in Section 20.3(d) must contain, at a minimum, the following additional information:
- (i) identification of the stage of design or construction to which the documentation relates;
 - (ii) all design or construction drawings and specifications necessary to enable the City Representative to make an informed decision as to whether Project Co is permitted to proceed pursuant to Schedule 10 - Review Procedure;
 - (iii) for each stage of the design or construction documentation, a schedule identifying all changes to the relevant documentation that has occurred from the previous stage of design or construction documentation; and

- (iv) where changes have been submitted, an indication of how the changes meet the requirements of this Project Agreement.
- (h) If Project Co commences or permits the commencement of the next level of design or construction of any part or parts of the System Infrastructure or the New Municipal Infrastructure prior to being entitled to proceed in accordance with Schedule 10 - Review Procedure and it is subsequently determined in accordance with Schedule 10 - Review Procedure or Schedule 26 - Dispute Resolution Procedure that the design or construction does not comply with this Project Agreement, then Project Co shall forthwith, at its own cost and risk undo, remove from the System Infrastructure or the New Municipal Infrastructure and replace and restore, as applicable, any parts of the design or construction that do not comply with this Project Agreement.
- (i) [Intentionally deleted].
- (j) Neither the City nor any City Party will have any liability:
 - (i) if a document submitted by Project Co and reviewed by the City, the City Representative or the City Design Team results in non-compliance with this Project Agreement by Project Co or a breach by Project Co of Applicable Law; or
 - (ii) for any loss or claim arising due to any defect in any documents, drawings, specifications or certificates submitted by Project Co.
- (k) Project Co and the City will cooperate with each other in the design review process. Notwithstanding such cooperation by the City, such review shall not constitute acceptance of the Works, and Project Co shall remain solely responsible for compliance in full with all requirements of this Project Agreement.
- (l) Project Co shall allow the City Representative and the City Design Team, at any time, a reasonable opportunity to view any items of Design Data, which shall be made available to the City Representative and/or the City Design Team, as applicable, as soon as practicable following receipt of a written request from the City Representative.
- (m) Project Co shall cause the Construction Contractor to establish and maintain a computerized design database and a web based Review Procedure Activities Register, which Project Co and the City may access remotely by computer to:
 - (i) view drawings comprised within the Design Data;
 - (ii) electronically store and print copies of such Design Data; and
 - (iii) track the status of each Works Submittal, pursuant to Article 3 of Schedule 10 – Review Procedure.

20.4 Start-Up Meeting

- (a) Within 10 Business Days after Commercial Close, Project Co and the Design Team shall attend a start-up meeting (the “**Start-Up Meeting**”) with the City to set out the design development process in greater detail.

- (b) The agenda for the Start-Up Meeting shall include the following:
- (i) Project Co's plan to develop a successful long-term partnership with the City for the purpose of supporting the City in achieving its vision, mission and core values;
 - (ii) Project Co's plan to ensure that the Works are completed in accordance with the requirements set forth in this Project Agreement;
 - (iii) Project Co's process to ensure optimum design quality;
 - (iv) Project Co's approach to ensure that all Project Co Parties perform the Works, as applicable, as a fully integrated team;
 - (v) a proposed schedule of Works Submittals which is consistent with the Current PBS and which provides for a progressive and orderly flow of Works Submittals from Project Co to the City Representative to allow sufficient time for review of each Works Submittal by the City Representative, and taking into account both the resources available to the City Representative to conduct such review and whether delay in the review of the subject matter of the Works Submittal will have a material impact on Project Co's ability to progress future anticipated Works Submittals and the Works in accordance with the Current PBS;
 - (vi) Project Co's plan to successfully integrate feedback from consultations with Stakeholders and the City Design Team;
 - (vii) Project Co's approach to timing, construction, and adjustment; and
 - (viii) a communication process that includes an electronic data room and the use of a computerized document tracking system that has the capacity to report, on request, the status of all design and construction documentation and that takes into account the document security protocol described in Section 50.5(f).

20.5 Design Review Meetings

- (a) In order to obtain input in the preparation of, and prior to submitting, the Design Development Submittals and the Construction Document Submittals, Project Co and the Design Team shall hold design review meetings (the "**Design Review Meetings**") with the City and the City Design Team upon the following terms:
- (i) the Project Co Representative shall arrange the Design Review Meetings in consultation with the City Representative;
 - (ii) all Design Review Meetings shall be held in the City of Ottawa unless the City agrees otherwise in writing;
 - (iii) the Parties shall cooperate to develop a reasonable schedule for the Design Review Meetings and shall incorporate such schedule into the draft Works Schedule;

- (iv) Project Co shall circulate to the City and the City Design Team an agenda for each of the Design Review Meetings no later than 10 Business Days prior to the relevant Design Review Meeting;
 - (v) in advance of a Design Review Meeting, Project Co may submit to the City Design Team for comment any interim drafts of any designs or plans required under this Project Agreement, which submissions shall be used to inform the City on the development of System Infrastructure and New Municipal Infrastructure design and provide an opportunity for dialog on compliance with the requirements of the Project Agreement. For greater certainty, interim submissions shall be informal and shall not be reviewed in accordance with Schedule 10 - Review Procedure;
 - (vi) the Design Review Meetings shall be held in person, except where otherwise agreed by the Parties, acting reasonably;
 - (vii) Project Co shall maintain minutes of the Design Review Meetings, including possible design solutions and changes in design, and, within 5 Business Days after each Design Review Meeting, Project Co shall provide to the City and the City Design Team a copy of the minutes, together with a copy of any notes, comments, sketches, drawings, tracings, lay-outs, plans or diagrams prepared at the Design Review Meeting; and
 - (viii) the City and Project Co agree that the subject matter of the Design Review Meetings shall not be regarded as Submittals to which Schedule 10 - Review Procedure applies, and that the City shall not be bound by the input provided in connection with the Design Review Meetings.
- (b) The Parties shall, together with the City Design Team, hold Design Review Meetings prior to the submission of:
- (i) each of the Design Development Submittals; and
 - (ii) each of the Construction Document Submittals.
- (c) The purpose of the Design Review Meetings is to facilitate the incorporation of the City input, involvement and feedback into the Design Data prior to submission of such Design Data in accordance with Schedule 10 - Review Procedure.

20.6 Testing

- (a) To the extent and in the manner provided by the Quality Documentation and other terms of this Project Agreement, all testing shall be carried out by a duly accredited and certified testing facility and organization. The City Representative shall be given timely advance Notice (being not less than 2 Business Days) of the date of such tests, except for categories of tests (if any) in respect of which the City Representative gives written Notice to Project Co that it does not require such Notice. The City Representative and any other City Party at the City's option shall be entitled to attend at any test. Any material or plant which fails such tests shall be rejected.

- (b) Project Co shall develop a test recording system which shall permit ready retrieval of all test readings and shall provide information relating to tests proposed, test methodology and test readings to the City Representative on request.
- (c) With respect to continuous testing operations (such as concrete quality, structural concrete strengths, aggregate quality, compaction tests and bituminous material quality), Project Co shall provide to the City Representative at regular intervals (not to exceed weekly unless otherwise agreed by the Parties) test summary sheets and statistical analyses indicating strength and quality trends.

20.7 Performance of Design Obligations

- (a) In the design and engineering of the System Infrastructure and New Municipal Infrastructure, Project Co, its consultants and the Project Co Parties shall exercise the standard of care normally exercised by licensed or registered professional engineering and architectural personnel and other licensed or registered professionals, as applicable, having knowledge and experience in performing design activities of a similar nature, scope and complexity.
- (b) Project Co shall ensure that all parts of the Works shall, as required by Applicable Law, be performed or reviewed by licensed or registered professional engineers and architects registered to practice in the Province of Ontario. Such architects and engineers shall certify and, if required by Applicable Law, sign and seal, all designs, drawings and technical reports confirming that they comply with all prevailing design standards and design practices for such work in the Province of Ontario and all other applicable standards, specifications and codes, as otherwise required by Applicable Law.

20.8 General Construction Obligations

- (a) Project Co is responsible for all construction means, methods and techniques used to undertake the Works and must provide everything (including labour, plant, equipment and materials) necessary for the construction and commissioning of the System Infrastructure and New Municipal Infrastructure, and other performance of the Works.
- (b) Project Co shall in a timely and professional manner and in accordance with the requirements of this Project Agreement:
 - (i) construct the Works diligently, expeditiously and in a thorough and workman-like manner consistent with Schedule 11 – Integrated Management System Requirements;
 - (ii) ensure that no works other than the Works under this Project Agreement are constructed on the Lands by Project Co or any person for whom Project Co is responsible at law;
 - (iii) protect the Works from all of the elements, casualty and damage; and
 - (iv) in respect of plant, equipment and materials incorporated in the Works, use plant, equipment and materials that:
 - (A) are of a kind that are consistent with the Output Specifications;

- (B) are new, of good quality and are used, handled, stored and installed in accordance with Applicable Law and Good Industry Practice with respect to health and safety so as not to be hazardous or dangerous; and
 - (C) where they differ from the Output Specifications, have been substituted with the City's prior written consent in accordance with Section 20.9.
- (c) [Intentionally deleted].
- (d) Without limiting the provisions of Sections 20.8(a), (b), and (c), Project Co shall:
- (i) have complete control of the Works and shall be responsible for the integration of the various parts and systems comprising any portions of the Works with existing parts of the municipal infrastructure systems and Existing Trillium Line Assets impacted by the Works;
 - (ii) prior to commencing applicable procurement and construction activities, verify, at the Site, all measurements and levels necessary for proper and complete fabrication, assembly and installation of the relevant Works, and shall further carefully compare such field measurements and conditions with the requirements of this Project Agreement. Where dimensions are not included or exact locations are not apparent, Project Co shall immediately notify the City Representative in writing and obtain written instructions from the City Representative (which written instructions shall be provided by the City within one (1) Business Day of receipt of such notification from Project Co) before proceeding with any part of the Works affected thereby; and
 - (iii) comply with all rules, directives and requirements of the City in respect of the Works as set forth in the Output Specifications so as not to disrupt (unless otherwise agreed to by the City) the operations of the existing municipal infrastructure systems.
- (e) Project Co acknowledges that in addition to the use of Good Industry Practice, this Project Agreement includes instructions as to the manner in which the Works are to be performed in order to minimize disturbance to properties and operations adjacent to the Lands, including with respect to noise, dust control and access to the Lands. Project Co shall develop and implement protocols in furtherance of the foregoing in accordance with the Output Specifications.
- (f) Project Co shall, at its own cost, use all methods required to comply with the instructions set out in this Project Agreement, during the performance of the New Municipal Infrastructure Works. Project Co shall, at its own cost, fully cooperate with the City in complying with said instructions during the performance of the New Municipal Infrastructure Works.
- (g) Should Project Co, in the performance of this Project Agreement, damage the Works, the property of the City at the Site, or property adjacent to the Site, Project Co shall be responsible to Make Good such damage at Project Co's expense.
- (h) Project Co shall maintain the Works in a tidy condition and free from the accumulation of waste products and debris, confine construction machinery and equipment, storage of products, and operations of employees to limits indicated by Applicable Law or this Project Agreement, and not

unreasonably encumber the Site with products. Project Co shall not load or permit to be loaded any part of the Works with a weight or force that will endanger the safety of the Works.

- (i) In performing the Works, Project Co shall have the sole responsibility for the design, erection, operation, maintenance, and removal of temporary supports, structures, and facilities and the design and execution of construction methods required in their use. Any review of Project Co's temporary supports, structures, or facilities or any shop drawings related thereto by the City or City Representative does not relieve Project Co of its "sole responsibility" under this section. Project Co shall engage registered professional engineering personnel skilled in the appropriate disciplines to perform the functions referred to in this Section 20.8(i) where required by Applicable Law or by this Project Agreement and in all cases, where such temporary supports, structures, and facilities and their method of construction are of such a nature that professional engineering skill is required to produce safe and satisfactory results.
- (j) Prior to application for the Final Completion Certificate, Project Co shall remove waste products and debris, and shall leave the Lands and the System clean and suitable for operation of the System. Project Co shall remove products, tools, construction machinery, and equipment not required for the performance of the remaining Works.

20.9 Substitutions

- (a) Whenever equipment, components, materials, supplies, tools, and other items are specified or otherwise described in this Project Agreement by using the name or catalogue or model number of a particular manufacturer, fabricator, vendor or distributor, or any other material name or description, the naming or identification of the item is intended to establish the type and the minimum function and quality required, and equipment, components, materials, supplies, tools, and other items of other manufacturers, fabricators, vendors or distributors shall not be substituted without the prior written consent of the City, which shall not be unreasonably withheld by the City if any such item is no longer commercially available.

20.10 Works Submittals

- (a) Any and all items, documents and anything else required or specified by this Project Agreement in respect of the Works to be submitted to, reviewed or otherwise processed by the City prior to Substantial Completion, including any and all subsequent revisions, amendments and changes thereto, shall be subject to review by the City pursuant to Schedule 10 - Review Procedure. The first document to be submitted by Project Co for review by the City pursuant to Schedule 10 - Review Procedure shall be the draft document control and security protocol described in Section 50.5(f).

20.11 [Intentionally Deleted]

20.12 Apprenticeship Plan and Program

- (a) No later than six months after Financial Close, Project Co shall provide a plan setting out Project Co's Project-specific approach to maximizing apprenticeship opportunities on the Project in connection with the completion of the Works (the "**Apprenticeship Plan**") for review and approval by the City. The Apprenticeship Plan shall include,

- (i) specific objectives for apprenticeship opportunities for the Project on a trade-by-trade basis;
 - (ii) apprenticeship opportunities for each trade required on the Project;
 - (iii) a confirmation that apprenticeships will be registered with the Ministry of Advanced Education and Skills Development and the Ontario College of Trades, as applicable;
 - (iv) a program to ensure the required supply of apprentices to meet Project Co's Apprenticeship Plan targets and requirements; and
 - (v) a program to support apprentices on the Project, to complete their apprenticeships prior to the Substantial Completion Date and, for those whose apprenticeships are not complete by the Substantial Completion Date a program to support apprentices to complete their apprenticeships after the Substantial Completion Date.
- (b) Project Co shall implement the approved Apprenticeship Plan.
- (c) Project Co shall provide an annual report to the City on the implementation of the Apprenticeship Plan which report shall include,
- (i) statistics on the number of apprentices involved in the Project relative to the number of journeypersons, for each month of the Project; and
 - (ii) detailed information setting out Project Co's progress toward achieving the objectives set out in the Apprenticeship Plan, including an identification of barriers that prevented Project Co from achieving its objectives.
- (d) The City may require Project Co to amend its Apprenticeship Plan if, in its opinion, acting reasonably, Project Co is failing to maximize apprenticeship opportunities on the Project pursuant to the then current Apprenticeship Plan.
- (e) The City may, in its sole discretion, release Project Co's Apprenticeship Plan to the public. Project Co's Apprenticeship Plan shall not be Confidential Information.

20.13 Utility Works - Cash Allowance

- (a) Project Co shall perform and complete, the Project Co Utility Works, and shall procure and coordinate the performance and completion of the Utility Company Self-Performed Works by the applicable Utility Company pursuant to Utility Agreements:
- (i) so as to satisfy the Output Specifications, and in particular, Article 8 of Schedule 15-2 – Design and Construction Requirements;
 - (ii) so as to satisfy the Design and Construction Specifications;
 - (iii) in accordance with the Works Schedule; and
 - (iv) in accordance with the other terms and conditions of this Project Agreement.

- (b) Project Co shall complete or cause the completion of the Utility Works as a precondition to achieving Substantial Completion. Project Co shall be solely responsible for coordinating the Utility Works with its activities in respect of the Project Operations and shall not be entitled to an extension of time or additional compensation in respect of the remainder of the Works as a result of the Utility Works or any matter relating thereto, except as provided for in this Section 20.13 or in Section 16.10.
- (c) The Project Co Utility Works shall be reviewed, certified, financed and paid for as part of Earned Value in accordance with Schedule 20 – Construction Period Payments. The Utility Company Self-Performed Works shall be reviewed, certified, financed and paid for in accordance with this Section 20.13. Project Co shall not be required to obtain financing for the costs of the Utility Company Self-Performed Works.
- (d) Prior to entering into a Utility Agreement for the performance of Utility Company Self-Performed Work, Project Co shall submit to the City Representative a draft of such agreement setting out the scope and pricing proposed by the Utility Company for the performance of the Utility Company Self-Performed Work for review and approval by the City. The City may, in conjunction with Project Co, for a period not to exceed 10 Business Days from receipt of the draft agreement, engage with the Utility Company to negotiate final scope and pricing for inclusion in the Utility Agreement based upon preferential pricing arrangements which the City may have with the applicable Utility Company, and notify Project Co by the end of such 10 Business Day period of the results of such discussions, and the City’s approval of the final scope and pricing to be contained in the applicable Utility Agreement. Project Co shall enter into the Utility Agreement on such City approved terms. The City will only pay the Utility Company Works Cash Allowance and Utility Works Fee in respect of Utility Agreements which have been approved by the City in accordance with this subsection 21.13(d). Failure for the City to provide comments on the draft agreements within the 10 Business Day period mentioned above will be deemed an acceptance of such draft by the City.
- (e) The estimated cost of the Utility Company Self-Performed Works is \$[REDACTED] (the “**Utility Company Works Cash Allowance**”) plus applicable HST, and shall be paid for by the City on a monthly progress basis as the Utility Company Self-Performed Works are progressed and invoiced by the applicable Utility Company to Project Co. In the event that the actual costs of the Utility Company Self-Performed Works as evidenced by invoices rendered by the applicable Utility Company exceeds the estimated Utility Company Works Cash Allowance for any cause other than the negligence, default or willful misconduct of Project Co or any Project Co Party, the City shall pay such additional cost, plus applicable HST and the applicable Utility Works Fee applicable to such additional cost.
- (f) The City shall also pay Project Co a fee of [REDACTED]% of the Utility Works Cost (the “**Utility Works Fee**”), plus applicable HST, for the management, coordination and administration of the completion of the Utility Company Self-Performed Works.
- (g) Project Co may, on a monthly basis, provide to the City Representative and the Independent Certifier a request for payment (each, a “**Request for Utility Works Payment**”) that includes (i) an itemized breakdown of the applicable Utility Company Self-Performed Works invoiced in the previous month by a Utility Company, (ii) the Utility Works Fee applicable to the costs of the Utility Company Self-Performed Works included in such invoice, and (iii) applicable HST in

respect of the amounts specified in (i) and (ii) above. Such Request for Utility Works Payment may be delivered concurrently with an application for progress payments on account of Earned Value achieved in respect of Project Co Utility Works in accordance with Schedule 20 – Construction Period Payments, but shall be presented separately for processing and payment by the City.

- (h) Project Co shall include with each Request for Utility Works Payment the certification of the Independent Certifier that the relevant Utility Company Self-Performed Works described in such Request for Utility Works Payment is eligible for payment by the City in accordance with this Section 20.13.
- (i) Project Co shall include with each Request for Utility Works Payment such additional supporting documentation as the City Representative may reasonably require in connection with the claimed base progress payments, the estimated cost to complete the Utility Company Self-Performed Works, any cumulative projected variance from the estimated Utility Company Works Cash Allowance and any discounts, rebates, refunds, chargebacks, credits, price adjustments and other allowances available to Project Co in connection with the Utility Company Self-Performed Works. Each Request for Utility Works Payment submitted to City shall be in a form stipulated by the City, acting reasonably, and shall support an “open-book” pricing approach for the completion of the Utility Company Self-Performed Works.
- (j) Within 10 Business Days of receipt of a Request for Utility Works Payment, the City shall, in consultation with the Independent Certifier, advise Project Co, in writing, whether or not it agrees with the particulars set out in the Request for Utility Works Payment. The City shall only be permitted to withhold its approval if either the City, or the Independent Certifier determine that the Request for Utility Works Payment does not contain the information that the City or the Independent Certifier require, acting reasonably, to discharge their obligations under this Section 20.13. If the City withholds its approval pursuant to this Section 20.13(j) and subsequently receives the information that the City requires, acting reasonably, to discharge its obligations under this Section 20.13, it shall, within 10 Business Days of its receipt of such information, make payment of the amount set out in the aforementioned Request for Utility Works Payment. Any Disputes with respect to determinations made under this Section 20.13 shall be resolved in accordance with Schedule 26 – Dispute Resolution Procedure.
- (k) If the City approves in writing the payment of the amount set out in a Request for Utility Works Payment, it shall make payment of the amount set out in the approved Request for Utility Works Payment within 10 Business Days of receipt of the Request for Utility Works Payment.
- (l) Project Co acknowledges and agrees that:
 - (i) all costs and expenses related to the administration and scheduling of the Utility Company Self-Performed Works, including, without limitation, the preparation of Requests for Utility Works Payment and any required reporting, shall be compensated solely by the Utility Works Fee; and,
 - (ii) all discounts, rebates, refunds, chargebacks, credits, price adjustments and other allowances available to Project Co or any Subcontractor in connection with the Utility Company Self-Performed Works shall be to the credit of the City.

20.14 Category 1 Utility Company Tracking System

- (a) Project Co shall, at its own cost and risk, provide to the City a system to track the progress made by the Category 1 Utility Companies in performing the activities described in the Utility Baseline Report. More specifically, such system shall:
 - (i) be kept updated on a daily basis and be available to the City in real time during normal business hours through a web-based interface which would include functionality to provide automated email alerts to a customizable frequency and set of email addresses;
 - (ii) be operational no later than the date upon which the first Category 1 Utility Company activity described in the Utility Baseline Report is commenced;
 - (iii) include a feature that highlights to the City and the applicable Category 1 Utility Company each outstanding applicable activity described in the Utility Baseline Report when it reaches the following milestone triggers:
 - (A) [REDACTED]% of the number of Business Days designated for completion by the Category 1 Utility Company in the Utility Baseline Report for the applicable activity described in the Utility Baseline Report; and
 - (B) [REDACTED]% of the number of Business Days designated for completion by the Category 1 Utility Company in the Utility Baseline Report for the applicable activity described in the Utility Baseline Report.
- (b) Project Co shall provide written notice to the City Representative with respect to any outstanding Category 1 Utility Company activity described in the Utility Baseline Report when it reaches the milestone triggers outlined in Section 20.14(a)(iii)(A) and Section 20.14(a)(iii)(B).
- (c) With respect to any failure by a Category 1 Utility Company to perform the obligations set out in the Utility Baseline Report, Project Co shall not be entitled to the Delay Event or Compensation Amount pursuant to Section 38.1(a)(xxii) unless the tracking system as described in this Section 20.14(a) is fully functional and available to the City, provides notice to the City of the milestones described in Section 20.14(a)(iii) and contains accurate information as to the progress made by the Category 1 Utility Companies in performing the activities described in the Utility Baseline Report at all material times.

20.15 Documents

- (a) For the duration of the Works, Project Co shall keep one copy of the current digital files of the Project Agreement, Project Documents, Works Schedule, submittals, reports, Variation Confirmations, Project Co Variation Notices, Variation Directives, partnering documents, records of meetings and all other documents necessary for the administration of the Project, all in good order and readily accessible and available to the City and the City Representative.
- (b) Project Co shall, where practical, keep one copy of current standards and manufacturers' literature specified in the Project Documents in good order and readily accessible and available to the City Representative for the duration of the Works.

21. ACCESS AND MONITORING

21.1 Access for City Parties

- (a) Subject to Section 21.1(b), but without limiting any of the City's rights in respect of the Lands, the System Infrastructure or the New Municipal Infrastructure, or the right of any third party in relation to that third party's portion of the Lands or New Municipal Infrastructure, Project Co acknowledges and agrees that throughout the Project Term, Project Co shall not restrict the access of the City, the City Parties, the Operator, and their respective representatives, to the Lands, the System Infrastructure or the New Municipal Infrastructure and any workshop where materials, plant or equipment are being manufactured, prepared or stored at all reasonable times during normal working hours, including for the purposes of general inspection or audit, or of attending any test or study being carried out in respect of the Works, or to fulfill any statutory, public or other duties or functions.
- (b) In exercising their access rights under Section 21.1(a) in respect of the Lands, the City, City Parties, the Operator and their respective representatives shall:
 - (i) provide reasonable prior Notice appropriate to the circumstances (other than for any offices or other facilities provided for the use of the City and/or City Parties); and
 - (ii) comply with all relevant safety procedures and any reasonable directions with regard to site safety that may be issued by or on behalf of the Project Co Representative from time to time.

21.2 Increased Monitoring

- (a) If, at any time during the Project Term, the City is of the opinion, acting reasonably, that there are defects in the Works or that Project Co has failed to comply, in any material respect, with the requirements of this Project Agreement (including the Output Specifications and the Project Co Proposal Extracts), the City may, without prejudice to any other right or remedy available to it, by Notice to Project Co, increase the level of monitoring of Project Co from that set out in this Project Agreement to such level as the City considers reasonable taking into account the nature of the relevant defect or failure until such time as Project Co shall have demonstrated, to the City's satisfaction, that it is capable of performing and will perform, in all material respects, its obligations under this Project Agreement. Project Co will compensate the City for any reasonable costs incurred as a result of such increased monitoring.

21.3 Right to Uncover

- (a) Project Co shall ensure that the City is afforded advance Notice of, and that the City is afforded a full opportunity to witness, all inspection and test activity in accordance with the Inspection and Test Plan. If Project Co does not provide such Notice and opportunity, Project Co shall at the request of the City uncover any relevant part of the Works which have been covered up or otherwise put out of view or remove any relevant part of the Works that have been proceeded with in order to permit the City to witness the relevant inspection or test activity. Project Co shall bear all costs of any such uncovering or removal, regardless of whether or not any defect is discovered in the relevant Works.

- (b) The City shall have the right, at any time during the Project Term, to request Project Co to uncover and inspect (or allow the City to inspect) any part or parts of the Works, or to require testing of any part or parts of the Works, where the City reasonably believes that such part or parts of the Works is or are defective or that Project Co has failed to comply with the requirements of this Project Agreement (including the Output Specifications, the Project Co Proposal Extracts and the Design Data) relevant to such part or parts of the Works, and Project Co shall comply with such request. When the City makes such a request, the City shall include reasonably detailed reasons with such request.
- (c) If an inspection shows that the relevant part or parts of the Works is or are defective or that Project Co has failed to comply with the requirements of this Project Agreement (including the Output Specifications, the Project Co Proposal Extracts and the Design Data) relevant to such part or parts of the Works, Project Co shall rectify all such defects and non-compliance diligently and at no cost to the City and Project Co shall not be entitled to any additional compensation or extension of time in relation thereto.
- (d) If an inspection shows that the relevant part or parts of the Works is or are not defective and that Project Co has complied with the requirements of this Project Agreement (including the Output Specifications, the Project Co Proposal Extracts and the Design Data) relevant to such part or parts of the Works, the exercise by the City of its rights pursuant to this Section 21.3:
 - (i) prior to Substantial Completion shall, subject to and in accordance with Section 38, be treated as a Delay Event and, subject to and in accordance with Section 39, be treated as a Compensation Event; and
 - (ii) following Substantial Completion shall, subject to and in accordance with Schedule 21 - Variation Procedure, result in a Variation.
- (e) The obligations in Section 21.3(a) shall not apply to the Revenue Vehicle Supplier.

21.4 No Relief from Obligations

- (a) The Parties acknowledge that the exercise by the City or the City Representative of the rights under this Section 21 shall in no way affect the obligations of Project Co under this Project Agreement except as set out in this Section 21.

21.5 Access by Others

- (a) Subject to Section 21.5(b) and subject to and in accordance with Section 9.8 (to the extent applicable), Project Co shall ensure that throughout the Project Term, without prejudice to any access rights of any such person as a member of the general public or pursuant to Applicable Law, that it does not restrict access to the Lands, System Infrastructure or the New Municipal Infrastructure for:
 - (i) the Independent Certifier to the extent required to perform its obligations pursuant to Schedule 6 – Independent Certifier Agreement;
 - (ii) inspectors and other persons authorized to act on behalf of the City and any counterparty to a Third Party Access Agreement, for inspection and/or acceptance purposes;

- (iii) all Other Contractors, including the owners or operators of any third party facilities and their agents at all reasonable times to exercise any right or power or perform any duty or obligation under any Applicable Law or the Utility Agreements, provided that, wherever consistent with the requirements of Applicable Law and the requirements of this Project Agreement, Project Co may limit such access so as to not unnecessarily impede or restrict traffic flows or any Project Operations;
 - (iv) all Governmental Authorities and Emergency Service Providers in order to carry out any work (including surveys and inspections) in accordance with or to exercise any right or power or perform any duty or obligation under any Applicable Law and provided that, whenever consistent with the applicable requirements of such Governmental Authority, Emergency Service Providers or Applicable Law and the requirements of this Project Agreement (as the case may be), Project Co may limit such access so as to not unnecessarily impede or restrict traffic flows or any Project Operations;
 - (v) any City Party, Other Contractors, owners or operators of third party facilities, Governmental Authorities, Emergency Service Providers and Utility Companies for the purposes of access to and from any other lands and/or facilities adjacent to or in proximity to the Lands, the System Infrastructure or the New Municipal Infrastructure owned or operated by such person or in which such person has any interest, provided that, whenever consistent with the requirements of Applicable Law and the requirements of this Project Agreement, Project Co may limit such access so as to not unnecessarily impede or restrict traffic flows or any Project Operations; and
 - (vi) any City Party to undertake emergency training in relation to the System Infrastructure or the New Municipal Infrastructure.
- (b) Subject to Section 21.5(c), the City shall require persons accessing Site(s) on the Lands in accordance with access rights under Section 21.5(a) to:
- (i) provide reasonable prior Notice to Project Co appropriate to the circumstances;
 - (ii) comply with all relevant health and safety procedures and any reasonable directions with regard to health and safety that may be issued by or on behalf of the Project Co Representative from time to time; and
 - (iii) if reasonably required by Project Co, be accompanied by a representative of Project Co or a Project Co Party.
- (c) Section 21.5(b) shall not apply,
- (i) to Additional Contractors, who shall instead comply with any instructions or procedures made by Project Co pursuant to Section 9.8;
 - (ii) in the case of access rights described in Section 21.5(a) for the purpose of responding to an Emergency;
 - (iii) for the purposes of responding to an emergency declared by the City or by a Governmental Authority; and

- (iv) in circumstance where the requirements of Section 21.5(b) are inconsistent with the requirements of the applicable Governmental Authority or Emergency Service Provider.

21.6 Public Use

- (a) Project Co shall have no right to grant, to the general public, the right to use either the System Infrastructure or the New Municipal Infrastructure. It shall be the right of the City to grant the right of use to the general public to the System Infrastructure and the New Municipal Infrastructure once completed in accordance with the provisions of this Project Agreement.
- (b) Except as explicitly permitted by the City or this Project Agreement, and subject to Project Co's compliance with all applicable Permits, Licences, Approvals and Authorizations, Project Co shall,
 - (i) minimize interference with the existing transit system at all times during the Construction Period; and
 - (ii) to the extent that the Project necessitates interference, in any way, with the operation of the existing transit system, including the imposition of any closures or detours on the existing transit system, use commercially reasonable efforts to cooperate with the City and other relevant third parties to ensure the continued operation of the existing transit system.
- (c) Except as otherwise expressly provided in this Project Agreement, Project Co shall not have any claim whatsoever against the City, any City Party, Emergency Service Providers or any other Governmental Authority for, or in respect of, any lane closure or diversion, including any lane closure or diversion as a result of the exercise of any other rights or powers or the discharge of any other duties or functions by any such authority, affecting all or any part of the Lands, the System Infrastructure or the New Municipal Infrastructure, at any time.
- (d) Subject to closures or diversions of traffic flow permitted by this Project Agreement, Project Co shall cause all Works and Maintenance and Rehabilitation Services to be carried on so as not to interfere unnecessarily with, and so as to minimize any necessary interference with, the convenience of the public in respect of, and the access of the public to and use of, any public or private roads or highways or other transportation infrastructure (other than the System Infrastructure and the New Municipal Infrastructure), whether under the control or in the possession of the City or any other person.

22. WORKS SCHEDULE

22.1 Completion of Works

- (a) Project Co shall complete the Works in accordance with this Project Agreement and achieve:
 - (i) Substantial Completion by the Scheduled Substantial Completion Date; and
 - (ii) Final Completion by the Scheduled Final Completion Date.

22.2 The Works Schedule

- (a) From Financial Close until PBS-2 becomes the Current PBS, PBS-1 shall be deemed to be the Current PBS and, until such time, the following provisions of the Project Agreement applicable to the Current PBS shall be applicable to PBS-1: Sections 9.2(a)(viii), 9.8(f)(ii), 9.8(f)(iii), 11.2(d), 20.1(a)(iv), 20.5(a)(iii) and 27.4(a)(i) of the Project Agreement; Sections 3.1(c)(ix) of Schedule 17 – Environmental Obligations; Section 1.6(b)(vii) of Schedule 21 - Variation Procedure; and Sections 1(b) and 1(c) of Schedule 31 – Works Report Requirements.
- (b) Project Co shall, in accordance with Schedule 12 – Works Scheduling Requirements, prepare and submit to the City and the Independent Certifier:
 - (i) within 75 days after Financial Close, PBS-2 and a schedule narrative in accordance with Section 2.3 of Schedule 12 - Works Scheduling Requirements indicating the differences between PBS-1 and PBS-2;
 - (ii) every month, within 10 Business Days after the end of each calendar month from Financial Close until Final Completion, the Monthly Progress Report and PBS Update in accordance with Schedule 31 – Works Reports Requirements;
 - (iii) within 10 Business Days after receipt of a written request from the City, acting reasonably, a Micro-Works Schedule for any specific area in accordance with Schedule 12 – Works Scheduling Requirements; and
 - (iv) Recovery Schedules, PBS Submittal, Look-ahead Schedules and As-built Schedules in accordance with Schedule 12 – Works Scheduling Requirements,each meeting the requirements of Schedule 12 – Works Scheduling Requirements to the satisfaction of the City that support the completion of the Works in accordance with Section 22.1.
- (c) The City shall review all submissions in accordance with Schedule 10 – Review Procedure.
- (d) At the request of the City Representative, the Project Co Representative shall review the Works Schedules with the City Representative to explain to the City Representative's satisfaction:
 - (i) the activity logic and planning assumptions contained in the Works Schedule;
 - (ii) any proposed changes to the Critical Path of the Works; and
 - (iii) any other matter raised by the City Representative concerning the Works Schedules.
- (e) Project Co and the City shall comply with the provisions of Schedule 12 – Works Scheduling Requirements.
- (f) Any comment or lack of comment by the City in regards to any Works Schedule indicating potential Delay Events pursuant to Section 38.2(a) of the Project Agreement shall not constitute any acknowledgement or acceptance of the potential delay.

23. LEED, ENERGY AND ENVIRONMENTAL REQUIREMENTS

23.1 Environmental Management / Contamination and Hazardous Substances

- (a) Project Co shall comply with the provisions of Schedule 17 - Environmental Obligations.

23.2 LEED Design and Construction Obligations

Project Co shall perform the Works relating to the New Walkley Yard so as to achieve the prerequisites and credits required to achieve LEED® Canada Certified and, except as set out in the Output Specifications, Project Co may, in its sole discretion, determine which additional credits to pursue.

23.3 Mandatory Prerequisites and Credits

- (a) Project Co shall, at a minimum, achieve the credits and prerequisites under the LEED Rating System provided for in the Output Specifications.
- (b) Project Co shall, at a minimum, achieve the “Credit 1 Optimize Energy Performance under Performance Category: Energy & Atmosphere” credit, and obtain a minimum of 5 points in respect of such credit.

23.4 LEED Progress Reports

As part of each Works Report, Project Co shall submit a progress report comparing actual construction and procurement activities with LEED® Canada Certified requirements.

23.5 LEED Certified Rating

- (a) If there is a change in the requirements for achievement of LEED® Canada Certified under the LEED Rating System, and Project Co is required by the CaGBC to comply with such change, then Project Co shall notify the City of such change and such change shall, subject to and in accordance with Schedule 21 - Variation Procedure, result in a Variation.
- (b) Project Co shall apply to the CaGBC to obtain LEED® Canada Certified for the New Walkley Yard as soon as possible.
- (c) In the event that:
 - (i) Project Co fails to obtain the minimum number of points required pursuant to Section 23.3(b); or
 - (ii) LEED® Canada Certified is not obtained within 24 months after the Substantial Completion Date,

other than as a direct result of any act or omission of the City or any City Party, Project Co shall pay to the City liquidated damages in the amount of \$[REDACTED]. The Parties agree that such liquidated damages are not a penalty but represent a genuine and reasonable pre-estimate of the damages that the City will suffer as a result of the happening of either of the specified events and would be difficult or impossible to quantify upon the happening of either of the specified events. Such payment shall constitute full and final settlement of any and all damages that may be claimed by the City as a result of a failure by Project Co to obtain the minimum number of points required pursuant to Section 23.3(b) or to achieve LEED® Canada Certified and, for greater

certainty, a failure by Project Co to obtain any of the mandatory prerequisites or credits set out in the Output Specifications or to achieve LEED® Canada Certified for the New Walkley Yard shall not result in a Project Co Event of Default. The Parties agree that such liquidated damages shall be payable whether or not the City incurs or mitigates its damages, and that the City shall not have any obligation to mitigate any such damages.

23.6 Greenhouse Gas Credits

- (a) Any greenhouse gas credits which may be guaranteed as a result of the Project shall be owned by the City and Project Co shall have no entitlement to any of such credits whatsoever.

24. INDEPENDENT CERTIFIER

24.1 Appointment

- (a) On or prior to Financial Close, the Parties shall appoint an independent, suitably qualified and experienced consultant to act as the Independent Certifier for the purposes of this Project Agreement and shall enter into an agreement with the Independent Certifier substantially in the form of Schedule 6 - Independent Certifier Agreement. If the Parties are unable to agree upon the Independent Certifier within such period of time, then the determination of the Independent Certifier shall be made in the same manner as the identification of a replacement Independent Certifier under Section 24.7(b).
- (b) Neither Party shall, without the prior written consent of the other Party, enter into any agreement with the Independent Certifier in connection with the Project other than the Independent Certifier Agreement, and Project Co shall ensure that no Project Co Party enters into any separate agreement with the Independent Certifier in connection with the Project.

24.2 Role of Independent Certifier

- (a) The general role, obligations and functions of the Independent Certifier are described in Schedule 6 - Independent Certifier Agreement.

24.3 Changes to Terms of Appointment

- (a) Neither the City nor Project Co shall without the other's prior written approval:
 - (i) waive, settle, compromise or otherwise prejudice any rights or claims which the other may from time to time have against the Independent Certifier; or
 - (ii) vary the terms of the Independent Certifier Agreement or the services performed or to be performed by the Independent Certifier.
- (b) The Parties shall perform their respective obligations arising under or in connection with the Independent Certifier Agreement.

24.4 Right to Change Appointment

- (a) The Parties agree that the Independent Certifier shall not provide any services or reports or other information to Project Co, the Lenders, the Project Co Parties or any other person other than pursuant to the performance of the functions of the Independent Certifier under this Project Agreement unless agreed to in writing by the Parties. The Parties may agree to terminate the Independent Certifier Agreement upon 30 days' Notice to the Independent Certifier. If such Notice is given, then, pursuant to Section 24.7, a new Independent Certifier will be appointed. The Parties agree that, notwithstanding the 30 days' Notice of termination, the Independent Certifier shall continue on a day-to-day basis thereafter until a new Independent Certifier is appointed.

24.5 Cooperation

- (a) The Parties agree to cooperate with each other generally in relation to all matters within the scope of or in connection with the Independent Certifier Agreement. All instructions and representations issued or made by either of the Parties to the Independent Certifier shall be simultaneously copied to the other and the Parties shall be entitled to attend all inspections performed by or meetings involving the Independent Certifier.

24.6 Payment of Independent Certifier

- (a) Project Co and the City shall share equally the responsibility for the payment of all fees and costs of the Independent Certifier.

24.7 Replacement

- (a) In the event of the Independent Certifier's engagement being terminated otherwise than for full performance, the Parties shall liaise and cooperate with each other in order to appoint a replacement consultant to act as the Independent Certifier as soon as reasonably practicable. The identity of any such replacement shall be as agreed by the Parties and the terms of his/her appointment shall, unless otherwise agreed by the Parties, be as set out in the Independent Certifier Agreement.
- (b) In the event the Parties fail to agree upon the identity of a replacement Independent Certifier within 5 Business Days of the original Independent Certifier's appointment being terminated, then a replacement Independent Certifier shall be chosen as follows:
- (i) each Party shall, within 5 Business Days thereafter, select 3 suitably qualified and experienced replacements that would be acceptable to that Party, and shall provide Notice thereof to the other Party, with a ranking of preference for replacements;
- (ii) if the Parties have both selected a common replacement, then such common replacement shall be the Independent Certifier, and if there is more than one common replacement, then the common replacement with the highest overall ranking (calculated by adding together the ordinal rank assigned by the Parties) shall be selected, and in the event of a tie, the lowest-cost of such tied replacements shall be selected; and

- (iii) if the Parties have not selected a common replacement, then the determination of the new replacement may be referred for resolution in accordance with Schedule 26 - Dispute Resolution Procedure.

25. COMMISSIONING AND COMPLETION

25.1 Commissioning Activities

- (a) Project Co shall perform all Commissioning, and shall support and facilitate, as necessary, the performance of all City Commissioning, if any, pursuant to the Testing and Commissioning Plan.

25.2 Commencement of Commissioning

- (a) Project Co shall give 30 days' written Notice to the Independent Certifier and the City Representative of the proposed commencement of the Commissioning Tests.
- (b) Project Co shall give at least 5 Business Days' Notice to, and shall invite, the Independent Certifier and the City Representative to witness, and to comment on, each aspect of the Commissioning. Project Co shall, together with such Notice, provide all information that the Independent Certifier and the City Representative may reasonably require in relation thereto, including:

- (i) tests proposed;
- (ii) test methodology; and
- (iii) expected test results.

25.3 Substantial Completion Certificate

- (a) Subject to Section 25.4, Project Co shall give the Independent Certifier and the City Representative at least 10 Business Days' Notice prior to the date upon which Project Co anticipates delivering the Substantial Completion Notice.
- (b) Project Co shall give the Independent Certifier and the City Representative Notice (the "**Substantial Completion Notice**") and upon the satisfaction of all requirements for Substantial Completion, which Substantial Completion Notice shall, describe, in reasonable detail, the satisfaction of the requirements for Substantial Completion, together with Project Co's opinion as to whether the conditions for issuance of the Substantial Completion Certificate have been satisfied.
- (c) The City shall, within 5 Business Days after receipt of a Substantial Completion Notice, provide the Independent Certifier and Project Co with the City's opinion as to whether the conditions for issuance of the Substantial Completion Certificate have been satisfied and, if applicable, any reasons as to why it considers that the Substantial Completion Certificate should not be issued.
- (d) Within 5 Business Days after Project Co's receipt of the City's opinion pursuant to Section 25.3(c), the Parties shall cause the Independent Certifier to determine whether the conditions for issuance of the Substantial Completion Certificate have been satisfied, having regard for the

opinions of both Project Co and the City, to determine whether any Minor Deficiencies exist, and to issue to the City and to Project Co either:

- (i) the Substantial Completion Certificate, confirming the date of issue as the Substantial Completion Date and setting out the Minor Deficiencies List (if applicable) in accordance with Section 25.7; or
 - (ii) a report detailing the matters that the Independent Certifier considers are required to be performed by Project Co to satisfy the conditions for issuance of the Substantial Completion Certificate.
- (e) Where the Independent Certifier has issued a report in accordance with Section 25.3(d)(ii) and Project Co has not referred a Dispute in relation thereto for resolution in accordance with Schedule 26 - Dispute Resolution Procedure, Project Co shall, within 5 Business Days after receipt of such report, provide the Independent Certifier and the City Representative with:
- (i) a detailed list indicating the rectification actions proposed for all matters raised in such report;
 - (ii) the schedule for completion of all such rectification actions; and
 - (iii) any additional Commissioning that needs to be undertaken as a result of the rectification actions,
- and Project Co shall perform all such additional rectification actions and Commissioning in a timely manner. Upon completion thereof, Project Co may give a further Substantial Completion Notice and Sections 25.3(c) to (e), inclusive, shall be repeated until the Substantial Completion Certificate has been issued.
- (f) The Independent Certifier's decision to issue or not to issue the Substantial Completion Certificate shall be final and binding on the Parties solely in respect of determining the Payment Commencement Date, and a Dispute in relation to the Payment Commencement Date shall not be subject to resolution pursuant to Schedule 26 - Dispute Resolution Procedure, provided, however, that any other Dispute in relation to the Independent Certifier's decision to issue or not to issue the Substantial Completion Certificate may be referred for resolution pursuant to the Dispute Resolution Procedure.

25.4 Substantial Completion Countdown Notice and Liquidated Damages for Failure to Achieve Substantial Completion

- (a) Project Co shall deliver to the City and the Independent Certifier a Notice (a "**Substantial Completion Countdown Notice**") not less than 180 days prior to (i) the Scheduled Substantial Completion Date, if Project Co anticipates that Substantial Completion will be achieved by or after the Scheduled Substantial Completion Date or (ii) such other date on which Project Co anticipates that Substantial Completion will be achieved, if Project Co anticipates that Substantial Completion will be achieved prior to the Scheduled Substantial Completion Date (in each case, the "**Anticipated Substantial Completion Date**").
- (b) [Not used].

- (c) In the event that Project Co has not provided a Substantial Completion Countdown Notice to the City in accordance with the requirements of Section 25.4(a), then Project shall,
- (i) within 3 Business Days after the date that the Substantial Completion Countdown Notice was to have been delivered to the City, pay to the City the sum of \$[REDACTED] as liquidated damages in respect of damages suffered and costs incurred by the City related to Project Co's failure to deliver the Substantial Completion Countdown Notice in a timely manner; and
- (ii) pay to the City the additional sum of \$[REDACTED] per calendar day as liquidated damages in respect of damages suffered and costs incurred by the City related to Project Co's failure to deliver such notice for each day after the date that the Substantial Completion Countdown Notice was to have been delivered to the City that the Substantial Completion Date Notice has not been delivered to the City in accordance with the requirements of Section 25.4(a).
- (d) In accordance with Schedule 12 – Works Scheduling Requirements, any Anticipated Substantial Completion Date shall not be earlier than the Scheduled Substantial Completion Date, without the prior written consent of the City, in its sole discretion.
- (e) Notwithstanding any other provision of this Project Agreement, if Project Co has not achieved Substantial Completion by the Outside Substantial Completion Date, as such date may be extended in accordance with Section 38, Project Co shall, in addition to any other liquidated damage payment obligations incurred under this Section 25.4, pay to the City the sum of \$[REDACTED] as liquidated damages in respect of damages suffered and costs incurred by the City related to Project Co's failure to achieve Substantial Completion by such date.
- (f) In the event that Project Co provides a Substantial Completion Countdown Notice establishing an Anticipated Substantial Completion Date in accordance with Section 25.4(a), or otherwise provides notice of an Anticipated Substantial Completion Date in accordance with the provisions of this Section 25.4 (the “**Initial Countdown Notice**”), but Project Co determines following such notification that Substantial Completion shall not be achieved on or before the Anticipated Substantial Completion Date established by such notices as aforesaid, Project Co shall forthwith notify the City in writing in respect thereof (the “**Subsequent Notice**”) and shall:
- (i) in such Subsequent Notice establish a revised date by which Project Co expects to achieve Substantial Completion (the “**Revised Substantial Completion Date**”), which Revised Substantial Completion Date shall be no earlier than,
- (A) the Anticipated Substantial Completion Date established by the Initial Countdown Notice, and
- (B) 15 days after the delivery of such Subsequent Notice;
- (ii) pay to the City, as liquidated damages in respect of damages suffered and costs incurred by the City related to Project Co's failure to achieve Substantial Completion by the Anticipated Substantial Completion Date established as aforesaid, the following sums:

- (A) If the Subsequent Notice is delivered between 1 and 29 days of the delivery of the Initial Countdown Notice, the sum of \$[REDACTED];
 - (B) If the Subsequent Notice is delivered between 30 and 59 days of the delivery of the Initial Countdown Notice, the sum of \$[REDACTED];
 - (C) If the Subsequent Notice is delivered between 60 and 89 days of the delivery of the Initial Countdown Notice, the sum of \$[REDACTED];
 - (D) If the Subsequent Notice is delivered between 90 and 119 days of the delivery of the Initial Countdown Notice, the sum of \$[REDACTED];
 - (E) If the Subsequent Notice is delivered between 120 and 149 days of the delivery of the Initial Countdown Notice, the sum of \$[REDACTED];
 - (F) If the Subsequent Notice is delivered more than 149 days of the delivery of the Initial Countdown Notice, the sum of \$[REDACTED].
- (iii) Notwithstanding Section 25.4(f)(ii), Project Co may, on one occasion only, issue a Subsequent Notice establishing a Revised Substantial Completion Date which is no later than 10 days after the Anticipated Substantial Completion Date without incurring the liquidated damages set out in Section 25.4(f)(ii) in whole or in part.
- (g) In the event that Project Co fails to achieve Substantial Completion by the Anticipated Substantial Completion Date without having delivered to the City a Subsequent Notice, or in the event that Project Co has issued a Subsequent Notice establishing a Revised Substantial Completion Date and Project Co fails to achieve Substantial Completion by such Revised Substantial Completion Date, without having delivered a further Subsequent Notice, then Project shall:
- (i) forthwith issue a Subsequent Notice to the City establishing a further revised date by which Project Co expects to achieve Substantial Completion (the “**Further Revised Substantial Completion Date**”), which Further Revised Substantial Completion Date shall be no earlier than 15 days after the delivery of such Subsequent Notice;
 - (ii) within 3 Business Days after the Anticipated Substantial Completion Date or the Revised Substantial Completion Date, as the case may be, pay to the City the amount of \$[REDACTED] as liquidated damages in respect of damages suffered and costs incurred by the City related to Project Co’s failure to achieve Substantial Completion and deliver notice thereof in a timely manner; and
 - (iii) If the Subsequent Notice in paragraph 25.4(g)(i) has not been delivered by Project Co, pay to the City the additional sum of \$[REDACTED] per calendar day for each day after the Anticipated Substantial Completion Date or the Revised Substantial Completion Date, as the case may be, that such Subsequent Notice in respect of the Further Revised Substantial Completion Date has not been delivered to the City, as liquidated damages in respect of damages suffered and costs incurred by the City related to Project Co’s failure to deliver such notice.

- (h) The provisions of this Section 25.4 shall repeat, *mutatis mutandis*, until such time as Project Co has achieved Substantial Completion or the Project Agreement has been terminated, whichever is the first to occur.
- (i) The Parties agree that the liquidated damages set out in this Section 25.4 are not a penalty but represent a genuine and reasonable pre-estimate of the damages that will be suffered by the City related to Project Co's failure to comply with and observe the provisions of this Section 25.4.
- (j) Project Co acknowledges and agrees that all liquidated damages set out in this Section 25.4 shall be payable whether or not the City incurs or mitigates these damages, and that the City shall have no obligation to mitigate these damages. Project Co further agrees that it is, and shall be, estopped from alleging that any liquidated damages set out in this Section 25.4 are a penalty and not liquidated damages, or are otherwise unenforceable for any reason, including that such damages were not incurred.
- (k) In the event that there is a Dispute concerning Substantial Completion and such Dispute is ongoing, the City shall not be entitled to payment of liquidated damages pursuant to this Section 25.4 unless and until such Dispute is resolved in accordance with the Dispute Resolution Procedure outlined in Schedule 26 – Dispute Resolution Procedure and, if resolved in favour of the City, the provisions respecting liquidated damages contained in this Section 25.4 shall apply with retroactive effect, except that there shall be added to the amount payable by Project Co on account of liquidated damages, the Payment Compensation Amount from the date the liquidated damages were required to be paid in the absence of the Dispute to the date of payment.
- (l) Notwithstanding any other provision of this Project Agreement, the payment of the liquidated damages amount pursuant to paragraph 25.4(e) shall not reduce the maximum amount of liability of Project Co as provided for in Section 55.4 of the Project Agreement.

25.5 City Commissioning

- (a) The Parties acknowledge that the City may perform City Commissioning both before and after the Substantial Completion Date. Prior to Substantial Completion, Project Co shall not restrict the City, and any of its employees and subcontractors from full access to the Lands, the System Infrastructure and the New Municipal Infrastructure and all relevant parts thereof at such times as may be set out in the Testing and Commissioning Plan to enable the City to undertake any City Commissioning in accordance with the Testing and Commissioning Plan. The City shall comply, and shall ensure that all other City Parties comply with the directions, procedures and safety guidelines established by Project Co for the Lands, the System Infrastructure and the New Municipal Infrastructure and shall use commercially reasonable efforts to minimize disruption to the Project Operations in performing any City Commissioning.
- (b) The City acknowledges that, during the City Commissioning Period, Project Co and its Subcontractors will be active on the Lands, the System Infrastructure and the New Municipal Infrastructure in both the rectification of Minor Deficiencies and the completion of Commissioning Tests, and the City shall take commercially reasonable steps to allow such activities to proceed in accordance with the Testing and Commissioning Plan.

- (c) Project Co acknowledges that, prior to and during the City Commissioning Period, Project Co and its Subcontractors shall cooperate with the City and all other City Parties and use commercially reasonable efforts to ensure that all requirements, and the timing and sequence of such requirements, of the City Commissioning activities are able to be completed in the timeframe for completion set out in the Testing and Commissioning Plan.

25.6 [Intentionally Deleted]

25.7 Minor Deficiencies

- (a) In the event that Minor Deficiencies exist when Project Co gives a Substantial Completion Notice, the Independent Certifier, in consultation with Project Co and the City, shall, within 15 Business Days of Project Co's application, prepare a list of all Minor Deficiencies (the "**Minor Deficiencies List**") identified at that time and an estimate of the cost for the City and the time for Project Co to complete and rectify such Minor Deficiencies. The City may withhold from the Substantial Completion Payment a holdback amount that is [REDACTED]% of the amount estimated by the Independent Certifier for the City to complete and rectify all Minor Deficiencies (the "**Completion Holdback**"), which holdback shall be held in an interest bearing account.
- (b) The Minor Deficiencies List will contain the schedule for the completion and rectification of the Minor Deficiencies. In determining the relevant time for rectifying Minor Deficiencies, Project Co shall schedule the completion and rectification of Minor Deficiencies so as to minimize, to the greatest extent reasonably possible, any lane or track closures, traffic diversions or restrictions or other impairment of the public's use and enjoyment of the System Infrastructure and the New Municipal Infrastructure or the relevant portion thereof, or disruption of the Project Operations or of the operations of the City, any City Party, any Governmental Authority or any Other Contractor, including the performance of the Governmental Activities and the Other Works, and otherwise in accordance with the Traffic and Transit Management Plan.
- (c) The Independent Certifier must prepare the Minor Deficiencies List in relation to the Substantial Completion Notice as soon as reasonably practicable and, in any event, before the Substantial Completion Certificate is issued, but shall not withhold the Substantial Completion Certificate by reason solely that there are Minor Deficiencies.
- (d) No later than 20 Business Days prior to the Anticipated Substantial Completion Date, the City may direct the Independent Certifier to amend, in consultation with Project Co and the City, the Minor Deficiencies List on one occasion to include a list of any and all Minor Deficiencies that were identified after the preparation of, or not included in, the Minor Deficiencies List pursuant to Section 25.7(a). The Independent Certifier shall prepare the amended Minor Deficiencies List as soon as reasonably practicable and, in any event, within 10 Business Days of such direction given by the City. The amended Minor Deficiencies List shall, following its preparation, be deemed to be the Minor Deficiencies List for the purposes of this Project Agreement, including, without limitation, for the purposes of Sections 25.7 to 25.9 inclusive. The amount of the Completion Holdback shall not be affected by the amended Minor Deficiencies List.
- (e) Where the Independent Certifier has been directed by the City to amend the Minor Deficiencies List pursuant to Section 25.7(d), the Independent Certifier shall specify commercially reasonable completion and rectification times for any newly added Minor Deficiencies.

- (f) The City may, in its sole discretion, waive any requirement for Substantial Completion, and the failure to meet any such requirement shall constitute a Minor Deficiency.
- (g) Nothing in this Section 25.7 shall prevent the City from making any adjustments to the Monthly Service Payments in accordance with Schedule 19 – Payment Mechanism following expiry of the period of time granted to Project Co to rectify the relevant Minor Deficiency, as set out in Section 25.8(a)(i) or 25.8(a)(ii), as applicable.

25.8 Rectification of Minor Deficiencies

- (a) Project Co shall, in consultation with the City Representative and so as to minimize, to the greatest extent reasonably possible, any lane or track closures, traffic diversions or restrictions or other impairment of the public's use and enjoyment of the System Infrastructure and the New Municipal Infrastructure or any portion thereof or disruption of the Project Operations or of the operations of the City, any City Party, any Governmental Authority or any Other Contractor, including the performance of the Governmental Activities and the Other Works, and otherwise in accordance with the Traffic and Transit Management Plan, complete and rectify all Minor Deficiencies:
 - (i) within 180 days of the issuance of the Minor Deficiencies List pursuant to Section 25.7(a) for all Minor Deficiencies where no time for completion and rectification has been specified by the Independent Certifier; or
 - (ii) within the time for completion and rectification of any Minor Deficiency where such a time was specified by the Independent Certifier in the Minor Deficiencies List.

- (b) Project Co acknowledges and agrees that the completion and rectification of Minor Deficiencies may require work outside of normal working hours in order to accommodate the efficient operation of the System Infrastructure and the New Municipal Infrastructure or any portion thereof and to ensure compliance with the Traffic and Transit Management Plan.

25.9 Failure to Rectify Minor Deficiencies

- (a) If Project Co fails to complete and rectify any Minor Deficiency within the time for its completion and rectification specified in Section 25.8, the City may engage others to perform the work necessary to complete and rectify such Minor Deficiency at the risk and cost of Project Co, and the City may deduct such cost from the Completion Holdback and interest accrued thereon.
- (b) Within 2 Business Days of Final Completion, the City shall release to Project Co the Completion Holdback (less any amounts deducted in accordance with Section 25.9(a)), together with all interest accrued thereon and applicable HST. Where the City exercises its rights pursuant to 25.9(a), if the cost of such completion and rectification exceeds the amount of the Completion Holdback and interest, then Project Co shall reimburse the City for all such excess cost.

25.9A Final Completion Countdown Notice

- (a) Project Co shall deliver a notice (the “**Final Completion Countdown Notice**”) to the City and the Independent Certifier specifying the date (which, for greater certainty, will be on or before the

Scheduled Final Completion Date) on which Project Co anticipates that Final Completion will be achieved (the “**Anticipated Final Completion Date**”).

- (b) The Final Completion Countdown Notice shall be delivered not less than 90 days prior to the Anticipated Final Completion Date. If Project Co fails to deliver the Final Completion Countdown Notice not less than 90 days prior to the Scheduled Final Completion Date, the Anticipated Final Completion Date shall be deemed to be the same date as the Scheduled Final Completion Date.

25.10 Final Completion Certificate

- (a) Project Co shall give the Independent Certifier and the City Representative at least 10 Business Days’ Notice prior to the date upon which Project Co anticipates delivering the Final Completion Notice.
- (b) Project Co shall give the Independent Certifier and the City Representative Notice (a “**Final Completion Notice**”) upon the satisfaction of all requirements for Final Completion, which Final Completion Notice shall describe, in reasonable detail:
- (i) the items of minor work of a seasonal nature that cannot be completed prior to the Final Completion Date, if any, and the time for completion of such work as agreed between the City and Project Co, each acting reasonably; and
 - (ii) the satisfaction of the requirements for Final Completion, including the completion and rectification of all Minor Deficiencies other than any outstanding seasonal work identified in the Final Completion Notice, and the submission of all records and data as set forth in the Commissioning Program, together with Project Co’s opinion as to whether the conditions for issuance of the Final Completion Certificate have been satisfied.
- (c) The City shall, within 5 Business Days after receipt of the Final Completion Notice, provide the Independent Certifier and Project Co with the City’s opinion as to whether the conditions for issuance of Final Completion Certificate have been satisfied and, if applicable, any reasons as to why it considers that the Final Completion Certificate should not be issued.
- (d) Within 5 Business Days after Project Co’s receipt of the City’s opinion pursuant to Section 25.10(c), the Parties shall cause the Independent Certifier to determine whether the conditions for issuance of the Final Completion Certificate have been satisfied, having regard for the opinions of both Project Co and the City, and to issue to the City and to Project Co either:
- (i) the Final Completion Certificate, confirming the date of issue as the Final Completion Date; or
 - (ii) a report detailing the matters that the Independent Certifier considers are required to be performed by Project Co to satisfy the conditions for issuance of the Final Completion Certificate, including any items on the Minor Deficiencies List which remain outstanding.
- (e) Where the Independent Certifier has issued a report in accordance with Section 25.10(d)(ii) and Project Co has not referred a Dispute in relation thereto for resolution in accordance with

Schedule 26 - Dispute Resolution Procedure, Project Co shall, within 5 Business Days after receipt of such report, provide the Independent Certifier and the City Representative with:

- (i) a detailed list indicating the rectification actions proposed for all matters raised in such report;
- (ii) the schedule for completion of all such rectification actions; and
- (iii) any additional Commissioning that needs to be undertaken as a result of the rectification actions,

and Project Co shall perform all such additional rectification actions in a timely manner. Upon completion thereof, Project Co may give a further Final Completion Notice and Sections 25.10(c) to (e), inclusive, shall be repeated until the Final Completion Certificate, has been issued.

- (f) Any Dispute in relation to the Independent Certifier's decision to issue or not to issue the Final Completion Certificate may be referred for resolution in accordance with Schedule 26 - Dispute Resolution Procedure.
- (g) If, within 30 days after the time specified in the Final Completion Notice for completion of seasonal work, Project Co has failed to complete such seasonal work, the City may engage others to perform the work necessary to complete the seasonal work, at the risk and cost of Project Co. Project Co shall pay to the City the costs incurred by the City to complete such seasonal work within 10 Business Days of presentation of an invoice for such costs.

25.11 Effect of Certificates/Use

- (a) The issue of a Substantial Completion Certificate or the Final Completion Certificate, the commencement of use by the City or the public of any part of the System Infrastructure under the terms of this Project Agreement or the commencement of any Governmental Activities shall, in no way:
 - (i) limit the obligations of Project Co under this Project Agreement including in respect of any defects, deficiencies or items of outstanding work existing or discovered prior to or after the date of any of such certificates or the date of the Minor Deficiencies List or of the amended Minor Deficiencies List described in Section 25.7(d); or
 - (ii) be construed as an approval by the City of the Works or the way in which they have been carried out.

25.12 Post-Completion Survey

- (a) Not more than 90 days after the Final Completion Date, Project Co, at its own cost and expense, shall prepare and submit to the City a reference plan of survey for the System Infrastructure built:
 - (i) on or within the City Road Allowance, identifying the location of the System Infrastructure together with a certain distance calculated from the outer boundary of such System Infrastructure, as well as all encumbrances and encroachments; and

- (ii) at the Stations, identifying the location of the System Infrastructure as well as all encumbrances and encroachments.
- (b) The reference plan of survey set out in Section 25.12(a) shall be prepared by a duly qualified Ontario Land Surveyor.
- (c) The reference plans of survey prepared and submitted by Project Co in accordance with Sections 25.12(a) and 25.12(b) that pertain to any below grade System Infrastructure and the New Municipal Infrastructure on the City Road Allowance or at the Stations (as the case may be) shall be a strata plan showing such System Infrastructure and the New Municipal Infrastructure as three dimensional parts on such reference plan. The reference plan of surveys shall be sufficient for conveyancing purposes and be in registrable form. Project Co, at its expense, shall correct or amend the reference plans if required by the City for purposes of depositing them on title, which corrections and amendments shall be made by Project Co within thirty (30) days after receipt of a Notice from the City.

25.13 New Municipal Infrastructure Works

- (a) Project Co shall achieve all New Municipal Infrastructure Works Acceptances by the Scheduled Substantial Completion Date.
- (b) The City Engineer shall:
 - (i) receive and monitor all drawings, specifications, plans and documents related to the design and development of the New Municipal Infrastructure Works;
 - (ii) receive and monitor all progress reports as necessary for the City Engineer to be in a position to confirm progress and extent of completion of the New Municipal Infrastructure Works;
 - (iii) review and monitor the tests described in Schedule 15 – Output Specifications in respect of the New Municipal Infrastructure Works;
 - (iv) prior to any certification and/or acceptance of New Municipal Infrastructure Works, consider the views and comments of both Project Co and the City in relation to the satisfaction of the conditions for such certification and/or acceptance;
 - (v) conduct inspections and reviews of the New Municipal Infrastructure Works as necessary for the City Engineer to be satisfied that the New Municipal Infrastructure Works are proceeding in accordance with the requirements of the Project Agreement;
 - (vi) review relevant documentation, including the Design Development Submittals relating to New Municipal Infrastructure Works, certificates and approvals, Permits, Licences, Approvals and Authorizations, certifications, test results, quality assurance audits, letters of assurance from professionals, schedules of equipment and staff profile schedules, in each case, relating to New Municipal Infrastructure Works provided to the City Engineer pursuant to this Project Agreement and within the timeframes contemplated for such review within Schedule 10 – Review Procedure; and

- (vii) provide all other services set forth in Schedule 15 – Output Specifications as it relates to the New Municipal Infrastructure Works, in each case, for purposes of enabling the City Engineer to confirm satisfaction of the conditions for issuance of the New Municipal Infrastructure Component Acceptance Certificate for each New Municipal Infrastructure Component and the Final New Municipal Infrastructure Works Acceptance Certificate in relation to all of the New Municipal Infrastructure.
- (c) Project Co shall deliver a notice (a “**New Municipal Infrastructure Works Component Countdown Notice**”) to the City and the City Engineer specifying the date on which Project Co anticipates that New Municipal Infrastructure Component Acceptance will be achieved in respect of such New Municipal Infrastructure Component (the “**Anticipated New Municipal Infrastructure Component Acceptance Date**”). The New Municipal Infrastructure Works Component Countdown Notice shall be delivered not less than 90 days prior to the Anticipated New Municipal Infrastructure Component Acceptance Date. Project Co shall give the City Engineer and the City Representative at least 10 Business Days’ notice prior to the date upon which Project Co anticipates all requirements for New Municipal Infrastructure Component Acceptance shall be satisfied.
- (d) Project Co shall give the City Engineer and the City Representative notice (the “**New Municipal Infrastructure Component Acceptance Notice**”) upon the satisfaction of all requirements of the New Municipal Infrastructure Component Acceptance, together with Project Co’s opinion as to whether the conditions for issuance of the New Municipal Infrastructure Component Acceptance Certificate have been satisfied, and each of the following:
 - (i) to the extent transferable and without prejudice to the City’s rights pursuant to Section 49 and Schedule 35 – Intellectual Property, all copyright licences for computer programs, or licences to use the same, used in connection with the applicable New Municipal Infrastructure Components together with all technical drawings and data, supplier agreements and contracts, utilities consumption information, environmental and technical reports, leases, licence and subletting data and contracts, asset conditions data, standard operating procedures processes and manuals, and all other information related to the New Municipal Infrastructure Works in respect of the applicable New Municipal Infrastructure Component accumulated up until the New Municipal Infrastructure Component Acceptance Date, in each case, in electronic format acceptable to the City, acting reasonably, where it exists in electronic format, and in original format, when not in electronic format;
 - (ii) the most recent Record Drawings relating to the New Municipal Infrastructure Works in the format that the City, acting reasonably, considers most appropriate at the time;
 - (iii) copies of all test results performed and test reports prepared in accordance with Schedule 15, together with all Project Co Permits, Licences, Approvals and Authorizations obtained and/or entered into in connection with the New Municipal Infrastructure Works in PDF or CADD format;
 - (iv) all Project Data and Intellectual Property relating to the design, construction and completion of the New Municipal Infrastructure Component; and

- (v) all information, reports, documents, records and the like referred to in the Project Agreement as it relates to New Municipal Infrastructure Works including as referred to in Schedule 25 – Record Provisions, in each case as it relates to New Municipal Infrastructure and New Municipal Infrastructure Works only;

(collectively, the “**New Municipal Infrastructure Component Works Requirements**”).

Within 10 Business Days after receipt of a New Municipal Infrastructure Component Acceptance Notice, the City Engineer shall determine whether the conditions for issuance of the New Municipal Infrastructure Component Acceptance Certificate have been satisfied and to issue to the City and Project Co either:

- (A) the New Municipal Infrastructure Component Acceptance Certificate, setting out in such certificate the New Municipal Infrastructure Component Acceptance Date; or
- (B) a report detailing the matters that the City Engineer considers are required to be performed by Project Co to satisfy the conditions for issuance of the New Municipal Infrastructure Component Acceptance Certificate.

- (e) Where the City Engineer has issued a report in accordance with Section 25.13(d)(vi)(B) above, Project Co shall, within 5 Business Days after receipt of such report, provide the City Engineer and the City Representative with:

- (i) a detailed list indicating the rectification actions proposed for all matters raised in such report;
- (ii) the schedule for completion of all such rectification actions; and
- (iii) any additional tests that need to be undertaken in respect of the New Municipal Infrastructure Works as a result of the rectification actions,

and Project Co shall perform all such additional rectification actions and testing in a timely manner. Upon completion thereof, Project Co may give a further New Municipal Infrastructure Component Acceptance Notice and Section 25.13(c) to (e) inclusive shall be repeated until the New Municipal Infrastructure Component Acceptance Certificate has been issued.

- (f) Notwithstanding the provisions of Section 25.13(e), in respect of the New Municipal Infrastructure components consisting of the Earl Armstrong Bridge and Leitrim Bridge structures, and the Park and Ride facilities at Bowesville and Leitrim stations, as well as the South Keys Fare Control building (all as described in the Output Specifications [which are important to the Works Schedules for the Project, the City Engineer may, upon the request and in consultation with Project Co, and being satisfied that the components have been completed to a point which would allow their use notwithstanding that they remain incomplete, accept the handover to and conditional acceptance by the City of, and permit the issuance of a conditional New Municipal Infrastructure Component Acceptance Certificate (a “**Conditional New Municipal Infrastructure Component Acceptance Certificate**”) to Project Co for, such New Municipal Infrastructure components, which would stipulate the deficiencies or incomplete items in such

New Municipal Infrastructure components (the “**NMI Minor Deficiencies**”) that would have to be corrected or completed before a final New Municipal Infrastructure Component Acceptance Certificate could be issued for such components. The Conditional New Municipal Infrastructure Component Acceptance Certificate would stipulate the schedule for the completion and rectification of the NMI Minor Deficiencies, and provide for an amount equal to [REDACTED]% of the amount estimated by the City Engineer to complete and rectify all NMI Minor Deficiencies (the “**NMI Minor Deficiency Deduction**”) to be deducted from the Earned Value calculation for such New Municipal Infrastructure components until the NMI Minor Deficiencies have been satisfactorily completed. Following completion of all of the NMI Minor Deficiencies to the satisfaction of the City Engineer, a final New Municipal Infrastructure Component Acceptance Certificate shall be issued in respect of the applicable components of the New Municipal Infrastructure, and the NMI Minor Deficiency Deduction shall be certified for payment in the Earned Value calculations.

- (g) On each New Municipal Infrastructure Component Acceptance Date in respect of each New Municipal Infrastructure Component:
- (i) Project Co shall cooperate fully with the City and any persons providing services on or at the New Municipal Infrastructure Components in order to avoid or mitigate, insofar as commercially reasonably, any inconvenience or any risk to the health and safety of any person at, on or under the Lands on which the New Municipal Infrastructure Works are or were performed, including those areas where any warranty work is or has been performed;
 - (ii) insofar as title to the New Municipal Infrastructure Components shall not have already passed to the City pursuant to Section 53.1, Project Co shall transfer to, and there shall vest in the City, free from all Encumbrances (other than the Encumbrances caused or consented to by the City), the New Municipal Infrastructure Components;
 - (iii) Project Co shall use commercially reasonable efforts to assign, or otherwise transfer, to the City, free from all Encumbrances (other than any Encumbrances caused or consented to by the City), the benefit of all manufacturers' warranties, including all documentation in respect thereof, in respect of mechanical and electrical plant and equipment used or made available by Project Co under this Project Agreement which is included in the New Municipal Infrastructure Components; and
 - (iv) subject to Section 49 and Schedule 35 - Intellectual Property, all information obtained by Project Co in connection with the New Municipal Infrastructure Works relating to the applicable New Municipal Infrastructure Components, including Record Drawings and other technical drawings and data, supplier agreements and contracts, utilities consumption information, environmental and technical reports, lease, licence and subletting data and contracts, asset conditions data, standard operating procedure, processes and manuals, and all other information directly related to the New Municipal Infrastructure Works relating to the applicable New Municipal Infrastructure Component accumulated over the course of the Project Term shall be the property of the City;
- (h) Subject to the warranty obligations described below, the issuance by the City Engineer in accordance with Section 25.13(d) of the New Municipal Infrastructure Component Acceptance

Certificate in respect of any New Municipal Infrastructure Component shall result in the responsibility for traffic management, maintenance, repair of the New Municipal Infrastructure Component described in such New Municipal Infrastructure Component Acceptance Certificate reverting back to the City.

- (i) After all final New Municipal Infrastructure Component Acceptance Certificates for all New Municipal Infrastructure Components have been delivered by the City Engineer to Project Co, Project Co shall deliver a notice to the City Engineer requesting delivery of the Final New Municipal Infrastructure Works Acceptance Certificate. Upon satisfaction of all conditions to complete the New Municipal Infrastructure Works and achievement of New Municipal Infrastructure Works Acceptance, the City Engineer shall deliver to Project Co the Final New Municipal Infrastructure Works Acceptance Certificate.
- (j) Project Co shall deliver to the City and the City Engineer the following, in each case, in form and substance satisfactory to the City and the City Engineer, acting reasonably, in order to be eligible to receive the Final New Municipal Infrastructure Works Acceptance Certificate one complete set of the New Municipal Infrastructure Component Works Requirements divided up in separate packages for each New Municipal Infrastructure Component (i) showing all alterations made to the New Municipal Infrastructure Works since the New Municipal Infrastructure Component Acceptance Date in respect of each New Municipal Infrastructure Component and (ii) including updates and additions to any of the New Municipal Infrastructure Works Requirements since the New Municipal Infrastructure Component Acceptance Date (the “**Final New Municipal Infrastructure Works Requirements**”).

25.14 Warranties on New Municipal Infrastructure

- (a) Project Co warrants that the New Municipal Infrastructure Works (i) shall conform to the specifications set out in Schedule 15 in all respects as it relates to the New Municipal Infrastructure, (ii) shall otherwise comply with the requirements and Project Co obligations applicable to all New Municipal Infrastructure Works and other Works (insofar as they relate to the New Municipal Infrastructure Works), (iii) shall be new, of good quality material as described in the Project Agreement, and (iv) shall be free of defects in materials, equipment and workmanship and the obligations of this Project Agreement shall apply *mutatis mutandis* to each New Municipal Infrastructure Component for a period or two (2) years from the New Municipal Infrastructure Acceptance Date in respect of such New Municipal Infrastructure Component, and Project Co shall extend the warranty on replaced parts and workmanship replaced during the initial warranty period as it relates to such New Municipal Infrastructure Component to the later of (y) six (6) months from the date of acceptance of the replacement parts and/or workmanship by the City acting reasonably, or (z) the expiry date of the initial warranty period in respect of such New Municipal Infrastructure Component.
- (b) If Project Co fails to perform its obligations set out in Section 25.14(a) in the time specified or subsequently agreed upon, without prejudice to any other right or remedy the City may have under the Project Agreement, the City may correct such New Municipal Infrastructure Works and/or other work described in Section 25.13 and any damage to the Lands on which the New Municipal Infrastructure Works have been performed by Project Co or a Project Co Party and deduct the cost and expense thereof from any holdback amount held by the City or from any payment then or thereafter due to Project Co under the Project Agreement.

25.15 Interim Substantial Completion

- (a) In the event that either:
- (i) the first New Revenue Vehicle has not been Delivered on or before the date which is 120 days prior to Scheduled Substantial Completion, or
 - (ii) the entire Fleet (as defined in the Revenue Vehicle Supply Contract) has not been Delivered on or before the date which is 60 days prior to Scheduled Substantial Completion,
- and in each case, Project Co is ready to receive, and capable of receiving, Delivery of such New Revenue Vehicles (collectively, the “**Interim Substantial Completion Conditions**”), Project Co shall provide prompt notice (and in any event within two (2) Business Days of such dates referenced above) confirming the Interim Substantial Completion Conditions (the “**Interim Substantial Completion Notice**”) to the City Representative. Following the issuance of the Interim Substantial Completion Notice, Project Co shall only be required to achieve Interim Substantial Completion on or prior to the Scheduled Substantial Completion Date and all references herein (other than those references in this Section 25.15 and the definition of Substantial Completion in Schedule 1) to Substantial Completion, Substantial Completion Date and Substantial Completion Certificate shall be automatically amended and read as references to Interim Substantial Completion, Interim Substantial Completion Date and Interim Substantial Completion Certificate such that all other requirements that would have been required to be performed by the City or Project Co in connection with, or as a result of, Substantial Completion shall be performed in connection with, or as a result of, Interim Substantial Completion.
- (b) In the event Project Co delivers a valid Interim Substantial Completion Notice:
- (i) Project Co shall complete the Remaining Works forthwith upon Delivery of the relevant New Revenue Vehicles and such Remaining Works shall form part of and be required to have been completed in connection with Final Completion;
 - (ii) the then current date specified as the Scheduled Substantial Completion Date shall automatically be amended and read as the date prior to which Project Co will achieve Interim Substantial Completion;
 - (iii) any Substantial Completion Countdown Notice previously delivered pursuant to Section 25.4 shall be deemed to be a notice of Project Co’s anticipation to achieve Interim Substantial Completion and the Anticipated Substantial Completion Date referenced therein shall be the date on which Project Co anticipates the achievement of Interim Substantial Completion; and
 - (iv) the City and Project Co shall enter into a Variation with respect to the Maintenance and Rehabilitation Services as more particularly described in Section 7 of Schedule 19 - Payment Mechanism.

26. MAINTENANCE AND REHABILITATION SERVICES

26.1 Overall Responsibility

- (a) Project Co shall, following the Substantial Completion Date, perform the Maintenance and Rehabilitation Services:
- (i) so as to satisfy the Output Specifications;
 - (ii) in accordance with the Project Co Proposal Extracts;
 - (iii) in accordance with Good Industry Practice;
 - (iv) in accordance with the Maintenance Plan; and
 - (v) in accordance with the other terms of this Project Agreement.
- (b) During the Maintenance Period, the City may, from time to time, grant a licence or licences for the temporary use of any Station Plaza or portion thereof for use as special event space (a “**Station Plaza Licence**”) to a person or persons (each, a “**Station Plaza Licencee**”). The City’s granting of a license for temporary use of any Station Plaza by a Station Plaza Licencee shall be in accordance with the following:
- (i) The City shall consult with Project Co from time to time with a view to considering Project Co’s recommendations regarding permitted uses, permitted times of day and days of the week, maximum number of people, and other appropriate restrictions on the temporary use of the Station Plazas;
 - (ii) If the City intends to grant a Station Plaza Licence, the City shall give Project Co Notice setting out the proposed terms of such Station Plaza Licence. Project Co may provide comments, if any, to the City for its consideration, which the City will take into account, acting reasonably. The City shall advise Project Co if in the City’s opinion, acting reasonably, any such Station Plaza Licence is likely to significantly impede Project Co from the performance of its obligations during the Maintenance Period or adversely affect safety and security;
 - (iii) In respect of Maintenance and Rehabilitation Services provided by Project Co exclusively in respect of Station Plaza Licences, the City shall pay to Project Co an amount equal to,
 - (A) Project Co’s Direct Costs, as defined in Appendix A to Schedule 21 – Variation Procedure; and
 - (B) Project Co’s applicable margins, as determined in accordance with Appendix B to Schedule 21 – Variation Procedure.
 - (iv) Project Co acknowledges and agrees that the granting of any Station Plaza Licence or Licences shall not, in and of itself, automatically entitle Project Co to a Variation; and

- (v) Project Co shall not prevent Station Plaza Licencees from occupying and using the Station Plazas in accordance with the terms of any such Station Plaza Licence;

26.2 Commencement of Maintenance and Rehabilitation Services

- (a) Project Co shall commence the Maintenance and Rehabilitation Services on the day immediately after the Substantial Completion Date and shall perform the Maintenance and Rehabilitation Services until the end of the Maintenance Period.

26.3 Equipment for Maintenance and Rehabilitation Services

- (a) Project Co will procure, deliver, install, commission, maintain, repair, decommission, upgrade and replace any equipment required by Project Co to perform the Maintenance and Rehabilitation Services.

26.4 No Closure of the System Infrastructure

- (a) During the Maintenance Period, Project Co shall not close all or a portion of the System Infrastructure in any circumstances other than as directed or approved by the City, acting reasonably.

26.5 Maintenance Plans

- (a) No later than 90 days prior to the Substantial Completion Date, Project Co shall submit to the City for review pursuant to Schedule 10 - Review Procedure, the Maintenance Plan for the first Contract Year, and shall update such plans as provided for in the Output Specifications annually thereafter.

26.6 Revisions to Maintenance Plan

- (a) No later than 30 days prior to the commencement of any calendar quarter, Project Co may submit to the City a revision to the applicable Maintenance Plan for the Contract Year in which the relevant calendar quarter falls showing the effect of the proposed changes. If Project Co is entitled to proceed with such changes pursuant to Schedule 10 - Review Procedure, then the Maintenance Plan as so amended shall become the Maintenance Plan in respect of that calendar quarter.

27. HUMAN RESOURCES

27.1 Admittance of Personnel

- (a) The City shall have the right to order the removal from the Lands, the System Infrastructure and the New Municipal Infrastructure of any person employed by (or acting on behalf of) Project Co, or any Project Co Party, whose presence, in the reasonable opinion of the City is likely to have an adverse effect on the Other Works or the Governmental Activities or who, in the reasonable opinion of the City is not a fit and proper person to be at the Lands, the System Infrastructure and the New Municipal Infrastructure for any reason, including a failure to comply with any City policy or any immediate obligation of the City to ensure the safety and well-being of persons at the Lands, the System Infrastructure and the New Municipal Infrastructure.

27.2 Confirmation of Action

- (a) Any action taken under Section 27.1 shall promptly be confirmed by the City to Project Co and, for greater certainty, shall not relieve Project Co of any of its obligations under this Project Agreement.

27.3 Finality as to Admission

- (a) Any decision of the City made pursuant to Section 27.1 shall be final and conclusive.

27.4 Staff Competency

- (a) Project Co shall ensure that:

- (i) there shall at all times be a sufficient number of persons employed or engaged by Project Co or any Project Co Party (including all relevant grades of supervisory staff) engaged in the performance of the Project Operations with the requisite level of skill and experience to perform the Project Operations in accordance with this Project Agreement. For greater certainty, this obligation shall include ensuring that there are a sufficient number of such skilled and experienced persons employed or engaged by Project Co or any Project Co Party to complete the Works in accordance with the Works Schedule and to cover periods of holiday, sickness, other absence, and anticipated and actual peaks in the Maintenance and Rehabilitation Services;
- (ii) all persons employed or engaged by Project Co or any Project Co Party (including all relevant grades of supervisory staff) engaged in the provision of the Project Operations receive such training and supervision as is necessary to ensure the proper performance of this Project Agreement and compliance with all health and safety rules, procedures and requirements, Authority Requirements and the City HR Policy; and
- (iii) it creates and maintains, and causes all Project Co Parties to create and maintain, a process which allows it to assess, monitor and correct, on an ongoing basis, the competency of persons employed or engaged by Project Co or any Project Co Party (including all relevant grades of supervisory staff) engaged in the provision of the Project Operations to ensure the proper performance of this Project Agreement.

27.5 Employee Training

- (a) Project Co shall and shall ensure all Project Co Parties establish and provide formal training programs and certification for the staff of Project Co and of all Project Co Parties required to be certified to perform specific tasks related to the Maintenance and Rehabilitation Services as required by any provincial or federal regulatory body. All training programs and activities shall be designed, developed, and implemented in accordance with established professional standards for performance based development. Project Co shall and shall ensure that all Project Co Parties consider all suggestions provided by the City to improve the training by Project Co and all Project Co Parties; however, the final decision on any training program is the responsibility of Project Co and the relevant Project Co Parties.

- (b) Project Co shall and shall ensure that the relevant Project Co Parties, upon the City's request, provide training program materials to the City for filing with regulatory agencies as and when required. All such training program materials or other documentation provided by Project Co and the relevant Project Co Parties shall be provided in both paper and digital formats, and shall be written in English.
- (c) Project Co and all Project Co Parties shall be responsible for the cost of all training and certification for all employees of Project Co and Project Co Party employees.

27.6 Convictions

- (a) Project Co (to the extent permitted by Applicable Law) shall, and shall cause such Project Co Party to, ensure that all potential employees (including, for greater certainty, permanent, temporary, full time and part time employees) and persons who may otherwise perform the Maintenance and Rehabilitation Services:
 - (i) are questioned concerning Relevant Convictions; and
 - (ii) are required to complete and deliver to Project Co a criminal records search form.
- (b) To the extent permitted by Applicable Law, Project Co shall, and shall cause each Project Co Party to, ensure that no person who discloses any Relevant Conviction, or who is found to have any Relevant Conviction following the completion of a criminal records search, in either case of which Project Co or a Project Co Party is aware or ought to be aware, is allowed access to the Lands, the System Infrastructure or the New Municipal Infrastructure to perform any Maintenance and Rehabilitation Services, without the prior written consent of the City, in its sole discretion.
- (c) To the extent permitted by Applicable Law, Project Co shall ensure that the City is kept advised at all times of any person employed or engaged by Project Co or any Project Co Party in the provision of any of the Maintenance and Rehabilitation Services who, subsequent to the commencement of such employment or engagement, (i) has been arrested or detained; (ii) receives a Relevant Conviction; or (iii) is charged with an offence that could lead to a Relevant Conviction (of which Project Co or a Project Co Party becomes aware or whose previous Relevant Convictions become known to Project Co or a Project Co Party). Project Co shall use commercially reasonable efforts to obtain, or to cause all Project Co Parties to obtain, all consents as may be required by Applicable Law or otherwise authorizing the disclosure of such information to the City as contemplated in this Section 27.6.

27.7 Disciplinary Action

- (a) The City, acting reasonably, may notify Project Co of any Project Co or Project Co Party employee who engages in misconduct or is incompetent or negligent in the performance of duties or whose presence or conduct on the Lands or at work is otherwise considered by the City to be undesirable, to constitute a threat to the health and/or safety of any of the users of the Lands and/or System Users or which the City considers may potentially compromise (i) the City's reputation or integrity, or (ii) the nature of the public transit system in the City of Ottawa so as to affect public confidence in the public transit system in the City of Ottawa or the Project. Upon

investigation, Project Co may institute, or cause the relevant Project Co Party to institute, disciplinary proceedings, which shall be in accordance with the requirements of Applicable Law, and shall advise the City in writing of the outcome of any disciplinary action taken in respect of such person.

27.8 Human Resources Policies

- (a) Project Co shall ensure that there are set up and maintained by it and by all Project Co Parties, human resources policies and procedures covering all relevant matters relating to the Project Operations (including, for example, health and safety). Project Co shall ensure that the terms and the implementation of such policies and procedures comply with Applicable Law, Authority Requirements, the City HR Policy and Good Industry Practice and that they are published in written form and that copies of them (and any revisions and amendments to them) are available to the City on a timely basis.

27.9 Management Organizations

- (a) Project Co shall provide, and shall ensure that all Project Co Parties provide, to the City, as required to keep such information current, the names of the management teams responsible for the performance of the Project Operations.

27.10 Governmental Authority

- (a) Project Co shall ensure that it and all Project Co Parties comply at all times with any regulations, policies or directions set by any Governmental Authority related to labour, employment and/or human resources.

28. GOODS, EQUIPMENT, CONSUMABLES AND MATERIALS

28.1 Standards

- (a) Project Co shall cause the goods, equipment, consumables and materials used or supplied by it or any Contractor or Subcontractor in connection with the Project Operations to be:
- (i) of good quality, fit for their intended purpose (other than to the extent a specific type of good, equipment, consumable or material is specified in the Output Specifications) and maintained in a safe, serviceable and clean condition in accordance with the Output Specifications and Good Industry Practice;
 - (ii) of the type specified in the Output Specifications, if applicable; and
 - (iii) in compliance with all Applicable Law,

and shall, as soon as practicable after receiving a request from the City Representative, supply to the City Representative evidence to demonstrate its compliance with this Section 28.1(a).

28.2 Stocks

- (a) Project Co shall cause sufficient stocks of goods, consumables, equipment and materials to be held in compliance with its obligations under this Project Agreement.

29. DAMAGE AND DESTRUCTION

29.1 Restoration and Reinstatement of Damage or Destruction

- (a) Project Co shall protect (i) the Works, (ii) the property of the City on the Site and (iii) the System Infrastructure, in each case, from damage or destruction which may arise as a result of Project Co's performance of the Project Operations under this Project Agreement, and Project Co shall be responsible for such damage or destruction, except for any damage or destruction which occurs as a result of acts or omissions by the City or any City Party.

- (b) Unless this Project Agreement is terminated in accordance with its terms, if all or any part of,

- (i) the Works, including the System Infrastructure and New Municipal Infrastructure, is damaged or destroyed prior to the Substantial Completion Date in respect of the System Infrastructure, or prior to the applicable New Municipal Infrastructure Component Acceptance Date in respect of the relevant New Municipal Infrastructure Component, or by an act or omission of Project Co or any Project Co Party; or;
- (ii) the property of the City on the Site, property adjacent to the Site, or the System Infrastructure is damaged or destroyed by an act or omission of Project Co or any Project Co Party,

Project Co shall, at its own cost and expense, Make Good and repair and replace the property of the City on the Site for which Project Co is responsible pursuant to (a) above, the property adjacent to the Site for which Project Co is responsible pursuant to in (a) above, the relevant New Municipal Infrastructure Component or the System Infrastructure or any part thereof, as applicable, (the "**Reinstatement Work**") promptly and in any event as soon as practicable in the circumstances. Except as otherwise expressly provided in this Project Agreement, damage to or destruction of all or any part of the System Infrastructure or the New Municipal Infrastructure shall not terminate this Project Agreement or relieve Project Co of any of its obligations hereunder or entitle Project Co to any compensation from the City.

- (c) Project Co shall not undertake to repair and/or replace any damage or destruction whatsoever to adjacent property or any infrastructure owned by third parties without first consulting the City and receiving written instructions as to the course of action to be followed.

29.2 Reinstatement Plan

- (a) If the Reinstatement Work in respect of the System Infrastructure or New Municipal Infrastructure is reasonably estimated to cost more than \$[REDACTED] (index linked) or in any other case where the City Representative, having regard to the nature of the damage or destruction, notifies Project Co that a Reinstatement Plan is required (excluding where the damage or destruction occurs before the Final Completion Date and the City Representative acting reasonably considers that the continued application of the Design and Construction Certification Procedure would be able to adequately address the Reinstatement Work without the

need for a separate Reinstatement Plan), Project Co shall, as soon as practicable and in any event within 20 Business Days after the occurrence of the damage or destruction or receipt of notification from the City Representative, as the case may be, (or if, with the exercise of all due diligence more than 20 Business Days is reasonably required for such purposes, then within such longer period of time after the occurrence of such damage or destruction or receipt of notification from the City Representative, as the case may be, as may be reasonably required with the exercise of all due diligence, provided Project Co exercises and continues to exercise all such due diligence) submit to the City Representative pursuant to Schedule 10 - Review Procedure a plan (a “**Reinstatement Plan**”) prepared by Project Co for carrying out the Reinstatement Work setting out, in reasonable detail, *inter alia*:

- (i) a description of the Reinstatement Work required to restore, replace and reinstate the damage or destruction;
- (ii) Project Co’s proposed schedule for the execution of the Reinstatement Work; and
- (iii) the information required pursuant to Schedule 21 - Variations as if such plan were an Estimate;

and the Reinstatement Work must not be commenced until the City Representative consents thereto in accordance with Schedule 10 - Review Procedure except to the extent necessary to address any Emergency or public safety needs.

29.3 Conduct of Reinstatement Work

- (a) Project Co shall cause the Reinstatement Work in respect of the System Infrastructure or New Municipal Infrastructure to be carried out in accordance with the Output Specifications and all other applicable requirements under this Project Agreement and, where applicable, in accordance with the Reinstatement Plan consented to by the City Representative in accordance with Schedule 10 - Review Procedure. All designs, plans and specifications in respect of the Reinstatement Work shall be subject to the Design and Construction Certification Procedure. If requested by the City Representative, the persons (and if applicable, a suitable parent entity thereof acceptable to the City) retained by Project Co to design and carry out any Reinstatement Work shall, as a condition to their retainer and prior to commencing any Reinstatement Work or design work in connection therewith, enter into a construction contract with Project Co and a direct agreement with the City in substantially the same forms as the Construction Contract and the Construction Contractor’s Direct Agreement.
- (b) In the event any Insurance Proceeds under Insurance Policies as referred to in Schedule 28 - Insurance Trust Agreement are available to carry out the Reinstatement Work in respect of the System Infrastructure or New Municipal Infrastructure, such Insurance Proceeds shall be paid into the Insurance Trust Account and shall be dispensed in accordance with the provisions of the Insurance Trust Agreement to carry out the Reinstatement Work.

30. MONITORING AND PERFORMANCE AUDITS

30.1 Performance Audits

(a) If the City reasonably believes that Project Co is in breach of its obligations with respect to Maintenance and Rehabilitation Services, including:

- (i) under Sections 26 and 27;
- (ii) under the Output Specifications; or
- (iii) in respect of any defects, deficiencies or items of outstanding work that should have been completed as part of the Works,

then the City may cause to be performed, by an arm's length consultant appointed by the City, a performance audit, inspection and survey of the System Infrastructure to assess whether the System Infrastructure has been and is being maintained by Project Co in accordance with Project Co's obligations (the "**Performance Audit**").

(b) The City shall notify Project Co in writing at least 10 Business Days prior to the date that the City wishes to cause a Performance Audit to be undertaken. The City shall, acting in good faith, consider any reasonable request by Project Co for the Performance Audit to be performed on an alternative date if such request is made by Project Co in writing at least 5 Business Days prior to the date originally requested by the City, on the basis that performing the Performance Audit on the date originally requested by the City would materially prejudice Project Co's ability to provide the Maintenance and Rehabilitation Services.

(c) When causing any Performance Audit to be undertaken, the City shall use commercially reasonable efforts to minimize any disruption caused to the provision of the Maintenance and Rehabilitation Services. The cost of a Performance Audit, except where Section 30.1(e) applies, shall be borne by the City. Project Co shall provide the City, at no additional cost or charge, with any reasonable assistance required by the City from time to time during the Performance Audit.

(d) If a Performance Audit shows that Project Co has not performed or is not performing its obligations in any material respect, the City shall:

- (i) provide Project Co with a written Notice of non-compliance;
- (ii) provide Project Co with instructions regarding rectification or Maintenance and Rehabilitation Services, as the case may be, required to be performed by Project Co in order for Project Co to perform its obligations;
- (iii) specify a reasonable period of time within which Project Co must perform such rectification or Maintenance and Rehabilitation Services; and
- (iv) be entitled to exercise all rights pursuant to Section 31.

(e) If a Performance Audit shows that Project Co has not performed or is not performing its obligations in any material respect, Project Co shall:

- (i) perform any rectification or Maintenance and Rehabilitation Services, as the case may be, required by the City within a reasonable period of time specified by the City, and be

- responsible for any costs incurred in performing such rectification or Maintenance and Rehabilitation Services, as the case may be; and
- (ii) pay or reimburse the City for the reasonable costs of the Performance Audit and any administrative costs incurred by the City in relation to the Performance Audit.
 - (f) Nothing in this Section 30.1 shall limit or restrict the City's rights hereunder to perform any other performance audits, inspections and surveys at its own cost and expense.
 - (g) The City's right to cause a Performance Audit to be undertaken may not be exercised more than once every 180 days unless any Performance Audit performed in the preceding 12 month period shows that Project Co has not performed or is not performing its obligations in any material respect.

30.2 Monitoring of Performance

- (a) Project Co shall monitor the performance of the Maintenance and Rehabilitation Services in the manner and at the frequencies set out in the Output Specifications and the Payment Mechanism, and shall compile and at all times maintain records which are accurate and complete of such monitoring and performance. In addition to Project Co's obligations as set out in the Output Specifications and the Payment Mechanism, Project Co shall, as reasonably requested by the City, provide the City Representative with relevant particulars of any aspects of Project Co's performance which fail to meet the requirements of this Project Agreement.
- (b) The City may, at any and all reasonable times, observe, inspect, monitor, audit and take any steps reasonably necessary to satisfy itself as to the adequacy of the monitoring, including performing sample checks.
- (c) The City may in its sole discretion and notwithstanding anything else to the contrary in this Project Agreement, share all performance monitoring information in respect of the Maintenance and Rehabilitation Period with the Operator.

30.3 Failure Points

- (a) In each Payment Period, Project Co shall measure the performance of the Maintenance and Rehabilitation Services, and based on the performance of the Maintenance and Rehabilitation Services in the applicable Payment Period, Failure Points may be awarded, as applicable, in accordance with the Payment Mechanism.

30.4 Warning Notices

- (a) Without prejudice to the City's rights under Section 43 and any other rights under this Project Agreement, if Project Co accrues the following number of Failure Points or more in any one Payment Period, then the City may give written Notice (a "**Warning Notice**") to Project Co setting out the matter or matters giving rise to such Notice and stating that it is a "**Warning Notice**".
 - (i) [REDACTED] Failure Points in respect of Train Kilometres Availability Failures; or

- (ii) [REDACTED] Failure Points in respect of Quality Failures and Service Failures combined.

30.5 Monitoring Notices

- (a) Without prejudice to the City's rights under Section 43 and any other rights under this Project Agreement, if Project Co accrues the following number of Failure Points or more in any rolling 3 Payment Periods, the City may, by Notice (a "Monitoring Notice") to Project Co require Project Co to increase the level of Project Co's monitoring of its own performance of its obligations under this Project Agreement until such time as Project Co shall have demonstrated to the reasonable satisfaction of the City that it is performing, and is capable of continuing to perform, its obligations under this Project Agreement in respect of the relevant Maintenance and Rehabilitation Services:
 - (i) [REDACTED] Failure Points in respect of Train Kilometres Availability Failures; or
 - (ii) [REDACTED] Failure Points in respect of Quality Failures and Service Failures combined.
- (b) The City may also issue a Monitoring Notice in the event that the Capital Coverage Ratio as reported in three consecutive Contract Months is less than the Threshold Capital Coverage Ratio.
- (c) If a Monitoring Notice is given, then:
 - (i) such Monitoring Notice shall specify in reasonable detail the additional measures to be taken by Project Co in monitoring its own performance;
 - (ii) if Project Co, acting reasonably, objects to any of the specified measures on the grounds that they are excessive or that the City was not entitled to give the Monitoring Notice, Project Co shall, within 5 Business Days of the receipt of the Monitoring Notice, provide Notice to the City's setting out matters objected to and any changes necessary in order to prevent prejudice to Project Co's performance of its obligations under this Project Agreement;
 - (iii) if Project Co provides the City a Notice under Section 30.5(c)(ii), the measures to be taken by Project Co shall be agreed between the Parties or, in the absence of agreement within 10 Business Days of the City's receipt of such Notice, may be referred for resolution in accordance with Schedule 26 - Dispute Resolution Procedure;
 - (iv) if Project Co fails to increase Project Co's monitoring as provided herein, the City may perform such monitoring save where Project Co, acting in good faith, is pursuing a Dispute pursuant to Section 30.5(c)(iii);

- (v) if it is determined in accordance with Schedule 26 - Dispute Resolution Procedure that the City was entitled to give the applicable Monitoring Notice, Project Co shall bear its own costs and reimburse the City for any reasonable costs and expenses incurred by or on behalf of the City in relation to the giving of such Monitoring Notice; and
 - (vi) if it is determined in accordance with Schedule 26 - Dispute Resolution Procedure that the City was not entitled to give the applicable Monitoring Notice, the City shall bear its own costs and reimburse Project Co for any reasonable costs and expenses incurred by or on behalf of Project Co in relation to the giving of such Monitoring Notice.
- (d) In respect of any Monitoring Notice, if Project Co shall have demonstrated to the reasonable satisfaction of the City that Project Co has performed its obligations under this Project Agreement for a period of 90 consecutive days and during such period has not received a Warning Notice or Monitoring Notice in respect of the same or similar Maintenance and Rehabilitation Services, as applicable, Project Co may apply for the withdrawal of such Monitoring Notice. If the City is satisfied, acting reasonably, that Project Co has satisfied the aforesaid requirements, it shall, within 10 Business Days of receipt of such application, withdraw such Monitoring Notice and cease to perform or require the performance of the increased monitoring implemented in respect of such Monitoring Notice.
- (e) If it is determined in accordance with Schedule 26 - Dispute Resolution Procedure that the City was not entitled to give any Monitoring Notice, the City shall promptly withdraw such Monitoring Notice and cease to perform or require the performance of the increased monitoring implemented in respect of such Monitoring Notice.

31. CITY'S REMEDIAL RIGHTS

31.1 Exercise of Remedial Rights

- (a) The City may exercise all rights set out in this Section 31 at any time and from time to time if:
- (i) The City, acting reasonably, considers that a breach by Project Co of any obligation under this Project Agreement, or any act or omission on the part of Project Co or any Project Co Party:
 - (A) does or can reasonably be expected to create a serious threat to the health, safety or security of any person, including any System User or City Party;
 - (B) does or can reasonably be expected to result in a materially adverse interruption in the Maintenance and Rehabilitation Services or the availability of the System Infrastructure to System Users;
 - (C) does or can reasonably be expected to materially prejudice the performance of any Governmental Activities; or
 - (D) may potentially compromise (I) the City's reputation or integrity, or (II) the nature of the public transit system in the City of Ottawa so as to affect public confidence in the public transit system in the City of Ottawa or the Project,

provided that:

- (E) in respect of a breach by Project Co of any obligation under this Project Agreement, or any act or omission on the part of Project Co or any Project Co Party, which can reasonably be expected to cause any of the consequences set out in Sections 31.1(a)(i)(A), 31.1(a)(i)(B) and 31.1(a)(i)(C), the City shall not exercise its rights under this Section 31 unless Project Co has failed to cure the relevant breach, act or omission within 5 Business Days of Notice from the City or, if such breach, act or omission cannot reasonably be cured within such 5 Business Day period, Project Co thereafter fails to diligently and continuously pursue such cure and to cure such breach, act or omission within a reasonable period thereafter, provided that Project Co shall not be entitled to a cure period if any of the consequences set out in Sections 31.1(a)(i)(A), 31.1(a)(i)(B) and 31.1(a)(i)(C) actually occur; and
 - (F) in respect of Section 31.1(a)(i)(D), the City shall not exercise its rights under this Section 31 unless Project Co has failed to cure the relevant breach, act or omission within 5 Business Days of Notice from the City or, if such breach, act or omission cannot reasonably be cured within such 5 Business Day period, Project Co thereafter fails to diligently and continuously pursue such cure and to cure such breach, act or omission within a reasonable period thereafter.
- (ii) Project Co accrues the following number of Failure Points or more in any one Payment Period:
- (A) [REDACTED] Failure Points in respect of Train Kilometres Availability Failures; or
 - (B) [REDACTED] Failure Points in respect of Quality Failures and Service Failures combined.
- (iii) while a Monitoring Notice is in effect that is not being disputed by Project Co, acting in good faith, Project Co receives a Warning Notice in respect of the same or similar Maintenance and Rehabilitation Services.
- (iv) pursuant to Schedule 11 – Integrated Management System Requirements, an IMS Audit that is not being disputed by Project Co, acting in good faith, shows that Project Co has not performed or is not performing its obligations and Project Co has failed to perform the rectification or Maintenance and Rehabilitation Services, as applicable, as provided in the Output Specifications.
- (v) a labour dispute materially affects or can reasonably be expected to materially affect the Project Operations, the Governmental Activities or the availability of the System Infrastructure to System Users.
- (vi) the City has received a notice under the Maintenance and Rehabilitation Contractor's Direct Agreement that entitles the City to exercise step-in rights thereunder.

- (vii) Project Co has failed to comply with any written direction issued by or on behalf of the City.
- (viii) Project Co has not caused the COR-Qualified Construction Project Co Party or the COR-Certified Construction Project Co Party, as the case may be, to perform its obligations with respect to its COR Certification or OHSAS 18001 Accreditation, as the case may be, in accordance with Section 9.6, or Project Co has not caused the COR-Qualified Construction Project Co Party or the COR-Certified Construction Project Co Party, as the case may be, to perform its obligations with respect to H&S Construction Inspections in accordance with Section 13(b), or to perform its obligations to rectify any non-compliance noted in any H&S Construction Inspection Report in accordance with Section 13(e).
- (ix) Project Co has not caused the COR-Qualified Maintenance Project Co Party or the ISO 45001 Certified Maintenance and Rehabilitation Project Co Party, as the case may be, to perform its obligations with respect to its COR Certification in accordance with Section 9.6, or Project Co has not caused the COR-Qualified Maintenance Project Co Party or the ISO 45001 Certified Maintenance and Rehabilitation Project Co Party, as the case may be, to perform its obligations with respect to H&S Maintenance Inspections in accordance with Section 13(b), or to perform its obligations to rectify any non-compliance noted in any H&S Maintenance Inspection Report in accordance with Section 13(e).

31.2 Emergency

- (a) Notwithstanding that Project Co is not in breach of its obligations under this Project Agreement, the City may exercise all of the rights set out in this Section 31 at any time and from time to time during the Maintenance Period if the City, acting reasonably, considers the circumstances to constitute an Emergency.

31.3 Rectification

- (a) Without prejudice to the City's rights under Section 43 and any other rights under this Project Agreement, in any of the circumstances set out in Sections 31.1 or 31.2, the City may, by written Notice, require Project Co to take such steps as the City, acting reasonably, considers necessary or expedient to mitigate, rectify or protect against such circumstance, including, if applicable, the termination and replacement of Subcontractors or a limited suspension of the performance of the Works, and Project Co shall use commercially reasonable efforts to comply with the City's requirements as soon as reasonably practicable.
- (b) If the City gives Notice to Project Co pursuant to Section 31.3(a) and either:
 - (i) Project Co does not either confirm, within 5 Business Days of such Notice or such shorter period as is appropriate in the case of an Emergency or in the event the City is entitled to exercise step-in rights under the Maintenance and Rehabilitation Contractor's Direct Agreement that it is willing to take the steps required in such Notice or present an alternative plan to the City to mitigate, rectify and protect against such circumstances that the City may accept or reject acting reasonably; or

- (ii) Project Co fails to take the steps required in such Notice or accepted alternative plan within such time as set out in such Notice or accepted alternative plan or within such longer time as the City, acting reasonably, shall think fit,

then the City may take such steps as it considers to be appropriate, acting reasonably, including, if applicable, exercising step-in rights under the Maintenance and Rehabilitation Contractor's Direct Agreement and requiring the termination and replacement of Subcontractors, either itself or by engaging others (including a third party) to take any such steps, and may perform or obtain the performance of the relevant Maintenance and Rehabilitation Services to the standards required by this Project Agreement, and the provisions of Section 40, including Section 40.1(a)(iv) and Section 40.1(a)(x), shall apply.

- (c) Notwithstanding the foregoing provisions of this Section 31.3, in the event of an Emergency, the Notice under Section 31.3(a) shall be given as promptly as possible having regard to the nature of the Emergency and the City may, prior to Project Co's confirmation under Section 31.3(b)(i), take such steps as are appropriate having regard to the nature of the Emergency.
- (d) Where the City considers it to be necessary to do so, the steps which the City may take pursuant to this Section 31.3 subsequent to the provision of the Notice under Section 31.3(a) unless the Notice is given at a later time as provided in Section 31.3(c), may, at the City's option, include the partial or total suspension of Project Co's right and obligation to perform any Maintenance and Rehabilitation Services having regard to the circumstances in question (without any extension of the Project Term or suspension of any other Maintenance and Rehabilitation Services, and the provisions of Section 40, including Section 40.1(a)(iv) and Section 40.2, shall apply, but such suspension shall be only for so long as, as applicable:
- (i) the circumstances referred to in Section 31.1 or 31.2 subsist; or
 - (ii) in respect of any such circumstances relating to Project Co's performance of the Maintenance and Rehabilitation Services, until such time as Project Co shall have demonstrated to the reasonable satisfaction of the City that, notwithstanding such circumstances, Project Co has taken such steps, including, if applicable, the termination and replacement of Subcontractors, as are required pursuant to this Section 31.3 and as are necessary to be capable of performing its obligations in respect of the relevant Maintenance and Rehabilitation Services to the required standard in accordance with this Project Agreement, and thereafter Project Co shall perform its obligations as aforesaid.

31.4 Costs and Expenses

- (a) Subject to the City's obligations pursuant to Sections 31.5 and 31.6:
- (i) Project Co shall bear all costs and expenses incurred by Project Co in relation to the exercise of the City's rights pursuant to this Section 31; and
 - (ii) Project Co shall reimburse the City for all reasonable costs and expenses incurred by the City in relation to the exercise of the City's rights pursuant to this Section 31.

31.5 Reimbursement Events

- (a) In this Section 31.5, a “**Reimbursement Event**” means:
- (i) an act or omission of Project Co or any Project Co Party or a breach by Project Co or any Project Co Party of any obligation under this Project Agreement, but only to the extent such act, omission or breach is caused by a City Party;
 - (ii) a labour dispute involving employees of any City Party that materially affects or can reasonably be expected to materially affect the Project Operations; or
 - (iii) an Emergency that is not caused or contributed to by an act or omission of Project Co or any Project Co Party or a breach by Project Co or any Project Co Party of any obligation under this Project Agreement.
- (b) If the City either takes steps itself or requires Project Co to take steps in accordance with this Section 31 as a result of a Reimbursement Event:
- (i) the City shall reimburse Project Co for the reasonable costs and expenses incurred by Project Co in relation to the exercise of the City’s rights pursuant to this Section 31 that would not otherwise have been incurred by Project Co in the proper performance of its obligations under this Project Agreement; and
 - (ii) subject to Section 31.5(c), the City shall bear all costs and expenses incurred by the City in relation to the exercise of the City’s rights pursuant to this Section 31.
- (c) If, in exercising its rights pursuant to this Section 31, the City performs any part of the Maintenance and Rehabilitation Services either itself or by engaging others, the City shall be entitled to deduct from any Monthly Service Payment the reasonable cost of performing such Maintenance and Rehabilitation Services. If the City makes such a deduction, then Project Co shall be relieved of its reimbursement obligations under Section 31.4(a)(ii) up to the amount equal to the deduction.

31.6 Reimbursement if Improper Exercise of Rights

- (a) If the City exercises its rights pursuant to this Section 31, but the City was not entitled to do so, the City shall reimburse Project Co for the reasonable costs and expenses directly incurred by Project Co over and above those that would otherwise have been incurred by Project Co in the proper performance of its obligations under this Project Agreement and that are directly and reasonably incurred by Project Co in complying with those written requirements of the City issued as a result of the City having exercised such rights.
- (b) Project Co acknowledges and agrees that Project Co has no right to require a determination of whether or not the City is entitled to exercise its rights pursuant to this Section 31 before taking any such action that the City may require and Project Co shall comply with all of the City’s requirements. Only concurrently with or after complying with the City’s requirements shall Project Co be entitled to refer any Dispute for resolution in accordance with Schedule 26 - Dispute Resolution Procedure.

32. PAYMENT

32.1 Construction Period Payments

- (a) The City shall pay to Project Co the Construction Period Payments, plus, for clarity, applicable HST in accordance with Schedule 20 – Construction Period Payments and this Project Agreement.
- (b) The City shall pay to Project Co the Substantial Completion Payment plus, for clarity, applicable HST, less any Lane Closure Adjustment on the Substantial Completion Payment Commencement Date in accordance with Schedule 20 – Construction Period Payments and this Project Agreement.

32.2 Monthly Service Payments

- (a) Subject to and in accordance with this Project Agreement, including this Section 32 and Schedule 19 - Payment Mechanism, the City shall pay to Project Co the Monthly Service Payments, plus, for clarity, any applicable HST.

32.3 Payment Adjustments

- (a) Project Co acknowledges and agrees that:
 - (i) the amount of any Monthly Service Payment may be adjusted pursuant to Schedule 19 - Payment Mechanism; and
 - (ii) such adjustments are integral to the provisions of this Project Agreement.
- (b) If, for any reason, any adjustment (including a Deduction) made pursuant to Schedule 19 - Payment Mechanism is invalid and unenforceable, and an Applicable Law that is a Change in Law is enacted that permits the City to recover or to cause such adjustment to be enforceable, such Change in Law (only to the extent that it permits the City to recover or to cause such adjustment to be enforceable) shall be deemed to not be a Relevant Change in Law and Project Co shall not be entitled to any compensation hereunder for such Change in Law.

32.4 Payment Commencement

- (a) Subject to and in accordance with this Project Agreement, the City shall pay Project Co the Monthly Service Payments calculated as being due to Project Co in respect of each Payment Period following the Payment Commencement Date in accordance with Schedule 19 - Payment Mechanism.
- (b) Project Co shall not be entitled to any Monthly Service Payments for any period prior to the Payment Commencement Date.

32.5 Adjustments to Payment Periods

- (a) The Annual Service Payment payable in respect of each of the first Contract Year and the last Contract Year shall be adjusted in accordance with Schedule 19 - Payment Mechanism.

32.6 Invoicing and Payment Arrangements

- (a) Within 5 Business Days following the end of each Payment Period, Project Co shall issue to the City an invoice for the amount of the Monthly Service Payment owing by the City to Project Co for such Payment Period, with such adjustments as provided in the Payment Adjustment Report issued in the previous Payment Period.
- (b) Project Co shall comply with all requirements of Schedule 19 - Payment Mechanism in respect of invoices and shall include with each invoice such supporting documentation as the City may reasonably require in connection with payments hereunder.
- (c) Each invoice shall be in a form agreed by the Parties, acting reasonably, and shall include as a minimum:
 - (i) the Monthly Service Payment payable in respect of the applicable Payment Period;
 - (ii) any adjustments set out in the Payment Adjustment Report issued in the previous Payment Period that have been approved by the City;
 - (iii) any other adjustments to reflect overpayments and underpayments, as agreed between the Parties or determined in accordance with Schedule 26 - Dispute Resolution Procedure;
 - (iv) any amount owing to the City under this Project Agreement;
 - (v) any amount owing to Project Co under this Project Agreement;
 - (vi) the net amount owing by the City to Project Co, or by Project Co to the City, as applicable; and
 - (vii) a statutory declaration in form and in substance satisfactory to the City with respect to CLA compliance and payment to all lien claimants:
 - (A) from Project Co, and
 - (B) upon request by the City, from any Project Co Party.
- (d) The invoices issued to the City in respect of the first Monthly Service Payment following the Payment Commencement Date (or the first invoice following expiry of the 45-day period referred to below) shall include up-to-date copies of the parcel registers for all of the Lands, which searches of title in support thereof shall not be performed earlier than 45 days following publication of a certificate of substantial performance of the Works pursuant to section 32(1) of the CLA.
- (e) HST shall be shown separately on all invoices from Project Co, together with Project Co's HST registration number.
- (f) Upon agreement of the Parties, the form of invoice may be changed from time to time.

- (g) The City Representative shall review each invoice submitted in accordance with this Section 32.6. the City shall pay the amount stated in such invoice on the first Business Day of the Payment Period next following the Payment Period in which the invoice is received. Any such payment shall be subject to adjustment pursuant to Section 32.6(k).
- (h) The City shall not be obligated to make any payment to Project Co unless all conditions precedent applicable to such payment under this Project Agreement have been satisfied by Project Co. Further, the City shall not be obligated to pay an invoice delivered by Project Co after the second Payment Period following the Payment Commencement Date until Project Co has delivered the Payment Adjustment Report referred to in Section 32.6(i) for the previous Payment Period. In the event that Project Co delivers any Payment Adjustment Report later than the stipulated date in Section 32.6(i), the City's obligation to pay the invoice issued by Project Co for the immediately following Payment Period shall be extended by the number of days by which Project Co was late in delivering the applicable Payment Adjustment Report to the City.
- (i) Within 5 Business Days following the end of each Payment Period, Project Co shall also submit to the City:
- (i) a Performance Monitoring Report in respect of the Payment Period just ended (as further described in Schedule 11 – Integrated Management System Requirements); and
 - (ii) a report (a “**Payment Adjustment Report**”) setting out any adjustments required between the actual Monthly Service Payments determined by Project Co to be owing by the City to Project Co in respect of the Payment Period just ended and the amount that was paid by the City during such Payment Period, including details of:
 - (A) all Deductions in relation to Availability Failures;
 - (B) all Deductions in relation to Quality Failures;
 - (C) all Deductions in relation to Service Failures; and
 - (D) any Gainshare Adjustment or Painshare Adjustment.
- (j) Project Co shall include with each Payment Adjustment Report such supporting documentation as is reasonably required to substantiate and confirm the adjustments set out in each Payment Adjustment Report.
- (k) Within 10 Business Days of receipt by the City of the Payment Adjustment Report, the City Representative shall:
- (i) determine and advise Project Co that the Payment Adjustment Report is approved by the City, in which case the adjustments set out therein will be reflected by Project Co in the invoice next issued by Project Co; or
 - (ii) if the City disputes Project Co's entitlement to any part of the amounts set out therein, notify Project Co in writing of that part of the amounts (insofar as at the time of such Notice the City are reasonably able to quantify it) which the City dispute and submit to Project Co such supporting documentation as is reasonably required to substantiate and

confirm such claim. In such event, the City shall withhold payment of any disputed amount pending agreement or determination of Project Co's entitlement to the disputed amount in accordance with Section 32.9.

32.7 Electronic Invoicing

- (a) Project Co shall cooperate with the reasonable requirements of the City, and shall submit its invoices and all other documentation relating to this Project Agreement in a form and with the structure and content as is reasonably required to be compatible with the City's information systems.

32.8 Final Payment Periods

- (a) At the beginning of each of the final 3 Payment Periods immediately prior to the Expiry Date, the City shall estimate, acting reasonably, the adjustments to the Monthly Service Payments for each such Payment Period. The City may withhold the amounts that it has reasonably estimated for such adjustments from amounts paid to Project Co during each of the final 3 Payment Periods.
- (b) Within 10 Business Days of receipt by the City of the applicable Payment Adjustment Report for each of the final 3 Payment Periods, the City Representative shall either:
- (i) determine and advise Project Co that the Payment Adjustment Report is approved by the City and perform a reconciliation between the amount payable based on such Payment Adjustment Report and the amount the City previously paid in respect of the applicable Payment Period. Based on such reconciliation, either the City or Project Co shall pay to the other Party the amount properly owing in accordance with such reconciliation; or
 - (ii) if the City disputes Project Co's entitlement to any part of the amounts set out therein, notify Project Co in writing of that part of the amounts (insofar as at the time of such Notice the City are reasonably able to quantify it) which the City disputes and submit to Project Co such supporting documentation as is reasonably required to substantiate and confirm such claim. In such event, the City Representative shall perform a reconciliation between the undisputed amount payable based on such Payment Adjustment Report and the amount the City previously paid in respect of the applicable Payment Period. Based on such reconciliation, either the City or Project Co shall pay to the other Party the amount properly owing in accordance with such reconciliation, provided that the City shall withhold payment of any disputed amount pending agreement or determination of Project Co's entitlement to the disputed amount in accordance with Section 32.9.

32.9 Disputes

- (a) If the City, acting in good faith, disputes all or any part of a Payment Adjustment Report and/or the Monthly Service Payments payable thereunder, it shall notify Project Co in writing of that part of the amounts (insofar as at the time of such Notice the City is reasonably able to quantify it) which the City disputes and submit to Project Co such supporting documentation as is reasonably required to substantiate and confirm such claim. The Parties shall use commercially reasonable efforts to resolve the Dispute in question within 10 Business Days of the aforesaid Notice of the Dispute. If they fail to so resolve the Dispute within such period, the Dispute may

be referred for resolution in accordance with Schedule 26 – Dispute Resolution Procedure. Following resolution of the Dispute, any amount which has been paid by the City that is determined not to have been payable shall be paid forthwith by Project Co to the City, and Project Co shall indemnify and hold harmless the City from and against any damages suffered or incurred resulting from such overpayment by the City as provided for at Section 54.1(e) on the basis that the due date was the date of the overpayment by the City. Following resolution of the Dispute, any amount that has been withheld by the City that is determined to have been payable shall be paid forthwith by the City to Project Co and the City shall indemnify and hold harmless Project Co from and against any damages suffered or incurred resulting from such withholding by the City as provided for at Section 54.2(c) on the basis that the due date was the date upon which such amount became payable to Project Co.

32.10 Payments

- (a) Unless specific timeframes are stipulated for payment of any amounts owing or payable by one Party to the other Party under this Project Agreement, such amounts shall be due within 30 days of receipt or deemed receipt of an invoice therefor.
- (b) Project Co shall maintain or cause to be maintained all holdbacks required pursuant to the CLA which may be maintained by way of cash, Letter of Credit or holdback release bond, and shall only release holdbacks on being satisfied that no claims for lien can be claimed in respect of the Subcontracts for which holdbacks are to be released.

32.11 Manner of Payment

- (a) All payments under this Project Agreement shall be made in Canadian dollars and shall be electronically transferred, quoting the invoice number or description against which payment is made, in immediately available funds on the due date to a single bank account located in Canada as may be designated by the recipient from time to time by written Notice to the other Party.
- (b) If the due date is not a Business Day, then the electronic transfer shall be made on the Business Day immediately succeeding such day.

32.12 Set-Off

- (a) The Parties agree that their rights of set-off at law or in equity are limited to the right of:
 - (i) the City to set off against any amounts otherwise due to Project Co pursuant to the terms of this Project Agreement (other than any Construction Period Payment and Unpaid Construction Period Payments), any amounts (including any amounts payable in accordance with Section 54) that are due to the City by Project Co pursuant to the terms of this Project Agreement; and
 - (ii) Project Co to set off against any amounts otherwise due to the City pursuant to the terms of this Project Agreement, any amounts (including any amounts payable in accordance with Section 54) that are due to Project Co by the City pursuant to the terms of this Project Agreement.

32.13 Effect of Payment

- (a) No payment hereunder shall be construed as an acceptance or approval of incomplete, defective or improper performance by Project Co of any of its obligations under this Project Agreement, nor shall it operate to relieve Project Co from the performance of any of its obligations under this Project Agreement which have not been performed.

32.14 Audit of Performance and Payment

- (a) Without limiting the City's rights and Project Co's obligations pursuant to Section 35.2, at any time and from time to time until 365 days after the Termination Date, the City may give Notice to Project Co requiring an audit of any matter relating to performance of the Project Operations and payments by or to the City within the 7 year period prior to the date of such Notice, including any Payment Adjustment Reports, and any other records, reports, information, documents or data relating to performance and payments to verify their accuracy, correctness and completeness.
- (b) The City shall appoint an auditor to perform and complete such audit at the City's cost and expense and pursuant to terms of reference determined by the City.
- (c) Within a reasonable time following receipt of a Notice referred to in Section 32.14(a), Project Co shall make available to the City's auditor, any Payment Adjustment Reports, and any other records, reports, information, documents or data relating to performance and payments.
- (d) The City shall notify Project Co of the results of the audit, and if the City's auditor discovers any inaccuracy, incorrectness or incompleteness, then, subject to Project Co's right to dispute the same in accordance with Schedule 26 – Dispute Resolution Procedure:
- (i) Project Co shall:
- (A) remedy any such inaccuracy, incorrectness or incompleteness and issue a revision to the applicable Payment Adjustment Report or other record, report, information, document or data; and
- (B) where the inaccuracy, incompleteness or incorrectness has resulted in any material overpayment by the City, reimburse the City for all costs relating to the auditor and audit to a maximum amount that is the lesser of:
- (I) the actual costs relating to the auditor and audit; or
- (II) an amount equal to the amount of any overpayment;
- (ii) where the inaccuracy, incompleteness or incorrectness has resulted in any overpayment, whether or not material, by the City, Project Co shall reimburse the City for the amount of such overpayment and, further, shall indemnify and hold harmless the City from and against any damages suffered or incurred resulting from such overpayment by the City as provided for at Section 54.1(e) on the basis that the due date was the date of the overpayment by the City; and
- (iii) where the inaccuracy, incompleteness or incorrectness has resulted in any underpayment by the City, whether or not material, the City shall pay Project Co the amount of such underpayment and, further, shall indemnify and hold harmless Project Co from and

against any damages suffered or incurred resulting from such underpayment by the City as provided for at Section 54.2(c) on the basis that the due date was the date of the underpayment by the City.

32.15 No Other Entitlement

- (a) Project Co shall not be entitled to any payments, compensation, rights, remedies, benefits or entitlements under or in connection with this Project Agreement, except as specifically and expressly set out in this Project Agreement

33. TAXES

33.1 Taxes

- (a) All amounts specified in this Project Agreement, including, for clarity, any compensation payable on termination, are expressed exclusive of HST, but inclusive of all other Taxes payable pursuant to Applicable Law. For clarity, the City shall not be required to pay any interest and/or penalties that are imposed on or assessed against Project Co or any Project Co Party for non-compliance with Applicable Law. If Project Co is required by Applicable Law to collect any such HST from the City, the City shall pay such HST to Project Co simultaneously with the amount to which such applicable HST relates or applies.
- (b) The City shall pay, when due and payable, all property taxes or payments in lieu of property taxes that are assessed in respect of ownership or use of the Lands, the System Infrastructure and the New Municipal Infrastructure.
- (c) The City shall pay all applicable HST properly payable in accordance with the *Excise Tax Act* (Canada) by the City upon and in connection with payments by the City to Project Co under this Project Agreement. For greater certainty, the Parties agree that the conditions set out in paragraph 168(3)(c) of the *Excise Tax Act* (Canada) are not satisfied at the time of Substantial Completion hereunder and, unless otherwise required by Applicable Law, any HST payable by the City hereunder shall be calculated solely by reference to the amount of the payment, without any deductions or adjustments on account of paragraph 168(3)(c) of the *Excise Tax Act* (Canada).

33.2 Changes in Scope of Taxation

- (a) If, as a result of a Change in Law, the application of Taxes under Part IX of the *Excise Tax Act* (Canada) or any provincial sales tax legislation changes with respect to the provision of any goods or services by Project Co in connection with the performance of the Works, the City and Project Co agree to cooperate to determine how such change affects their respective obligations under this Project Agreement to the extent not already addressed in this Project Agreement.

33.3 Changes in Recoverability of Tax Credits

- (a) The City will pay to Project Co from time to time, as the same is incurred by Project Co, amounts equal to any Irrecoverable Tax to the extent such Irrecoverable Tax results from a Change in Law. Project Co will pay to the City from time to time, as the same is incurred by Project Co, amounts equal to any Recoverable Tax to the extent such Recoverable Tax results from a Change in Law.

- (b) For the purposes of this Section 33.3, the term “**Irrecoverable Tax**” means HST or an irrecoverable sales tax levied by the Province in lieu of all or a portion of HST incurred by Project Co in respect of the supply of any good or service to the City which is consumed, used or supplied, or to be consumed, used or supplied, exclusively by Project Co in the course of carrying out the Works or otherwise performing the Project Operations to the extent that Project Co is unable to recover or be credited with input tax credits, refunds, rebates or exemptions for such HST.
- (c) For the purposes of this Section 33.3, the term “**Recoverable Tax**” means HST incurred by Project Co in respect of the supply of any good or service to the City which is consumed, used or supplied, or to be consumed, used or supplied, exclusively by Project Co in the course of carrying out the Works or otherwise performing the Project Operations to the extent that Project Co is able to recover or be credited with input tax credits, refunds, rebates or exemptions for such HST.

33.4 Information and Assistance Provided by Project Co

- (a) Project Co shall, at the City’s request and cost, assist the City in applying for and obtaining all remissions and credits of Taxes to which the City is entitled.
- (b) The City may apply for a global or general exemption, waiver, remission, or refund of some or all Taxes which may otherwise be applicable in relation to this Project Agreement. Project Co shall, at the City’s cost, assist the City in making any applications for such global or general exemption, waiver, remission or refund and shall provide the City with such documentation as the City may reasonably require to support such application and, in any event, shall provide such consent as the City may require. Any exemption, waiver, remission, refund or other recovery of Taxes obtained by the City through such application shall accrue to the sole benefit of the City.
- (c) Project Co will provide the City with any information reasonably requested by the City from time to time in relation to any Taxes chargeable in accordance with this Project Agreement and payable by the City to Project Co from time to time.

33.5 Residency – *Income Tax Act (Canada)*

- (a) Project Co shall not undertake any action or transaction that, if undertaken, would cause or result in Project Co becoming a Non-Resident without the City’s prior written consent, which consent may be withheld in the City’s sole discretion.

33.6 Taxes – General

- (a) Project Co shall not, without the prior written consent of the City (which consent may be withheld in its sole discretion), undertake any action or transaction that, if undertaken, would cause the City or any the City Party to have (or result in the City or any City Party having) any obligation to deduct, withhold or remit any Taxes that are required by Applicable Law to be deducted, withheld or remitted from any amounts paid or credited to Project Co or any Project Co Party under this Project Agreement or under any other Project Document.

33.7 Taxes – Indemnity

- (a) If:

- (i) Project Co becomes a Non-Resident, or
- (ii) The City or any City Party are or become required by Applicable Law to deduct or withhold any amount in respect of Taxes on or in respect of any amounts paid or credited to Project Co or a Project Co Party by the City or any City Party under this Project Agreement or under any of the Project Documents,

then the City or any City Party shall be entitled to make any applicable deductions or withholdings required by Applicable Law from any amount paid or credited or to be paid or credited to Project Co or a Project Co Party on or after the date on which:

- (iii) Project Co or the Project Co Party becomes a Non-Resident and at all times while it remains a Non-Resident; or
- (iv) the City or any City Party are required by Applicable Law to deduct or withhold amounts in respect of any such amounts,

in each case, in respect of all Taxes that are required by Applicable Law to be deducted or withheld from amounts paid or credited to a Non-Resident or otherwise as required by Applicable Law; and all amounts paid or credited by the City or any City Party under this Project Agreement or under any other Project Document to Project Co or a Project Co Party shall be paid or credited net of such deductions or withholdings.

(b) If:

- (i) Project Co becomes a Non-Resident, or
- (ii) the City or any City Party are or become required by Applicable Law to deduct and withhold any amount in respect of Taxes on or in respect of any amounts paid or credited to Project Co or a Project Co Party by the City or any City Party under this Project Agreement or under any of the Project Documents,

Project Co shall, in each case, indemnify and hold harmless the City and the City Parties for:

- (iii) the full amount of all Taxes (“**Indemnifiable Taxes**”) that arise, are imposed on or are required to be paid by the City or any City Party in respect of any amounts paid or credited by the City or any City Party to Project Co or any Project Co Party under this Project Agreement or under any other Project Document as a result of either of the foregoing items less any amount withheld or deducted by the City or any City Party in respect of such Taxes, and
- (iv) any liability payable or incurred in connection with Indemnifiable Taxes (including penalties, interest and reasonable expenses associated with Tax compliance, reporting and contesting such liability for Indemnifiable Taxes, including reasonable professional expenses payable or incurred in connection therewith) arising from or with respect to Indemnifiable Taxes, whether or not they were correctly or legally asserted (“**Associated Liabilities**”).

Payment under this indemnification shall be made within 30 days from the date the City makes written demand for it. A certificate containing reasonable detail as to the amount of Indemnifiable Taxes and Associated Liabilities submitted to Project Co by the City shall be conclusive evidence, absent manifest error, of the amount due from Project Co to the City. The City shall be entitled to exercise its rights of set-off under Section 32.12 against any amounts owing under this indemnification. In the event that it is finally determined that such Indemnifiable Taxes were not correctly or legally asserted or remitted, then such Indemnifiable Taxes shall be reimbursed to Project Co following such final determination.

34. FINANCIAL MODEL

34.1 Appointment of Custodian

- (a) On or prior to Financial Close, the Parties shall appoint a suitably qualified and experienced person to act as the custodian for the purposes of this Project Agreement, and shall enter into an agreement with the Custodian substantially in the form of Schedule 3 - Custody Agreement.

34.2 Delivery and Use of Financial Model

- (a) In accordance with Schedule 2 - Completion Documents, Project Co shall deliver copies of the Financial Model (1 printed copy and 2 copies on CD-Rom) to the City and the Custodian to be held in custody on terms to be agreed by the Parties.
- (b) Following the approval by the City of any amendment to the Financial Model, Project Co shall promptly deliver copies of the revised Financial Model, in the same form as the original Financial Model (or such other form as may be agreed by the Parties from time to time), to the City and the Custodian.
- (c) The Parties shall instruct the Custodian to keep both a hard copy and an electronic copy of all versions of the Financial Model.
- (d) Project Co hereby grants to the City an irrevocable, royalty free, perpetual, non-exclusive and transferable license, including the right to grant sub-licences, to use the Financial Model or any revised Financial Model for any purpose in connection with this Project Agreement, whether during or after the Project Term.
- (e) For greater certainty, Project Co acknowledges and agrees that the City shall not be liable to Project Co for, and Project Co shall not seek to recover from the City or any City Party, any damages, losses, costs, liabilities or expenses which may arise (whether in contract, tort or otherwise) as a result of any errors in the Financial Model.

35. RECORDS, INFORMATION AND AUDIT

35.1 Records Provisions

- (a) Project Co shall comply with Schedule 25 - Record Provisions.

35.2 Information and General Audit Rights

- (a) Project Co shall provide and shall cause each Subcontractor to provide to the City all information, reports, documents, records and the like, including as referred to in Schedule 25 - Record Provisions, in the possession of, or available to, Project Co as the City may reasonably require from time to time for any purpose in connection with this Project Agreement, other than Sensitive Information. Project Co shall use commercially reasonable efforts to ensure that, for such purpose, all such information, reports, documents, records and the like in the possession of, or available to, the Contractors shall be available to Project Co and Project Co shall include relevant terms in all Subcontracts to this effect.
- (b) Project Co shall also provide to the City, and shall require each Subcontractor, including the Contractors, to provide to the City (at the City's reasonable cost), all information, reports, documents, records and the like required to be provided pursuant to Section 35.2(a) which subsequently come into the possession of, or become available to, Project Co or each Subcontractor, as the City may reasonably require from time to time to enable the City to provide reports, notices, returns and the like pursuant to Applicable Law, including information and documentation pertaining to the physical condition of the System Infrastructure and the New Municipal Infrastructure, security, health and safety, fire safety, emergency preparedness, environmental matters, employees and human resources related matters, other than Sensitive Information.
- (c) Project Co shall promptly after receipt provide the City with a copy of any material notice, order, direction, requirement or other similar communication received by it or by any Subcontractor from any Governmental Authority in relation to any of the Project Operations or the System Infrastructure and the New Municipal Infrastructure, and Project Co shall include relevant terms in all Subcontracts to this effect.
- (d) Project Co shall promptly notify the City of any actions, suits, proceedings, or investigations commenced, pending or threatened against Project Co or, to Project Co's knowledge, any Subcontractor at law or in equity before any Governmental Authority or arbitral body (whether or not covered by insurance) that individually or in the aggregate could result in any material adverse effect on the business, properties, or assets or the condition, financial or otherwise, of Project Co or in any impairment of its ability to perform its obligations under this Project Agreement.
- (e) All information, reports, documents and records in the possession of, or available to, Project Co, including as referred to in Schedule 25 - Record Provisions, which are required to be provided to or available to the City hereunder, shall be subject and open to inspection and audit by the City at any time and from time to time, which inspection and audit shall take place during normal business hours and at Project Co's normal places of business unless the City and Project Co otherwise agree. The City shall also have the right to monitor and audit the performance of any and all parts of the Project Operations wherever located, and Project Co shall cooperate with, and shall require each Subcontractor to cooperate with, and provide access to the representatives of the City monitoring and auditing such parts of the Project Operations, including providing it with access and copies (at the City's reasonable cost) of all relevant information, reports, documents and records pertaining to the performance of such parts of the Project Operations. Except as otherwise provided herein, all of the City's costs for the inspections, audits and monitoring shall be borne by the City.

- (f) In conducting an audit of Project Co under Section 35.2(e) or as otherwise provided under this Project Agreement, the City shall have all rights necessary or incidental to conducting an audit, including the right to have access to and inspect and take copies (at the City's reasonable cost) of all books and records of Project Co required to be provided to or available to the City hereunder, upon reasonable Notice and at reasonable times. Project Co shall fully cooperate with the City and its auditors in the conduct of any audits, including by making available all such records and accounts (other than Sensitive Information) in existence at that time as they may require to perform a full and detailed audit, and Project Co further agrees to promptly review and settle with the City all matters arising from such audits, including the refunding of monies to the City where applicable. At the reasonable request of the City's auditors, Project Co shall provide such information, reports, documents and records as the City's auditors may reasonably require, other than Sensitive Information.
- (g) The City's rights pursuant to this Section 35.2 shall be in addition to, and shall not limit, any other audit, information, inspection or similar rights under this Project Agreement.
- (h) The City's rights pursuant to this Section 35.2 shall not limit or restrict any Governmental Authority's right of review, audit, information or inspection under Applicable Law. The City's right pursuant to this Section 35.2 may also be exercised by the Auditor General of Ontario, Her Majesty the Queen in right of Canada and the Auditor General of Canada without the requirement for further action on the part of the City.
- (i) Without limiting the generality of Section 35.2(a) and subject to Section 50.1(a) and 50.3, in the event that the City is required to provide information, including financial information, in relation to the Project, to the Province for corporate or financial reporting purposes, Project Co shall provide such information to the City as the City may reasonably require in order to comply with its corporate or financial reporting obligations. Project Co acknowledges and agrees that such information may include Sensitive Information.

35.3 Delivery of Reports to the City

- (a) During the Maintenance Period, in addition to Project Co's obligations pursuant to this Section 35, Project Co shall provide the City with a copy of all reports required pursuant to the Project Agreement including, but not limited to, the Performance Monitoring Report, the Payment Adjustment Report, the Joint Insurance Cost Report and any other reports which are required to be delivered to the City pursuant to this Project Agreement and which are requested by the City.

35.4 Lenders' Consultant Reports

- (a) Project Co shall cause the Lenders' Agent to cause, in accordance with Section 5(j) of Schedule 41 – Lenders' Direct Agreement, the Lenders' Consultant to provide the City a copy of any written assessment or report of the Works under the Design and Construction Contract, including but not limited to, any certificate of payment, concurrently with its delivery to the Lenders' Agent.

36. CHANGES IN LAW

36.1 Performance after Change in Law

- (a) Following any and all Changes in Law, Project Co shall perform the Project Operations in accordance with the terms of this Project Agreement, including in compliance with Applicable Law.

36.2 Works Change in Law

- (a) On the occurrence of a Works Change in Law:
- (i) either Party may give Notice to the other of the need for a Variation as a result of such Works Change in Law;
 - (ii) the Parties shall meet within 10 Business Days of such Notice to consult with respect to the effect of the Works Change in Law and to reach an agreement on whether a Variation is required as a result of such Works Change in Law, and, if the Parties have not, within 10 Business Days of this meeting, reached an agreement, either Party may refer the question of whether a Works Change in Law has occurred or the effect of any Works Change in Law for resolution in accordance with Schedule 26 – Dispute Resolution Procedure; and
 - (iii) the City shall, within 10 Business Days of agreement or determination that a Variation is required, issue a Variation Enquiry and the relevant provisions of Schedule 21 - Variation Procedure shall apply except that:
 - (A) Project Co may only object to any such Variation Enquiry on the grounds that the implementation of the Variation would not enable it to comply with the Works Change in Law;
 - (B) Project Co shall be responsible for obtaining all Project Co Permits, Licences, Approvals and Authorizations required in respect of the Variation;
 - (C) the City shall not be entitled to withdraw any such Variation Enquiry unless the Parties otherwise agree;
 - (D) Project Co shall proceed to implement the Variation within such period as will enable it to comply with the Works Change in Law as soon as reasonably practicable; and
 - (E) Project Co shall not be entitled to any payment or other compensation or relief from performance of its obligations under this Project Agreement in respect of any Works Change in Law or associated Variation other than as established pursuant to Schedule 21 - Variation Procedure.

36.3 Relevant Change in Law

- (a) On the occurrence of a Relevant Change in Law, either Party shall be entitled to seek compensation for any increase or decrease (as the case may be) in the net cost to Project Co of performing the Project Operations so as to put such Party in no better and no worse position than it would have been in had the Relevant Change in Law not occurred. Any such compensation shall be calculated in accordance with this Section 36.3.

- (b) On the occurrence of a Relevant Change in Law:
- (i) either Party may give Notice to the other of the need for a Variation as a result of such Relevant Change in Law;
 - (ii) the Parties shall meet within 10 Business Days of such Notice to consult with respect to the effect of the Relevant Change in Law and to reach an agreement on whether a Variation is required as a result of such Relevant Change in Law, and, if the Parties have not, within 10 Business Days of this meeting, reached an agreement, either Party may refer the question of whether a Relevant Change in Law has occurred or the effect of any Relevant Change in Law for resolution in accordance with Schedule 26 - Dispute Resolution Procedure; and
 - (iii) the City shall, within 10 Business Days of agreement or determination that a Variation is required, issue a Variation Enquiry and the relevant provisions of Schedule 21 - Variation Procedure shall apply except that:
 - (A) Project Co may only object to any such Variation Enquiry on the grounds that the implementation of the Variation would not enable it to comply with the Relevant Change in Law;
 - (B) Project Co shall be responsible for obtaining all Development Approvals and Project Co Permits, Licences, Approvals and Authorizations required in respect of the Variation;
 - (C) the City shall not be entitled to withdraw any such Variation Enquiry unless the Parties otherwise agree;
 - (D) Project Co shall proceed to implement the Variation within such period as will enable it to comply with the Relevant Change in Law as soon as reasonably practicable;
 - (E) the Parties shall, without prejudice to their respective general obligations to comply with the terms of this Project Agreement:
 - (I) use commercially reasonable efforts to mitigate the adverse effects of any Relevant Change in Law and take commercially reasonable steps to minimize any increase in costs arising from such Relevant Change in Law; and
 - (II) use commercially reasonable efforts to take advantage of any positive or beneficial effects of any Relevant Change in Law and take commercially reasonable steps to maximize any reduction in costs arising from such Relevant Change in Law; and
 - (F) any entitlement to compensation payable shall be in accordance with this Section 36.3, and any calculation of compensation shall take into consideration, *inter alia*:

- (I) any failure by a Party to comply with Section 36.3(b)(iii)(E);
 - (II) the extent to which a Party has been, or shall be, compensated in respect of such Relevant Change in Law as a result of any indexation or adjustment of the Monthly Service Payments under this Project Agreement;
 - (III) any increase or decrease in its costs resulting from such Relevant Change in Law; and
 - (IV) any amount which Project Co recovers under any insurance policy (or would recover if it complied with its obligations to insure under this Project Agreement or the terms of any policy of insurance required under this Project Agreement) which amount, for greater certainty, shall not include the amount of any excess or deductibles or any amount above the maximum insured amount applicable to any such insurance policy.
- (c) Project Co shall not be entitled to any payment or compensation or, except as provided in Section 38 or otherwise in this Project Agreement, relief in respect of any Relevant Change in Law, or the consequences thereof, other than in accordance with this Section 36.3, and Section 39 shall be construed accordingly.

37. VARIATIONS

37.1 Variation Procedure

- (a) Except as otherwise expressly provided in this Project Agreement, Schedule 21 - Variation Procedure shall apply in respect of Variations and Small Works.
- (b) For greater certainty, Project Co shall, subject to and in accordance with Schedule 21 - Variation Procedure, be entitled to a Variation if a written direction issued by or on behalf of the City to Project Co or any Project Co Party results in a variation, addition, reduction, substitution, omission, modification, deletion, removal or other change to the whole or any part of the Project Operations, including in relation to the whole or any part of the Works or the Maintenance and Rehabilitation Services. Furthermore, Project Co shall be entitled to request and claim for the occurrence of a Variation as otherwise provided for in this Project Agreement, including in respect of any provision requiring a determination as to the need for a Variation or whether a Variation is required.
- (c) Without limiting Project Co's obligations pursuant to Section 9.3 and Schedule 21 - Variation Procedure, Project Co shall include in each Subcontract, and shall cause each Project Co Party to comply with, the Variation Procedure, to the extent that the Variation Procedure requires Project Co to minimize the cost and impact of Variations, including Variations as to scope of the Works or the Maintenance and Rehabilitation Services.

37.2 Innovation and Value Engineering

- (a) Project Co acknowledges that the City at all times desires to reduce the Monthly Service Payments and the overall cost to the City of the Works and the Maintenance and Rehabilitation

Services, and Project Co agrees to cooperate, explore and work with the City in investigating and considering innovation and value engineering and other cost saving measures.

- (b) If an innovation and value engineering proposal is at any time and from time to time originated and initiated solely by Project Co, Project Co may make a proposal (the “**Innovation Proposal**”) by Notice to the City.
- (c) The Parties agree that the subject of an Innovation Proposal shall not include:
 - (i) any Variation Enquiry initiated by the City;
 - (ii) any Variation resulting from a Change in Law; or
 - (iii) any change to City Activities.
- (d) The Innovation Proposal must:
 - (i) set out sufficient detail to enable the City to evaluate the Innovation Proposal in full;
 - (ii) specify Project Co’s reasons and justification for proposing the Innovation Proposal;
 - (iii) request the City to consult with Project Co with a view to deciding whether to agree to the Innovation Proposal and, if so, what consequential changes the City requires as a result;
 - (iv) indicate any implications of the Innovation Proposal, including a difference between the existing and the proposed requirements of this Project Agreement, and the comparative advantages of each to Project Co and the City;
 - (v) indicate, in particular, whether an increase or decrease to the Monthly Service Payments is proposed, and, if so, give a detailed cost estimate of such proposed change;
 - (vi) indicate if there are any dates by which a decision by the City must be made;
 - (vii) indicate the capital cost of the Innovation Proposal, including the cost of financing; and
 - (viii) include such other information and documentation as may be reasonably requested by the City to fully evaluate and consider the Innovation Proposal.
- (e) The City shall, acting in good faith, evaluate the Innovation Proposal, taking into account all relevant issues, including whether:
 - (i) a change in the Monthly Service Payments will occur;
 - (ii) the Innovation Proposal affects the quality of the Works, the Maintenance and Rehabilitation Services, or the likelihood of successful completion of the Works or performance of the Maintenance and Rehabilitation Services;

- (iii) the Innovation Proposal will benefit or interfere with the efficient operation of the System Infrastructure, the New Municipal Infrastructure or the performance of the City Activities;
 - (iv) the Innovation Proposal will interfere with the relationship between the City and third parties;
 - (v) the financial strength of Project Co is sufficient to deliver the changed Works or perform the changed Maintenance and Rehabilitation Services, as applicable;
 - (vi) the residual value of the System Infrastructure or the New Municipal Infrastructure is affected;
 - (vii) the Innovation Proposal will change the Monthly Service Payment;
 - (viii) the Innovation Proposal materially affects the risks or costs to which the City is exposed; or
 - (ix) any other matter the City considers relevant.
- (f) The City may request clarification or additional information regarding the Innovation Proposal, and may request modifications to the Innovation Proposal.
- (g) The City may, in its sole discretion, accept or reject any Innovation Proposal.
- (h) If the City accepts the Innovation Proposal, with or without modification, the relevant Innovation Proposal shall be documented and evidenced by a written Variation Confirmation, together with any other documents necessary to amend this Project Agreement or any relevant Project Documents to give effect to the Innovation Proposal.
- (i) Unless the City specifically agrees to an increase in the Monthly Service Payments in accepting an Innovation Proposal pursuant to Section 37.2(h), there shall be no increase in the Monthly Service Payments as a result of an Innovation Proposal.
- (j) If, after taking into account the agreed implementation and reasonably allocated development costs incurred by Project Co in connection with the Innovation Proposal and any other uses of the Innovation Proposal by Project Co, the Innovation Proposal causes or will cause the costs of Project Co and/or of a Subcontractor to decrease, the net savings in the costs of Project Co and/or the Subcontractor will be shared equally by Project Co and the City, and the City's share of the net savings shall, as agreed by the Parties, be reflected in either a lump sum payment or in a reduction of the Monthly Service Payments.
- (k) If an Innovation Proposal causes or will cause the costs of the City to decrease, the net savings in the costs of the City will be shared as follows:
- (i) equally by Project Co and the City for the first 5 years following the implementation of the Innovation Proposal; and

- (ii) thereafter, the City shall be entitled to the full benefit of the net savings in costs (if applicable),

and Project Co's share of the net savings shall, at the City's sole option, be reflected in either a lump sum payment or in an increase in the Monthly Service Payments.

38. DELAY EVENTS

38.1 Definition

- (a) For the purposes of this Project Agreement, "**Delay Event**" means any of the following events or circumstances only to the extent, in each case, that it affects the Works so as to cause a delay in achieving Substantial Completion by the Scheduled Substantial Completion Date:
- (i) the implementation of a Variation to the extent Project Co has identified such delay in its Estimate and such delay has been documented in the Variation Confirmation;
 - (ii) any breach by the City of any of the City's obligations under this Project Agreement (including any delay by the City in giving access to the Lands pursuant to Section 14.1, any obstruction of the rights afforded to Project Co under Section 14.1, or any delay by the City in carrying out its obligations set forth in Schedule 10 - Review Procedure), except to the extent that any such breach is caused, or contributed to, by Project Co or any Project Co Party;
 - (iii) an uncovering of the Works pursuant to Section 21.3 where such Works are not subsequently found to be defective or not in compliance with the requirements of this Project Agreement (including the Output Specifications, the Project Co Proposal Extracts and the Design Data), unless such uncovering of the Works was reasonable in the light of other defects or non-compliance previously discovered by the City in respect of the same or a similar component of the Works or subset of the Works;
 - (iv) a requirement pursuant to Section 16.2(h)(i) and Section 16.2(g) for Project Co to perform any alteration, addition, demolition, extension or variation in the Works, or to suspend or delay performance of the Works, upon the discovery of Contamination, which alteration, addition, demolition, extension or variation in the Works, or suspension or delay in the performance of the Works, would not otherwise be required under this Project Agreement;
 - (v) a requirement pursuant to Sections 16.3(c)(ii)(A) or 16.3(d) for Project Co to perform any alteration, addition, demolition, extension or variation in the Works, or to suspend or delay performance of the Works, upon the discovery of any fossils, artifacts and other objects having artistic, historic, archaeological or monetary value, including human remains and burial sites, which alteration, addition, demolition, extension or variation in the Works, or suspension or delay in the performance of the Works, would not otherwise be required under this Project Agreement;
 - (vi) a requirement pursuant to Sections 16.4(b) or 16.4(c) for Project Co to perform any alteration, addition, demolition, extension or variation in the Works, or to suspend or

- delay performance of the Works, upon the discovery of Species-at-Risk for which the City is responsible, which alteration, addition, demolition, extension or variation in the Works, or suspension or delay in the performance of the Works, would not otherwise be required under this Project Agreement;
- (vii) subject to compliance by Project Co with the provisions of Section 9.8, damage, costs or delays from the execution of Additional Works on the Lands by Additional Contractors, as applicable, in the circumstances described in Section 9.8(f), as applicable;
 - (viii) a requirement pursuant to Section 13.1 of Schedule 26 - Dispute Resolution Procedure for Project Co to proceed in accordance with the direction of the City during the pendency of a Dispute, which Dispute is subsequently determined in Project Co's favour;
 - (ix) an event of Force Majeure;
 - (x) a Relief Event;
 - (xi) a Relevant Change in Law;
 - (xii) [not used];
 - (xiii) a requirement pursuant to Section 16.9 for Project Co to perform any alteration, addition, demolition, extension or variation in the Works, or to suspend or delay performance of the Works, upon discovery of a City Retained Latent Defect Responsibility, which alteration, addition, demolition, extension or variation in the Works, or suspension or delay in the performance of the Works, would not otherwise be required under the Project Agreement;
 - (xiv) a stop work order issued by a Governmental Authority in respect of the System Infrastructure or the Works, provided that such order was not issued as a result of a Relief Event, an act of Force Majeure, or as a result of an act, omission or fault of Project Co or a Project Co Party;
 - (xv) changes to the terms, conditions or requirements of the Environmental Assessments (except to the extent resulting from any change by Project Co to the design of the Project or any an act, omission or fault of Project Co or a Project Co Party);
 - (xvi) a Delay Event determined by the Adjudicator pursuant to Section 6.4(b) of Schedule 26 – Dispute Resolution Procedure;
 - (xvii) a requirement that Project Co perform obligations under an Encumbrance pursuant to Section 15.2(c)(iii) or Section 15.2(d), which performance imposes costs or delays in the performance of Project Operations;
 - (xviii) a requirement for Project Co to perform any alteration, addition, demolition, extension or variation in the Works, or to suspend or delay performance of the Works, upon the discovery of unknown Utility Infrastructure or Mislocated Utility Infrastructure pursuant to Section 16.10, which alteration, addition, demolition, extension or variation in the

- Works, or suspension or delay in the performance of the Works, would not otherwise be required under this Project Agreement;
- (xix) a requirement for Project Co to perform any alteration, addition, demolition, extension or variation in the Works, or to suspend or delay performance of the Works, as a result of error in the Geotechnical Report;
- (xx) subject to compliance with Section 9.4(g), the City's failure to issue to Project Co a final determination in respect of a Listed Project Co PLAA as set out and subject to Section 9.4;
- (xxi) pursuant to an explicit provision in a permit, licence or approval granted by the City to a third party developer in respect of an Adjacent Development, that third party developer,
- (A) constructs a physical barrier that prevents Project Co from carrying out the Works or any of the Maintenance and Rehabilitation Services; or
- (B) creates a significant physical impediment that prevents Project Co from carrying out the Works;
- (xxii) failure by a Category 1 Utility Company to perform its obligations, as set out in the Utility Baseline Report within the applicable time periods set out in the Utility Baseline Report, to the extent that such event does not arise (directly or indirectly) as a result of any act or omission of the Project Co or any Project Co Party. For clarity, for the purposes of determining whether a failure of a Category 1 Utility Company described in this Section 38.1(a)(xxii) has caused a delay in achieving Substantial Completion by the Scheduled Substantial Completion Date, or a delay in achieving Final Completion by the Scheduled Final Completion Date, the Parties shall have regard to the cumulative effect of all failures by the Category 1 Utility Company in accordance with this Section 38.1(a)(xxii).
- (b) For clarity, in respect of Section 38.1(a)(xxii), a failure by a Category 1 Utility Company to perform its obligations as set out in the Utility Baseline Report within the applicable time periods set out in the Utility Baseline Report shall not, in any event, be cause for a Delay Event unless Project Co has,
- (i) fully complied with its obligations pursuant to the applicable Utility Agreement and the Baseline Utility Report;
- (ii) properly coordinated the work being performed by the applicable Category 1 Utility Company with the Works; and
- (iii) provided sufficient access to Site to the applicable Category 1 Utility Company for the purposes of carrying out the Category 1 Utility Company's work.
- (c) For further clarity, Section 38.1(a)(xxii) does not apply in respect of,
- (i) Category 1 Utility Companies in circumstances other than those specifically set out in the Utility Baseline Report;

- (ii) failures of any Utility Companies that are not Category 1 Utility Companies including failures of such Utility Companies to perform in accordance with the applicable Utility Agreement; or
- (iii) Works carried out by Project Co or Project Co Parties or goods or services provided by Project Co or Project Co Parties to the Utility Companies.

38.2 Consequences of a Delay Event

- (a) Project Co shall provide written Notice to the City Representative and the Independent Certifier within 5 Business Days of becoming aware of the occurrence of any event or circumstances described in Sections 38.1(a)(ii), 38.1(a)(iv), 38.1(a)(v), 38.1(a)(vi), 38.1(a)(vii), 38.1(a)(xii), 38.1(a)(xiii), 38.1(a)(xiv), 38.1(a)(xv), 38.1(a)(xvi), 38.1(a)(xvii), 38.1(a)(xviii), 38.1(a)(xix), 38.1(a)(xx), 38.1(a)(xxi), or 38.1(a)(xxii) which, at the time of its occurrence, is reasonably likely to form the basis of a future claim by Project Co for relief under Section 38.2(e) as a Delay Event (a “**Notice of Pending Claim**”).
- (b) Project Co shall, within 10 Business Days (or such longer period of time as the Parties may agree) after delivering such notification under Section 38.2(a), provide further written details to the City Representative and the Independent Certifier which shall include:
 - (i) identification of the category of Delay Event on which Project Co’s future claim for relief would be based if such event or circumstances were to form the basis of a claim for relief as a Delay Event;
 - (ii) details of the event or circumstances forming the basis of Project Co’s notification under Section 38.2(a);
 - (iii) details of the contemporary records which Project Co shall thereafter maintain to substantiate its claim for extra time if the event or circumstances detailed in accordance with Section 38.2(b)(ii) forms the basis of a future claim by Project Co for relief as a Delay Event;
 - (iv) details of the consequences (whether direct or indirect, financial or non-financial) that such event or circumstances may have upon the Scheduled Substantial Completion Date, if such event or circumstances forms the basis of a future claim by Project Co for relief as a Delay Event; and
 - (v) details of any measures that Project Co proposes to adopt to prevent such event or circumstances from forming the basis of a future claim by Project Co for relief as a Delay Event or to mitigate the consequences of such claim if such event or circumstances were to become a Delay Event.
- (c) As soon as possible but in any event within 3 Business Days of Project Co receiving, or becoming aware of, any supplemental information pertaining to the event or circumstances disclosed in Section 38.2(a), Project Co shall submit further particulars based on such information to the City Representative and the Independent Certifier.

- (d) The City Representative shall, after receipt of written details under Section 38.2(b), or of further particulars under Section 38.2(c), be entitled by written notice to require Project Co to provide such further supporting particulars as the City Representative may reasonably consider necessary. Project Co shall afford the City Representative and the Independent Certifier reasonable facilities for their investigations, including, without limitation, on-site inspection.
- (e) In addition to complying with its obligations under Sections 38.2(a) and 38.2(b), Project Co shall provide written notice to the City Representative and the Independent Certifier within 5 Business Days of: (A) becoming aware that an event or circumstances has satisfied, or will satisfy, in the opinion of Project Co, the applicable definition of Delay Event, or (B) becoming aware of the occurrence of an event to which Section 38.2(k) applies. Project Co shall, within 10 Business Days after such notification, provide further written details of the Delay Event or the event to which Section 38.2(k) applies to the City Representative and the Independent Certifier, including, if and as applicable, to substitute or supplement the information given in Sections 38.2(a), 38.2(b) and 38.2(c), to further substantiate or support Project Co's claim which shall include, to the extent not previously provided:
- (i) a statement of which Delay Event (or event pursuant to Section 38.2(k)) upon which the claim is based;
 - (ii) details of the circumstances from which the Delay Event (or event pursuant to Section 38.2(k)) arises;
 - (iii) details of the contemporary records which Project Co shall maintain to substantiate its claim for extra time or pursuant to Section 38.2(k);
 - (iv) details of the consequences (whether direct or indirect, financial or non-financial) which such Delay Event may have upon the Scheduled Substantial Completion Date, including a Critical Path analysis of the event or circumstance indicating the impact on the Scheduled Substantial Completion Date; and
 - (v) details of any measures which Project Co proposes to adopt to mitigate the consequences of such Delay Event or event pursuant to Section 38.2(k).
- (f) As soon as possible but in any event within 3 Business Days of Project Co receiving, or becoming aware of, any supplemental information which may further substantiate or support Project Co's claim under Section 38.2(e), Project Co shall submit further particulars based on such information to the City Representative and the Independent Certifier.
- (g) The City Representative shall, after receipt of written details under Section 38.2(e), or of further particulars under Section 38.2(f), be entitled by written Notice to require Project Co to provide such further supporting particulars as the City Representative may reasonably consider necessary. Project Co shall afford the City Representative and the Independent Certifier reasonable facilities for investigating the validity of Project Co's claim, including on-site inspection.
- (h) Subject to the provisions of this Section 38, the City Representative shall allow Project Co an extension of time equal to the delay caused by the Delay Event and shall fix a revised Scheduled

Substantial Completion Date or Outside Substantial Completion Date, as applicable, as soon as reasonably practicable and in any event within 10 Business Days of the later of:

- (i) the date of receipt by the City Representative of Project Co's Notice given in accordance with Section 38.2(e) and the date of receipt of any further particulars (if such are required under Section 38.2(f)), whichever is later; and
 - (ii) the date of receipt by the City Representative of any supplemental information supplied by Project Co in accordance with Section 38.2(f) and the date of receipt of any further particulars (if such are required under Section 38.2(g)), whichever is later.
- (i) For the avoidance of doubt, there shall be no extension to the Project Term as a result of any delay caused by a Delay Event.
- (j) If:
- (i) the City Representative declines to fix a revised Scheduled Substantial Completion Date or Outside Substantial Completion Date, as applicable;
 - (ii) Project Co considers that a different Scheduled Substantial Completion Date or Outside Substantial Completion Date, as applicable, should be fixed;
 - (iii) there is a dispute as to whether a Delay Event (or event pursuant to Section 38.2(k)) has occurred; or
 - (iv) there is a dispute as to whether Project Co is entitled to the relief set out in Section 38.2(k),

then Project Co shall be entitled to refer the matter for determination by the Independent Certifier. The decision of the Independent Certifier may be disputed by either Party and referred for resolution in accordance with Schedule 26 - Dispute Resolution Procedure.

- (k) Subject to Project Co meeting the obligations set out in Section 38.2 and Section 38.3, if,
- (i) a Lane Closure is directly caused or extended by one or more of the events set out in Section 38.1(a), whether or not such event constitutes a Delay Event, such Lane Closure or extension thereof shall not be included in the Aggregate Actual Lane Closures or the Aggregate Actual Lane Closures Cost for the relevant Road Section for the purposes of calculating the Lane Closure Adjustment in accordance with the process set out in Schedule 7 – Mobility Matters;
 - (ii) a Construction Period Quality Failure,
 - (A) has been assessed in accordance with Schedule 20 – Construction Period Payments; and
 - (B) has arisen from a Non-Conformance that has been directly caused by one or more of the events set out in Section 38.1(a), whether or not such event constitutes a Delay Event,

such Construction Period Quality Failure shall not be applied as part of the Construction Period Deduction for the relevant Payment Period in accordance with Section 6 of Schedule 20 – Construction Period Payments.

- (iii) For clarity, Section 38.2(k)(i) shall apply only to the extent that a Lane Closure was not contemplated by the Aggregate Target Lane Closures and not merely because a Lane Closure has been deferred.
- (l) To the extent Project Co does not comply with its obligations under Sections 38.2(a), 38.2(b), 38.2(c), 38.2(d), 38.2(e), 38.2(f) or 38.2(g), subject to Section 38.2(m) such failure shall be taken into account in determining Project Co's entitlement to an extension of time pursuant to this Section 38.
- (m) If Project Co does not provide further written details to the City and the Independent Certifier as required under Section 38.2(b) within the 10 Business Day period referred to in such Section, Project Co acknowledges and agrees that, after a further 10 Business Days, Project Co shall not be entitled to rely upon, and the City shall not be obligated to consider, the notice given under Section 38.2(a) for the purposes of determining Project Co's entitlement to relief under this Section 38. Project Co, at its option, may submit a new, currently dated notice which complies with the provisions of Section 38.2(a) for the same event or circumstance which gave rise to the previous, unsubstantiated notice, and the provisions of this Section 38 shall apply to such new notice, *mutatis mutandis*. Project Co acknowledges and agrees that the City, in determining Project Co's entitlement to an extension of time pursuant to this Section 38 and without limiting any other right of the City under this Project Agreement, shall be entitled to take into account the delay between:
 - (i) Project Co becoming aware of the occurrence of the event or circumstance forming the basis of the original notice delivered pursuant to Section 38.2(a), and
 - (ii) Project Co submitting the new notice pursuant to Section 38.2(a) in respect of that event or occurrence.

38.3 Mitigation

- (a) If Project Co is (or claims to be) affected by a Delay Event or an event pursuant to Section 38.2(k), Project Co shall, and shall require all Project Co Parties to, take and continue to take commercially reasonable steps:
 - (i) to eliminate or mitigate the consequences of such event upon the performance of its obligations under this Project Agreement;
 - (ii) to continue to perform its obligations under this Project Agreement to the extent possible notwithstanding the Delay Event or event pursuant to Section 38.2(k); and
 - (iii) to resume performance of its obligations under this Project Agreement affected by the Delay Event (or event pursuant to Section 38.2(k)) as soon as practicable.
- (b) To the extent that Project Co does not comply with its obligations under this Section 38.3, such failure shall be taken into account in determining,

- (i) Project Co's entitlement to an extension of time pursuant to this Section 38; and
- (ii) Project Co's entitlement to the relief contemplated in Section 38.2(k).

39. COMPENSATION EVENTS

39.1 Definition

- (a) For the purposes of this Project Agreement, "**Compensation Event**" means any event referred to in Sections 38.1(a)(ii), 38.1(a)(iii), 38.1(a)(iv), 38.1(a)(v), 38.1(a)(vi), 38.1(a)(vii), 38.1(a)(viii), 38.1(a)(xii), 38.1(a)(xiii), 38.1(a)(xiv), 38.1(a)(xv), 38.1(a)(xvi), 38.1(a)(xvii), 38.1(a)(xviii), 38.1(a)(xix), 38.1(a)(xxi) and 38.1(a)(xxi) as a direct result of which Project Co has incurred loss or expense, whether or not any of these events has also caused a delay and the procedure described in Section 38.2 shall apply, *mutatis mutandis*, to such events as Compensation Events (including, for certainty, Section 38.2(l)).

39.2 Consequences of a Compensation Event

- (a) If a Compensation Event occurs, Project Co's sole right to compensation shall be as set out in this Section 39. For greater certainty, except as aforesaid, no other Delay Event shall entitle Project Co to receive any compensation, except as otherwise provided in:
 - (i) Schedule 21 - Variation Procedure, in the case of a Delay Event referred to in Section 38.1(a)(i);
 - (ii) Section 42, in the case of a Delay Event referred to in Section 38.1(a)(ix);
 - (iii) Section 41, in the case of a Delay Event referred to in Section 38.1(a)(x); and
 - (iv) Section 36.3, in the case of a Delay Event referred to in Section 38.1(a)(xi).
- (b) Subject to Sections 39.3 and 39.4, if it is agreed, or determined in accordance with Schedule 26 - Dispute Resolution Procedure, that there has been a Compensation Event, Project Co shall be entitled to such compensation as would place Project Co in no better and no worse position than it would have been in had the relevant Compensation Event not occurred. For greater certainty, in respect of a Compensation Event that is also a Delay Event, such compensation will include amounts which, but for the Delay Event, would have been paid by the City to Project Co. Project Co shall promptly provide the City Representative with any information the City Representative may require in order to determine the amount of such compensation.
- (c) If the City is required to compensate Project Co pursuant to this Section 39.2, then the City may either pay such compensation as a lump sum payment or payments at times and in a manner to be agreed with Project Co, acting reasonably, or, alternatively, the City may request Project Co to agree to an adjustment to the Monthly Service Payments. If Project Co agrees to an adjustment to the Monthly Service Payments, then the provisions of Schedule 21 - Variation Procedure shall apply.
- (d) To the extent that Project Co does not comply with its obligations under Sections 38.2(a), 38.2(b), 38.2(c), 38.2(d), 38.2(e), 38.2(f), 38.2(g) or 38.2(m), and subject to Section 38.2(m), such failure

shall be taken into account in determining Project Co's entitlement to relief pursuant to this Section 39.

39.3 Mitigation

- (a) If Project Co is (or claims to be) affected by a Compensation Event, Project Co shall, and shall require all Project Co Parties to, take and continue to take commercially reasonable steps to minimize the amount of compensation due in accordance with this Section 39 in relation to any Compensation Event.
- (b) To the extent that Project Co does not comply with its obligations under this Section 39.3, such failure shall be taken into account in determining Project Co's entitlement to relief pursuant to this Section 39.

39.4 Insured Exposure

- (a) The compensation payable to Project Co pursuant to this Section 39 shall be reduced by any amount which Project Co or a Project Co Party recovers, or is entitled to recover, under any insurance policy, or would have recovered if it had complied with the requirements of this Project Agreement in respect of insurance or the terms of any policy of insurance required under this Project Agreement, which amount, for greater certainty, shall not include any excess or deductibles or any amount over the maximum amount insured under any such insurance policy.

39.5 Delivery of PBS-2

- (a) If an event referred to in Sections 38.1(a)(iii), 38.1(a)(iv), 38.1(a)(v), 38.1(a)(vi), 38.1(a)(vii), 38.1(a)(viii) or 38.1(a)(xv) occurs after the date that is 150 days following Financial Close as such date may be extended in accordance with Section 38.2(h) and prior to the City assigning the comment "NO COMMENT" or "MINOR COMMENT" to PBS-2 in accordance with Schedule 12 – Works Scheduling Requirements, Project Co shall not be entitled to receive any compensation under this Section 39 in respect of such Compensation Event unless such Compensation Event is also a Delay Event, in which case Project Co shall be entitled to compensation in an amount equal to the lesser of:
 - (i) the Debt Service Amount accrued and paid or that became payable in accordance with the Lending Agreements during the period of delay; and
 - (ii) the compensation which, but for the application of this Section 39.5, Project Co would have been entitled to pursuant to Section 39.2(b).

39.6 Special Compensation Regarding Category 1 Utility Company

- (a) For the purposes of the special compensation regarding Category 1 Utility Companies, the following shall apply:
 - (i) Sections 39.3 and 39.4 shall apply to the compensation set out in this Section 39.6 notwithstanding that the Delay Event referred to in Section 38.1(a)(xxii) is not a Compensation Event;

- (b) If it is agreed, or determined in accordance with Schedule 26 - Dispute Resolution Procedure, that there has been a Delay Event referred to in Section 38.1(a)(xxii), Project Co shall be entitled to the following:
- (i) an amount calculated in accordance with the following:
- (A) For the purpose of this Section 39.6(b)(i), “**Non-Debt Compensation Amount**” means an amount that would place Project Co in no better and no worse position than it would have been in had the applicable Delay Event referred to in Section 38.1(a)(xxii) not occurred but excluding any interest or financing costs accrued and paid or which became payable in accordance with the Lending Agreements during the period of the applicable Delay Event (such excluded amount, the “**Special Utility Debt Compensation Amount**”);
- (B) If the applicable Delay Event delays any Substantial Completion for 30 or fewer days, the City shall pay to Project Co an amount equal to [REDACTED] per cent of the Non-Debt Compensation Amount and [REDACTED] per cent of the Special Utility Debt Compensation Amount for the period of the delay;
- (C) If the applicable Delay Event delays any Substantial Completion for 60 or fewer days, the City shall pay to Project Co an amount equal to,
- (I) [REDACTED] per cent of the Non-Debt Compensation Amount in respect of the first 30 days of the delay, plus,
- (II) [REDACTED] per cent of the Non-Debt Compensation Amount for the number of days of delay exceeding 30 days of delay; plus
- (III) [REDACTED] per cent of the Special Utility Debt Compensation Amount for the period of the delay.
- (D) If the applicable Delay Event delays any Substantial Completion for 180 or fewer days, the City shall pay to Project Co an amount equal to,
- (I) [REDACTED] per cent of the Non-Debt Compensation Amount in respect of the first 30 days of delay, plus,
- (II) [REDACTED] per cent of the Non-Debt Compensation Amount in respect of the next 30 days of delay, plus,
- (III) [REDACTED] per cent of the Non-Debt Compensation Amount in respect of the number of days exceeding 60 days of delay; plus
- (IV) [REDACTED] per cent of the Special Utility Debt Compensation Amount for the period of the delay.
- (E) If the applicable Delay Event delays any Substantial Completion for more than 180 days, the City shall pay to Project Co an amount equal to,

- (I) [REDACTED] per cent of the Non-Debt Compensation Amount in respect of the first 30 days of delay, plus,
- (II) [REDACTED] per cent of the Non-Debt Compensation Amount in respect of the next 30 days of delay, plus,
- (III) [REDACTED] per cent of the Non-Debt Compensation Amount in respect of the number of days exceeding 120 days of delay, plus,
- (IV) [REDACTED] per cent of the Non-Debt Compensation Amount in respect of the number of days exceeding 180 days of delay, plus
- (V) [REDACTED] per cent of the Special Utility Debt Compensation Amount for the period of the delay.

40. EXCUSING CAUSES

40.1 Definition

- (a) For the purposes of this Project Agreement, “**Excusing Cause**” means any of the following events or circumstances if it occurs after the Substantial Completion Date and to the extent, in each case, that it interferes adversely with, or causes a failure of, the performance of the Maintenance and Rehabilitation Services:
 - (i) the implementation of a Variation to the extent Project Co has identified any impact on the Maintenance and Rehabilitation Services in its Estimate and such impact has been documented in the Variation Confirmation;
 - (ii) any breach by the City of any of the City’s obligations under this Project Agreement (including any obstruction of the rights afforded to Project Co under Section 14.1), except to the extent that any such breach is caused, or contributed to, by Project Co or any Project Co Party;
 - (iii) any deliberate or negligent act or omission of any City Party or any failure by any City Party (having regard to the interactive nature of the activities of the City and Project Co) to take commercially reasonable steps to perform its activities in a manner which minimizes undue interference with Project Co’s performance of the Maintenance and Rehabilitation Services, except to the extent:
 - (A) any such act, omission or failure is caused, or contributed to, by Project Co or any Project Co Party;
 - (B) any City Party is acting in accordance with a recommendation or instruction of Project Co or any Project Co Party;
 - (C) any such act, omission or failure was contemplated in Schedule 15 - Output Specifications or was otherwise provided for in this Project Agreement; or

- (D) the consequences of any such act, omission or failure would have been prevented by the proper performance of Project Co's obligations under this Project Agreement;
- (iv) the implementation of any action taken by the City, or any suspension of Project Co's obligation to deliver all or any part of the Maintenance and Rehabilitation Services, or the compliance by Project Co with instructions given by the City, in each case in the circumstances referred to in Section 31;
- (v) the performance of any Small Works in accordance with the terms of this Project Agreement during the period of time agreed between the City and Project Co;
- (vi) any official or unofficial strike, lockout, work to rule or other labour-related action involving employees of any City Party, except to the extent that any such labour-related action is caused, or contributed to, by Project Co or any Project Co Party;
- (vii) the occurrence of any Contamination for which the City is responsible pursuant to Section 16.2;
- (viii) the discovery of any fossils, artifacts and other objects having artistic, historic, archaeological or monetary value, including human remains and burial sites for which the City is responsible pursuant to Section 16.3;
- (ix) the discovery of any Species-at-Risk for which the City is responsible pursuant to Section 16.4;
- (x) a derailment, collision, or any other accident involving the exterior of a Revenue Vehicle, including at intersections, except to the extent that any such derailment, collision, or other accident is caused, or contributed to, by Project Co or any Project Co Party;
- (xi) a derailment, collision, or any other accident involving both an element of Fixed Infrastructure (as defined in Schedule 15-1 – Technical Terms and Reference Documents) and a road vehicle except to the extent that any such collision is caused, or contributed to, by Project Co or any Project Co Party;
- (xii) any civil disobedience or protest action, including any action taken by any person or persons protesting or demonstrating against the carrying out of any part of the Project Operations or during the Maintenance Period in general, provided, however, that a civil disobedience or protest action shall not, in any event, be an Excusing Cause unless Project Co has fully complied with Section 9.7;
- (xiii) the operation of additional rail vehicles on the System by third parties unrelated to: (i) Project Co's performance of the Project Operations; (ii) a breach by Project Co of its other obligations under this Project Agreement; (iii) an act or omission of Project Co or any Project Co Party; or (iv) any other matter within Project Co's control.

40.2 Consequences of an Excusing Cause

- (a) Provided that the effect of an Excusing Cause is claimed by Project Co, in writing, within 10 Business Days of the date on which Project Co or any Project Co Party became aware of the occurrence of such Excusing Cause, then (subject to Sections 40.3 and 40.4):
- (i) any failure by Project Co to perform, and any poor performance of, any affected Maintenance and Rehabilitation Services shall not constitute a breach of this Project Agreement by Project Co, no Failure Points shall accrue in respect of such failure and Project Co shall be relieved of its obligations to perform such Maintenance and Rehabilitation Services for the duration and to the extent prevented by such Excusing Cause;
 - (ii) any interference shall be taken into account in measuring the performance of any affected Maintenance and Rehabilitation Services in accordance with the Performance Monitoring Program, which shall be operated as though the relevant Maintenance and Rehabilitation Services had been performed free from such adverse interference;
 - (iii) any interference shall be taken into account in operating the Payment Mechanism, which shall be operated as though any Availability Failure, Quality Failure or Service Failure resulting from such interference had not occurred, so that Project Co shall be entitled to payment under this Project Agreement as if there had been no such interference with the Maintenance and Rehabilitation Services, provided however that Project Co shall not be entitled to any additional compensation, except as may be provided hereunder for compensation under Section 39 or otherwise in accordance with this Project Agreement and for compensation on termination of this Project Agreement, if this Project Agreement is terminated as provided herein;
 - (iv) this Section 40.2 shall not limit the City's entitlement to reimbursement pursuant to Section 31.4;

the City shall reimburse Project Co for all incremental Direct Costs (including all applicable Taxes and all legal or professional services, legal costs being on a full indemnity basis) incurred by Project Co as a result of any Excusing Cause referred to in Section 40.1(a)(ii), 40.1(a)(iii), 40.1(a)(vi), 40.1(a)(vii), 40.1(a)(viii), 40.1(a)(ix),^a 40.1(a)(xii) or 40.1(a)(xiii), including costs arising from any steps taken to cure or mitigate against such events, together with any applicable margin for overhead and profit on such Direct Costs as set out in Schedule 21 - Variation Procedure; and

- (v) the Monthly Service Payments payable by the City shall be reduced by any savings in Direct Costs arising from Project Co being relieved of its obligations to perform the Maintenance and Rehabilitation Services, as otherwise provided herein, together with any applicable margin for overhead and profit on such Direct Costs as set out in Schedule 21 - Variation Procedure.

40.3 Mitigation

- (a) If Project Co is (or claims to be) affected by an Excusing Cause, Project Co shall, and shall require all Project Co Parties to, take and continue to take commercially reasonable steps:
 - (i) to eliminate or mitigate the consequences of such event upon the performance of its obligations under this Project Agreement;
 - (ii) to continue to perform its obligations under this Project Agreement to the extent possible notwithstanding the Excusing Cause; and
 - (iii) to resume performance of its obligations under this Project Agreement affected by the Excusing Cause as soon as practicable.
- (b) To the extent that Project Co does not comply with its obligations under this Section 40.3, such failure shall be taken into account in determining Project Co's entitlement to relief pursuant to this Section 40.

40.4 Insured Exposure

- (a) The compensation payable to Project Co pursuant to this Section 40 shall be reduced by any amount which Project Co or a Project Co Party recovers, or is entitled to recover, under any insurance policy, or would have recovered if it had complied with the requirements of this Project Agreement in respect of insurance or the terms of any policy of insurance required under this Project Agreement, which amount, for greater certainty, shall not include any excess or deductibles or any amount over the maximum amount insured under any such insurance policy.

41. RELIEF EVENTS

41.1 Definition

- (a) For the purposes of this Project Agreement, "**Relief Event**" means any of the following events or circumstances to the extent, in each case, that it causes any failure by a Party to perform any of its obligations under this Project Agreement:
 - (i) fire, explosion, lightning, storm, tempest, hurricane, tornado, flood, ionizing radiation (to the extent it does not constitute Force Majeure), earthquake, riot or civil commotion;
 - (ii) failure by any Utility Company, local authority or other like body to enter into a Utility Agreement, perform works or provide services (solely in its role as utility service provider or similar service provider to the Project), provided, however, that such a failure shall not, in any event, be cause for a Relief Event, unless Project Co:
 - (A) has performed its obligations under any applicable agreement with the Utility Company with respect to the provision of such services and the relevant Utility Company has failed to meet its obligations thereunder; and
 - (B) has made all, and is continuing to make all, commercially reasonable efforts to diligently enforce its legal rights under any applicable agreement in respect of such services and otherwise cause the Utility Company to perform those works or services.

For clarity, Section 41.1(a)(ii) shall apply only in circumstances where the Utility Company is providing services to Project Co of the type provided by the Utility Company in the normal course of its business. For further clarity, Section 41.1(a)(ii) shall not apply in circumstances where Project Co has entered into a Utility Agreement for the design and construction of Utility Infrastructure and the applicable Utility Company has failed to comply with its obligations under such an agreement;

- (iii) accidental loss or damage to the Works and/or the System Infrastructure or any roads servicing the Lands;
- (iv) without prejudice to any obligation of Project Co to provide stand-by power facilities in accordance with this Project Agreement, failure or shortage of power, fuel or transport;
- (v) blockade or embargo falling short of Force Majeure;
- (vi) any official or unofficial strike, lockout, work to rule or other labour-related action generally affecting the System Infrastructure or the New Municipal Infrastructure or the construction or facility maintenance industry (or a significant sector of that industry) in the Province of Ontario; or
- (vii) any civil disobedience or protest action, including any action taken by any person or persons protesting or demonstrating against the carrying out of any part of the Project Operations or the construction and/or operation of transit systems in general, provided, however, that a civil disobedience or protest action shall not, in any event, be cause for a Relief Event unless Project Co has fully complied with Section 9.7.

41.2 Consequences of a Relief Event

- (a) Subject to Section 41.3:
 - (i) no right of termination, other than either Party's right to terminate this Project Agreement pursuant to Section 45.1, shall arise under this Project Agreement by reason of any failure by a Party to perform any of its obligations under this Project Agreement; and
 - (ii) as soon as the events or circumstances constituting a Relief Event have ceased any Failure Points accrued in respect of any failure by Project Co to perform any of its obligations under this Project Agreement shall be cancelled and any related Warning Notices and Monitoring Notices shall be withdrawn,

but only to the extent that such failure to perform, is caused by the occurrence of a Relief Event (it being acknowledged and agreed by the Parties that all other rights and obligations of the Parties under this Project Agreement remain unaffected by the occurrence of a Relief Event). For greater certainty, the City shall be entitled to make Deductions in accordance with Schedule 19 - Payment Mechanism notwithstanding the cancellation of Failure Points pursuant to Section 41.2(a)(ii).

- (b) In respect of a Relief Event that is also a Delay Event pursuant to Section 38.1(a)(x):

- (i) Project Co shall only be relieved of its obligations under this Project Agreement to the extent, if any, provided for in Section 38; and
 - (ii) in respect of a Relief Event occurring prior to the Substantial Completion Date affected by that Delay Event and referred to in Section 41.1(a)(ii) (but only in respect of failure by a Utility Company to perform works or provide services), 41.1(a)(v), 41.1(a)(vi) or 41.1(a)(vii), on the earlier of (A) the Substantial Completion Date and (B) the date of payment of the City Default Termination Sum, Non-Default Termination Sum or Breach of Refinancing Termination Sum (and as a part thereof) in accordance with Schedule 22 - Compensation on Termination, the City shall pay to Project Co an amount equal to the Debt Service Amount accrued and paid or that became payable in accordance with the Lending Agreements during the period of delay by Project Co or any Project Co Party to the Lenders up to and including the Scheduled Substantial Completion Date or the date of payment of the City Default Termination Sum, Non-Default Termination Sum or Breach of Refinancing Termination Sum, as applicable, together with interest thereon at the rate payable on the Debt Amount, which, but for the Delay Event, would not have been paid by Project Co to the Lenders.
- (c) If a Relief Event occurs prior to the Substantial Completion Date, Project Co shall not be entitled to receive any compensation other than as expressly provided in Sections 41.2(b)(ii) and 47.
- (d) During a Relief Event which occurs on or after the Substantial Completion Date, the provisions of Schedule 19 - Payment Mechanism will continue to be in full force and effect, subject to Section 41.2(a).
- (e) Subject to Section 47, Project Co's sole right to payment or otherwise in relation to the occurrence of a Relief Event shall be as provided in this Section 41.
- (f) In respect of a Relief Event that,
- (i) occurs prior to the Initial Capital Investment Date; and
 - (ii) causes a delay to Project Co in performing the Works,

the City shall pay to Project Co, on the first Construction Period Payment date after the Initial Capital Investment Date is achieved, an amount equal to the Debt Service Amount accrued and paid, or which became payable, by Project Co or any Project Co Party to the Lenders, in accordance with the Lending Agreements, during the period of delay, up to and including the first Construction Period Payment date, together with interest thereon at the rate payable on the Debt Amount, which, but for the delay caused by the Relief Event would not have been paid by Project Co to the Lenders.

41.3 Mitigation and Process

- (a) Where a Party is (or claims to be) affected by a Relief Event, such Party shall take commercially reasonable steps to mitigate the consequences of the Relief Event upon the performance of its obligations under this Project Agreement, shall resume performance of its obligations affected by

the Relief Event as soon as practicable and shall use commercially reasonable efforts to remedy its failure to perform.

- (b) To the extent that the Party claiming relief does not comply with its obligations under this Section 41.3, such failure shall preclude such Party's entitlement to relief pursuant to this Section 41.
- (c) The Party claiming relief shall give written Notice to the other Party within 5 Business Days of such Party becoming aware of the relevant Relief Event. Such initial Notice shall give sufficient details to identify the particular event claimed to be a Relief Event.
- (d) A subsequent written Notice shall be given by the Party claiming relief to the other Party within a further 5 Business Days of the initial Notice, which Notice shall contain such relevant information relating to the failure to perform (or delay in performing) as is available, including the effect of the Relief Event on the ability of the Party to perform, the action being taken in accordance with Section 41.3(a), the date of the occurrence of the Relief Event, and an estimate of the period of time required to overcome the Relief Event and/or its effects.
- (e) The Party claiming relief shall notify the other as soon as the consequences of the Relief Event have ceased and of when performance of its affected obligations can be resumed.
- (f) If, following the issue of any Notice referred to in Section 41.3(d), the Party claiming relief receives or becomes aware of any further information relating to the Relief Event and/or any failure to perform, such Party shall submit such further information to the other Party as soon as reasonably possible.

41.4 Insured Exposure

- (a) The compensation payable to Project Co pursuant to this Section 41 shall be reduced by any amount which Project Co or a Project Co Party recovers, or is entitled to recover, under any insurance policy, or would have recovered if it had complied with the requirements of this Project Agreement in respect of insurance or the terms of any policy of insurance required under this Project Agreement, which amount, for greater certainty, shall not include any excess or deductibles or any amount over the maximum amount insured under any such insurance policy.

42. FORCE MAJEURE

42.1 Definition

- (a) For the purposes of this Project Agreement, "**Force Majeure**" means any of the following events or circumstances which directly causes either Party to be unable to perform all or a material part of its obligations under this Project Agreement:
 - (i) war, civil war, armed conflict, terrorism, acts of foreign enemies or hostilities;
 - (ii) nuclear or radioactive contamination of the Works, the System Infrastructure and/or the Lands, unless Project Co or any Project Co Party is the source or cause of the contamination;

- (iii) chemical or biological contamination of the Works, the System Infrastructure and/or the Lands from any event referred to in Section 42.1(a)(i);
- (iv) pressure waves caused by devices traveling at supersonic speeds; or
- (v) the discovery of any Species-at-Risk, fossils, artifacts and other objects having artistic, historic, archaeological or monetary value, including human remains and burial sites, which, as a result of Applicable Law, requires the Works to be abandoned.

42.2 Consequences of Force Majeure

- (a) Subject to Section 42.3, the Party claiming relief shall be relieved from liability under this Project Agreement to the extent that, by reason of the Force Majeure, it is not able to perform its obligations under this Project Agreement.
- (b) In respect of an event of Force Majeure that is also a Delay Event pursuant to Section 38.1(a)(ix):
 - (i) Project Co shall only be relieved of its obligations under this Project Agreement to the extent, if any, provided for in Section 38;
 - (ii) on the earlier of (A) the Substantial Completion Date and (B) the date of payment of the City Default Termination Sum, Non-Default Termination Sum or Breach of Refinancing Termination Sum (and as a part thereof) in accordance with Schedule 22 - Compensation on Termination, the City shall pay to Project Co an amount equal to the Debt Service Amount accrued and paid or which became payable in accordance with the Lending Agreements during the period of delay by Project Co or any Project Co Party to the Lenders up to and including the Scheduled Substantial Completion Date or the date of payment of the City Default Termination Sum, Non-Default Termination Sum or Breach of Refinancing Termination Sum, as applicable, together with interest thereon at the rate or rates payable on the principal amount of debt funded under the Lending Agreements, which, but for the Delay Event, would not have been paid by Project Co to the Lenders.
- (c) If an event of Force Majeure occurs prior to the Substantial Completion Date, Project Co shall not be entitled to receive any compensation other than as expressly provided in Sections 42.2(b)(ii) and 47.
- (d) During an event of Force Majeure which occurs on or after the Substantial Completion Date, the provisions of Schedule 19 - Payment Mechanism will be suspended, and the City shall pay to Project Co, for each Payment Period, an amount which reflects the cost to Project Co of the Maintenance and Rehabilitation Services performed, provided that, during such Payment Period, the amount paid to Project Co pursuant to this Section 42.2(d) shall never be more than the Maximum Service Payment.
- (e) Subject to the provisions of this Section 42, and with respect to an event of Force Majeure that is not a Delay Event and that arises prior to the Substantial Completion Date,
 - (i) a Lane Closure that is directly caused or extended by the occurrence of an event of Force Majeure shall not be included in the Aggregate Actual Lane Closures or the Aggregate Actual Lane Closure Cost for the relevant Road Section for the purposes of calculating

the Lane Closure Adjustment in accordance with the process set out in Schedule 7 – Mobility Matters;

- (ii) a Construction Period Quality Failure that,
 - (A) has been assessed in accordance with Schedule 20 – Construction Period Payments; and
 - (B) has arisen from a Non-Conformance that has been directly caused by an event of Force Majeure,

shall not be applied as part of the Construction Period Deduction for the relevant Payment Period in accordance with Section 6 of Schedule 20 – Construction Period Payments.

(f) Subject to Section 47, Project Co's sole right to payment or otherwise in relation to the occurrence of an event of Force Majeure shall be as provided in this Section 42.

(g) In respect of an event of Force Majeure that,

- (i) occurs prior to the Initial Capital Investment Date; and
- (ii) causes a delay to Project Co in performing the Works,

the City shall pay to Project Co, on the first Construction Period Payment date after the Initial Capital Investment Date is achieved, an amount equal the Debt Service Amount accrued and paid, or which became payable, by Project Co or any Project Co Party to the Lenders, in accordance with the Lending Agreements, during the period of the delay, up to and including the first Construction Period Payment date, together with interest thereon at the rate payable on the Debt Amount, which, but for the delay caused by the event of Force Majeure would not have been paid by Project Co to the Lenders.

42.3 Mitigation and Process

- (a) Where a Party is (or claims to be) affected by an event of Force Majeure, such Party shall take commercially reasonable steps to mitigate the consequences of such event of Force Majeure upon the performance of its obligations under this Project Agreement, shall resume performance of its obligations affected by the event of Force Majeure as soon as practicable and shall use commercially reasonable efforts to remedy its failure to perform.
- (b) To the extent that the Party claiming relief does not comply with its obligations under this Section 42.3, such failure shall be taken into account in determining such Party's entitlement to relief pursuant to this Section 42.
- (c) The Party claiming relief shall give written Notice to the other Party within 5 Business Days of such Party becoming aware of the relevant event of Force Majeure. Such initial Notice shall give sufficient details to identify the particular event claimed to be an event of Force Majeure.

- (d) A subsequent written Notice shall be given by the Party claiming relief to the other Party within a further 5 Business Days of the initial Notice, which Notice shall contain such relevant information relating to the failure to perform (or delay in performing) as is available, including the effect of the event of Force Majeure on the ability of the Party to perform, the action being taken in accordance with Section 42.3(a), the date of the occurrence of the event of Force Majeure, and an estimate of the period of time required to overcome the event of Force Majeure and its effects.
- (e) The Party claiming relief shall notify the other as soon as the consequences of the event of Force Majeure have ceased and of when performance of its affected obligations can be resumed.
- (f) If, following the issue of any Notice referred to in Section 42.3(d), the Party claiming relief receives or becomes aware of any further information relating to the event of Force Majeure and/or any failure to perform, such Party shall submit such further information to the other Party as soon as reasonably possible.

42.4 Insured Exposure

- (a) The compensation payable to Project Co pursuant to this Section 42 shall be reduced by any amount which Project Co or a Project Co Party recovers, or is entitled to recover, under any insurance policy, or would have recovered if it had complied with the requirements of this Project Agreement in respect of insurance or the terms of any policy of insurance required under this Project Agreement, which amount, for greater certainty, shall not include any excess or deductibles or any amount over the maximum amount insured under any such insurance policy.

42.5 Modifications

- (a) The Parties shall use commercially reasonable efforts to agree to any modifications to this Project Agreement which may be equitable having regard to the nature of an event or events of Force Majeure. Schedule 26 - Dispute Resolution Procedure shall not apply to a failure of the City and Project Co to reach agreement pursuant to this Section 42.5.

43. PROJECT CO DEFAULT

43.1 Project Co Events of Default

- (a) Subject to Section 43.1(b), for the purposes of this Project Agreement, “**Project Co Event of Default**” means any one or more of the following events or circumstances:
 - (i) the occurrence of any of the following events other than as a consequence of a breach by the City of its payment obligations hereunder:
 - (A) Project Co admits in writing its inability to pay its debts generally as they become due, or makes a general assignment for the benefit of creditors, or a receiver, manager, administrator, administrative receiver, receiver and manager, trustee, custodian or other similar official or any other like person is appointed by or on behalf of or at the instance of a creditor of Project Co with respect to Project Co or any of the property, assets or undertaking of Project Co, or any creditor of Project Co takes control, or takes steps to take control, of Project Co

or any of Project Co's assets, or any proceedings are instituted against Project Co that result in Project Co being declared or ordered bankrupt or in administration, liquidation, winding-up, reorganization, compromise, arrangement, adjustment, protection, relief or composition of it or with respect to it or its debts or obligations, or any such proceedings are instituted by Project Co seeking any such result, or any such proceedings are instituted by a person other than Project Co, the City, a City Party or a person related to any of them seeking such result and such proceedings have or will have a material adverse effect on the Governmental Activities or the availability of the System Infrastructure to System Users (where such proceedings have not been withdrawn, stayed, discharged, or are otherwise of no further effect, within 90 days of being instituted), under any Applicable Law (including the *Bankruptcy and Insolvency Act* (Canada) and the *Companies' Creditors Arrangement Act* (Canada)) relating to bankruptcy, insolvency or reorganization of or relief with respect to debtors or debtors' obligations or assets or other similar matters, or seeking the appointment of a receiver, manager, administrator, administrative receiver, receiver and manager, trustee, custodian or other similar official or like person for it or with respect to any of its assets, or any resolutions are passed or other corporate actions of Project Co are taken to authorize any of the actions set forth in this Section 43.1(a)(i)(A);

- (B) Project Co ceases performing a substantial portion of its business, or a substantial portion of such business is suspended or is not being performed, whether voluntarily or involuntarily, that has or will have a material adverse effect on Project Co's ability to perform its obligations under this Project Agreement;
 - (C) if any execution, sequestration, extent, garnishment or other process of or order by any court becomes enforceable against Project Co or if a distress or analogous process is levied against any property of Project Co that materially adversely affects Project Co's ability to perform its obligations hereunder; or
 - (D) Project Co suffers any event, or any event or set of circumstances occurs or comes about, analogous to the foregoing events or sets of circumstances set out in this Section 43.1(a)(i) in any jurisdiction in which it is incorporated or resident and such event or set of circumstances would, if set out in Section 43.1(a)(i)(A), (B) or (C), constitute a Project Co Event of Default;
- (ii) Project Co failing to achieve Substantial Completion within 365 days after the Scheduled Substantial Completion Date (the "**Longstop Date**");
 - (iii) Project Co either:
 - (A) failing to deliver a Recovery Schedule in accordance with Schedule 12 – Works Scheduling Requirements;
 - (B) delivering a Recovery Schedule under Schedule 12 – Works Scheduling Requirements which indicates that Project Co will not achieve Substantial Completion by the Longstop Date; or

- (C) delivering a Recovery Schedule under Schedule 12 – Works Scheduling Requirements that is not acceptable to the Independent Certifier, acting reasonably, as to the matters set out in Section 2.4 of Schedule 12 – Works Scheduling Requirements;
- (iv) Project Co making any representation or warranty herein that is false or misleading when made, and that has or will have at any time a material adverse effect on the performance of Project Operations, the Governmental Activities or the availability of the System Infrastructure to System Users, or that may compromise (A) the City's reputation or integrity, or (B) the nature of the public transit system in the City of Ottawa so as to affect public confidence in the public transit system in the City of Ottawa or the Project and, in the case of a false or misleading representation or warranty that is capable of being remedied, such breach is not remedied within 10 Business Days of receipt of Notice of the same from the City;
- (v) Project Co committing a breach of Section 50 or Section 51 or a breach of its obligations under this Project Agreement (other than a breach that is referred to in Sections 43.1(a)(i) to (iv) inclusive or 43.1(a)(vi) to (xx) inclusive) which has or will have a material adverse effect on the Governmental Activities or the availability of the System Infrastructure to System Users, other than where such breach is a consequence of a breach by the City of its obligations under this Project Agreement, and upon becoming aware of such breach Project Co failing to remedy such breach in accordance with all of the following:
- (A) Project Co shall:
- (I) immediately commence and thereafter diligently continue to remedy the breach and to mitigate any adverse effects on the City and the Governmental Activities or the availability of the System Infrastructure to System Users;
- (II) put forward, within 5 Business Days of receipt of Notice of such breach from the City, a reasonable plan and schedule for diligently remedying the breach and mitigating its effect, which plan and schedule shall specify in reasonable detail the manner in which, and the latest date by which, such breach is proposed to be remedied, which latest date shall in any event be within 60 days of Notice of such breach, or if such breach is not capable of being rectified in such period then such longer period as is reasonable in the circumstances; and
- (III) thereafter perform its obligations to achieve all elements of such plan and schedule in accordance with its terms within the time for the performance of its obligations thereunder; and
- (B) upon Project Co failing to comply with any of the provisions of Section 43.1(a)(v)(A):

- (I) Project Co shall continue to diligently remedy the breach and to mitigate any adverse effects on the City and the Governmental Activities or the availability of the System Infrastructure to System Users;
 - (II) Project Co shall, within 3 Business Days after Notice from the City, submit a plan and schedule, which the City shall have no obligation to accept, for remedying the breach and mitigating its effect within such period, if any, acceptable to the City, in its sole discretion, and thereafter perform its obligations to achieve all elements of such plan and schedule in accordance with its terms within the time for the performance of its obligations thereunder; and
 - (III) for greater certainty, Project Co failing to comply with any of the provisions of this Section 43.1(a)(v)(B), or the City, in its sole discretion, not accepting the plan and schedule submitted by Project Co pursuant to Section 43.1(a)(v)(B)(II), shall constitute a Project Co Event of Default;
- (vi) Project Co wholly abandoning the Works for a period which exceeds 3 Business Days from receipt by Project Co of a written request to return to the Site, other than as a consequence of a breach by the City of its obligations under this Project Agreement;
 - (vii) Project Co ceasing to perform any Maintenance and Rehabilitation Services in accordance with this Project Agreement which is necessary for the Governmental Activities or the availability of the System Infrastructure to System Users, other than as a consequence of a breach by the City of its obligations under this Project Agreement;
 - (viii) Project Co failing to comply with Sections 57.1 or 57.3;
 - (ix) the occurrence of any Change in Ownership or Change in Control which is prohibited by Section 57.4;
 - (x) Project Co being awarded a total of [REDACTED] or more Failure Points in any rolling 3 Payment Periods;
 - (xi) Project Co being awarded a total of [REDACTED] or more Failure Points in any rolling 6 Payment Periods;
 - (xii) Project Co being awarded a total of [REDACTED] or more Failure Points in any rolling 12 Payment Periods;
 - (xiii) Project Co failing to remove an Encumbrance that arose due to an act or omission of Project Co or any Project Co Party (other than any Encumbrance derived through the City) within 45 days of the earlier of:
 - (A) the registration of such Encumbrance against title to the Lands or any part thereof; and
 - (B) the date on which Project Co or any Project Co Party knew, or ought to have known, about the existence of the Encumbrance;

- (xiv) Project Co failing to pay any sum or sums due to the City under this Project Agreement, which sum or sums are not being disputed by Project Co in accordance with Schedule 26 - Dispute Resolution Procedure or have not been set off by Project Co pursuant to Section 32.12(a)(ii), and which sum or sums, either singly or in aggregate, exceed(s) \$[REDACTED] (index linked), and such failure continues for 30 days from receipt by Project Co of a Notice of non-payment from the City;
- (xv) Project Co failing to comply with Section 58;
- (xvi) Project Co failing to comply with Section 7.3 or Schedule 27 - Refinancing;
- (xvii) Project Co failing to obtain any bond, security or insurance required to be obtained by or on behalf of Project Co pursuant to this Project Agreement or any such bond, security or insurance being vitiated or otherwise ceasing to be in full force and effect or in material compliance with the requirements set out in this Project Agreement, other than as a consequence of a breach by the City of its obligations under this Project Agreement, and:
 - (A) in respect of insurance, such breach by Project Co is not remedied within 10 Business Days of the occurrence of the breach; and
 - (B) in respect of a bond or security, such breach by Project Co is not remedied within 5 Business Days of Project Co becoming aware of such breach;
- (xviii) Project Co failing to comply with any determination, order or award made against Project Co in accordance with Schedule 26 - Dispute Resolution Procedure;
- (xix) at any time after the Substantial Completion Date, Project Co committing a breach of its obligations under this Project Agreement (other than as a consequence of a breach by the City of its obligations under this Project Agreement) which results in a health and safety related criminal conviction or a conviction under the *Occupational Health and Safety Act* (Ontario) against Project Co or any Project Co Party or the City (an "**H&S Conviction**") provided however that:
 - (A) an H&S Conviction against Project Co, a Project Co Party or the City shall not constitute a Project Co Event of Default if, within 90 days from the date of the H&S Conviction (whether or not the H&S Conviction is subject to an appeal or any further judicial process), the involvement in the Project Operations of each relevant Project Co Party (which in the case of an individual director, officer or employee shall be deemed to include the Project Co Party of which that person is a director, officer or employee) is terminated in accordance with Section 57.3 or Project Co takes such other disciplinary action against each such Project Co Party as is acceptable to the City, in its sole discretion; and
 - (B) in determining whether to exercise any right of termination for a Project Co Event of Default pursuant to this Section 43.1(a)(xix), the City shall:

- (I) act in a reasonable and proportionate manner having regard to such matters as the gravity of any offence and the identity of the person committing the act leading to the H&S Conviction; and
 - (II) give all due consideration, where appropriate, to action other than termination of this Project Agreement; or
- (xx) Project Co failing to comply with Section 27.4 and 27.8.
- (b) The City shall not exercise any rights under this Section 43 (except its rights under Section 43.5(a)(i)) as a result of a Project Co Event of Default referred to in Sections 43.1(a)(vii), 43.1(a)(x), 43.1(a)(xi) and 43.1(a)(xii) until the day following the Substantial Completion Payment Commencement Date. For greater certainty, if the City is prevented from exercising any rights under this Section 43 by the terms of the immediately preceding sentence, then, notwithstanding the passage of time or any intervening event (including that the City may have exercised its rights under Section 43.5(a)), on and after the day following the Substantial Completion Payment Commencement Date, the City may exercise any such rights.

43.2 Notification of Occurrence

- (a) Project Co shall, promptly upon Project Co becoming aware of the occurrence, notify the City of the occurrence, and details, of any Project Co Event of Default and of any event or circumstance which is likely, with the passage of time, giving of Notice, determination of any condition, or otherwise, to constitute or give rise to a Project Co Event of Default.

43.3 Right to Termination

- (a) On the occurrence of a Project Co Event of Default, or at any time after the City becomes aware of a Project Co Event of Default (and, if the occurrence of a Project Co Event of Default is disputed by Project Co in good faith, then following confirmation in accordance with Schedule 26 - Dispute Resolution Procedure that a Project Co Event of Default has occurred), the City may, subject to Section 43.4, terminate this Project Agreement in its entirety by written Notice having immediate effect given to Project Co, and to any person specified in the Lenders' Direct Agreement to receive such Notice.

43.4 Remedy Provisions

- (a) In the case of a Project Co Event of Default referred to in Sections 43.1(a)(i)(B), 43.1(a)(i)(C), 43.1(a)(i)(D) (where the Project Co Event of Default referred to in Section 43.1(a)(i)(D) is analogous to a Project Co Event of Default referred to in Section 43.1(a)(i)(B) or 43.1(a)(i)(C)), 43.1(a)(iii), 43.1(a)(iv), 43.1(a)(vi), 43.1(a)(vii), 43.1(a)(viii), 43.1(a)(ix) (where the Project Co Event of Default referred to in Section 43.1(a)(ix) is capable of being remedied), 43.1(a)(xiv), 43.1(a)(xvi), 43.1(a)(xvii) (where the Project Co Event of Default referred to in Section 43.1(a)(xvii) is not in respect of insurance), 43.1(a)(xviii), 43.1(a)(xix) or 43.1(a)(xx), the City shall, prior to being entitled to terminate this Project Agreement, give Notice of default to Project Co, and to any person specified in the Lenders' Direct Agreement to receive such Notice, and Project Co shall:

- (i) within 5 Business Days of such Notice of default, put forward a reasonable plan and schedule for diligently remedying the Project Co Event of Default, which schedule shall specify in reasonable detail the manner in, and the latest date by which, such Project Co Event of Default is proposed to be remedied, which latest date shall, in any event, be within 30 days of the Notice of default, or if such breach is not capable of being remedied in such period then such longer period as is acceptable to the City, acting reasonably; and
 - (ii) thereafter, perform its obligations to achieve all elements of such plan and schedule in accordance with its terms within the time for the performance of its obligations thereunder.
- (b) Where Project Co puts forward a plan and schedule in accordance with Section 43.4(a)(i) that has a date for the Project Co Event of Default to be remedied that is beyond 30 days from the Notice of default, the City shall have 5 Business Days from receipt of the same within which to notify Project Co that the City does not accept such longer period in the plan and schedule and that the 30 day limit will apply, failing which the City shall be deemed to have accepted the longer period in the plan and schedule.
- (c) If a Project Co Event of Default, of which a Notice of default was given under Section 43.4(a), occurs and:
- (i) Project Co fails to immediately commence and thereafter diligently continue to remedy the Project Co Event of Default and to mitigate any adverse effects on the City and the Governmental Activities or the availability of the System Infrastructure to System Users; or
 - (ii) Project Co fails to put forward a plan and schedule pursuant to Section 43.4(a)(i); or
 - (iii) such Project Co Event of Default is not remedied within 30 days of such Notice of default or such longer period as is established pursuant to the plan and schedule established pursuant to Sections 43.4(a) and (b); or
 - (iv) where Project Co puts forward a plan and schedule pursuant to Section 43.4(a)(i) and Project Co fails to perform its obligations thereunder necessary to achieve all elements of such plan and schedule in accordance with its terms within the time for the performance of its obligations,
- then the City may terminate this Project Agreement in its entirety by written Notice with immediate effect, such Notice to be given to Project Co, and to any person specified in the Lenders' Direct Agreement to receive such Notice.
- (d) Notwithstanding that the City may give the Notice referred to in Section 43.4(a), and without prejudice to the other rights of the City in this Section 43.4, at any time during which a Project Co Event of Default is continuing, the City may, at Project Co's risk and expense, take such steps as the City considers appropriate, either itself or by engaging others (including a third party) to take such steps, to perform or obtain the performance of Project Co's obligations under this Project Agreement or to remedy such Project Co Event of Default.

- (e) Upon the occurrence of a Project Co Event of Default that Project Co has remedied pursuant to this Section 43.4, such occurrence of a Project Co Event of Default shall thereafter cease to be a Project Co Event of Default and the City shall not be entitled to terminate this Project Agreement for that occurrence of a Project Co Event of Default.

43.5 Replacement of Non-Performing Maintenance and Rehabilitation Contractor

- (a) The City may, acting reasonably, require Project Co to terminate the Maintenance and Rehabilitation Contractor and ensure that a replacement Maintenance and Rehabilitation Contractor is appointed in accordance with Section 57.3 to provide the Maintenance and Rehabilitation Services within 60 days:

- (i) as an alternative to termination of this Project Agreement pursuant to Sections 43.3 or 43.4, in any circumstance in which the City could exercise such right of termination, if the Project Co Event of Default was caused, or contributed to, by the Maintenance and Rehabilitation Contractor or otherwise relates to the Maintenance and Rehabilitation Services; or
- (ii) if Project Co accrues, in any rolling 6 Payment Periods more than:
- (A) [REDACTED] Failure Points in respect of Train Kilometres Availability Failures; or
- (B) [REDACTED] Failure Points in respect of Quality Failures and Service Failures combined,

provided that this Section 43.5 shall not give rise to partial termination of either the obligation to provide the Project Operations or this Project Agreement.

- (b) If the City exercises its rights under this Section 43.5, Project Co shall, within 5 Business Days, put forward a proposal for the interim management or performance of the Maintenance and Rehabilitation Services until such time as a replacement Maintenance and Rehabilitation Contractor can be engaged by Project Co. If Project Co fails to do so, or if its proposal is not reasonably likely to give adequate performance of the Maintenance and Rehabilitation Services and the Parties cannot agree within a further 3 Business Days to a plan for the interim management or performance of the Maintenance and Rehabilitation Services, then, without prejudice to the other rights of the City in this Section 43.5, the City itself may perform, or engage others (including a third party) to perform, the Maintenance and Rehabilitation Services and Section 31.4 shall apply, *mutatis mutandis*, to the Maintenance and Rehabilitation Services. Any Dispute in respect of the interim management or provision of the Maintenance and Rehabilitation Services may be referred for resolution in accordance with Schedule 26 - Dispute Resolution Procedure.
- (c) If Project Co fails to terminate, or secure the termination of, the Maintenance and Rehabilitation Contractor and to secure a replacement Maintenance and Rehabilitation Contractor in accordance with this Section 43.5, the City shall be entitled to exercise its termination rights in accordance with Sections 43.3 and 43.4, as applicable.

- (d) Where a replacement Maintenance and Rehabilitation Contractor is appointed in accordance with this Section 43.5, [REDACTED]% of the Failure Points accrued by Project Co prior to such replacement shall be cancelled.

43.6 Replacement of Non-Performing Revenue Vehicle Supplier

- (a) The City may, acting reasonably, require Project Co to terminate the Revenue Vehicle Supplier as an alternative to termination of this Project Agreement pursuant to Sections 43.3 or 43.4, in any circumstance in which the City could exercise such right of termination, if the Project Co Event of Default was caused, or contributed to, by the Revenue Vehicle Supplier. In the event the City does not exercise its rights and if the Project Co Event of Default was caused by the Revenue Vehicle Supplier, Project Co may, acting reasonably, with the consent of the City, terminate the Revenue Vehicle Supplier as an alternative to termination of this Project Agreement pursuant to Sections 43.3 or 43.4.
- (b) If Project Co fails to terminate, the City shall be entitled to exercise its termination rights in accordance with Sections 43.3 and 43.4, as applicable.
- (c) If the City or Project Co exercises its right under this Section 43.6, then:
- (i) the subject Project Co Event of Default that was caused, or contributed to, by the Revenue Vehicle Supplier shall be deemed to be cured and there shall no longer be a Project Co Event of Default in respect of such event or events;
 - (ii) Project Co and the City shall work together in good faith and use reasonably commercial efforts to attempt to secure an appropriate replacement Revenue Vehicle Supplier to supply the New Revenue Vehicles and to mitigate the impact of such replacement Revenue Vehicle Supplier on the Works Schedule and the performance of the Project Operations;
 - (iii) if such right is exercised by the City prior to the date which is one year prior to the Scheduled Substantial Completion Date, Project Co shall only be required to achieve Interim Substantial Completion on or prior to the Scheduled Substantial Completion Date and all references herein to Substantial Completion and Scheduled Substantial Completion shall be automatically amended and read as references to Interim Substantial Completion and Scheduled Interim Substantial Completion, respectively, such that all other requirements that would have been required to be performed in connection with Substantial Completion shall be performed in connection with Interim Substantial Completion; and
 - (iv) to the extent the City provides any replacement vehicles to replace any New Revenue Vehicles that were not delivered by the Revenue Vehicle Supplier or that were delivered after the original Revenue Vehicle Supplier was terminated, and as a result thereof Project Co incurs any delays or increased costs in the performance of the Project Operations, such performance shall, subject to and in accordance with Schedule 21 – Variation Procedure, result in a Variation.

43.7 City's Costs

- (a) Project Co shall reimburse the City for all reasonable costs (including all applicable Taxes and all legal or professional services, legal costs being on a full indemnity basis) properly incurred by the City in exercising its rights under this Section 43, including any relevant increased administrative expenses. The City shall take commercially reasonable steps to mitigate such costs.

43.8 No other Rights to Terminate

- (a) The City shall have no right or entitlement to terminate this Project Agreement, or to accept any repudiation of this Project Agreement, and shall not purport to exercise any such right or entitlement except as set forth in Sections 43 and 45.

43.9 Project Co Termination of Revenue Vehicle Supplier

- (a) Project Co shall not exercise any right to terminate the Revenue Vehicle Supply Contract without the consent of the City.

44. CITY DEFAULT

44.1 City Events of Default

- (a) For the purposes of this Project Agreement, “**City Event of Default**” means any one or more of the following events or circumstances:
- (i) the City failing to pay any sum or sums due to Project Co under this Project Agreement, which sum or sums are not being disputed by the City in accordance with Schedule 26 - Dispute Resolution Procedure or have not been set off by the City pursuant to Section 32.12(a)(ii), and which sum or sums, either singly or in aggregate, exceed(s) \$[REDACTED] (index linked), and:
- (A) in respect of a Construction Period Payment or the Substantial Completion Payment, such failure continues for 30 Business Days;
- (B) subject to Section 44.1(a)(i)(C), in respect of any Monthly Service Payment, such failure continues for 30 days;
- (C) in respect of any 3 Monthly Service Payments in any rolling 9 month period, such failure continues for 15 Business Days in respect of each such Monthly Service Payment; or
- (D) in respect of any other payment due and payable by the City to Project Co under this Project Agreement, such failure continues for 90 days,
- in any such case, from receipt by the City of a Notice of non-payment from or on behalf of Project Co;
- (ii) the City committing a material breach of its obligations under Section 14 (other than as a consequence of a breach by Project Co of its obligations under this Project Agreement),

- which breach materially adversely affects the ability of Project Co to perform its obligations under this Project Agreement for a continuous period of not less than 60 days; or
- (iii) an act of any Governmental Authority which renders it impossible for Project Co to perform all or substantially all of its obligations under this Project Agreement (other than as a consequence of a breach by Project Co of its obligations under this Project Agreement) for a continuous period of not less than 60 days (for greater certainty, the non-issuance of, or the imposition of any conditions or limitations in, any of the Project Co Permits, Licences, Approvals and Authorizations shall not constitute an “act of any Governmental Authority”).

44.2 Project Co's Options

- (a) On the occurrence of a City Event of Default and while the same is continuing, Project Co may give Notice to the City of the occurrence of such City Event of Default, which Notice will specify the details thereof. If Project Co gives such Notice and the applicable City Event of Default has not been remedied within 30 days of receipt by the City of Notice of the occurrence of such City Event of Default, at Project Co's option and without prejudice to its other rights and remedies under this Project Agreement, Project Co may:
- (i) suspend performance of the Works and the Maintenance and Rehabilitation Services until such time as the City has remedied such City Event of Default; or
- (ii) terminate this Project Agreement in its entirety by Notice in writing having immediate effect.

44.3 Project Co's Costs

- (a) The City shall reimburse Project Co for all reasonable costs (including all applicable Taxes and all legal or professional services, legal costs being on a full indemnity basis) properly incurred by Project Co in exercising its rights under this Section 44, including any relevant increased administrative expenses. Project Co shall take commercially reasonable steps to mitigate such costs.

44.4 No Other Rights to Terminate

- (a) Project Co shall have no right or entitlement to terminate this Project Agreement, nor to accept any repudiation of this Project Agreement, and shall not exercise, nor purport to exercise, any such right or entitlement except as expressly set forth in this Project Agreement.

45. RELIEF EVENT AND NON-DEFAULT TERMINATION

45.1 Termination for Relief Event

- (a) Subject to Section 45.1(b), if a Relief Event occurs and the effects of the Relief Event continue for 180 days from the date on which the Party affected gives Notice to the other Party pursuant to Section 41.3(c), either Party may, at any time thereafter, terminate this Project Agreement by written Notice to the other Party having immediate effect, provided that the effects of the Relief

Event continue during such period to prevent either Party from performing a material part of its obligations under this Project Agreement.

- (b) Neither Party shall be entitled to exercise its right to terminate this Project Agreement in accordance with Section 45.1(a) if Project Co or a Project Co Party recovers, or is entitled to recover, under any insurance policy, or would have recovered if it had complied with the requirements of this Project Agreement in respect of insurance or the terms of any policy of insurance required under this Project Agreement, an amount which is equal to or greater than the Monthly Service Payment.

45.2 Termination for Force Majeure

- (a) If an event of Force Majeure occurs and the Parties, having used commercially reasonable efforts, have failed to reach agreement on any modification to this Project Agreement pursuant to Section 42.5 within 180 days from the date on which the Party affected gives Notice to the other Party as set out therein, either Party may, at any time thereafter, terminate this Project Agreement by written Notice to the other Party having immediate effect, provided that the effects of the event of Force Majeure continue during such period to prevent either Party from performing a material part of its obligations under this Project Agreement.

45.3 Termination for Convenience

- (a) The City shall, in its sole discretion and for any reason whatsoever, be entitled to terminate this Project Agreement at any time on 180 days' written Notice to Project Co.
- (b) In the event of Notice being given by the City in accordance with this Section 45.3, the City shall, at any time before the expiration of such Notice, be entitled to direct Project Co to refrain from commencing, or allowing any third party to commence, the Works, or any part or parts of the Works, or the Maintenance and Rehabilitation Services, or any element of the Maintenance and Rehabilitation Services, where such Works or Maintenance and Rehabilitation Services have not yet been commenced.

45.4 Automatic Expiry on Expiry Date

- (a) This Project Agreement shall terminate automatically on the Expiry Date.
- (b) Project Co shall not be entitled to any compensation due to termination of this Project Agreement on expiry of the Project Term on the Expiry Date.

46. EFFECT OF TERMINATION AND TRANSITIONAL ARRANGEMENTS

46.1 Termination

- (a) Notwithstanding any provision of this Project Agreement, upon the service of a Notice of termination or termination on the Expiry Date pursuant to Section 45.4, this Section 46 shall apply in respect of such termination.

46.2 Continued Effect - No Waiver

- (a) Notwithstanding any breach of this Project Agreement by a Party, the other Party may elect to continue to treat this Project Agreement as being in full force and effect and to enforce its rights under this Project Agreement without prejudice to any other rights which such other Party may have in relation to such breach. The failure of either Party to exercise any right under this Project Agreement, including any right to terminate this Project Agreement and any right to claim damages, shall not be deemed to be a waiver of such right for any continuing or subsequent breach.

46.3 Continuing Performance

- (a) Subject to any exercise by the City of its rights to perform, or to seek, pursuant to this Project Agreement, a third party to perform, the obligations of Project Co, the Parties shall continue to perform their obligations under this Project Agreement (including, if applicable, pursuant to Schedule 22 - Compensation on Termination) notwithstanding the giving of any Notice of default or Notice of termination, until the termination of this Project Agreement becomes effective in accordance with this Section 46.

46.4 Effect of Notice of Termination

- (a) On the service of a Notice of termination, or termination on the Expiry Date pursuant to Section 45.4:
- (i) if termination is prior to the Substantial Completion Date, in so far as any transfer shall be necessary to fully and effectively transfer such property to the City as shall not already have been transferred to the City pursuant to Section 53.1, Project Co shall transfer to, and there shall vest in, the City, free from all Encumbrances (other than the Encumbrances caused or consented to by the City), such part of the Works, the System Infrastructure and the New Municipal Infrastructure as shall have been constructed and such items of plant, infrastructure and equipment as shall have been procured by Project Co, and, if the City so elects:
- (A) all plant, equipment and materials (other than those referred to in Section 46.4(a)(i)(B)) on or near to the Site shall remain available to the City for the purposes of completing the Works; and
- (B) all construction plant and equipment shall remain available to the City for the purposes of completing the Works, subject to payment by the City of the Construction Contractor's reasonable charges;
- (ii) if termination is prior to the Substantial Completion Date, Project Co shall deliver to the City (to the extent such items have not already been delivered to the City) one complete set of all Project Data and Intellectual Property relating to the design, construction and completion of the Works, the System Infrastructure and the New Municipal Infrastructure;
- (iii) in so far as title shall not have already passed to the City pursuant to Section 53.1 or Section 46.4(a)(i), Project Co shall hand over to, and there shall vest in, the City, free from all Encumbrances (other than any Encumbrances caused or consented to by the

City), the System Infrastructure and the New Municipal Infrastructure, together with all other assets and rights capable of being transferred that are necessary for the performance of the Project and the Project Operations and all facilities and equipment including, notwithstanding that termination may occur prior to the Expiry Date, the verification and transfer of inventory as set forth in Appendix C (Expiry Date Requirements) of the Maintenance and Rehabilitation Requirements, and to the extent that any such assets or rights are not capable of being transferred by Project Co to the City, Project Co shall enter into agreements or make other arrangements in order to permit the use of the assets or rights by the City in order to enable it, or its designated agents or subcontractors, to continue to perform the activities which would have otherwise been performed by Project Co if this Project Agreement had not been terminated;

- (iv) if the City so elects, Project Co shall ensure that any of the Subcontracts between Project Co and a Subcontractor (including the Construction Contract and the Maintenance and Rehabilitation Contract), and any other instrument entered into between any such Subcontractor and Project Co for securing the performance by such Subcontractor of its obligations in respect of the Project Operations or to protect the interests of Project Co, shall be novated or assigned to the City or its nominee, provided that where termination occurs other than as a result of a Project Co Event of Default, the consent of the relevant Subcontractor shall be required, and further provided that any such novation or assignment of a Subcontract with any Contractor shall be made to the City pursuant to, and subject to, the terms of the applicable Direct Agreement;
- (v) Project Co shall, or shall ensure that any Project Co Party shall, offer to sell (and if the City so elects, execute such sale) to the City at a fair value (determined as between a willing vendor and willing purchaser, with any Disputes as to such fair value being resolved in accordance with Schedule 26 - Dispute Resolution Procedure), free from all Encumbrances (other than any Encumbrances caused or consented to by the City), all or any part of the stocks of material and other assets, road vehicles, construction equipment, spare parts and other moveable property owned by Project Co or any Project Co Parties and dedicated to or predominantly used in respect of the System Infrastructure, and reasonably required by the City in connection with the operation of the System Infrastructure or the performance of the Maintenance and Rehabilitation Services;
- (vi) Project Co shall deliver to the City (to the extent such items have not already been delivered to the City) one complete set of:
 - (A) the most recent Record Drawings in the format that the City, acting reasonably, considers most appropriate at the time showing all alterations made to the System Infrastructure since the Substantial Completion Date;
 - (B) the most recent maintenance, operation and training manuals for the System Infrastructure; and
 - (C) current regulations and standards governing the System Infrastructure.
- (vii) Project Co shall use commercially reasonable efforts to assign, or otherwise transfer, to the City, free from all Encumbrances (other than any Encumbrances caused or consented

to by the City), the benefit of all manufacturers' warranties, including all documentation in respect thereof, in respect of mechanical and electrical plant and equipment used or made available by Project Co under this Project Agreement and included in the System Infrastructure and the New Municipal Infrastructure;

- (viii) Project Co shall deliver to the City all information, reports, documents, records and the like referred to in Section 35, including as referred to in Schedule 25 - Record Provisions, except where such are required by Applicable Law to be retained by Project Co or the Project Co Parties (in which case complete copies shall be delivered to the City);
- (ix) in the case of the termination of this Project Agreement on the Expiry Date in accordance with Section 45.4, the System Infrastructure and elements of the System Infrastructure shall be in the condition required in accordance with Section 48 and Schedule 23 - Expiry Transition Procedure; and
- (x) in the case of termination prior to the Expiry Date, Project Co shall implement the requirements set out in Sections 2.2, 2.3(a)(ii) and 2.5 to 2.9 of Appendix C to Schedule 15-3 of this Project Agreement, taking into account the circumstances of termination occurring prior to the Expiry Date, and meet any timeframes set out in the notice of termination for the implementation of such requirements.

46.5 Ownership of Information

- (a) Subject to Section 49, all information obtained by Project Co, including the Record Drawings and other technical drawings and data, supplier agreements and contracts, utilities consumption information, environmental and technical reports, lease, license and subletting data and contracts, asset condition data, standard operating procedures, processes and manuals and all other information directly related to the Project Operations accumulated over the course of the Project Term shall be the property of the City and upon termination of this Project Agreement shall be provided or returned to the City, as applicable, in electronic format acceptable to the City, acting reasonably, where it exists in electronic format, and in its original format, when not in electronic format.

46.6 Provision in Subcontracts

- (a) Project Co shall make provision in all Subcontracts to which it is a party (including requiring the relevant Project Co Parties to make such provision and to require other Project Co Parties to make such provision) to ensure that the City shall be in a position to exercise its rights, and Project Co shall be in a position to perform its obligations, under this Section 46.

46.7 Transitional Arrangements

- (a) On the termination of this Project Agreement for any reason, for a reasonable period both before and after any such termination, Project Co shall, subject to the continued performance of Maintenance and Rehabilitation Services pursuant to Sections 3.2 and 3.3 of Schedule 22 - Compensation on Termination if applicable:

- (i) cooperate fully with the City and any successors providing services in the nature of any of the Maintenance and Rehabilitation Services and any part of the Maintenance and Rehabilitation Services in order to achieve a smooth transfer of the manner in which the Maintenance and Rehabilitation Services is performed and to avoid or mitigate, in so far as reasonably practicable, any inconvenience or any risk to the health and safety of any System Users;
 - (ii) as soon as practicable remove from the Lands all property belonging to Project Co or any Project Co Party that is not acquired by the City pursuant to Section 46.4 or otherwise, and, if Project Co has not done so within 60 days after any Notice from the City requiring it to do so, the City may, without being responsible for any loss, damage, costs or expenses, remove and sell any such property and shall hold any proceeds, less all costs incurred to the credit of Project Co;
 - (iii) forthwith deliver to the City Representative:
 - (A) all keys to, and any pass cards and other devices used to gain access to any part of the System Infrastructure; and
 - (B) to the extent transferable and without prejudice to the City's rights pursuant to Section 49, any copyright licences for any computer programs, or licences to use the same, used in connection with the operation of the System Infrastructure;
 - (iv) as soon as practicable vacate the Lands and, without limiting Project Co's obligations under Schedule 23 - Expiry Transition Procedure, shall leave the Lands and the System Infrastructure in a safe, clean and orderly condition.
- (b) If the City wishes to conduct a competition prior to the Expiry Date with a view to entering into an agreement for the provision of services, which may or may not be the same as, or similar to the Maintenance and Rehabilitation Services or any part of the Maintenance and Rehabilitation Services, following the expiry of this Project Agreement, Project Co shall, subject to payment of Project Co's reasonable costs, cooperate with the City fully in such competition process, including by:
- (i) providing any information which the City may reasonably require to conduct such competition, including all information contained in any asset management system maintained by Project Co not otherwise transferred to the City, other than Sensitive Information; and
 - (ii) assisting the City by allowing any or all participants in such competition process unrestricted access to the Lands and the System Infrastructure.

46.8 Cessation of Rights and Obligations on Termination

- (a) On completion of Project Co's obligations pursuant to this Section 46, this Project Agreement shall terminate and, except as provided in Section 46.9, all rights and obligations of the City and Project Co under this Project Agreement shall cease and be of no further force and effect.

46.9 Survival

- (a) Except as otherwise provided in this Project Agreement, termination of this Project Agreement shall be without prejudice to, and shall not affect:
- (i) all representations, warranties and indemnities under this Project Agreement; and
 - (ii) Sections 1.2, 5, 7, 15.2, 16.1, 16.3(a), 16.4(a), 16.5(a), 24.6, 25.11, 25.14, 30.1, 30.5, 31, 32.6, 32.8, 32.12, 32.13, 32.14, 33, 34, 35, 43.6, 44.3, 45.4, 46, 47, 48, 49 with the exception of 49.4(b), 50, 51, 53, 54, 55, 56, 58.3, 59.1, 62.4, 62.8, 62.9, 62.10, 62.11 and 62.12 of this Project Agreement, Schedule 7 – Mobility Matters, Schedule 22 - Compensation on Termination, Sections 2, 4 and 5 of Schedule 23 - Expiry Transition Procedure, Sections 1.2 to 1.8 of Schedule 25 - Record Provisions, Schedule 26 - Dispute Resolution Procedure, Sections 2.1 – 2.7, and 3.2-3.9 of Schedule 35 – Intellectual Property, Schedule 36 – System Extension and any other provisions of this Project Agreement which are expressed to survive termination and which are required to give effect to such provisions which survive termination or to such termination or the consequences of such termination,

all of which shall survive the termination of this Project Agreement, including for termination on the Expiry Date pursuant to Section 45.4.

47. COMPENSATION ON TERMINATION

47.1 Compensation on Termination

- (a) If this Project Agreement is terminated in accordance with the terms hereof, then Schedule 22 - Compensation on Termination shall apply and the City shall pay Project Co any applicable compensation on termination.

47.2 Full and Final Settlement

- (a) Except as otherwise provided in Section 47.2(b), any compensation paid pursuant to this Section 47, including pursuant to Schedule 22 - Compensation on Termination in the total amount owing thereunder, shall be in full and final settlement of any claims, demands and proceedings of Project Co and the City, and each shall be released from all liability to the other in relation to any breaches or other events leading to such termination of this Project Agreement, and the circumstances leading to such breach or termination, and Project Co and the City shall be precluded from exercising all other rights and remedies in respect of any such breach or termination whether in contract, tort, restitution, statute, at common law or otherwise.
- (b) Section 47.2(a) shall be without prejudice to:
- (i) any liability of either Party to the other, including under the indemnities contained in this Project Agreement, that arose prior to the Termination Date (but not from the termination itself or the events leading to such termination) to the extent such liability has not already been set off pursuant to Section 32.12 or taken into account pursuant to Schedule 22 - Compensation on Termination in determining or agreeing upon the City Default Termination Sum, Adjusted Highest Qualifying Tender Price, Adjusted Estimated Fair Value, Non-Default Termination Sum or any other termination sum, as the case may be;

- (ii) any liabilities arising under or in respect of any breach by either Party of their obligations under Section 46.9 of this Project Agreement, or the Sections referred to therein, which did not lead to such termination and which arises or continues after the Termination Date; and
- (iii) any amount owing to the City in relation to:
 - (A) Taxes or tax withholdings, including workers' compensation levies;
 - (B) fines, penalties or restitution orders by a court under any Federal or Provincial statute;
 - (C) any order made by a court under the *Civil Remedies Act* (Ontario); and
 - (D) any fraud or other criminal offence committed against the City.

48. EXPIRY TRANSITION PROCEDURE

48.1 Expiry Transition

- (a) Project Co and the City shall each comply with the requirements of Schedule 23 – Expiry Transition Procedure.

49. INTELLECTUAL PROPERTY

49.1 Ownership of Intellectual Property

- (a) Subject to Section 49.4, the Ownership of Intellectual Property shall be as set out in Schedule 35 – Intellectual Property. Project Co and the City shall each comply with the requirements of Schedule 35 – Intellectual Property.

49.2 Licences to Intellectual Property

- (a) Schedule 35 – Intellectual Property sets out the terms on which Intellectual Property used or supplied in connection with the Project will be licensed.

49.3 Representation and Warranty

- (a) Project Co represents, warrants and covenants to the City that:

- (i) Project Co has and shall have the full and unencumbered right to provide all rights and Licences granted to the City in this Project Agreement and to make all assignments of Intellectual Property as contemplated in this Project Agreement and to otherwise fully comply with the terms and requirements of Schedule 35 – Intellectual Property and its obligations therein;
- (ii) any Intellectual Property Licences to the City pursuant to this Project Agreement does not and shall not infringe, and is not and shall not be misappropriation of, any third party Intellectual Property rights;

(iii) as of Commercial Close:

- (A) Project Co has not received any alleged infringement or misappropriation notices from third parties regarding the any such Intellectual Property; and
- (B) no fact is known to Project Co (including in respect of any actual, pending or threatened disputes, claims, suits, actions or proceedings or any other circumstance or event) that will, or could reasonably, effect, limit or prevent Project Co from fully complying with this Section 49.3(a).

49.4 Jointly Developed Materials

- (a) To the extent any data, documents, drawings, reports, plans, software, formulae, calculations or designs or any other materials or Intellectual Property are developed jointly by, Project Co or any Subcontractor and the City to the exclusion of any other party pursuant to this Project Agreement or in relation to the System Infrastructure, the Lands or Project Operations (the “**City Jointly Developed Materials**”), then the Parties hereby acknowledge and agree that the City shall be the sole and exclusive owner of all right, title and interest in and to the City Jointly Developed Materials, any Intellectual Property associated therewith and any and all Modifications thereto and Project Co shall, at the request of the City, execute such further agreements and cause the Subcontractors to execute any and all assignments, waivers of moral rights and other documents as may be reasonably required to fulfill the intent of this provision.
- (b) The City hereby grants Project Co a royalty free, non-exclusive and non-transferable license, with a right to grant sub-licences to each Subcontractor, to use the City Jointly Developed Materials during the Project Term for the sole purposes of Project Co or any Subcontractor performing its obligations under this Project Agreement or its Subcontract, as applicable. For clarity, the license granted to Project Co in accordance with this Section 49.4(b) shall not extend to any City Jointly Developed Materials.
- (c) Upon termination of this Project Agreement, all rights and licences whatsoever granted to Project Co in the Jointly Developed Materials shall automatically terminate, and Project Co shall return any and all Jointly Developed Materials in the custody or possession of Project Co to the City, in the case of the City Jointly Developed Materials.
- (d) In the event of any inconsistency between this Section 49.4 and any provision of Schedule 35 – Intellectual Property, the wording of this Section 49.4 shall prevail.

49.5 Maintenance of Data

- (a) To the extent that any of the data, materials and documents referred to in this Section 49 or Schedule 35 – Intellectual Property are generated by, or maintained on, a computer or similar system, Project Co shall procure for the benefit of the City, either at no charge or at the lowest reasonable fee, the grant of a license or sub-license for any relevant software to enable the City or its nominee to access and otherwise use, subject to the payment by the City of any relevant fee) such data, materials and documents in accordance with rights granted pursuant to Schedule 35 – Intellectual Property.

- (b) For the purposes of Section 49.5(a), “use” has the meaning set out in Schedule 35 – Intellectual Property, and includes the Limited Modification Rights.
- (c) Without limiting the obligations of Project Co under Section 49.5(a), Project Co shall ensure the back-up and storage in safe custody of the data, materials and documents referred to in this Section 49 in accordance with Good Industry Practice. Project Co shall submit to the City Representative Project Co’s proposals for the back-up and storage in safe custody of such data, materials and documents and the City shall be entitled to object if the same is not in accordance with Good Industry Practice. Project Co shall comply, and shall cause all Project Co Parties to comply, with all procedures to which the City Representative has not objected. Project Co may vary its procedures for such back-up and storage subject to submitting its proposals for change to the City Representative, who shall be entitled to object on the basis set out above. Any Disputes in connection with the provisions of this Section 49.5(c) may be referred for resolution in accordance with Schedule 26 - Dispute Resolution Procedure with reference to Good Industry Practice.

49.6 City Trade-Marks

- (a) Project Co shall not:
 - (i) use any City Trade-Marks without obtaining a trade-mark license on terms and conditions mutually satisfactory to the City and Project Co, each acting reasonably; or
 - (ii) use the names or any identifying logos or otherwise of the City or the City Representative in any advertising or permit them so to be used except with the prior written consent of the City.

49.7 Confidential Information

- (a) It is expressly acknowledged and agreed that nothing in this Section 49 shall be deemed to create or convey to a Party any right, title, or interest in and/or to the Confidential Information of the other Party.

49.8 Government Use of Documents

- (a) Project Co hereby disclaims any right, title or interest of any nature whatsoever it may have in or to this Project Agreement that might prohibit or otherwise interfere with the City’s ability to use this Project Agreement in any manner desired by the City.
- (b) Project Co hereby consents to the use by the City of this Project Agreement, and any portion thereof, subject to compliance with FIPPA and to the removal by the City (in consultation with Project Co) of any information supplied in confidence to the City by Project Co in circumstances where disclosure may be refused under Section 17(1) of FIPPA.

49.9 Restrictions

- (a) The Parties hereby agree that either Party may use the Project Know-How for any purpose, provided, however, that neither Project Co nor any Subcontractor shall use the Project Know-How to the extent that such Project Know-How incorporates, references or is otherwise based on

the Project Data, the Intellectual Property Rights, the Jointly Developed Material, the Intellectual Property of the City, the Intellectual Property of any City Party or any third party provided by the City, the Confidential Information of the City, the Confidential Information of any City Party or any third party provided by the City, including the Output Specifications unless such use is otherwise permitted pursuant to this Project Agreement in order to enable Project Co and the Project Co Parties to meet Project Co's obligations under this Project Agreement.

- (b) Project Co hereby covenants and agrees that it will not make any commercial use, including use in any other request for proposal or similar procurement process, of the Project Data, the Intellectual Property Rights, the Jointly Developed Material, the Intellectual Property of the City, the Intellectual Property of any City Party or any third party provided by the City, the Confidential Information of the City, the Confidential Information of any City Party or any third party provided by the City, including the Output Specifications, or any other drawings, reports, documents, plans, formulae, calculations, manuals, or other data that was created specifically for the Project or was based upon the Project Data, the Intellectual Property Rights, the Jointly Developed Material, the Intellectual Property of the City, the Intellectual Property of any City Party provided by the City, the Confidential Information of the City, the Confidential Information of any City Party provided by the City, including the Output Specifications.
- (c) Nothing in this Section 49.9 shall be deemed to grant to any party (including any Subcontractor or any personnel thereof) any right or License in respect of any other party's or other persons' Intellectual Property.

50. CONFIDENTIALITY/COMMUNICATIONS

50.1 Disclosure

- (a) Subject to Sections 50.1(b), 50.1(c) and 50.2, but notwithstanding anything else in this Project Agreement to the contrary, Project Co acknowledges and agrees that, in accordance with the transparency and accountability principles of the IPFP Framework, the City has a right to disclose or publish (including on websites) this Project Agreement, any or all terms hereof, including any or all contractual submissions and other records kept in accordance with this Project Agreement, any information related to the performance of Project Co (or any Project Co Party) or any information derived from this Project Agreement or the information related to the performance of Project Co (or any Project Co Party) as the City, in its sole discretion, may consider appropriate. In exercising its discretion, the City will be guided by the principles set out in Sections 50.1(b) and 50.1(c).
- (b) The City will not disclose portions of this Project Agreement, any terms hereof, including any contractual submissions or other records kept in accordance with this Project Agreement, any information related to the performance of Project Co (or any Project Co Party) or any information derived from this Project Agreement or the information related to the performance of Project Co (or any Project Co Party) which would be exempt from disclosure under Section 17(1) of FIPPA.
- (c) Notwithstanding Section 50.1(b), but subject to Section 50.2, where a compelling public interest in the disclosure of the information clearly outweighs the public interest in limiting the disclosure of the information supplied by Project Co (or any Project Co Party), the City may disclose such information.

50.2 Redaction

- (a) Prior to disclosing or publishing this Project Agreement, any terms hereof, including any contractual submissions or other records kept in accordance with this Project Agreement, any information related to the performance of Project Co (or any Project Co Party) or any information derived from this Project Agreement or the information related to the performance of Project Co (or any Project Co Party), the City shall provide to Project Co a redacted version of this Project Agreement or other documents or information to be disclosed or published, on the basis that the information so redacted constitutes information which should not be disclosed pursuant to Section 50.1(b). The Parties acknowledge and agree that the Annual Service Payment, but not the breakdown thereof, may be disclosed.
- (b) If Project Co, acting in good faith, contends that any of the information not redacted constitutes information that falls within the scope of Section 50.1(b) and, accordingly, would be exempt from disclosure under FIPPA, the dispute may be referred for resolution in accordance with Schedule 26 - Dispute Resolution Procedure, and the City shall not disclose any information in dispute until a determination is made. Any such determination shall be made with reference to the text and principles of FIPPA.

50.3 Disclosure to Government

- (a) Project Co acknowledges and agrees that subject to compliance with FIPPA, the City will be free to use, disclose or publish (including on websites) any information, including Confidential Information, on such terms and in such manner as the City sees fit.
- (b) For greater certainty, Project Co acknowledges and agrees that, subject only to the removal of any information which Project Co is (or would be) entitled to refuse to disclose pursuant to section 17(1) of FIPPA, this Project Agreement, any contractual submissions or other records kept in accordance with this Project Agreement, any information related to the performance of Project Co (or any Project Co Party) or any information derived from this Project Agreement or the information related to the performance of Project Co (or any Project Co Party) are public documents and information and, as such, may be disclosed by the City.

50.4 Freedom of Information and Protection of Privacy Act (Ontario)

- (a) The Parties acknowledge and agree that FIPPA applies to the City, and that the City is required to fully comply with FIPPA.
- (b) The City shall, within the time periods provided in FIPPA for a party to exercise rights to prevent disclosure of information, advise Project Co of any request for Confidential Information that relates to Project Co (or any Project Co Party) or of the City's intention to voluntarily release any information or documents which contain Confidential Information that relates to Project Co (or any Project Co Party).

50.5 Use and Disclosure of Confidential Information

- (a) Except as authorized hereunder, each Party shall hold in confidence, not disclose and not permit any person any manner of access to, whether directly or indirectly, any Confidential Information

of the other Party, provided that this Section 50 shall not restrict either Party from disclosing such Confidential Information to its professional advisors, to the extent necessary, to enable that Party to perform, to cause to be performed, or to enforce, its rights or obligations under this Project Agreement.

- (b) Project Co may:
- (i) disclose in confidence to the Lenders and prospective Lenders, including any trustee or agent of the Lenders and the Lenders' Agent, and their respective professional advisors such Confidential Information as is reasonably required by the Lenders in connection with the raising or syndication of the financing or any sub-participation in the financing of the Works or which Project Co is obliged to supply by the terms of the Lending Agreements; and
 - (ii) disclose in confidence to any Project Co Party and their professional advisors, such Confidential Information as is necessary for the performance by that Project Co Party of that Project Co Party's obligations under this Project Agreement.
- (c) Project Co acknowledges that the City may use the Confidential Information of Project Co for purposes not specific to the Project, but for other general governmental purposes, such as development of the City's alternate procurement and financing policies and framework. the City will advise Project Co prior to using any Confidential Information of Project Co for non-Project purposes.
- (d) Subject to the foregoing, neither Party shall use, or directly or indirectly cause, authorize or permit any other person to use, any Confidential Information of the other Party except for the purposes of this Project Agreement, as permitted by this Project Agreement or as authorized by the disclosing Party in writing.
- (e) Each Party shall,
- (i) protect all Confidential Information of the disclosing Party with the same degree of care as it uses to prevent the unauthorized use, disclosure, publication, or dissemination of its own confidential information of a similar nature or character, but in no event with less than a reasonable degree of care;
 - (ii) if legally compelled to disclose any Confidential Information,
 - (A) provide the disclosing Party with prompt Notice to that effect to allow the disclosing Party to seek any appropriate remedies and cooperate with the disclosing Party and its legal counsel; and
 - (B) disclose only that portion of the Confidential Information that it is legally required to disclose; and
 - (iii) provide Confidential Information to the disclosing Party upon demand by the disclosing Party.

Section 50.5(e)(iii) shall not apply to Confidential Information in relation to which a Party has been provided a license pursuant to Schedule 35 – Intellectual Property provided that the use of such Confidential Information is in accordance with Schedule 35 – Intellectual Property.

- (f) Without limiting the generality of this Section 50.5, Project Co shall comply with the document control and security protocol submitted by Project Co pursuant to Section 20.10 and approved by the City, which protocol shall prescribe limitations on the use, disclosure and storage of this Project Agreement and any other Confidential Information specified by the City.

50.6 Exceptions

- (a) Information of a Party (the “**Proprietor**”), other than Government Sensitive Information and other than Personal Information, will not be considered to be Confidential Information in the following circumstances:
- (i) the Proprietor advises the other Party to whom the information has been disclosed (the “**Confidant**”) that the information is not required to be treated as Confidential Information;
 - (ii) the information is as of Commercial Close, or becomes at any time thereafter, generally available to or accessible by the public through no fault or wrongdoing of the Confidant;
 - (iii) the information is a matter of public record or in the public domain;
 - (iv) the information was in the possession of the Confidant prior to its disclosure and the Confidant came into possession of such information without being in breach of this Project Agreement;
 - (v) the information is received by the Confidant on a non-confidential basis from a source other than the Proprietor, provided that to the best of the Confidant’s knowledge such source is not bound by a confidentiality agreement with the Proprietor or otherwise prohibited from disclosing the information to the Confidant by a contractual, legal or fiduciary obligation;
 - (vi) the information was independently developed by the Confidant without access to the Confidential Information, as evidenced by written records;
 - (vii) the information is required to be disclosed pursuant to Applicable Law, provided that the Confidant provides the Proprietor with reasonable notification and an opportunity to contest such requirement prior to disclosure;
 - (viii) the information is disclosed to the City upon a termination of this Project Agreement, pursuant to Section 46 or is otherwise required by the City for the purposes of performing (or having performed) the Project Operations, including the design or construction of the System Infrastructure, the operation, maintenance or improvement of the System Infrastructure, or any other operations or services the same as, or similar to, the Project Operations, or to exercise any right granted pursuant to Schedule 35 – Intellectual Property that survives the termination of this Project Agreement; or

(ix) the information would not be exempt from disclosure under FIPPA.

50.7 Survival of Confidentiality

(a) The obligations in Section 50.1 to Section 50.6 will cease on the date that is 3 years after the Termination Date and accordingly shall survive the termination of the Project Agreement.

50.8 Communication and Stakeholder Engagement Obligations

(a) The Parties shall comply with the provisions of Schedule 18 - Communications and Stakeholder Engagement Obligations. The Revenue Vehicle Supplier shall not be required to comply with the provisions of Schedule 18 - Communications and Stakeholder Engagement Obligations.

50.9 Confidentiality of Intellectual Property

(a) Nothing in this Section 50 shall prevent the City from exercising any right granted to the City pursuant to Schedule 35 – Intellectual Property. The City shall have the right to disclose Confidential Information of Project Co Parties when exercising the rights granted pursuant to Schedule 35 – Intellectual Property in accordance therewith.

51. PERSONAL INFORMATION

51.1 General

- (a) Project Co acknowledges the importance of maintaining the confidentiality and privacy of Personal Information.
- (b) Project Co shall, and shall require each Project Co Party to, only collect, hold, process, use, store and disclose Personal Information with the prior consent of the City and: (i) shall not collect, hold, process, use or store Personal Information except to the extent necessary to perform Project Co's obligations under this Project Agreement; and (ii) shall not disclose Personal Information or otherwise permit access to or make Personal Information available to any person except as expressly permitted or instructed by the City.
- (c) Project Co shall, and shall require each Project Co Party to, at all times treat Personal Information as strictly confidential and shall comply with all applicable requirements of the Output Specifications and the requirements of Applicable Law, including FIPPA, the *Personal Information Protection and Electronic Documents Act* (Canada), and any other Canadian federal or provincial legislation now in force or that may in the future come into force governing the collection, use, disclosure and protection of personal information applicable to Project Co, each Project Co Party or to the Project Operations.
- (d) Project Co shall take all necessary and appropriate action, and shall require each Project Co Party to take all necessary and appropriate action, against any person who fails to comply with this Section 51.
- (e) Project Co shall allow the City on reasonable Notice to inspect any Personal Information in the custody or possession of Project Co or a Project Co Party and to audit Project Co and each Project Co Party's compliance with this Section 51 including the measures used by Project Co and each

Project Co Party to protect Personal Information, and otherwise promptly and properly respond to all reasonable inquiries of the City with respect to Project Co or each Project Co Party's handling of Personal Information.

- (f) Project Co shall not subcontract or delegate to any third party any of the Project Operations that involve or may involve the collection, use, storage, processing or any other handling of Personal Information without the express consent of the City and without obtaining written contractual commitments of such third party substantially the same as those of this Section 51.

51.2 Protection of Personal Information

- (a) Project Co shall implement and use, and shall require each Project Co Party to implement and use, appropriate technical, organizational and physical security measures to protect Personal Information against loss, theft and unauthorized access, disclosure, copying, use, modification or disposal, and shall otherwise ensure that Project Co, the Project Co Parties, and its and their staff shall protect, secure and keep confidential any Personal Information.
- (b) Project Co shall and shall cause each Project Co Party to restrict access to Personal Information to only those authorized employees and permitted Project Co Parties that require access to such Personal Information to fulfil their job requirements in connection with the Project Operations and that are subject to obligations of confidentiality and Personal Information protection no less stringent than those of this Section 51.
- (c) Upon termination of this Project Agreement or upon request of the City, whichever comes first, Project Co shall immediately cease all use of and return to the City or, at the direction of the City, dispose of, destroy or render permanently anonymous all Personal Information, in each case using appropriate technical, organizational and physical security measures to protect Personal Information against loss, theft and unauthorized access, disclosure, copying, use or modification.
- (d) To the extent that any of the Project Operations involve or may involve destruction or disposal of Personal Information, including any disposal or destruction pursuant to Section 51.2(c), such activities shall include, at a minimum, irreversible destruction, shredding or pulverizing of all documents, records or media containing Personal Information to a size or state that ensures that the document, record or other medium is permanently destroyed and that no information contained therein can be read, reconstructed or deciphered.
- (e) Project Co shall immediately inform the City of any actual or suspected loss, theft or accidental or unauthorized access, disclosure, copying, use, modification or destruction of Personal Information by Project Co or any Project Co Party or any other breach of this Section 51.
- (f) The City may from time to time require that Project Co and any Project Co Party or member of its or their staff execute and deliver within two Business Days of such request an agreement satisfactory to the City, acting reasonably, requiring such person to keep Personal Information confidential.

51.3 Personal Information

- (a) Project Co shall provide, and shall cause each Project Co Party to provide, in a timely manner, all necessary and reasonable information and co-operation to the City and to any regulatory or other governmental bodies or authorities with jurisdiction or oversight over Applicable Law governing the collection, use, disclosure and protection of personal information in connection with any investigations, audits or inquiries made by any such bodies or authorities under such legislation.
- (b) To the extent of any conflict or inconsistency between this Section 51 and any other provision of the Project Agreement, this Section 51 shall prevail.
- (c) The obligations in this Section 51 shall survive the termination of this Project Agreement.

52. INSURANCE AND PERFORMANCE SECURITY

52.1 General Requirements

- (a) Project Co and the City shall comply with the provisions of Schedule 24 - Insurance and Performance Security Requirements.

52.2 No Relief from Liabilities and Obligations

- (a) Neither compliance nor failure to comply with the insurance provisions of this Project Agreement shall relieve Project Co or the City of their respective liabilities and obligations under this Project Agreement.

53. TITLE

53.1 Title

- (a) Title to each item and part of the System Infrastructure or the New Municipal Infrastructure, including any materials, supplies, equipment, facilities, parts and any other deliverable or component items, but not the risk of loss or damage or destruction thereto or therefrom, shall pass to the City (or as the City may direct) upon the receipt of such item on the Lands, provided however that title to items of tangible personal property (personal property that can be seen, weighed, measured, felt or touched or that is in any way perceptible to the senses and includes computer programs, natural gas and manufactured gas) that comprise the System Infrastructure and the New Municipal Infrastructure or are to be affixed or attached to the System Infrastructure and the New Municipal Infrastructure prior to Substantial Completion shall pass to the City (or as the City may direct) at the time that such items are included in the System Infrastructure and the New Municipal Infrastructure or are to be affixed or attached to the System Infrastructure and the New Municipal Infrastructure.

54. INDEMNITIES

54.1 Project Co Indemnities to the City

- (a) Project Co shall indemnify and save harmless the City and City Parties and each of their respective directors, officers, employees, agents and representatives from and against any and all Direct Losses which may be suffered, sustained, incurred or brought against them as a result of, in respect of, or arising out of any one or more of the following:

- (i) a failure by Project Co to achieve Substantial Completion by the Scheduled Substantial Completion Date;
- (ii) any physical loss of or damage to all or any part of the Lands, lands that are adjacent to the Lands (but that are not Lands), the System Infrastructure or of any part of the New Municipal Infrastructure prior to being handed over to the City pursuant to Section 25.13, or to any equipment, assets or other property related thereto;
- (iii) the death or personal injury of any person;
- (iv) any physical loss of or damage to property or assets of any third party including, for clarity, any physical loss of or damage to the System Infrastructure, or New Municipal Infrastructure after Handover to the City;
- (v) any other loss or damage of any third party (except for Injurious Affection claims under (vi)); or
- (vi) Injurious Affection claims made by third parties,

in the case of Section 54.1(a)(i) to Section 54.1(a)(v), arising, directly or indirectly, out of, or in consequence of, or involving or relating to, the performance or any breach of this Project Agreement by Project Co or any act or omission of Project Co or any Project Co Party, and in the case of Section 54.1(a)(vi) arising, directly or indirectly, out of, or in consequence of, or involving or relating to, any breach of this Project Agreement by Project Co or any Project Co Party, except, in all cases, to the extent caused, or contributed to, by:

- (vii) the breach of this Project Agreement by the City; or
 - (viii) in respect of Section 54.1(a)(i), deliberate or negligent act or omission of the City or any City Party; or
 - (ix) in respect of Sections 54.1(a)(ii), 54.1(a)(iii), 54.1(a)(iv), 54.1(a)(v) or 54.1(a)(vi), any act or omission of the City or any City Party; or
 - (x) a deliberate or negligent act or omission of a System User that results in undue interference with Project Co's performance of the Maintenance and Rehabilitation Services and Project Co has been unable to take commercially reasonable steps necessary to prevent, negate or mitigate the undue interference due to acting in accordance with a recommendation or instruction of the City or an appropriate City Party, except to the extent:
 - (A) any such deliberate or negligent act or omission is caused or contributed to by Project Co or any Project Co Party; or
 - (B) the System User is acting in accordance with a direction, recommendation or instruction of Project Co or any Project Co Party.
- (b) Project Co shall indemnify and save harmless the City and each of its directors, officers, employees, agents and representatives from and against any and all Direct Losses which may be

suffered, sustained, incurred or brought against them as a result of, in respect of, or arising out of any breach of a representation or warranty by Project Co herein.

- (c) Project Co shall indemnify and save harmless the City and each of its directors, officers, employees, agents and representatives from and against any and all Direct Losses which may be suffered, sustained, incurred or brought against them as a result of, in respect of, arising out of, or involving or relating to any one or more of the following:
- (i) the performance by Project Co of this Project Agreement not in accordance with or in breach of the requirements of any Permits, Licences, Approvals and Authorizations, Applicable Law or requirements of Governmental Authorities, or the failure of Project Co to obtain all necessary Project Co Permits, Licences, Approvals and Authorizations in accordance with this Project Agreement;
 - (ii) any Contamination on, in or under, or migrating to or from, the Lands, for which Project Co is responsible pursuant to Section 16.2; or
 - (iii) the provision of assistance by the City to Project Co pursuant to Section 9.7(e), except to the extent that such Direct Losses are caused, or contributed to, by the breach of this Project Agreement by the City or by any act or omission of the City or any City Party.
- (d) Without prejudice to the City's rights under Section 43 and any other rights under this Project Agreement, if the City exercises its step-in rights under any Direct Agreement, Project Co shall indemnify the City for all obligations of Project Co assumed by the City under the Contracts, and for all reasonable costs and expenses incurred by the City in relation to the exercise of the City's rights.
- (e) Project Co shall indemnify the City for damages suffered or incurred on account of: (i) any payment not duly made by Project Co pursuant to the terms of this Project Agreement on the due date; (ii) any overpayment to or underpayment by Project Co; or (iii) an amount determined as payable by Project Co to the City under Schedule 26 - Dispute Resolution Procedure, by payment of an amount equal to the Payment Compensation Amount calculated from the day after the date on which payment was due, the day on which overpayment was made by the City, or from the date identified (if any) applicable to an amount determined as payable by Project Co to the City under Schedule 26 - Dispute Resolution Procedure, up to and including the date of payment.
- (f) Project Co shall defend, in accordance with the procedures of Section 54.3, and indemnify and save harmless the City and City Parties and each of their respective directors, officers, employees, agents and representatives from and against any and all Direct Losses which may be suffered, sustained, incurred or brought against them as a result of, in respect of, or arising out of any one or more of the following:
- (i) any breach of Section 49.3;
 - (ii) any claim, suit, action or proceeding by a Person alleging that (x) any Intellectual Property Licensed or assigned to and used by the City pursuant to this Project Agreement; or (y) any Intellectual Property or other materials used by Project Co or any

Project Co Party or any Subcontractor in the performance of the Project Operations and the Project, infringes or misappropriates any Intellectual Property rights of that Person, other than where such claim, suit, action or proceeding is directly caused by,

- (A) the use of such Intellectual Property by the City not in accordance with this Project Agreement or the applicable Technical Information; or
 - (B) the use of such Intellectual Property by the City in combination with other products, software or equipment not supplied by or on behalf of Project Co or the Subcontractors and not authorized by any of them;
 - (iii) any claim, suit, action or proceeding by any Lessor alleging that Project Co or any Project Co Party or any Subcontractor has used any City Supplied Third Party Intellectual Property in breach of Sections 3.1(a)(ii), 3.1(b), 3.1(c) or 3.1(d) of Schedule 35 – Intellectual Property.
- (g) Without limiting and in addition to the obligations in Section 54.1(f), if, as a result of a claim under Section 54.1(f)(i) or Section 54.1(f)(ii), all or any part of any Intellectual Property Licensed or assigned to and used by the City pursuant to this Project Agreement; or any Intellectual Property or other materials used by Project Co or any Subcontractor in the performance of the Project Operations and the Project (any or all of the foregoing the “**Infringing Material**”) becomes, or in Project Co’s opinion is likely to be, enjoined from use, Project Co will:
- (i) give notice to the City of the same; and
 - (ii) at its sole option and expense, either:
 - (A) procure for itself and the City, to the extent required, the right to continue to use the infringing element or component of the Infringing Material as contemplated in this Project Agreement; or
 - (B) modify the infringing element or component of the Infringing Material so that it is non-infringing without materially affecting the quality, performance and functionality of such infringing element or component, or replace the infringing element or component with a substitute of materially equivalent quality, performance and functionality.

54.2 City Indemnities to Project Co

- (a) The City shall indemnify and save harmless Project Co and the Project Co Parties and each of their respective directors, officers, employees, agents and representatives from and against any and all Direct Losses which may be suffered, sustained, incurred or brought against them as a result of, in respect of, or arising out of any one or more of the following:
- (i) the death or personal injury of any person arising, directly or indirectly, out of, or in consequence of, or involving or relating to, the performance or breach of this Project Agreement by the City or any act or omission of any City Party, except to the extent caused, or contributed to, by the breach of this Project Agreement by Project Co or by any act or omission of Project Co or any Project Co Party;

- (ii) any physical loss of or damage to all or any part of any property or assets of Project Co or any Project Co Party, arising, directly or indirectly, out of, or in consequence of, or involving or relating to, breach of this Project Agreement by the City or any deliberate or negligent act or omission of any City Party, except to the extent caused, or contributed to, by the breach of this Project Agreement by Project Co or by any act or omission of Project Co or any Project Co Party; and
- (iii) any physical loss of or damage to property or assets of any third party, or any other loss or damage of any third party, arising, directly or indirectly, out of, or in consequence of, or involving or relating to, breach of this Project Agreement by the City or any deliberate or negligent act or omission of any City Party, except to the extent caused, or contributed to, by the breach of this Project Agreement by Project Co or by any act or omission of Project Co or any Project Co Party,

provided that there shall be excluded from the indemnity given by the City any liability for the occurrence of risks against which Project Co is required to insure under this Project Agreement to the extent of the proceeds available or that should have been available but for a failure by Project Co to comply with its obligations to properly insure under this Project Agreement.

- (b) The City shall indemnify and save harmless Project Co and its directors, officers, employees, agents and representatives from and against any and all Direct Losses which may be suffered, sustained, incurred or brought against them as a result of, in respect of, or arising out of any breach of a representation or warranty by the City herein.
- (c) The City shall indemnify Project Co for damages suffered or incurred on account of: (i) any payment not duly made by the City pursuant to the terms of this Project Agreement on the due date; (ii) any overpayment to or underpayment by the City; or (iii) an amount determined as payable by the City to Project Co under Schedule 26 - Dispute Resolution Procedure, by payment of an amount equal to the Payment Compensation Amount calculated from the day after the date on which payment was due, the day on which overpayment was made by Project Co, or from the date identified (if any) applicable to an amount determined as payable by the City to Project Co under Schedule 26 - Dispute Resolution Procedure, up to and including the date of payment.
- (d) The City shall indemnify and save harmless Project Co and its directors, officers, employees, agents and representatives from and against any and all Direct Losses which may be suffered, sustained, incurred or brought against them as a result of, in respect of, or arising out of any breach of a representation or warranty by the City set out in Section 5.2(a).

54.3 Conduct of Claims

- (a) This Section 54.3 shall apply to the conduct of claims, made by a third person against a Party having, or claiming to have, the benefit of an indemnity pursuant to this Project Agreement. The Party having, or claiming to have, the benefit of the indemnity is referred to as the "**Beneficiary**" and the Party giving the indemnity is referred to as the "**Indemnifier**".
- (b) If the Beneficiary receives any Notice, demand, letter or other document concerning any claim for which it appears that the Beneficiary is, or may become entitled to, indemnification under this Section 54, the Beneficiary shall give written Notice to the Indemnifier as soon as reasonably

practicable and in any event within 10 Business Days of receipt of the same. Such Notice shall specify with reasonable particularity, to the extent that information is available, the factual basis for the claim and the amount of the claim.

- (c) Subject to Sections 54.3(d), 54.3(e) and 54.3(f), on the giving of such Notice by the Beneficiary, where it appears that the Beneficiary is or may be entitled to indemnification from the Indemnifier in respect of all, but not part only, of the liability arising out of the claim, the Indemnifier shall (subject to providing the Beneficiary with a secured indemnity to the Beneficiary's reasonable satisfaction against all costs and expenses that the Beneficiary may incur by reason of such action) be entitled to dispute the claim in the name of the Beneficiary at the Indemnifier's own expense and take conduct of any defence, dispute, compromise, or appeal of the claim and of any incidental negotiations. The Beneficiary shall give the Indemnifier all reasonable cooperation, access and assistance for the purposes of considering and resisting such claim. The Beneficiary shall have the right to employ separate counsel in respect of such claim and the reasonable fees and expenses of such counsel shall be to the account of the Indemnifier only where representation of both the Indemnifier and Beneficiary by common counsel would be inappropriate due to any actual or potential conflicting interests between the Indemnifier and Beneficiary.
- (d) With respect to any claim conducted by the Indemnifier:
 - (i) the Indemnifier shall keep the Beneficiary fully informed and consult with it about material elements of the conduct of the claim;
 - (ii) the Indemnifier shall not bring the name or reputation of the Beneficiary into disrepute;
 - (iii) the Indemnifier shall not pay, compromise or settle such claims without the prior consent of the Beneficiary, such consent not to be unreasonably withheld or delayed;
 - (iv) the Indemnifier shall not admit liability or fault to any third party without the prior consent of the Beneficiary, such consent not to be unreasonably withheld or delayed; and
 - (v) the Indemnifier shall use commercially reasonable efforts to have the Beneficiary named as a beneficiary under any release given by the persons bringing the claim to which this Section 54.3 relates.
- (e) The Beneficiary shall be free to pay or settle any such claim on such terms as it thinks fit and without prejudice to its rights and remedies under this Project Agreement if:
 - (i) the Indemnifier is not entitled to take conduct of the claim in accordance with Section 54.3(c);
 - (ii) the Indemnifier fails to notify the Beneficiary of its intention to take conduct of the relevant claim within 10 Business Days of the Notice from the Beneficiary under Section 54.3(b) or notifies the Beneficiary that the Indemnifier does not intend to take conduct of the claim; or
 - (iii) the Indemnifier fails to comply in any material respect with Section 54.3(d).

- (f) The Beneficiary shall be free at any time to give Notice to the Indemnifier that the Beneficiary is retaining or taking over, as the case may be, the conduct of any defence, dispute, compromise or appeal of any claim, or of any incidental negotiations, to which Section 54.3(c) applies. For greater certainty, Project Co acknowledges and agrees that where the City is the Beneficiary, the City may retain or take over such conduct in any matter involving Personal Information or any matter involving public policy. On receipt of such Notice the Indemnifier shall promptly take all steps necessary to transfer the conduct of such claim to the Beneficiary, and shall provide to the Beneficiary all relevant documentation and all reasonable cooperation, access and assistance for the purposes of considering and resisting such claim. If the Beneficiary gives any Notice pursuant to this Section 54.3(f), then the Indemnifier shall be released from any liabilities arising under the applicable indemnity hereunder in respect of the applicable claim.
- (g) If the Indemnifier pays to the Beneficiary an amount in respect of an indemnity and the Beneficiary subsequently recovers, whether by payment, discount, credit, saving, relief or other benefit or otherwise, a sum or anything else of value (the “**Recovery Amount**”) which is directly referable to the fact, matter, event or circumstances giving rise to the claim under the indemnity, the Beneficiary shall forthwith repay to the Indemnifier whichever is the lesser of:
- (i) an amount equal to the Recovery Amount less any out-of-pocket costs and expenses properly incurred by the Beneficiary in recovering the same; and
 - (ii) the amount paid to the Beneficiary by the Indemnifier in respect of the claim under the relevant indemnity,
- provided that there shall be no obligation on the Beneficiary to pursue any Recovery Amount and that the Indemnifier is repaid only to the extent that the Recovery Amount, aggregated with any sum recovered from the Indemnifier, exceeds the loss sustained by the Beneficiary except, however, that if the Beneficiary elects not to pursue a Recovery Amount, the Indemnifier shall be entitled to require an assignment to it of the right to do so.
- (h) Any person taking any of the steps contemplated by this Section 54.3 shall comply with the requirements of any insurer who may have an obligation to provide an indemnity in respect of any liability arising under this Project Agreement.

54.4 Mitigation - Indemnity Claims

- (a) For greater certainty, Section 62.4 applies to any indemnity given under this Project Agreement and any such indemnity shall not extend to Direct Losses which could have been reduced or avoided by the Beneficiary complying with such Section.

55. LIMITS ON LIABILITY

55.1 Indirect Losses

- (a) Subject to Section 55.1(b), without prejudice to the City’s rights under the Payment Mechanism, or the Parties’ rights in respect of payments provided for herein, the indemnities under this Project Agreement shall not apply and there shall be no right to claim damages for breach of this

Project Agreement, in tort or on any other basis whatsoever, to the extent that any loss claimed by either Party is:

- (i) for punitive, exemplary or aggravated damages;
- (ii) for loss of profits, loss of use, loss of production, loss of business or loss of business opportunity; or
- (iii) a claim for consequential loss or for indirect loss of any nature suffered or allegedly suffered by either Party,

(collectively, "**Indirect Losses**").

- (b) With respect to the indemnity in Section 54.1(a)(i), the exceptions in Sections 55.1(a)(ii) and (iii) shall not apply as a result of, or in relation to, the City's loss of use of the System Infrastructure or the New Municipal Infrastructure or a portion thereof, which for the purposes of Section 54.1(a)(i), shall be Direct Losses.

55.2 No Liability in Tort

- (a) Subject to the indemnities provided herein, neither the City nor any City Party shall be liable in tort to Project Co or any Project Co Party, and neither Project Co nor any Project Co Party shall be liable in tort to the City or any City Party in respect of any negligent act or omission of any such person relating to or in connection with this Project Agreement and no such person shall bring such a claim.

55.3 Sole Remedy

- (a) Subject to:
 - (i) any other rights of the City expressly provided for in this Project Agreement; and
 - (ii) the City's right to claim, on or after termination of this Project Agreement, the amount of its reasonable costs, losses, damages and expenses suffered or incurred by it as a result of rectifying or mitigating the effects of any breach of this Project Agreement by Project Co except to the extent that the same has already been recovered by the City pursuant to this Project Agreement or has been taken into account to reduce any compensation payable by the City pursuant to Section 47,

the sole remedy of the City in respect of a failure to perform the Maintenance and Rehabilitation Services in accordance with this Project Agreement shall be the operation of the Payment Mechanism.

- (b) Nothing in Section 55.3(a) shall prevent or restrict the right of the City to seek injunctive relief or a decree of specific performance or other discretionary remedies of a court of competent jurisdiction.
- (c) Notwithstanding any other provision of this Project Agreement, and except to the extent recovered under any of the insurances required pursuant to Schedule 24 - Insurance and

Performance Security Requirements, neither Party shall be entitled to recover compensation or make a claim under this Project Agreement, or any other agreement in relation to the Project, in respect of any loss that it has incurred (or any failure of the other Party) to the extent that the Party has already been compensated in respect of that loss or failure pursuant to this Project Agreement, or otherwise.

- (d) For clarity, the following shall apply with respect to the following deductions and liquidated damages set out in the Project Agreement:
- (i) the liquidated damages paid by Project Co pursuant to Section 25.4 and any amounts recovered under the indemnity in Section 54.1(a)(i) shall be the sole remedy in respect of (A) Project Co's failure to achieve Substantial Completion by the date established pursuant to Section 25.4(a) and (B) Project Co's failure to achieve Substantial Completion by the Scheduled Substantial Completion Date, but, for clarity, shall not limit the City's termination rights otherwise provided for herein;
 - (ii) the liquidated damages paid by Project Co pursuant to Section 10.4 shall be the sole financial remedy in respect of failure by Project Co to provide the Key Individuals named in Schedule 9 – Key Individuals (in respect of the Works) immediately after Commercial Close, but, for clarity, shall not be the City's sole remedy with respect to damages that may otherwise be incurred by the City with respect to a delay to the Project caused by Project Co as a result of Project Co's contravention of Section 10.4;
 - (iii) the liquidated damages paid by Project Co pursuant to Section 23.5 shall be the sole remedy in respect of Project Co's failure to obtain the minimum number of points required pursuant to Section 23.3(b) and to obtain LEED® Canada Certified 24 months after the Substantial Completion Date (where such failure is not as a direct result of any act or omission of the City or any City Party); and
 - (iv) the amounts deducted from the Substantial Completion Payment pursuant to Schedule 20 – Construction Period Payments shall not be the City's sole remedy in respect of Project Co's failure to perform in accordance with the Project Agreement.

55.4 Maximum Liability

- (a) Subject to Section 55.4(b), the maximum aggregate liability of each Party, shall,
- (i) in respect of all claims under Section 54 which arise during or are in respect of the Construction Period, not exceed \$[REDACTED] (the “**Construction Period Limit**”); and
 - (ii) in respect of all claims under Section 54 which arise during or are in respect of the Maintenance Period, not exceed \$[REDACTED] (the “**Maintenance Period Limit**”),

provided that the Construction Period Limit and the claims associated therewith shall be exclusive of the Maintenance Period Limit and the claims associated therewith. The Construction Period Limit and Maintenance Period Limit shall be index linked and shall be exclusive of any insurance or performance security proceeds received or which will be received pursuant to

performance security or policies maintained in accordance with Schedule 24 - Insurance and Performance Security Requirements. Neither the Construction Period Limit nor the Maintenance Period Limit shall apply in cases of wilful misconduct or deliberate acts of wrongdoing.

- (b) Project Co's maximum aggregate liability in respect of all claims under Section 54.1(a)(i) and the liquidated damages paid by Project Co pursuant to Section 25.4 shall not exceed \$[REDACTED]. This limit shall be included within Project Co's Construction Period Limit, shall be index linked and shall be exclusive of any insurance or performance security proceeds received or which will be received pursuant to policies maintained in accordance with Schedule 24 - Insurance and Performance Security Requirements. This limit shall not apply in cases of wilful misconduct or deliberate acts of wrongdoing.
- (c) Nothing in this Section 55.4 shall restrict, limit, prejudice or in any other way impair the rights and/or remedies of the Parties under any other provision of this Project Agreement.
- (d) For clarity, nothing in this Section 55.4 shall restrict or limit, or establish any maximum liability, in respect of any amount payable, by Project Co to the City, as the Lane Closure Adjustments pursuant to Schedule 7 – Mobility Matters.

56. DISPUTE RESOLUTION PROCEDURE

- (a) All Disputes shall be resolved in accordance with, and the Parties shall comply with, Schedule 26 - Dispute Resolution Procedure.

57. ASSIGNMENT, SUBCONTRACTING AND CHANGES IN CONTROL

57.1 Project Co Assignment

- (a) Project Co shall not assign, transfer, charge, dispose of or otherwise alienate any interest in this Project Agreement, any of the Contracts or any agreement entered into in connection with this Project Agreement without the prior written consent of the City, which shall not be unreasonably withheld or delayed, and which shall, in any event, be conditional upon Project Co paying to the City any amount calculated under Section 57.6(a)(ii) and that no assignment, transfer, charge, disposition or other alienation shall be permitted to a person where that person or its Affiliate is a Restricted Person or a person whose standing or activities may compromise (i) the City's reputation or integrity, or (ii) the nature of the public transit system in the City of Ottawa so as to affect public confidence in the public transit system in the City of Ottawa or the Project.
- (b) Section 57.1(a) shall not apply to the grant of any security for any loan made to Project Co under the Lending Agreements provided that any grantee of such security shall enter into the Lenders' Direct Agreement in relation to the exercise of its rights, if the City so requires.

57.2 Assignment by the City

- (a) The City, upon providing written notice to Project Co, may assign, transfer, dispose of or otherwise alienate any interest in this Project Agreement or any agreement in connection with this Project Agreement to which Project Co and the City are parties:
 - (i) to the Province;

- (ii) as may be required to comply with Applicable Law;
 - (iii) to any minister of the Province;
 - (iv) to an agency of the Province having the legal capacity, power, authority and ability to become a party to and to perform the obligations of the City under this Project Agreement provided that such person confirms in writing to Project Co that it will perform all of the City's obligations hereunder and under the other Project Documents to which the City is party in respect of the period from and after the assignment; and
 - (v) in circumstances other than those described in Sections 57.2(a)(i) to 57.2(a)(iv), with the prior written consent of Project Co; provided that the person to whom any such assignment, transfer, disposition or other alienation is made has the capacity to perform, and confirms in writing to Project Co that it will perform all the obligations of the City hereunder and under any agreement in connection with this Project Agreement to which Project Co and the City are parties in respect of the period from and after the assignment.
- (b) The City shall not be released of any of its obligations under this Project Agreement except upon an assignment, transfer, disposition or other alienation of its interest in this Project Agreement in accordance with this Section 57.2.

57.3 Subcontractors

- (a) Project Co shall not subcontract any interest in this Project Agreement, or any of the Contracts, and shall not permit the Contractors to subcontract any interest in any of the Contracts to a Restricted Person, or any Affiliate thereof, or a person whose standing or activities may compromise (i) the City's reputation or integrity, or (ii) the nature of the public transit system in the City of Ottawa so as to affect public confidence in the public transit system in the City of Ottawa or the Project.
- (b) Project Co shall not terminate, agree to the termination of or replace any Contractor unless Project Co has complied with Sections 7.2(a), 57.3(c) and 57.3(d) or received the prior written consent of the City.
- (c) Subject to Section 57.3(d), if any of the Contracts shall at any time lapse, terminate or otherwise cease to be in full force and effect, whether by reason of expiry, default or otherwise, with the effect that the Contractor, shall cease to act in relation to the Project, Project Co shall forthwith appoint a replacement, subject to the City's prior written consent, acting reasonably, as to the suitability of the replacement.
- (d) It is a condition of replacement of the Construction Contractor, Maintenance and Rehabilitation Contractor and Revenue Vehicle Supplier that, and Project Co shall require that, any replacement enter into a contract upon the same or substantially similar terms as the person so replaced and into a direct agreement on the same terms as the Direct Agreement entered into by the person so replaced, unless any material variations are approved by the City, acting reasonably.

57.4 Changes in Ownership and Control

- (a) No Restricted Person or a person whose standing or activities are inconsistent with the City's reputation or integrity shall be permitted to have at any time or acquire, Direct or Indirect Power or Control over any member of the Project Co Group in relation to the decisions, management, actions or policies of Project Co or in relation to the operation, management and ownership of the Project.
- (b) No Change in Ownership of Project Co, or of any Control Party, shall be permitted:
 - (i) where the person acquiring the ownership interest is a Restricted Person or a person whose standing or activities may compromise (A) the City's reputation or integrity, or (B) the nature of the public transit system in the City of Ottawa so as to affect public confidence in the public transit system in the City of Ottawa or the Project; or
 - (ii) if such Change in Ownership would have a material adverse effect on the performance of the Project Operations, the Governmental Activities or the availability of the System Infrastructure to System Users.
- (c) In the event that a person having Direct or Indirect Power or Control over any member of the Project Co Group in relation to the decisions, management, actions or policies of Project Co or in relation to the operation, management and ownership of the Project becomes a Restricted Person, the City may:
 - (i) in the case of an individual who becomes a Restricted Person, require that such Restricted Person be divested of his or her Direct or Indirect Power or Control; or
 - (ii) in any other circumstance, require a Change in Ownership so that the Restricted Person shall be divested of its Direct or Indirect Power or Control,in each case, on such terms as are satisfactory to the City, in its discretion.
- (d) Project Co shall provide notice to the City of any Change in Ownership of Project Co or of any Control Party, as the case may be, that is not a Change in Control within 5 Business Days after such Change in Ownership, and such notice shall include:
 - (i) a statement identifying all persons with an ownership interest in Project Co or the relevant Control Party, as the case may be, and their respective holdings of such ownership interests, in each case prior to and following such Change in Ownership; and
 - (ii) a statement identifying the Excess Equity Gain arising from such Change in Ownership together with supporting calculations and documents.
- (e) Subject to Sections 57.4(a), (b) and (c) and to the payment by Project Co of any Excess Equity Gain under Section 57.6(a)(i), no Change in Control of Project Co, or of any Control Party, shall be permitted without the prior written consent of the City, not to be unreasonably withheld or delayed.
- (f) Project Co shall provide notice to the City of any proposed Change in Control of Project Co or of any Control Party, as the case may be, not less than 20 Business Days prior to such proposed Change in Control, and such notice shall include:

- (i) a statement identifying all persons with an ownership interest in Project Co or the relevant Control Party, as the case may be, and their respective holdings of such ownership interests in each case prior to and following any such proposed Change in Control;
- (ii) as applicable, the legal name, registered address, directors and officers of, and nature of the business and activities carried on by, the person who would acquire control over Project Co or the relevant Control Party pursuant to such Change in Control; and
- (iii) a statement identifying the Excess Equity Gain which would arise from such proposed Change in Control together with supporting calculations and documents.

Following the delivery to the City of the notice referred to in this Section 57.4(f), Project Co shall provide the City with such other information pertaining to the proposed Change in Control as the City may reasonably request.

- (g) Upon request by Project Co and delivery of the information required by the City, the City shall advise Project Co whether the person described in such particulars is a Restricted Person or a person whose standing or activities may compromise (A) the City's reputation or integrity, or (B) the nature of the public transit system in the City of Ottawa so as to affect public confidence in the public transit system in the City of Ottawa or the Project.
- (h) Notwithstanding the definition of "Control Parties" set out Schedule 1 – Definitions and Interpretation, this Section 57.4 shall not apply to a Change in Ownership or Change in Control of persons whose equity securities or units evidencing ownership or any other ownership interests are listed on a recognized stock exchange.

57.5 City's Due Diligence

- (a) Project Co shall promptly reimburse the City for the City's reasonable due diligence costs (including fees of professional advisors) in connection with any consent required of the City pursuant to, or the City's determination of Project Co's compliance with, Sections 57.1, 57.3 or 57.4, whether or not such consent is granted.

57.6 Gain Share

- (a) The City shall be entitled to receive a [REDACTED]% share of:
 - (i) any Excess Equity Gain arising from a Change in Ownership of Project Co; and
 - (ii) the amount from the proceeds of a sale of any of Project Co's assets to a third party, which sale includes an assignment, transfer, disposition of or other alienation of an interest in the Project Agreement by Project Co made in accordance with Section 57.1, that is equal to the amount that would have been payable in accordance with Section 57.6(a)(i) if such sale had proceeded as a Change in Ownership of Project Co.

For all sales of Equity Capital subsequent to the initial sale, Threshold Equity Sale Amount shall mean an Equity Sale Amount that would result in an Equity Sale IRR equal to the Equity Sale IRR of the previous sale of Equity Capital.

58. PROHIBITED ACTS

58.1 Definition

(a) The term “**Prohibited Act**” means:

- (i) offering, giving or agreeing to give to the City or any public body (or anyone employed by or acting on their behalf), or to any family member of such person, any gift or consideration of any kind as an inducement or reward:
 - (A) for doing or not doing, or for having done or not having done, any act in relation to the obtaining or performance of this Project Agreement or any other agreement with the City or any public body in connection with the Project; or
 - (B) for showing or not showing favour or disfavour to any person in relation to this Project Agreement or any other agreement with the City or any public body in connection with the Project;

provided that this Section 58.1(a)(i) shall not apply to Project Co or any Project Co Party (or anyone employed by or acting on their behalf) providing consideration to the City or any public body in the ordinary course, or as reasonably necessary, to fulfill or comply with the obligations and liabilities of Project Co under this Project Agreement or any other agreement with the City or any public body in connection with the Project;

- (ii) entering into this Project Agreement or any other agreement with the City or any public body in connection with the Project if a commission or a fee has been paid or has been agreed to be paid by Project Co, or on its behalf or to its knowledge, to the City or any public body (or anyone employed by or acting on their behalf), or to any family member of such person, unless, before the relevant agreement is entered into, particulars of any such commission or fee have been disclosed in writing to the City, provided that this Section 58.1(a)(ii) shall not apply to a fee or commission paid by Project Co or any Project Co Party (or anyone employed by or acting on their behalf) to the City or any public body pursuant to an agreement where such fee or commission is paid in the ordinary course, or as reasonably necessary, to fulfill or comply with the obligations and liabilities of Project Co under this Project Agreement or any other agreement with the City or any public body in connection with the Project without contravening the intent of this Section 58;
- (iii) breaching or committing any offence under Applicable Law in respect of corrupt or fraudulent acts in relation to this Project Agreement or any other agreement with the City or any public body in connection with the Project; or
- (iv) defrauding or attempting to defraud or conspiring to defraud the City or any other public body.

58.2 Remedies

(a) If Project Co or any Project Co Party (or anyone employed by or acting on their behalf) commits any Prohibited Act, then the City shall be entitled to act in accordance with the following:

- (i) if the Prohibited Act is committed by Project Co or by an employee acting under the direction of a director or officer of Project Co, then the City may give written Notice to Project Co and Section 43 shall apply;
 - (ii) if the Prohibited Act is committed by an employee of Project Co acting independently of a direction of a director or officer of Project Co, then the City may give written Notice to Project Co and Section 43 shall apply, unless, within 30 days of receipt of such Notice, Project Co terminates the employee's employment and ensures that the relevant part of the Project Operations shall be performed by another person;
 - (iii) if a Prohibited Act is committed by a Project Co Party or by an employee of that Project Co Party not acting independently of a direction of a director or officer of that Project Co Party, then the City may give written Notice to Project Co and Section 43 shall apply, unless, within 30 days of receipt of such Notice, Project Co terminates the relevant Subcontract and ensures that the relevant part of the Project Operations shall be performed by another person, where relevant, in accordance with Section 57.3;
 - (iv) if the Prohibited Act is committed by an employee of a Project Co Party acting independently of a direction of a director or officer of that Project Co Party, then the City may give Notice to Project Co and Section 43 shall apply, unless, within 30 days of receipt of such Notice, Project Co causes the termination of the employee's employment and ensures that the relevant part of the Project Operations shall be performed by another person; and
 - (v) if the Prohibited Act is committed on behalf of Project Co or a Project Co Party by a person not specified in Sections 58.2(a)(i) to 58.2(a)(iv), then the City may give Notice to Project Co and Section 43 shall apply, unless, within 30 days of receipt of such Notice, Project Co causes the termination of such person's employment or the appointment of their employer and, if necessary, ensures that the relevant part of the Project Operations shall be performed by another person.
- (b) Any Notice of termination under this Section 58.2 shall specify:
- (i) the nature of the Prohibited Act;
 - (ii) the identity of the person whom the City believes has committed the Prohibited Act; and
 - (iii) the date of termination in accordance with the applicable provisions of this Project Agreement.
- (c) Without prejudice to its other rights or remedies under this Section 58.2, the City shall be entitled to recover from Project Co any Direct Loss sustained in consequence of any breach of this Section 58.
- 58.3 Permitted Payments**
- (a) Nothing contained in this Section 58 shall prevent Project Co or any other person from paying any proper commission, fee or bonus whether to its employees within the agreed terms of their

employment or otherwise, and such commission fee or bonus shall not constitute a Prohibited Act.

58.4 Notification

- (a) Project Co shall notify the City of the occurrence and details of any Prohibited Act promptly on Project Co becoming aware of its occurrence.

58.5 Replacement of Project Co Party

- (a) Where Project Co is required to replace any Project Co Party pursuant to this Section 58, the party replacing such Project Co Party shall from the time of the replacement be deemed to be a Project Co Party and the provisions of this Project Agreement shall be construed accordingly.

59. NOTICES

59.1 Notices to Parties

- (a) All notices, requests, demands, instructions, certificates, consents and other communications (each being a “**Notice**”) required or permitted under this Project Agreement shall be in writing (whether or not “written notice” or “notice in writing” is specifically required by the applicable provision of this Project Agreement) and served by sending the same by registered mail, facsimile or by hand, as follows:

If to Project Co:

[REDACTED]

Email: [REDACTED]

Attn.: [REDACTED]

If to City of Ottawa:

City of Ottawa
110 Laurier Ave West
Ottawa, Ontario K1P 1J1
Mail code: [REDACTED]

Email: [REDACTED]

Attn: [REDACTED]

59.2 Notices to Representatives

- (a) In addition to the notice requirements set out in Section 59.1, where any Notice is to be provided or submitted to the City Representative or the Project Co Representative it shall be provided or submitted by sending the same by registered mail, facsimile or by hand, as follows:

If to Project Co Representative:

[REDACTED]

Email: [REDACTED]

Attn: [REDACTED]

with a copy to:

[REDACTED]

Attn: [REDACTED]

If to the City Representative:

City of Ottawa
110 Laurier Ave West
Ottawa, Ontario K1P 1J1
Mail code: [REDACTED]

Email: [REDACTED]

Attn: [REDACTED]

59.3 Facsimile

- (a) Where any Notice is provided or submitted to a Party via facsimile, an original of the Notice sent via facsimile shall promptly be sent by regular mail or registered mail. For greater certainty, a Notice given via facsimile shall not be invalid by reason only of a Party's failure to comply with this Section 59.3.

59.4 Change of Address

- (a) Either Party to this Project Agreement may, from time to time, change any of its contact information set forth in Sections 59.1 or 59.2 by prior Notice to the other Party, and such change shall be effective on the Business Day that next follows the recipient Party's receipt of such Notice unless a later effective date is given in such Notice.

59.5 Deemed Receipt of Notices

- (a) Subject to Sections 59.5(b), 59.5(c) and 59.5(d):
- (i) a Notice given by registered mail shall be deemed to have been received on the third Business Day after mailing;
 - (ii) a Notice given by hand delivery shall be deemed to have been received on the day it is delivered; and
 - (iii) a Notice given by facsimile shall be deemed to have been received on the day it is transmitted by facsimile.
- (b) If the Party giving the Notice knows or ought reasonably to know of difficulties with the postal system which might affect negatively the delivery of mail, any such Notice shall not be mailed but shall be made or given by personal delivery or by facsimile transmission in accordance with this Section 59.

- (c) If any Notice delivered by hand or transmitted by facsimile is so delivered or transmitted, as the case may be, either on a day that is not a Business Day or on a Business Day after 4:00 p.m. (recipient's local time), then such Notice shall be deemed to have been received by such recipient on the next Business Day.
- (d) A Notice given by facsimile shall be deemed to have been received by the recipient on the day it is transmitted only if a facsimile transmission report (maintained by the sender) indicates that the transmission of such Notice was successful.

59.6 Service on the City

- (a) Where any Notice is required to be served on the City, the obligation to serve such Notice shall be fulfilled by serving it on the City in accordance with the provisions of this Section 59.

60. EMERGENCY MATTERS

60.1 Emergency

- (a) From Financial Close until Substantial Completion Date, upon the occurrence of an Emergency, Project Co shall comply with the Emergency Response Plan.
- (b) From and after Substantial Completion Date, upon the occurrence of an Emergency, Project Co shall comply with its Emergency Response Plan in accordance with the Output Specifications.
- (c) If, in respect of any Emergency, the City notifies Project Co that it requires compliance with any additional or overriding procedures as may be determined by the City or any other statutory body, then Project Co shall, subject to Schedule 21 - Variation Procedure (if compliance with such procedures constitutes a Variation), comply with such procedures (whether such procedures are specific to the particular Emergency or of general application and on the basis that such procedures shall take precedence to the extent that they overlap with the procedures mentioned in Section 60.1(a) or (b)).

61. INTENTIONALLY DELETED

62. GENERAL

62.1 Amendments

- (a) This Project Agreement may not be varied, amended or supplemented except by an agreement in writing signed by duly authorized representatives of the Parties and stating on its face that it is intended to be an amendment, restatement or other modification, as the case may be, to this Project Agreement.

62.2 Waiver

- (a) No waiver made or given by a Party under or in connection with this Project Agreement shall be binding or effective unless the waiver is in writing, signed by an authorized representative of the Party giving such waiver, and delivered by such Party to the other Parties. No waiver made with respect to any right, power or remedy in one instance will be deemed to be a waiver with respect

to any other instance involving the exercise of such right, power, or remedy or with respect to any other right, power, or remedy.

- (b) Failure by either Party to exercise any of its rights, powers or remedies hereunder or its delay to do so shall not constitute a waiver of those rights, powers or remedies. The single or partial exercise of a right, power or remedy shall not prevent its subsequent exercise or the exercise of any other right, power or remedy.

62.3 Relationship Between the Parties

- (a) The Parties are independent contractors. This Project Agreement is not intended to and does not create or establish between the Parties, or between the City and any Project Co Party, any relationship as partners, joint venturers, employer and employee, master and servant, or (except as provided in this Project Agreement), of principal and agent, and does not create or establish any relationship whatsoever between the City and any representative or employee of Project Co or the Project Co Parties.
- (b) The Parties further agree that:
- (i) except as expressly provided in this Project Agreement, neither Party shall be, or be deemed to be, an agent of the other Party, and neither Party shall have authority hereunder to represent that it is an agent of the other Party, or to accept any order, or enter into any contract or agreement, or make any representations or warranties of any kind to any person, or to assume or create any obligation, express or deemed, on behalf of or binding, or purportedly binding upon, the other Party;
 - (ii) neither Party shall be required to make or pay employment benefits, contributions for Employment Insurance, Canada Pension Plan, Workers' Compensation Board or other similar levies with respect to any persons employed or engaged by the other Party;
 - (iii) except as otherwise expressly provided in this Project Agreement, each Party shall be free from the control of the other Party as to the manner in which it shall perform its obligations, or cause same to be performed, under this Project Agreement; and
 - (iv) any person which a Party may engage as an agent, employee, subcontractor or otherwise, to perform such Party's obligations under this Project Agreement, as permitted hereby, shall, unless the Parties otherwise agree in writing, be engaged by such Party to act solely on behalf of such Party, and such person shall not act, or be deemed to act, on behalf of the Party that did not engage its services.

62.4 General Duty to Mitigate

- (a) The City and Project Co shall at all times take commercially reasonable steps to minimize and mitigate any loss for which the relevant Party is entitled to bring a claim against the other Party pursuant to this Project Agreement.

62.5 Actual Knowledge

- (a) Except where limited to actual knowledge and/or such knowledge which they, at law, may from time to time, be deemed to have, Project Co and the City shall, for all purposes of this Project Agreement, be deemed to have such knowledge in respect of the Project as is actually held (or ought reasonably to be held) by the directors, officers and senior management of Project Co and in the case of the City, its directors, officers and senior management, and the City Representative or the Project Co Representative, as applicable. For clarity, except as expressly set out to the contrary, a reference in this Project Agreement to the “knowledge” of Project Co or of the City shall be construed in a manner consistent with the foregoing sentence.

62.6 Entire Agreement

- (a) Except where provided otherwise in this Project Agreement, this Project Agreement constitutes the entire agreement between the Parties in connection with its subject matter and supersedes all prior representations, communications, negotiations and understandings, whether oral, written, express or implied, concerning the subject matter of this Project Agreement.

62.7 No Reliance

- (a) Each of the Parties acknowledge that:
- (i) it has not entered into this Project Agreement on the basis of and does not rely, and has not relied, upon any statement or representation, whether negligent or innocent, or warranty or other provision, whether oral, written, express or implied, made or agreed to by any person, whether a Party to this Project Agreement or not, except those expressly made, given or repeated in this Project Agreement and the only remedy or remedies available in respect of any misrepresentation or untrue statement made to it shall be those expressly provided for in this Project Agreement; and
- (ii) this Section 62.7 shall not apply to any statement, representation or warranty made fraudulently, or to any provision of this Project Agreement which was induced by fraud, for which the remedies available shall be all those available under the law governing this Project Agreement.

62.8 Severability

- (a) Each provision of this Project Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Project Agreement is declared invalid, unenforceable or illegal by the courts of a competent jurisdiction, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Project Agreement. If any such provision of this Project Agreement is invalid, unenforceable or illegal, the Parties shall, acting in good faith, promptly negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Project Agreement as near as possible to its original intent and effect.

62.9 Enurement

- (a) This Project Agreement and any other agreement entered into in connection with the Project to which the City and Project Co are parties shall enure to the benefit of, and be binding on, the City and Project Co and their respective successors and permitted transferees and assigns.

62.10 Governing Law and Jurisdiction

- (a) This Project Agreement, and each of the documents contemplated by or delivered under or in connection with this Project Agreement, shall be governed by and construed in accordance with the laws of Ontario and the laws of Canada applicable therein and shall be treated in all respects as an Ontario contract, without regard to conflict of laws principles.
- (b) Subject to Schedule 26 - Dispute Resolution Procedure, the Parties hereby irrevocably attorn to the exclusive jurisdiction of the courts of the Province of Ontario and all courts competent to hear appeals therefrom.

62.11 Cumulative Remedies

- (a) Except as otherwise set forth in this Project Agreement, the rights, powers and remedies of each Party set forth in this Project Agreement are cumulative and are in addition to and without prejudice to any other right, power or remedy that may be available to such Party under this Project Agreement.

62.12 Further Assurance

- (a) Each Party shall do all things, from time to time, and execute all further documents necessary to give full effect to this Project Agreement.

62.13 Costs

- (a) Each Party shall be responsible for paying its own costs and expenses incurred in connection with the negotiation, preparation and execution and delivery of this Project Agreement.

62.14 Language of Agreement

- (a) Each of the parties acknowledges having requested and being satisfied that this Project Agreement and related documents be drawn in English. Chacune des parties reconnaît avoir demandé que ce document et ses annexes soient rédigés en anglais et s'en déclare satisfaite.
- (b) For greater certainty, all correspondence, notices, drawings, test reports, certificates, specifications, information, operating and maintenance instructions, name plates, identification labels, instructions and notices to the public and staff and all other written, printed or electronically readable matter required in accordance with, or for purposes envisaged by, this Project Agreement shall be in English.

62.15 Proof of Authority

- (a) The City and Project Co each reserve the right to require any person executing this Project Agreement on behalf of the other Party to provide proof, in a form acceptable to the City or

Project Co, as applicable, that they have the requisite authority to execute this Project Agreement on behalf of and to bind the City or Project Co, as applicable.

62.16 Counterparts

- (a) This Project Agreement may be executed in one or more counterparts. Any single counterpart or a set of counterparts executed, in either case, by all the Parties shall constitute a full, original and binding agreement for all purposes. Counterparts may be executed either in original or faxed form provided that any Party providing its signature in faxed form shall promptly forward to the other Party an original signed copy of this Project Agreement which was so faxed.

62.17 City Party as Third Party Beneficiaries

- (a) The provisions of Sections 6.1, 6.2(a), 6.3(a), 8.1(b), 9.2(a)(i), 9.2(a)(ii), 9.4(b), 9.5(a)(iv), 16.1(a), 20.3(h), 21.1, 33.7, 34.2(e), 54.1, and 55.2(a) and each other provision of this Project Agreement which is expressed to be for the benefit of a City Party or a City Party, as applicable, are:
- (i) intended for the benefit of each City Party, or City Party, as applicable and, if so set out in the relevant Section, each City Party's or City Party's, as applicable, directors, officers employees, board appointees, agents and representatives, and shall be enforceable by each of such persons and his or her heirs, executors, administrators and other legal representatives (collectively, in respect of each City Party, the "**City Party Third Party Beneficiaries**", and in respect of each City Party, the "**City Third Party Beneficiaries**"); and
- (ii) are in addition to, and not in substitution for, any other rights that the City Party Third Party Beneficiaries may have in contract or otherwise.
- (b) The City shall hold the rights and benefits of Sections 6.1, 6.2(a), 6.3(a), 8.1(b), 9.2(a)(i), 9.2(a)(ii), 9.4(b), 9.5(a)(iv), 16.1(a), 20.3(h), 21.1, 33.7, 34.2(e), 54.1, and 55.2(a) and each other provision of this Project Agreement which is to the benefit of each City Party or City Party, as applicable, in trust for and on behalf of the City Party Third Party Beneficiaries or the City Third Party Beneficiaries, as applicable, and the City hereby accepts such trust and agrees to hold the benefit of and enforce performance of such covenants on behalf of the City Party Third Party Beneficiaries or the City Third Party Beneficiaries, as applicable.

62.18 Copyright Notice

- (a) The Parties acknowledge that the City is the exclusive owner of the copyright in the Project Agreement.

IN WITNESS WHEREOF the Parties have executed this Project Agreement as of the date first above written.

CITY OF OTTAWA

Per:

Name: [REDACTED]

Title: [REDACTED]

TRANSITNEXT GENERAL PARTNERSHIP

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the corporation.

SCHEDULE 1

DEFINITIONS AND INTERPRETATION

1. **Definitions.** In the Project Agreement, unless the context otherwise requires, the following terms have the following meanings:
 - 1.1 “**Accessibility for Ontarians with Disabilities Act (Ontario)**” means the *Accessibility for Ontarians with Disabilities Act*, S.O. 2005, c. 11, as amended from time to time.
 - 1.2 “**Account Trustee**” has the meaning given in Schedule 28 – Insurance Trust Agreement.
 - 1.3 “**Activity**” or “**Activity Id**” shall mean an element of Work performed during the course of the Project. An Activity has an expected duration and cost requirements, and shall be the lowest level of any Works Schedule.
 - 1.4 “**Actual Relevant Insurance Cost**” has the meaning given in Section 7.1(a) of Schedule 24 - Insurance and Performance Security Requirements.
 - 1.5 “**Additional Contractor**” means any independent contractor (not being, for the avoidance of doubt, any of the Third Party Contractors or Project Co or any Project Co Party) or the City’s own forces, engaged by the City to carry out the Additional Works.
 - 1.6 “**Additional Property Interest**” has the meaning given in Schedule 33 – Lands.
 - 1.7 “**Additional Works**” means those works or services, in relation to any of the System Infrastructure which are not Works or Maintenance and Rehabilitation Services and which are to be carried out by an Additional Contractor, including works or services to be performed either before or after Substantial Completion.
 - 1.8 “**Adjacent Developments**” means any development works or like activity carried out during the Project Term by or on behalf of any third party adjacent to or which otherwise affects or may potentially affect any part of the Works, the Maintenance and Rehabilitation Services, the Lands or the System Infrastructure.
 - 1.9 “**Adjudicator**” has the meaning given in Schedule 26 - Dispute Resolution Procedure.
 - 1.10 “**Adjusted Estimated Fair Value**” has the meaning given in Schedule 22 – Compensation on Termination.
 - 1.11 “**Adjusted Highest Qualifying Tender Price**” has the meaning given in Schedule 22 – Compensation on Termination.
 - 1.12 “**Affiliate**” means an “**affiliate**” as that term is used in the *Business Corporations Act* (Ontario) and any successor legislation thereto, and, in the case of Project Co, shall include each of its unitholders, shareholders, partners or owners as the case may be.
 - 1.13 “**Aggregate Actual Lane Closures**” or “**AALC**” has the meaning given in Schedule 7 – Mobility Matters.

- 1.14 **“Aggregate Actual Lane Closure Cost”** or “AALCC” has the meaning given in Schedule 7 – Mobility Matters.
- 1.15 **“Airport”** means the Ottawa MacDonald Cartier International Airport in Ottawa, Canada.
- 1.16 **“Airport Authority”** means the Ottawa MacDonald Cartier International Airport Authority and its agents and representatives.
- 1.17 **“Airport Authority Construction Agreement”** has the meaning given in the Airport Authority MOU.
- 1.18 **“Airport Authority MOU”** means the “Ottawa Airport-Airport Link Memorandum of Understanding” between the Airport Authority and the City relating to the Airport Link and the Station to be built at the Airport.
- 1.19 **“Airport Authority Operating Agreement”** has the meaning given in the Airport Authority MOU.
- 1.20 **“Airport Link”** has the meaning given in Schedule 15 – Output Specifications.
- 1.21 **“Airport Link Lands”** has the meaning given in the Airport Authority MOU.
- 1.22 **“Airport Link Lands Sublease”** has the meaning given in the Airport Authority MOU.
- 1.23 **“Ancillary Documents”** means the Construction Contract; the Maintenance and Rehabilitation Contract; the Performance Security; [REDACTED]; [REDACTED]; and [REDACTED].
- 1.24 **“Annual Service Payment”** has the meaning given in Schedule 19 – Payment Mechanism.
- 1.25 **“Anticipated Final Completion Date”** has the meaning given in Section 25.9A(a) of the Project Agreement.
- 1.26 **“Anticipated New Municipal Infrastructure Components Acceptance Date”** has the meaning given in Section 25.13(c) of the Project Agreement.
- 1.27 **“Anticipated Substantial Completion Date”** has the meaning given in Section 25.4(a) of the Project Agreement.
- 1.28 **“Applicable Law”** means:
 - (a) any statute or proclamation or any delegated or subordinate legislation including regulations and by-laws;
 - (b) any Authority Requirement; and

- (c) any judgment of a relevant court of law, board, arbitrator or administrative agency which is a binding precedent in the Province of Ontario,
in each case, in force in the Province of Ontario, or otherwise binding on Project Co, any Project Co Party, the City or any City Party.
- 1.29 “**Appointed Representative**” has the meaning given in Schedule 41 – Lenders’ Direct Agreement.
- 1.30 “**Appointed Representative Notice**” has the meaning given in Schedule 41 – Lenders’ Direct Agreement.
- 1.31 “**Apprenticeship Plan**” has the meaning given in Section 20.12 of the Project Agreement.
- 1.32 “**Arbitration Act, 1991 (Ontario)**” means the *Arbitration Act, 1991*, S.O. 1991, c. 17, as amended from time to time.
- 1.33 “**Archaeological Reports**” means collectively the following reports:
- a) [REDACTED];
 - b) [REDACTED];
 - c) [REDACTED];
 - d) [REDACTED];
 - e) [REDACTED];
 - f) [REDACTED]; and
 - g) [REDACTED].
- 1.34 “**Architect**” means an architect licensed by the Ontario Association of Architects to practice in the Province of Ontario.
- 1.35 “**As-built Schedule**” has the meaning given in Schedule 12 – Works Scheduling Requirements.
- 1.36 “**Associated Liabilities**” has the meaning given in Section 33.7(b)(iv) of the Project Agreement.
- 1.37 “**Authority Requirements**” means any order, direction, directive, request for information, policy, administrative interpretation, guideline or rule of or by any Governmental Authority.
- 1.38 “**Availability Failure**” has the meaning given in Schedule 19 - Payment Mechanism.

- 1.39 **“Background Information”** means any and all drawings, reports (including the Environmental Reports, the Archaeological Reports, the Geotechnical Reports, the Cultural Heritage Reports and the Environmental Assessments, and any other report given or otherwise referred to in the Output Specifications), studies, data, documents, or other information, given or made available to Project Co or any Project Co Party by the City or any City Party, or which was obtained from or through any other sources prior to Commercial Close.
- 1.40 **“Bank”** has the meaning given in Schedule 28 - Insurance Trust Agreement.
- 1.41 **“Bank Act (Canada)”** means the *Bank Act*, S.C. 1991, c. 46, as amended from time to time.
- 1.42 **“Bankruptcy and Insolvency Act (Canada)”** means the *Bankruptcy and Insolvency Act*, R.S.C. 1985, c. B-3, as amended from time to time.
- 1.43 **“Base Case Equity IRR”** means [REDACTED]%, which for greater certainty, is calculated on a pre-tax basis.
- 1.44 **“Base Relevant Insurance Cost”** has the meaning given in Schedule 24 - Insurance and Performance Security Requirements.
- 1.45 **“Beneficiary”** has the meaning given in Section 54.3(a) of the Project Agreement.
- 1.46 **“Board Order”** means an order, decision or directive governing the construction, modification, reconstruction, expansion, use, operation and/or maintenance of the Existing Trillium Line Assets and/or the System Infrastructure and issued by the Board of Transport Commissioners, the Canadian Transportation Commission (including the Railway Transport Committee), the National Transportation Agency of Canada and/or the Canadian Transportation Agency or any predecessor or successor board, commission, agency or committee of any of the foregoing.
- 1.47 **[REDACTED]**
- 1.48 **“[REDACTED] Vehicle Maintenance Contract”** has the meaning given in Schedule 15 – Output Specifications.
- 1.49 **“Bonds”** means any one or more of the Performance Bond and the Labour and Material Payment Bond described in Section 19 of Schedule 24 – Insurance and Performance Security Requirements, and, collectively, means all of them.
- 1.50 **“Blocked Accounts Agreement”** means the account control agreement to be entered into between Project Co, the City and [REDACTED] (or another account bank acceptable to Project Co and the City, acting reasonably) on or prior to Substantial Completion in substantially the same form as the Blocked Accounts Agreements (as defined in the Lending Agreements).
- 1.51 **“Business Corporations Act (Ontario)”** means that *Business Corporations Act*, R.S.O. 1990, c. B.16, as amended from time to time.

- 1.52 **“Business Day”** means any day other than Saturday, Sunday, a statutory holiday in the Province of Ontario or any day on which banks are not open for business in the City of Ottawa, Ontario.
- 1.53 **“Business Opportunities”** has the meaning given in Section 4.1(a) of the Project Agreement.
- 1.54 **“CaGBC”** means the Canadian Green Building Council.
- 1.55 **“Canadian and Industry Standards”** means, at the applicable time, those standards, practices, methods and procedures applicable to Good Industry Practice.
- 1.56 **“Canadian GAAP”** shall be deemed to be the generally accepted accounting principles from time to time approved by the Canadian Institute of Chartered Accountants, or any successor institute, applicable as at the date on which such calculation is made or required to be made in accordance with generally accepted accounting principles, as such principles may be amended or varied by International Financial Reporting Standards then in effect in Canada, in any case consistently applied from one period to the next.
- 1.57 **“Capital Expenditure”** means capital expenditure as interpreted in accordance with Canadian GAAP.
- 1.58 **“Capital Railway Rules”** has the meaning given in Schedule 15 – Output Specifications.
- 1.59 **“Carleton University”** means Carleton University and its agents and representatives.
- 1.60 **“Category 1 Utility Company”** means any one of:
- (a) [REDACTED];
 - (b) [REDACTED];
 - (c) [REDACTED];
 - (d) [REDACTED];
 - (e) [REDACTED];
 - (f) [REDACTED];
 - (g) [REDACTED];
 - (h) [REDACTED]; and
 - (i) [REDACTED].
- 1.61 **“Cemeteries Act (Revised) (Ontario)”** means the *Cemeteries Act (Revised)*, R.S.O. 1990, c. C.4, as amended from time to time.

- 1.62 **“Certificate of Recognition”** means the certification issued by IHSA to a person confirming that the health and safety management systems of such person comply with the terms, provisions and conditions of the COR Program.
- 1.63 **“Certification Services”** has the meaning given in Schedule 6 - Independent Certifier Agreement.
- 1.64 **“Certification Services Variation”** has the meaning given in Schedule 6 - Independent Certifier Agreement.
- 1.65 **“Certified H&S Inspector”** means an individual who is an employee or contractor of the IHSA and has the necessary credentials recognized by the COR Program for the purpose of such individual performing any inspections as may be required to be performed in accordance with Section 13(b) of the Project Agreement.
- 1.66 **“Change in Control”** means, with respect to a person:
- (a) any Change in Ownership, where the effect of such change is to result in control of the decisions made by or on behalf of such person subsequently being with a different entity or entities than prior to such change;
 - (b) any other change in respect of the power to elect a majority of the directors of the person or otherwise control the decisions made on behalf of such person; or
 - (c) any other change of direct or indirect power or authority through any contractual right or other power or interest with or over a person to influence, direct, cause to change or prevent from changing the approval of a decision, direction of the management, actions or policies of such person, to direct or cause the direction of the management, actions or policies of such person.
- 1.67 **“Change in Law”** means the coming into effect or repeal (without re-enactment or consolidation) in Ontario of any Applicable Law, or any amendment or variation of any Applicable Law, including any judgment of a relevant court of law which changes binding precedent in Ontario in each case after Commercial Close.
- 1.68 **“Change in Ownership”** means, with respect to a person, any change in ownership, whether beneficial or otherwise, of any of the shares or units of ownership of such person, or in the direct or indirect power to vote or transfer any of the shares or units of ownership of such person.
- 1.69 **“Changed Cost for Utilities”** means an amount equal to,
- (a) the total aggregate price actually paid by Project Co for the Eligible Utilities Costs minus any Ineligible Cost Increase; minus,
 - (b) the Original Eligible Utilities Cost.
- 1.70 **“City”** means the City of Ottawa.

- 1.71 **“City Activities”** means the provision of all governmental services and the conduct of all activities provided in connection or otherwise associated with transit and other similar services, including the operation and maintenance of a light rail transit system on the System Infrastructure corridor.
- 1.72 **“City Commissioning”** means the commissioning activities to be carried out by the City or any other person on behalf of the City in accordance with the Commissioning Plan.
- 1.73 **“City Commissioning Period”** means the period during which the City, or any other person on behalf of the City, are performing the City Commissioning.
- 1.74 **“City Default Termination Sum”** has the meaning given in Schedule 22 - Compensation on Termination.
- 1.75 **“City Design Team”** means any of the City, its agents, contractors and subcontractors of any tier and its or their directors, officers and employees, and other persons engaged in respect of design reviews, design evaluation, or design consultation processes with respect to the System Infrastructure or the City Activities, but excluding Project Co and any Project Co Party.
- 1.76 **“City Engineer”** means the engineer appointed by the City in connection with, among other things, acceptance of the New Municipal Infrastructure Work.
- 1.77 **“City Event of Default”** has the meaning given in Section 44.1(a) of the Project Agreement.
- 1.78 **“City HR Policy”** means the City’s human resources policies and guidelines, as they may be amended from time to time and provided to Project Co in writing.
- 1.79 **“City Jointly Developed Materials”** has the meaning given in Section 49.4(a) of the Project Agreement. Any reference to “**Jointly Developed Materials**” shall mean City Jointly Developed Materials.
- 1.80 **“City Party”** means any of the City’s agents, contractors and subcontractors of any tier engaged with respect to the Project Operations and its or their directors, officers and employees, including for clarity the Operator but excluding Project Co and any Project Co Party, and “**City Parties**” shall be construed accordingly.
- 1.81 **“City Permits, Licences, Approvals and Authorizations”** means those permissions, consents, approvals, certificates, permits, licences, agreements and authorizations, Utility Agreements, and Development Approvals which are the responsibility of the City to obtain as set out Schedule 32 – City Permits, Licences, Approvals and Authorizations, but for greater certainty shall not include any permission, consent, approval, certificate, permit, licence, agreement or authorization not set out in Schedule 32 – City Permits, Licences, Approvals and Authorizations but required by the terms of any such item set out in such Schedule.
- 1.82 **“City PLAA Deadline”** has the meaning given in 9.4(f) of the Project Agreement.

- 1.83 **“City Project Manager”** means the [REDACTED].
- 1.84 **“City Representative”** means the person designated as such by the City on or prior to Commercial Close and any permitted replacement.
- 1.85 **“City Reserve”** has the meaning given in Schedule 33 – Lands.
- 1.86 **“City Retained Dow’s Lake Latent Defect Responsibility”** means any Latent Defect in the Dow’s Lake Tunnel Structure.
- 1.87 **“City Retained Existing Structures Latent Defect Responsibility”** means any Latent Defect in the Existing City Retained Latent Defect Structures.
- 1.88 **“City Retained Latent Defect Responsibility”** has the meaning given in Section 16.9 of the Project Agreement.
- 1.89 **“City Road Allowance”** has the meaning given in Schedule 33 – Lands.
- 1.90 **“City Standards”** means the more recent version of (a) the standards of the City as of December 31, 2016, and (b) the standards of the City set out in Article 3 of Schedule 15-1 of the Output Specifications. For clarity, where there is a conflict, inconsistency or duplication of a standard referenced in items (a) and (b) of this definition of City Standards, the more recent standard shall apply.
- 1.91 **“City Taxes”** means taxes, or payments in lieu of taxes, imposed by the City and HST and property taxes for which the City is responsible pursuant to Section 35 of the Project Agreement.
- 1.92 **“City Third Party Beneficiaries”** has the meaning given in Section 62.17(a)(i) of the Project Agreement.
- 1.93 **“City Trade-Marks”** means any and all Trade-Marks used by the City in any manner whatsoever.
- 1.94 **“City Warranty Deliverables”** means, in respect of New Municipal Infrastructure only, each of the following:
 - (a) a copy of a water wellness report prepared, stamped, signed and dated by a professional engineer licensed in the Province of Ontario for all applicable items under the heading “Sanitary, Storm and Combined Sewers”, “Watermains”, “Underground Storage Tanks/Superpipes”, “Oil Grit Separators”, and “Wet or Dry Pond or Other Stormwater Management Facilities”;
 - (b) for sanitary sewers, storm water sewers and combined sewers, four CDs/DVDs and one hard copy set, in PDF format and generated from the source electronic document and scanned from hard copies, of each of the following:
 - (i) material testing results;

- (ii) performance test results; and
 - (iii) video report and detailed written report and electronic files containing chainage-specific defect codes from a CCTV inspection, and where deficiencies have been identified by a CCTV inspection, delivery of evidence that all deficiencies have been rectified;
- (c) for special infrastructure, five CDs/DVDs and two hard copy sets, in PDF format and generated from the source electronic document and not scanned from hard copies of each of the following:
- (i) material testing results;
 - (ii) performance test results; and
 - (iii) video report and detailed written report and electronic files containing chainage-specific defect codes from a CCTV inspection and where all deficiencies have been identified by the CCTV inspection, delivery of evidence that all deficiencies have been rectified;
- (d) if significant repairs were carried out by Project Co to correct any defects, deficiencies or non-compliant items in the New Municipal Infrastructure during the warranty inspection period for the New Municipal Infrastructure set out in Section 25.15 of the Project Agreement, a written certification of the New Municipal Infrastructure in a form acceptable to the City, acting reasonably, from professionals licensed in the Province of Ontario qualified to certify the specific type of work and equipment being certified, each such certificate shall be stamped, signed and dated by the licensed professional; and
- (e) for trees, a written report on the results of an arborist inspection, conducted two years after planting, to demonstrate that trees are in good health.
- 1.95 **“Civil Remedies Act (Ontario)”** means the *Civil Remedies Act*, S.O. 2001, c.28, as amended from time to time.
- 1.96 **“CLA”** means the *Construction Lien Act* (Ontario).
- 1.97 **“Commercial Close”** means the date of the Project Agreement.
- 1.98 **“Commissioning Plan”** means the commissioning activities to be carried out by the City or any other person on behalf of the City in accordance with the Testing and Commissioning Plan.
- 1.99 **“Commissioning Tests”** means all commissioning tests:
- (a) described in Schedule 14 – Testing and Commissioning;
 - (b) required by Applicable Law, Canadian and Industry Standards or CSA Standards;

- (c) recommended by the manufacturer of any part of the System Infrastructure; and
 - (d) required to be included in the Testing and Commissioning Plan by the Independent Certifier, the City Commissioning Agent or the City Representative pursuant to Section 25.2 of the Project Agreement.
- 1.100 “**Communications System**” has the meaning given in Schedule 15-1 of the Output Specifications.
- 1.101 “**Companies’ Creditors Arrangement Act (Canada)**” means the *Companies’ Creditors Arrangement Act*, R.S.C. 1985, c. C-36, as amended from time to time.
- 1.102 “**Compensation Event**” has the meaning given in Section 39.1(a) of the Project Agreement.
- 1.103 “**Completion Holdback**” has the meaning given in Section 25.7(a) of the Project Agreement.
- 1.104 “**Complex Structure**” means any post-tensioned or pre-tensioned structure that has undergone significant structural alteration making it difficult for personnel at the Site to predict the direction of forces or likely collapse mechanism to be experienced by such structure in connection with any Demolition of all or any part of such structure.
- 1.105 “**Complex Structure Demolition**” means any Demolition where:
- (a) significant structural elements, such as girders, columns, shearwalls or slabs, or Complex Structures are being removed, de-stressed, altered or removed;
 - (b) large penetrations are being created through slabs;
 - (c) any Demolition may cause the collapse of any building or structure (or any portion thereof) and such collapse may directly impact adjacent occupied areas of a building or structure and potentially jeopardize the safety of workers, staff or the general public using such building or structure; and
 - (d) the Demolition of any building or structure (or any portion thereof) has the potential to result in any materials collapsing onto or interfering with any pedestrian right-of-way or into an occupied part of any building or structure
- 1.106 “**Conditional New Municipal Infrastructure Component Acceptance Certificate**” has the meaning given in Section 25.13(f) of the Project Agreement.
- 1.107 “**Confederation Line**” means Stage 1 of the light rail transit line under construction in Ottawa, Ontario, Canada from Tunney’s Pasture in the west end of Ottawa to Blair Road in the east end of Ottawa.
- 1.108 “**Confidant**” has the meaning given in Section 50.6(a)(i) of the Project Agreement.

- 1.109 “**Confidential Information**” means all confidential and proprietary information which is supplied by or on behalf of a Party, whether before or after Commercial Close.
- 1.110 “**Construction Activities**” means construction, rehabilitation, Reinstatement Work, rectification work, and any other aspect of the Works that:
- (a) comprises the alteration, augmenting, upgrading, construction, completion, inspection, calibration, testing or commissioning of any part of the System Infrastructure ;
 - (b) comprises the assessment of any System Infrastructure;
 - (c) may affect the structural integrity of any System Infrastructure and including any such aspect of the Works carried out as part of any Force Majeure Event, Relief Event, Variation, or Innovation Proposal accepted by the City; or
 - (d) comprises Construction Clearing and Grubbing.
- 1.111 “**Construction Certificate**” means a certificate with contents described in Attachment 2 to Appendix A of Schedule 10 – Review Procedure.
- 1.112 “**Construction Clearing and Grubbing**” means the stage of the Works in which vegetation and debris is cleared from the Lands (clearing) and a root rake or similar device is employed to remove roots remaining in the soil (grubbing).
- 1.113 “**Construction Contract**” means the construction contract between Project Co and the Construction Contractor dated on or about Financial Close.
- 1.114 “**Construction Contractor**” means [REDACTED], engaged by Project Co to perform the Works and any substitute construction contractor engaged by Project Co as may be permitted by the Project Agreement.
- 1.115 “**Construction Contractor’s Direct Agreement**” means the direct agreement between the City, Project Co, the Construction Contractor and the Construction Guarantor in the form set out in Schedule 5-1 - Construction Contractor’s Direct Agreement.
- 1.116 “**Construction Document Submittals**” has the meaning given in Section 20.3(d)(ii) of the Project Agreement.
- 1.117 “**Construction Guarantor**” means [REDACTED].
- 1.118 “**Construction Lien Act (Ontario)**” means the *Construction Lien Act*, R.S.O. 1990, c. C.30, as amended from time to time.
- 1.119 “**Construction Management Plan**” or “**CMP**” has the meaning given in Schedule 11 – Integrated Management System Requirements.
- 1.120 “**Construction Period**” means the period of time commencing on Financial Close to and including the Final Completion.

- 1.121 “**Construction Period Complaint Protocol**” has the meaning given in Schedule 18 – Communications and Stakeholder Engagement Obligations.
- 1.122 “**Construction Period Deduction**” has the meaning given in Schedule 20 – Construction Period Payments.
- 1.123 “**Construction Period Lands**” has the meaning given in Schedule 33 – Lands.
- 1.124 “**Construction Period Limit**” has the meaning given in Section 55.4(a)(i) of the Project Agreement.
- 1.125 “**Construction Period Payment**” has the meaning given in Schedule 20 – Construction Period Payments.
- 1.126 “**Construction Period Quality Failure**” has the meaning given in Schedule 20 – Construction Period Payments.
- 1.127 “**Construction Safety Management Plan**” has the meaning given in Schedule 11 – Integrated Management System Requirements.
- 1.128 “**Contamination**” means the presence of any Hazardous Substance in the environment, except Hazardous Substances present in the environment in concentrations below applicable standards as set by Applicable Laws. If Contamination is present in soil, surface water or groundwater, then the soil, surface water or groundwater, as applicable, containing the Contamination shall also be deemed to be Contamination for the purposes of the Project Agreement.
- 1.129 “**Contract Month**” has the meaning given in Schedule 19 - Payment Mechanism.
- 1.130 “**Contract Year**” has the meaning given in Schedule 19 - Payment Mechanism.
- 1.131 “**Contractors**” means the Construction Contractor and the Maintenance and Rehabilitation Contractor.
- 1.132 “**Contracts**” means the Construction Contract and the Maintenance and Rehabilitation Contract.
- 1.133 “**Control Party**” means:
 - (a) any person with any form of direct ownership interest in Project Co;
 - (b) [REDACTED]; and
 - (c) [REDACTED].
- 1.134 “**Controlled Elements**” means any of (i) the System Infrastructure and (ii) during the Construction Period, the Site (which, for greater certainty, shall include the City Reserve to the extent it forms part of the Site).

- 1.135 “**Copyrights**” means all copyrights (registered or otherwise) and registrations and applications for registration thereof, and all rights therein provided by multinational treaties or conventions.
- 1.136 “**COR Certification**” means, in respect of a person, receipt by such person of its: (i) Certificate of Recognition; and (ii) Letter of Good Standing.
- 1.137 “**COR-Certified Construction Project Co Party**” has the meaning given in Section 9.6(a)(ii) of the Project Agreement.
- 1.138 “**COR Program**” means the national safety program known as “The Certificate of Recognition (COR™)”, being a safety program that enables persons to assess their health and safety management systems to manage risks, establish controls, and minimize the incidence of injury and illness to their workers, and being nationally trademarked and endorsed by participating members of the Canadian Federation of Construction Safety Associations, or such other national safety program approved by HMQ.
- 1.139 “**COR-Qualified Construction Project Co Party**” means one of the following:
- (a) where the Construction Contractor is a single legal entity, the Construction Contractor; or
 - (b) where the Construction Contractor is a joint venture, each member of the joint venture, or
 - (c) where the Construction Contractor is a partnership, each partner of the partnership.
- provided that each such person has current OHSAS 18001 Accreditation in good standing.
- 1.140 “**CP License**” has the meaning given in Schedule 15 – Output Specifications.
- 1.141 “**CP Rail**” means the Canadian Pacific Railway and its agents and representatives.
- 1.142 “**CPI**” means CPI-XFET for Canada, as published by Statistics Canada from time to time, or failing such publication, such other index as the Parties may agree, or as may be determined in accordance with Schedule 26 - Dispute Resolution Procedure, which most closely resembles such index.
- 1.143 “**CPI_n**” is the value of CPI on January 1 of the relevant Contract Year “n”, to be determined by reference to the relevant index in the month immediately preceding the indexation date.
- 1.144 “**CPI₀**” is the value of CPI on the Inflation Base Date, to be determined by reference to the relevant index in the month immediately preceding the Inflation Base Date.
- 1.145 “**Crisis Communications Plan**” has the meaning given in Schedule 18 – Communications and Stakeholder Engagement Obligations.

1.146 “**Critical Comment**” means any Non-Conformance or combination of Major Comments that:

- (a) In the reasonable opinion of the City, demonstrates that Project Co is performing the Works in a manner that may result in Project Co becoming unable to satisfy the requirements for Substantial Completion;
- (b) Is persistent, ongoing or repeated; or
- (c) In the reasonable opinion of the City, by its continued existence or through the process of rectification, would:
 - (i) result in a Critical Qualifying NCR;
 - (ii) result or is reasonably expected to result in material disruption to the public or a materially adverse disruption to traffic flow or the public transit system in the City of Ottawa;
 - (iii) prejudice or is reasonably expected to materially prejudice the performance of any Governmental Activities;
 - (iv) create or is reasonably expected to create a serious threat to the health, safety or security of any person, including any System User or City Party;
 - (v) materially increase the City’s risk or risk transfer to the City or any City Party;
 - (vi) materially adversely affect the ability of any City Party, Other Contractor or the Operator to perform their activities as permitted or contemplated by the Project Agreement;
 - (vii) materially adversely affect or change the critical path of the Project as defined in the Current Progress Works Schedule, adversely affect Project Co’s ability to achieve Substantial Completion by the Scheduled Substantial Completion Date, require a material re-sequencing of the Works or cause any delay in achieving Substantial Completion; or
 - (viii) potentially compromise (A) the reputation or integrity of the City and/or any City Party; or (B) the nature of the public transit system in the City of Ottawa so as to affect public confidence in the public transit system in the City of Ottawa or the Project.

1.147 “**Critical Path(s)**” has the meaning given to it in Schedule 12-Works Scheduling Requirements.

1.148 “**Critical Qualifying NCR**” has the meaning given to it in Schedule 20 – Construction Period Payments.

1.149 “**Crossing Agreement**” means an agreement, entered into by a previous owner or operator of part of the railway corridor which accommodates or will accommodate the

Existing Trillium Line and/or Trillium Line Extension for the purposes of establishing terms and conditions governing crossings of the railway corridor including but not limited to a utility crossings, pedestrian crossings (at grade or grade separated) and/or roadway crossings (at grade or grade separated) which agreements were assigned to and assumed by the City pursuant to the Existing Trillium Line P&S Agreements dated December 6, 2002 and March 21, 2005 respectively and described in more detail in Section 1.1 of Schedule 33 – Lands.

- 1.150 “**Crown**” means Her Majesty the Queen.
- 1.151 “**Crown Agency Act (Ontario)**” means the *Crown Agency Act*, R.S.O. 1990, c.48, as amended from time to time.
- 1.152 “**CSA**” means the Canadian Standards Association.
- 1.153 “**CSA Standards**” means, at the applicable time, the Canadian Standards Association standards.
- 1.154 “**Cultural Heritage Reports**” means the reports set out in Appendix D to this Schedule 1 – Definitions and Interpretation and includes the following reports:
 - (a) [REDACTED].
- 1.155 “**Currency Act (Canada)**” means the *Currency Act*, R.S.C., 1985, c. C-52, as amended from time to time.
- 1.156 “**Current PBS**” is, at any point in time, the latest version of the PBS which has been reviewed by the City in accordance with Schedule 10 – Review Procedure. The Current PBS shall be used for Project Co Construction Period Payment Documentation.
- 1.157 “**Custodian**” means the person appointed as Custodian pursuant to the Custody Agreement and as may be permitted pursuant to the Project Agreement.
- 1.158 “**Custody Agreement**” means the custody agreement between Project Co, the Lenders’ Agent, the City and the Custodian in the form set out in Schedule 3 - Custody Agreement.
- 1.159 “**Daily Performance Report**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.160 “**Data Room**” has the meaning given in section 2.4(1) of the RFP.
- 1.161 “**Debt Service Amount**” means, for any period, the principal and interest payable by Project Co or any Project Co Party to the Lenders in the normal course under the Lending Agreements, provided that at any time where any portion of the interest payable to the Lenders is subject to a Hedging Agreement between Project Co and a Hedge Provider, interest payable on account of such portion of interest payable to the Lenders shall be calculated based on the fixed rate payable by Project Co under such Hedging Agreement without regard to whether such fixed rate is payable directly to a Lender or to the Hedge

Provider under the relevant Hedging Agreement and all references to interest payable to the Lenders under this Project Agreement shall be construed accordingly.

- 1.162 “**Deduction**” has the meaning given in Schedule 19 - Payment Mechanism.
- 1.163 “**Defect**” means a defect or deficiency in an item that is readily apparent on reasonable inspection or described in, properly inferable, or readily discoverable from the Background Information.
- 1.164 “**Delay Event**” has the meaning given in Section 38.1(a) of the Project Agreement.
- 1.165 “**Delivered**” has the meaning given thereto in the Revenue Vehicle Supply Contract.
- 1.166 “**Demolition**” means the removal of a building or structure, as the case may be, or of any material part of a building or structure.
- 1.167 “**Design and Bid Fee**” has the meaning given in the Request for Proposals.
- 1.168 “**Design Certificate**” means a certificate with contents described in Attachment 1 to Appendix A of Schedule 10 – Review Procedure.
- 1.169 “**Design and Construction Certification Procedure**” means the process for review and issuance of Design Certificates and Construction Certificates in accordance with Schedule 10 – Review Procedure.
- 1.170 “**Design and Construction Requirements**” means the relevant specifications, standards, procedures and other requirements for the design and construction of the System Infrastructure, the New Municipal Infrastructure, final disposition of the Existing Trillium Line Assets, all as set out in Schedule 15-2 of the Output Specifications.
- 1.171 “**Design and Construction Specifications**” means the specifications as set out in Schedule 15-2 of the Output Specifications.
- 1.172 “**Design Brief**” means a narrative document to accompany Works Submittals with contents described in Schedule 10 – Review Procedure.
- 1.173 “**Design Data**” means all drawings, reports, documents, plans, software, formulae, calculations, and other data prepared or obtained by Project Co relating to the design, construction, testing or monitoring of the System Infrastructure and the New Municipal Infrastructure, but excluding Intellectual Property Rights of third parties, such as CAD software, that is used only in the process of design and construction.
- 1.174 “**Design Development Submittals**” has the meaning given in Section 20.3(d)(i) of the Project Agreement.
- 1.175 “**Design Management Plan**” or “**DMP**” has the meaning given in Schedule 11 – Integrated Management System Requirements.

- 1.176 “**Design Review Meetings**” has the meaning given in Section 20.5(a) of the Project Agreement.
- 1.177 “**Design Team**” means [REDACTED], engaged by Project Co to design the System Infrastructure and the New Municipal Infrastructure and any substitute design team engaged by Project Co as may be permitted by the Project Agreement.
- 1.178 [Not used]
- 1.179 “**Development Approval**” means development permits, building permits, zoning approvals and any other planning or development permit, consent or applicable Permits, Licences, Approvals and Authorizations required from time to time for construction of the System Infrastructure and the New Municipal Infrastructure.
- 1.180 “**Direct Agreements**” means the Construction Contractor’s Direct Agreement and the Maintenance and Rehabilitation Contractor’s Direct Agreement.
- 1.181 “**Direct Cost**” has the meaning given in Schedule 21 -Variation Procedure.
- 1.182 “**Direct Losses**” means all damage, losses, liabilities, penalties, fines, assessments, claims, actions, costs, expenses (including the cost of legal or professional services, legal costs being on a substantial indemnity basis), proceedings, demands and charges whether arising under statute, contract or at common law, except Indirect Losses.
- 1.183 “**Direct or Indirect Power or Control**” means the direct or indirect power or control over the decisions, management, actions or policies of a person, including through the direct or indirect power or control over the decisions, management, actions or policies of any persons having direct or indirect power or control over the decisions, management, actions or policies of any other person, whether through:
- (a) ownership, beneficial or otherwise, of greater than [REDACTED] percent of any of the shares, units or equity interests of a person;
 - (b) the direct or indirect power to vote any of the shares, units or equity interests of a person where an individual’s ownership, beneficial or otherwise, is equal to or exceeds [REDACTED] percent of the voting securities, units or equity interests of such person; or
 - (c) the direct or indirect power or authority to influence or direct the approval of a decision, the management, actions or policies of a person or to prevent the approval of a decision, the management, actions or policies of a person through any contractual right or other power or interest with or over a person.
- 1.184 “**Discount Rate**” has the meaning given in Schedule 22 - Compensation on Termination.

1.185 “**Discriminatory Change in Law**” means any Change in Law the effect of which is to discriminate directly against or impose additional Taxes which apply specifically to:

- (a) transit systems, including transit systems whose design, construction, financing, maintenance and rehabilitation and facilities management are procured by a contract similar to the Project Agreement in relation to other similar transit systems;
- (b) the System Infrastructure or the New Municipal Infrastructure in relation to other transit systems, including light rail transit systems;
- (c) Project Co in relation to other persons; or
- (d) Persons undertaking projects for design, construction, financing, maintenance and rehabilitation and facilities management that are procured by a contract similar to the Project Agreement in relation to other persons undertaking similar projects procured on a different basis,

except that such Change in Law shall not be a Discriminatory Change in Law:

- (e) where it is in response to any act or omission on the part of Project Co which contravenes Applicable Law (other than an act or omission rendered illegal by virtue of the Discriminatory Change in Law itself);
- (f) solely on the basis that its effect on Project Co is greater than its effect on other companies; or
- (g) where such Change in Law is a change in Taxes that affects companies generally.

1.186 “**Dispute**” has the meaning given in Schedule 26 – Dispute Resolution Procedure.

1.187 “**Dispute Resolution Procedure**” means the procedure set out in Schedule 26 - Dispute Resolution Procedure.

1.188 “**Distributions**” means distributions paid in respect of the Equity Capital permitted under Schedule 4 – Wide Equity Funding Requirements.

1.189 “**Distribution Account**” means the following account opened at the [REDACTED] in the name of Project Co:

SWIFT:	[REDACTED]
Canadian Routing Code:	[REDACTED]
Account No.:	[REDACTED]
Beneficiary Name:	[REDACTED]

1.190 “**Dow’s Lake Tunnel Structure**” means the structural system of the existing Dow’s Lake tunnel, the maintenance responsibilities of which are provided for in Attachment 8 of Appendix A to Schedule 15-3 of the Output Specifications.

- 1.191 “**Dust Control Plan**” has the meaning given in Schedule 17 – Environmental Obligations.
- 1.192 “**Early Works Agreement**” has the meaning given in Section 1.5(a) of the Project Agreement.
- 1.193 “**Earned Value**” has the meaning given in Schedule 20 – Construction Period Payments.
- 1.194 “**Economic Interest**” means any right to receive, directly or indirectly and whether in cash or in kind, a payment, repayment, fee, interest, dividend, distribution, redemption or any other consideration of benefit or value to the recipient of any nature whatsoever, but excluding wages, salaries or other employment-related benefits.
- 1.195 “**Embargo Period**” means the dates when Utility Companies do not permit works to be undertaken.
- 1.196 “**Emergency**” means any situation, event, occurrence, multiple occurrences or circumstances:
- (a) that:
 - (i) constitutes or may constitute a hazard to or jeopardizes or may jeopardize or pose a threat to health and safety of any persons (including System Users and City Parties) or any part of or the whole of the System Infrastructure;
 - (ii) causes or may cause damage or harm to property, buildings and/or equipment;
 - (iii) constitutes a hostage situation or state of emergency declared as such by the City Representative or the City (acting reasonably);
 - (iv) materially interferes with or prejudices or may materially interfere with or prejudice the safe operation of the System Infrastructure, any part of the Lands, the conduct of Project Operations, or the conduct of Governmental Activities; or
 - (v) constitutes a period of transition to or from war;
- and which, in the opinion of the City, requires immediate action to prevent and/or mitigate the occurrence (or risk of the occurrence) of the foregoing; or
- (b) which gives rise to an emergency, as determined by any statutory body including (notwithstanding the generality of the foregoing) an Emergency Service Provider.
- 1.197 “**Emergency Response Plan**” means the plan to be prepared, submitted and implemented by Project Co in accordance with Schedule 15 - Output Specifications.
- 1.198 “**Emergency Service Providers**” means any Police Service, firefighting service, ambulance service, armed forces or other authority with emergency service authority

pursuant to Applicable Law which may require access to the System Infrastructure from time to time.

- 1.199 “**Enabling Works**” means that scope of work described in the City’s purchase order [REDACTED] performed by or on behalf of [REDACTED].
- 1.200 “**Encumbrances**” means the Encumbrances listed in Schedule 16 - Encumbrances and any other encumbrances deemed to be Encumbrances as described in and for the purposes set out in Section 15.2(d) of the Project Agreement.
- 1.201 “**Environmental Approvals**” means:
 - (a) any authorization(s) issued by the Ontario Ministry of the Environment and Climate Change relating to the Environmental Assessments;
 - (b) the Fisheries Act Authorizations; and
 - (c) any Permits, Licences, Approvals and Authorizations relating to environmental matters.
- 1.202 “**Environmental Assessments**” means the documents listed in Appendix “B” of Schedule 1 – Definitions and Interpretation.
- 1.203 “**Environmental Law**” means all Applicable Law relating to public health or the protection of the environment or Species-at-Risk.
- 1.204 “**Environmental Management Plan**” has the meaning given in Schedule 17 – Environmental Obligations.
- 1.205 “**Environmental Manager**” has the meaning given in Schedule 11 – Integrated Management System Requirements.
- 1.206 “**Environmental Reports**” means collectively, the following reports:
 - (a) [REDACTED]
 - (b) [REDACTED]
 - (c) [REDACTED]
 - (d) [REDACTED]
 - (e) [REDACTED]
 - (f) [REDACTED]
 - (g) [REDACTED]
 - (h) [REDACTED]

- (i) [REDACTED]
- (j) [REDACTED]
- (k) [REDACTED]
- (l) [REDACTED]
- (m) [REDACTED]
- (n) [REDACTED]
- (o) [REDACTED]
- (p) [REDACTED]
- (q) [REDACTED]
- (r) [REDACTED]
- (s) [REDACTED]
- (t) [REDACTED]
- (u) [REDACTED]
- (v) [REDACTED]
- (w) [REDACTED]
- (x) [REDACTED]
- (y) [REDACTED]
- (z) [REDACTED]
- (aa) [REDACTED]
- (bb) [REDACTED]
- (cc) [REDACTED]
- (dd) [REDACTED]
- (ee) [REDACTED]
- (ff) [REDACTED]
- (gg) [REDACTED]

- (hh) [REDACTED]
- (ii) [REDACTED]
- (jj) [REDACTED]
- (kk) [REDACTED]
- (ll) [REDACTED]
- (mm) [REDACTED]
- (nn) [REDACTED]
- (oo) [REDACTED]
- (pp) [REDACTED]
- (qq) [REDACTED]
- (rr) [REDACTED]
- (ss) [REDACTED]
- (tt) [REDACTED]
- (uu) [REDACTED]
- (vv) [REDACTED]
- (ww) [REDACTED]
- (xx) [REDACTED]
- (yy) [REDACTED]
- (zz) [REDACTED]
- (aaa) [REDACTED]
- (bbb) [REDACTED]
- (ccc) [REDACTED]
- (ddd) [REDACTED]
- (eee) [REDACTED]
- (fff) [REDACTED]

(ggg) [REDACTED]

- 1.207 “**Equity Capital**” means the aggregate (without double counting) of all subscribed share capital, shareholder loans, loans made or capital contributed to Project Co by any Affiliate of Project Co or of a Project Co Party, and other contributed capital of Project Co.
- 1.208 “**Equity Contribution Agreement**” means the equity contribution agreement date on or about the date hereof between Project Co and [REDACTED] and the Lenders’ Agent setting out, *inter alia*, the terms and conditions of the Equity Contributions.
- 1.209 “**Equity Contributions**” means the equity contributed to Project Co pursuant to the Equity Contribution Agreement.
- 1.210 “**Equity Gain**” means an amount equal to the greater of zero and the difference between:
- (a) the amount paid in consideration of the percentage of Equity Capital (as at Financial Close) sold in a particular sale of Equity Capital; and
 - (b) the amount, calculated on a pre-tax basis, paid in consideration of the percentage of Equity Capital (as at Financial Close) sold in a particular sale of Equity Capital received in full on the day of the sale of Equity Capital, taken together with all Distributions paid in respect of the Equity Capital, and taking account of the actual timing of payment of all such amounts.
- 1.211 “**Equity IRR**” means the projected internal rate of return to the Equity Provider over the full term of this Project Agreement, taking into account the aggregate of all its investments and of all Distributions made and projected to be made.
- 1.212 “**Equity Lock-Up Account**” means the following account opened at [REDACTED] in the name of Project Co:
- | | |
|------------------------|------------|
| SWIFT: | [REDACTED] |
| Canadian Routing Code: | [REDACTED] |
| Account No.: | [REDACTED] |
| Beneficiary Name: | [REDACTED] |
- 1.213 “**Equity Provider**” means each of [REDACTED] and [REDACTED].
- 1.214 “**Equity Sale Amount**” means the gross amount, without taking into account any transaction costs and fees, received in consideration of a percentage of Equity Capital.
- 1.215 “**Equity Sale IRR**” means the annualized internal rate of return realized by the seller on a sale of any percentage Equity Capital, between the date on which such seller initially invests in or acquires such percentage of Equity Capital, and the date on which the sale of such percentage of Equity Capital occurs. Equity Sale IRR shall be calculated using the XIRR function in Excel, by taking into account the Equity Sale Amount, together with all Distributions received by the seller with respect to such percentage of Equity Capital, and the amount initially paid by the same seller to invest in or acquire the percentage of the

Equity Capital in question, as well as the actual timing of payment and/or receipt of all such amounts.

- 1.216 “**ESA**” means the *Endangered Species Act, 2007 (Ontario)*.
- 1.217 “**Escrow Account**” has the meaning given in Schedule 23 - Expiry Transition Procedure.
- 1.218 “**Estimate**” has the meaning given in Schedule 21 - Variation Procedure.
- 1.219 “**Estimated Fair Value**” has the meaning given in Schedule 22 - Compensation on Termination.
- 1.220 “**Event of Vandalism**” has the meaning given in Schedule 15 – Output Specifications.
- 1.221 “**Excess Equity Gain**” means an amount equal to the greater of zero and the difference between:
 - (a) the Equity Sale Amount; and
 - (b) the Threshold Equity Sale Amount.
- 1.222 “**Excise Tax Act (Canada)**” means the *Excise Tax Act, R.S.C., 1985, c. E-15*, as amended from time to time.
- 1.223 “**Excusing Cause**” has the meaning given in Section 40.1(a) of the Project Agreement.
- 1.224 “**Executive Council Act (Ontario)**” means the *Executive Council Act, R.S.O. 1990, c. E. 25*, as amended from time to time.
- 1.225 “**Existing City Retained Latent Defect Structures**” means the following structures forming part of the Existing Trillium Line Assets as more fully described in Appendix “C” of Part 2 of Schedule 15-2 - Output Specifications:
 - (a) [REDACTED];
 - (b) [REDACTED];
 - (c) [REDACTED];
 - (d) [REDACTED];
 - (e) [REDACTED];
- 1.226 “**Existing Contamination**” has the meaning given in Section 16.2(a) of the Project Agreement.
- 1.227 “**Existing Trillium Line**” means the approximately 8km long passenger rail line currently operated and maintained by the City of Ottawa from Bayview Station in the

north to Greenboro Station in the south. The Existing Trillium Line also has stations at Carling, Carleton and Mooney's Bay.

- 1.228 “**Existing Trillium Line Assets**” means the infrastructure, assets and systems of the Existing Trillium Line which are located in, on or adjacent to the Lands and which are handed over by the City to Project Co at the commencement of the Shutdown Period, but excluding the Existing Vehicle Fleet.
- 1.229 “**Existing Vehicle Fleet**” has the meaning given in Schedule 15-1 of the Output Specifications.
- 1.230 “**Existing Vehicle Maintenance Standard**” means the vehicle maintenance of the Existing Vehicle Fleet in accordance with (i) the [REDACTED], (ii) the LINT DMU Inspection & Safety Rules approved by Transport Canada , and (iii) the vehicle cleaning, fueling, inspections, maintenance, and field technical support regime contemplated in the [REDACTED], including the “Annex A Terms of Reference” thereto.
- 1.231 “**Existing Walkley Yard**” has the meaning given in Schedule 15-1 of the Output Specifications.
- 1.232 “**Expanded Trillium Line**” means, collectively, the Existing Trillium Line and the Trillium Line Extension.
- 1.233 “**Expert**” has the meaning given in Schedule 26 - Dispute Resolution Procedure.
- 1.234 “**Expiry Date**” means the 27th anniversary of the Scheduled Substantial Completion Date and in no event will the Expiry Date be adjusted.
- 1.235 “**Expiry Rehabilitation Costs**” has the meaning given in Schedule 23 - Expiry Transition Procedure.
- 1.236 “**Expiry Transition Amount**” has the meaning given in Schedule 23 - Expiry Transition Procedure.
- 1.237 “**Expiry Transition Procedure**” means the procedure for expiry transition described in Schedule 23 - Expiry Transition Procedure.
- 1.238 “**Expiry Transition Process Asset Preservation Work Schedule**” has the meaning given in Schedule 15 – Output Specifications.
- 1.239 “**Expiry Transition Requirements**” has the meaning given in Schedule 23 - Expiry Transition Procedure.
- 1.240 “**Expiry Transition Security**” has the meaning given in Schedule 23 - Expiry Transition Procedure.
- 1.241 “**Expiry Transition Works**” has the meaning given in Schedule 23 - Expiry Transition Procedure.

- 1.242 “**Expiry Transition Works Costs**” has the meaning given in Schedule 23 - Expiry Transition Procedure.
- 1.243 “**Extension Contractor**” has the meaning given in Schedule 36 – System Extension.
- 1.244 “**External IMS Audit**” has the meaning given in Schedule 11 – Integrated Management System Requirements.
- 1.245 “**Facilities**” has the meaning given in Schedule 15 – Output Specifications.
- 1.246 “**Factory Acceptance Test**” or “**FAT**” has the meaning given in Schedule 14 – Testing and Commissioning.
- 1.247 “**Failure Points**” has the meaning given in Schedule 19 - Payment Mechanism.
- 1.248 “**Fare Control Service Provider**” means the Third Party Contractor responsible for supply, installation, operation and non-custodial maintenance of all fare control equipment.
- 1.249 “**Final Completion**” means the completion of the Works in accordance with the Project Agreement, including completion of all Minor Deficiencies, other than any minor work that is seasonal in nature and cannot be completed by the Final Completion Date.
- 1.250 “**Final Completion Certificate**” means the certificate to be issued by the Independent Certifier in accordance with Section 25.10 of the Project Agreement.
- 1.251 “**Final Completion Date**” means the date on which Final Completion is achieved as evidenced by the Final Completion Certificate, as such date shall be stated therein.
- 1.252 “**Final Completion Notice**” has the meaning given in Section 25.10(b) of the Project Agreement.
- 1.253 “**Final Completion Countdown Notice**” has the meaning given in Section 25.9A(a) of the Project Agreement.
- 1.254 “**Final Design Development**” or “**FDD**” has the meaning given in Schedule 10 – Review Procedure.
- 1.255 “**Final New Municipal Infrastructure Works Acceptance Certificate**” means the certificate issued by the City Engineer to Project Co confirming New Municipal Infrastructure Works Acceptance.
- 1.256 “**Final New Municipal Infrastructure Works Requirement**” has the meaning given in Section 25.13(j) of the Project Agreement.
- 1.257 “**Final New System Infrastructure Condition Report**” has the meaning given in Schedule 23 – Expiry Transition Procedure.

- 1.258 “**Financial Administration Act, R.S.O. 1990, c. F.12**” means the *Financial Administration Act*, R.S.O. 1990, c. F.12, as amended from time to time.
- 1.259 “**Financial Close**” means the first date that funding is available under the Lending Agreements.
- 1.260 “**Financial Close Target Date**” means Friday March 29, 2019, as such date may be extended in accordance with the provisions of the Project Agreement.
- 1.261 “**Financial Model**” means the computer spreadsheet model for the Project incorporating statements of Project Co’s cashflows including all expenditure, revenues, financing and taxation of the Project Operations together with the profit and loss accounts and balance sheets for Project Co throughout the Project Term accompanied by details of all assumptions, calculations and methodology used in their compilation and any other documentation necessary or desirable to operate the model.
- 1.262 “**Financial Obligations**” means the obligation to pay any application fees, third party fees, costs or charges (including all applicable taxes thereon), the provision of any letters of credit, instruments of guarantee, bonds or security deposits, or any other financial security obligations.
- 1.263 “**FIPPA**” means the *Freedom of Information and Protection of Privacy Act* (Ontario).
- 1.264 “**Fisheries Act Authorizations**” means the authorization(s) issued by Fisheries and Oceans Canada in connection with the Project, and any amendment or supplement to the authorization(s) as may be issued after Commercial Close or required in connection with the Project from time to time during the Project Term.
- 1.265 “**Float**” has the meaning given to in Schedule 12 - Works Scheduling Requirements .
- 1.266 “**Force Majeure**” has the meaning given in Section 42.1(a) of the Project Agreement.
- 1.267 “**Freedom of Information and Protection of Privacy Act (Ontario)**” means the *Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, c. F.31, as amended from time to time.
- 1.268 “**Funeral, Burial and Cremations Services Act, 2002 (Ontario)**” means the *Funeral, Burial and Cremations Services Act*, S.O. 2002, c. 33, as amended from time to time.
- 1.269 “**Future Known Expansion**” includes, without limitation and subject to further approval by the City, the future works in the design of the Project listed in Article 2.9(d) of Part 1 in Schedule 15-2 of the Output Specifications.
- 1.270 “**Geotechnical Reports**” means the reports listed in Appendix E to this Schedule 1 – Definitions and Interpretation.
- 1.271 “**Good Industry Practice**” means using standards, practices, methods and procedures to a good commercial standard, conforming to Applicable Law and exercising that degree of skill and care, diligence, prudence and foresight which would reasonably and ordinarily

- be expected from a qualified, skilled and experienced person engaged in a similar type of undertaking under the same or similar circumstances.
- 1.272 “**Government Sensitive Information**” means any information which is designated as such by the City from time to time, or which a reasonable person, having regard to the circumstances, would regard as sensitive, including (i) all confidential information that is designated as such by Applicable Law, and (ii) any record, the disclosure of which could be injurious to the interests of the City.
- 1.273 “**Governmental Activities**” means the provision of all governmental services and the conduct of all activities provided in connection or otherwise associated with the Lands or the System Infrastructure by any Governmental Authority or Emergency Service Provider, and includes the City Activities.
- 1.274 “**Governmental Authority**” means any federal, provincial, territorial, regional, municipal or local governmental authority, quasi-governmental authority, court, government or self-regulatory organization, commission, board, tribunal, organization, or any regulatory, administrative or other agency, or any political or other subdivision, department, or branch of any of the foregoing, having legal jurisdiction in any way over the City, any aspect of the performance of the Project Agreement, the operation of the Trillium Line Extension or the Governmental Activities, in each case to the extent it has or performs legislative, judicial, regulatory, administrative or other functions within its jurisdiction.
- 1.275 “**Guarantors**” means the Construction Guarantor and the Maintenance and Rehabilitation Guarantor.
- 1.276 “**Guideway**” has the meaning given in Schedule 15 – Output Specifications.
- 1.277 “**H&S Certification Default Event**” has the meaning given in Section 9.6(c) of the Project Agreement.
- 1.278 “**H&S Certification Maintenance Plan**” has the meaning given in Section 9.6(c)(vii)(B) of the Project Agreement.
- 1.279 “**H&S Certification Reinstatement Plan**” has the meaning given in Section 9.6(c)(vii)(B) of the Project Agreement.
- 1.280 “**H&S Construction Inspection**” has the meaning given in Section 13(b) of the Project Agreement.
- 1.281 “**H&S Construction Inspection Report**” has the meaning given in Section 13(c) of the Project Agreement.
- 1.282 “**H&S Construction Re-Inspection**” has the meaning given in Section 13(e)(ii) of the Project Agreement.
- 1.283 “**H&S Construction Re-Inspection Report**” has the meaning given in Section 13(e)(iii) of the Project Agreement.

- 1.284 “**H&S Conviction**” has the meaning given in Section 43.1(a)(xix) of the Project Agreement.
- 1.285 “**H&S Maintenance Inspection**” has the meaning given in Section 13(b) of the Project Agreement.
- 1.286 “**H&S Maintenance Inspection Report**” has the meaning given in Section 13(d) of the Project Agreement.
- 1.287 “**H&S Maintenance Re-Inspection**” has the meaning given in Section 13(e)(ii) of the Project Agreement.
- 1.288 “**H&S Maintenance Re-Inspection Report**” has the meaning given in Section 13(e)(iv) of the Project Agreement.
- 1.289 “**Handover**” means, as applicable, the successful handover, by Project Co of,
- (a) the New Municipal Infrastructure, or a component thereof, to the City in accordance with Section 25.13 of the Project Agreement including, for clarity, the delivery of the Final New Municipal Works Acceptance Certificate by the City Engineer to Project Co in accordance with Section 25.13(i) of the Project Agreement; or
 - (b) the New Utility Infrastructure to the Utility Companies and in accordance with the requirements agreed to between Project Co and the Utility Companies.
- 1.290 “**Has Knowledge**” or “**Have Knowledge**” means:
- (a) a natural person knows or has knowledge when information is received or acquired by the person under the circumstances in which a reasonable person would take cognizance of it; and
 - (b) corporation knows or has knowledge when information has been received or has come to the attention of:
 - (i) a director or officer of the corporation; or
 - (ii) a senior employee of the corporation with responsibility for matters to which the information relates,
 - (c) the City knows or has knowledge when information has been received or has come to the attention of:
 - (i) [REDACTED];
 - (ii) [REDACTED]; or
 - (iii) [REDACTED];

under circumstances in which a reasonable person would take cognizance of it and, in the case of Project Co, shall include matters referred to in subparagraph (a) or (b) above with respect to the Contractors, and “**Knowledge**” has a corresponding meaning.

- 1.291 “**Hazardous Substances**” means any contaminant, pollutant, dangerous substance, toxic substance, liquid waste, industrial waste, gaseous waste, hauled liquid waste, hazardous material, or hazardous substance as defined or identified pursuant to any Applicable Law.
- 1.292 “**Health and Safety Certification Maintenance Plan**” has the meaning given in Section 9.6(b)(iv)(B) of the Project Agreement.
- 1.293 “**Health and Safety Certification Reinstatement Plan**” has the meaning given in Section 9.6(b)(iii)(B) of the Project Agreement.
- 1.294 “**Hedge Provider**” means a person that has entered into a Hedging Agreement with Project Co pursuant to the Lending Agreements, together with their successors and permitted assigns.
- 1.295 “**Hedging Agreement**” means an agreement relating to the hedging of interest rate risk entered into by Project Co and the Hedge Provider(s) pursuant to the Lending Agreements.
- 1.296 “**HST**” means the value-added tax imposed pursuant to Part IX of the *Excise Tax Act* (Canada), and any successor legislation thereto.
- 1.297 “**IHSA**” means Infrastructure Health and Safety Association, a not-for-profit occupational safety organization formed on January 1, 2010 that provides health and safety training material and services to Ontario construction, electrical utilities and transportation industries, and is accredited in Ontario to issue and grant Certificates of Recognition and Letters of Good Standing, or such other person so accredited in Ontario to issue and grant Certificates of Recognition and Letters of Good Standing.
- 1.298 “**IMS Audit**” has the meaning given in Schedule 11 – Integrated Management System Requirements.
- 1.299 “**Initial Capital Investment Date**” has the meaning given in Schedule 20 – Construction Period Payments.
- 1.300 “**Income Tax Act (Canada)**” means the *Income Tax Act*, R.S.C., 1985, c. 1, as amended from time to time.
- 1.301 “**Income Tax Act (Ontario)**” means the *Income Tax Act*, R.S.O. 1990, c. I.2, as amended from time to time.
- 1.302 “**Indemnifiable Taxes**” has the meaning given in Section 33.7(b)(iii) of the Project Agreement.
- 1.303 “**Indemnifier**” has the meaning given in Section 54.3(a) of the Project Agreement.

- 1.304 “**Independent Certifier**” means the person appointed as the Independent Certifier pursuant to the Independent Certifier Agreement and as may be permitted pursuant to the Project Agreement.
- 1.305 “**Independent Certifier Agreement**” means the contract entered into between Project Co, the City and the Independent Certifier in substantially the form attached hereto as Schedule 6 - Independent Certifier Agreement.
- 1.306 “**Independent Inspector**” has the meaning given in Schedule 23 - Expiry Transition Procedure.
- 1.307 “**Independent Safety Assessor**” means an independent party appointed by Project Co to assess:
 - (a) the safety and security of the Works prior to Substantial Completion; and
 - (b) changes to System Infrastructure after Substantial Completion, if any.
- 1.308 “**Indirect Losses**” has the meaning given in Section 55.1(a) of the Project Agreement.
- 1.309 “**Inflation Base Date**” has the meaning given in Schedule 19 - Payment Mechanism.
- 1.310 “**Injurious Affection**” has the meaning given in the *Expropriations Act*, R.S.O. 1990, c. E. 26, as amended from time to time.
- 1.311 “**Innovation Proposal**” has the meaning given in Section 37.2(b) of the Project Agreement.
- 1.312 “**IPFP Framework**” means the alternative financing and procurement project framework which complies with the principles set out in *MOI’s Building a Better Tomorrow: An Infrastructure Planning, Financing and Procurement Framework for Ontario’s Public Sector*.
- 1.313 “**Inspection and Test Plan**” has the meaning given in Schedule 11 – Integrated Management System Requirements.
- 1.314 “**Insurance Adjustment**” has the meaning given in Section 7.3 of Schedule 24 - Insurance and Performance Security Requirements.
- 1.315 “**Insurance Cost Differential**” has the meaning given in Section 7.1(c) of Schedule 24 - Insurance and Performance Security Requirements.
- 1.316 “**Insurance Policies**” has the meaning given in Schedule 28 - Insurance Trust Agreement.
- 1.317 “**Insurance Proceeds**” has the meaning given in Schedule 28 - Insurance Trust Agreement.

- 1.318 “**Insurance Review Date**” has the meaning given in Schedule 24 - Insurance and Performance Security Requirements.
- 1.319 “**Insurance Review Period**” has the meaning given in Schedule 24 - Insurance and Performance Security Requirements.
- 1.320 “**Insurance Trust Account**” means Account No. [REDACTED] at [REDACTED].
- 1.321 “**Insurance Trust Agreement**” means the insurance trust agreement to be entered into between the City, Project Co, the Lenders’ Agent and the Account Trustee in the form set out in Schedule 28 - Insurance Trust Agreement.
- 1.322 “**Integrated Management Plans**” or “**IMP**” have the meaning given in Schedule 11 – Integrated Management System Requirements.
- 1.323 “**Integrated Management System**” and “**IMS**” have the meanings given in Schedule 11 – Integrated Management System Requirements.
- 1.324 “**Integrated System Extension**” has the meaning given in Schedule 36 – System Extension.
- 1.325 “**Intellectual Property**” means all intellectual and industrial property, including without limitation: (i) Trade-Marks; (ii) Patents; (iii) Copyrights; (iv) inventions, whether or not patentable, whether or not reduced to practice or whether or not yet made the subject of a pending patent application or applications; (v) ideas and conceptions of potentially patentable subject matter, including, without limitation, any patent disclosures, whether or not reduced to practice and whether or not yet made the subject of a pending patent application or applications; (vi) trade secrets and confidential, technical or business information (including ideas, formulas, compositions, designs, inventions, and conceptions of inventions whether patentable or unpatentable and whether or not reduced to practice); (vii) whether or not confidential, technology (including know-how and show-how), manufacturing and production processes and techniques, methodologies, research and development information, drawings, specifications, designs, plans, proposals, technical data, copyrightable works, marketing and business data, pricing and cost information, business and marketing plans; (x) copies and tangible embodiments of all the foregoing, in whatever form or medium; (ix) all rights to obtain and rights to apply for any of the foregoing and all rights therein provided by multinational treaties or conventions; (x) all rights under any agreements or instruments with respect to items in (i) to (ix) above; and (xi) all rights to sue and recover and retain damages and costs and attorneys’ fees for present and past infringement or other violation of any of the intellectual property rights hereinabove set out.
- 1.326 “**Intellectual Property Rights**” means all right, title and interest in, to and under the Intellectual Property in or associated with the Project Data and all Intellectual Property which, or the subject matter of which, is at any time before or after Commercial Close created, brought into existence, acquired, used or intended to be used by Project Co, any Subcontractor or by other third parties (for such third parties’ use by or on behalf of or for the benefit of Project Co) for any or all of the purposes of:

- (a) the Works, including the design and construction of the System Infrastructure (excluding Intellectual Property Rights of third parties, such as CAD software, that is used only in the process of design and construction);
 - (b) the Maintenance and Rehabilitation Services, including the maintenance, improvement, testing and rehabilitation of the System Infrastructure;
 - (c) any other Project Operations; or
 - (d) the Project Agreement.
- 1.327 **“Interim Maintenance Period”** has the meaning given in Section 7 of Schedule 19 – Payment Mechanism.
- 1.328 **“Interim Substantial Completion”** means the point at which (i) the System Infrastructure, the New Municipal Infrastructure, the New Utility Infrastructure have been completed in accordance with the Project Agreement; (ii) the Payment Certifier appointed pursuant to Section 15.3(g) of the Project Agreement has certified the substantial performance of the Construction Contract and the related certificate of substantial performance of the Works is published pursuant to Section 32(1) of the CLA; and (iii) all requirements for Readiness for Revenue Service described in Schedule 14 – Testing and Commissioning have been satisfied in respect of the System Infrastructure and the New Municipal Infrastructure as a whole, in each case, other than in respect of Minor Deficiencies and Remaining Works. For clarity, Interim Substantial Completion shall include the successful completion of the SIT required to verify the System Infrastructure will: comply with the AODA/ADA requirements relative to the New Revenue Vehicles; comply with all the required clearances relative to the New Revenue Vehicles.
- 1.329 **“Interim Substantial Completion Certificate”** means, following the delivery of the Interim Substantial Completion Notice, the certificate to be issued by the Independent Certifier in accordance with Section 25.3 of the Project Agreement.
- 1.330 **“Interim Substantial Completion Date”** means the date on which Interim Substantial Completion is achieved as evidenced by the Interim Substantial Completion Certificate, as such date shall be stated therein.
- 1.331 **“Internal IMS Audit”** has the meaning given in Schedule 11 – Integrated Management System Requirements.
- 1.332 **“International Financial Reporting Standards”** means international financial reporting standards within the meaning of the IAS Regulation 1606/2002 and in effect from time to time, consistently applied.
- 1.333 **“ISO 45001 Accreditation”** means, in respect of an entity, such entity having received certification in respect of its health and safety management systems that such systems comply with the requirements of ISO 45001.

- 1.334 “**ISO 45001 Compliant Maintenance and Rehabilitation Project Co Party**” means one of the following:
- (a) where the Maintenance and Rehabilitation Contractor is a single legal entity, the Maintenance and Rehabilitation Contractor; or
 - (b) where the Maintenance and Rehabilitation Contractor is a joint venture, each member of the joint venture; or;
 - (c) where the Maintenance and Rehabilitation Contractor is a partnership, each partner of the partnership.
- 1.335 “**ISO 45001 Accredited Maintenance and Rehabilitation Project Co Party**” has the meaning given in Section 9.6(b)(ii) of the Project Agreement.
- 1.336 “**Joint Insurance Cost Report**” has the meaning given in Schedule 24 - Insurance and Performance Security Requirements.
- 1.337 **Key Individual**” means those Project Co Parties listed in Schedule 9 - Key Individuals.
- 1.338 **Key Works Milestones**” has the meaning given in Schedule 12 - Works Scheduling Requirements.
- 1.339 “**Labour and Material Payment Bond**” means, collectively, the Labour and Material Payment Bond and the Multiple Obligee Rider to Labour and Material Payment Bond in the form attached as Appendix C to Schedule 24 – Insurance and Performance Security Requirements.
- 1.340 “**Lands**” has the meaning given in Schedule 33 – Lands.
- 1.341 “**Lands Table**” has the meaning given in Schedule 33 – Lands.
- 1.342 “**Lane Closure**” has the meaning given in Schedule 7 – Mobility Matters.
- 1.343 “**Lane Closure Adjustment**” has the meaning given in Schedule 7 – Mobility Matters.
- 1.344 “**Lane Closure Target Letter**” has the meaning given in Schedule 7 – Mobility Matters.
- 1.345 “**Latent Defect**” means a shortcoming, failure, fault, inadequacy, weakness, deficiency or imperfection whether caused by inappropriate or inadequate design, construction, installation, affixation or material, lack of or improper maintenance, negligence or wilful damage by a third party that is not visible or readily apparent through normal inspection, investigation or use or that is not properly inferable from the age and prior use of the item; provided that: (i) any condition described in, properly inferable, readily apparent or readily discoverable from the Background Information; (ii) any condition that (A) is attributable to the failure by Project Co to perform the Project Operations in accordance with the Project Agreement, (B) is caused by Project Co or any Project Co Party, or (C) is attributable to Project Co’s design or construction means and methods, shall not constitute a Latent Defect.

- 1.346 “**LEED**” means Leadership in Energy & Environmental Design.
- 1.347 “**LEED Rating System**” means the CaGBC’s Leadership in Energy & Environmental Design (LEED) Green Building Rating System for New Construction and Major Renovations, LEED® Canada-NC 2009.
- 1.348 “**Lenders**” means any or all of the persons acting arm’s length to Project Co and each Project Co Party who provide the financing, and for greater clarity, excludes the Hedge Provider(s) or any other hedge providers and their respective permitted successors and assigns and any Affiliate of Project Co or a Project Co Party.
- 1.349 “**Lenders’ Agent**” has the meaning given in Schedule 41 – Lenders’ Direct Agreement.
- 1.350 “**Lenders’ Consultant**” means [REDACTED].
- 1.351 “**Lenders’ Direct Agreement**” means the direct agreement to be entered into between the City, the Lenders’ Agent and Project Co in the form set out in Schedule 41 - Lenders’ Direct Agreement.
- 1.352 “**Lending Agreements**” means any or all of the agreements or instruments to be entered into by Project Co or any of its Affiliates relating to the financing of the Project Scope, including, for greater certainty, any interest rate hedging arrangements entered into between Project Co and any hedge providers in connection with the foregoing and any agreements or instruments to be entered into by Project Co or any of its Affiliates relating to the rescheduling of their indebtedness in respect of the financing of the Works or the refinancing of the Works.
- 1.353 “**Letter of Credit**” means the letter or letters of credit delivered in accordance with Section 9.1(2) of the Request for Proposals.
- 1.354 “**Letter of Credit Provider**” has the meaning given in the Request for Proposals.
- 1.355 “**Letter of Good Standing**” means the document issued by IHSA to a person confirming that the internal maintenance audit performed by such person regarding its health and safety management systems has been approved by ISHA, and that such person has successfully completed such internal audit pursuant to the terms and conditions of the COR Program.
- 1.356 “**Line Replaceable Unit**” means a modular component which is removed and replaced at the field level to restore the end item to an operational ready condition.
- 1.357 “**Limited Modification Rights**” has the meaning given in Schedule 35 – Intellectual Property.
- 1.358 “**Limitations Act, 2002 (Ontario)**” means the *Limitations Act, 2002*, S.O. 2002, c. 24, Sch. B, as amended from time to time.
- 1.359 “**Listed PLAA Tracking System**” has the meaning given in Section 9.4(h) of the Project Agreement.

- 1.360 “**Listed Project Co PLAs**” means those Project Co Permits, Licences, Approvals and Authorizations listed in Appendix F to this Schedule 1 – Definitions and Interpretation.
- 1.361 “**Liquid Market**” has the meaning given in Schedule 22 - Compensation on Termination.
- 1.362 “**Load-Path Diagram**” means a graphically illustrated diagram that indicates in all relevant detail (including by use of colour-coded arrows indicating the directions of forces caused by dead loads, live loads, vertical loads and lateral loads) how the structural loads are transferred throughout a building or structure that is to be the subject of a Demolition.
- 1.363 “**Longstop Date**” has the meaning given in Section 43.1(a)(ii) of the Project Agreement.
- 1.364 “**Look-ahead Schedule**” has the meaning given in Schedule 12 – Works Scheduling Requirements.
- 1.365 “**Maintenance and Rehabilitation Contract**” means the agreement between Project Co and the Maintenance and Rehabilitation Contractor or such other party as shall be approved by the City to perform the Maintenance and Rehabilitation Services with respect to the System Infrastructure.
- 1.366 “**Maintenance and Rehabilitation Contractor**” means [REDACTED] engaged by Project Co to perform the Maintenance and Rehabilitation Services and any substitute person engaged by Project Co to perform such work as may be permitted by the Project Agreement.
- 1.367 “**Maintenance and Rehabilitation Contractor’s Direct Agreement**” means the direct agreement to be entered into amongst the City, the Maintenance and Rehabilitation Contractor and the Maintenance and Rehabilitation Guarantor, in the form set out in Schedule 5-2 – Maintenance and Rehabilitation Contractor’s Direct Agreement.
- 1.368 “**Maintenance and Rehabilitation Guarantor**” means [REDACTED].
- 1.369 “**Maintenance and Rehabilitation Plan**” has the meaning given in Schedule 15-1 of the Output Specifications.
- 1.370 “**Maintenance and Rehabilitation Management Plan**” or “**M&RMP**” has the meaning given in Schedule 11 – Integrated Management System Requirements.
- 1.371 “**Maintenance and Rehabilitation Requirements**” means the maintenance and rehabilitation requirements as set out in Schedule 15-3 of the Output Specifications.
- 1.372 “**Maintenance and Rehabilitation Services**” has the meaning given in Schedule 15-1 of the Output Specifications, as such work and services may from time to time be varied in accordance with the Project Agreement, but specifically excluding Governmental Activities and the Works.
- 1.373 “**Maintenance and Rehabilitation Submittals**” has the meaning given in Section 1.1 of Part B of Schedule 10 – Review Procedure.

- 1.374 “**Maintenance Committee**” has the meaning given in Section 12.1(a) of the Project Agreement.
- 1.375 “**Maintenance Period**” means the period from the Substantial Completion Date and expiring at midnight on the Termination Date.
- 1.376 “**Maintenance Period Limit**” has the meaning given in Section 55.4(a)(ii) of the Project Agreement.
- 1.377 “**Maintenance Plan**” has the meaning given in Schedule 15 – Output Specifications.
- 1.378 “**Maintenance Vehicles**” has the meaning given in Schedule 15 – Output Specifications”.
- 1.379 “**Major Comment**” means any Non-Conformance that:
 - (a) contains significant deficiencies;
 - (b) is reasonably expected to result in a Medium Qualifying NCR; or
 - (c) the continued existence of which is reasonably expected to result in Project Co being unable to satisfy the requirements of Substantial Completion by the Longstop Date.
- 1.380 “**Major Maintenance Schedule**” has the meaning given in Section 16.5(c) of the Project Agreement.
- 1.381 “**Make Good**”, “**Made Good**” and derivatives thereof, means repairing, restoring, refurbishing, rehabilitating or performing filling operation on the Works as required under the Project Agreement or any existing components disturbed due to the Works, to at least the condition existing at the commencement of the Works, in terms of construction integrity, finishes, alignment with existing adjoining surfaces, compatibility of materials, sound attenuation criteria, exfiltration/infiltration requirements, air/vapour barrier and thermal continuity.
- 1.382 “**Maximum Service Payment**” has the meaning given in Schedule 22 - Compensation on Termination.
- 1.383 “**Medium Qualifying NCR**” has the meaning given to it in Schedule 20 – Construction Period Payments.
- 1.384 “**Milestone**” has the meaning given in Schedule 12 – Works Scheduling Requirements.
- 1.385 “**Minimum Required Fleet**” has the meaning given in Schedule 15-1 – Output Specifications: Technical Terms and Reference Documents.
- 1.386 “**Minor Deficiencies**” means any defects, deficiencies and items of outstanding work (including in relation to seasonal work) arising from or related to the work required to achieve Substantial Completion, and that would not materially impair:

- (a) the public's, System Users', or the City's use and enjoyment of the System Infrastructure or any third parties use and enjoyment of their respective System Infrastructure (including any City Commissioning);
- (b) the performance of the Governmental Activities;
- (c) the performance of the Maintenance and Rehabilitation Services by Project Co;
- (d) safety, security, or traffic flow on the System Infrastructure in any relevant respect.

For greater certainty Minor Deficiencies shall not be applicable to nor shall Minor Deficiencies include defects, deficiencies and items of outstanding work arising from or related to the supply of the New Revenue Vehicles.

1.387 “**Minor Deficiencies List**” has the meaning given in Section 25.7(a) of the Project Agreement.

1.388 “**Minor Comment**” means any Non-Conformance that:

- (a) generally conforms to the requirements of the Project Agreement, but in which immaterial deficiencies have been found; or
- (b) the continued existence of which is not reasonably expected to result in Project Co becoming unable to satisfy the requirements for Substantial Completion but may result in a Minor Deficiency.

1.389 “**Minor System User Contamination**” means Contamination where the costs of clean up or remediation shall not exceed \$[REDACTED] on a per occurrence basis (and not in the aggregate).

1.390 “**Mislocated Utility Infrastructure**” means:

- (a) Utility Infrastructure that is discovered more than 200mm horizontally from the provided surveyed point via any Quality Level A investigation in the Subsurface Utility Engineering Report;
- (b) Utility Infrastructure that is discovered more than 150mm vertically from the provided surveyed point via any Quality Level A investigation in a Subsurface Utility Engineering Report;
- (c) Utility Infrastructure that is discovered more than 1500mm horizontally from the location provided via any Quality Level B investigation in a Subsurface Utility Engineering Report;
- (d) Utility Infrastructure that is discovered more than 2000mm horizontally from the location provided in the Quality Level C investigation in a Subsurface Utility Engineering Report

- (e) Utility Infrastructure that is discovered more than 3000mm horizontally from the location provided in the Quality Level D investigation in a Subsurface Utility Engineering Report; or
- (f) Utility Infrastructure that is owned by the City that is discovered more than 600mm vertically from the location provided in a Subsurface Utility Engineering Report,

provided, however, that the following shall be excluded from the definition of “**Mislocated Utility Infrastructure**”:

- (g) any Utility Infrastructure that is a service connection;
- (h) any Utility Infrastructure that is above-ground, aerial, or at-grade;
- (i) any of the following Utility Infrastructure that is owned by the City;
 - (A) watermains of nominal diameter less than 150mm;
 - (B) combined sewers or storm sewers of nominal diameter less than 300mm;
 - (C) sanitary sewers of nominal diameter less than 225mm; and
 - (D) street lighting and traffic signal cables.
- (j) any Utility Infrastructure relocations carried out at the Site subsequent to Commercial Close, including with respect to,
 - (A) the Works; and
 - (B) Third Party Works and Additional Works.

- 1.391 “**Modification**” has the meaning given in Schedule 35 – Intellectual Property.
- 1.392 “**MOI**” means Her Majesty The Queen in right of Ontario as represented by the Minister of Infrastructure, and includes any successors thereto or persons exercising delegated power under the Minister’s authority.
- 1.393 “**Monitoring Notice**” has the meaning given in Section 30.5(a) of the Project Agreement.
- 1.394 “**Monthly Equity Distribution Ratio**” has the meaning given in the Financial Model.
- 1.395 “**Monthly Previously Paid HST Amount**” means, if applicable, a monthly HST amount to be determined as provided for below which in the aggregate is equal to the amount of the Section 35.1(c) Payment. The amount of each Monthly Previously Paid HST Amount shall be:
 - (a) the amount of the Section 35.1(c) Payment amortized on a straight line basis over the Monthly Service Payments due over the remainder of the Maintenance Period

following the payment of the Section 35.1(c) Payment subject to an alternative basis on which to amortize the remaining unapplied Section 35.1(c) Payment as provided for by Applicable Law in which case the City shall determine the Monthly Previously Paid HST Amount in accordance with such Applicable Law, provided that the City may, at any time, proceed to obtain an advance ruling under the *Excise Tax Act (Canada)* (or rely upon an existing advance ruling under the *Excise Tax Act (Canada)*) in respect to some other basis for amortizing the remaining unapplied Section 35.1(c) Payment over the Monthly Service Payments due over the remainder of the Maintenance Period, and in such event, the remaining unapplied Section 35.1(c) Payment may be amortized over the Monthly Service Payments in a manner provided for in the advance ruling if the City so determines in its sole discretion;

- (b) communicated by the City to Project Co in writing at the same time that the City pays Project Co the Section 35.1(c) Payment; and
- (c) credited to the City in each Monthly Service Payment invoice sent by Project Co to the City following the payment of the Section 35.1(c) Payment.

- 1.396 “**Monthly Progress Report**” means a monthly progress report submitted by Project Co in accordance with Part 2 of Schedule 31 – Works Report Requirements.
- 1.397 “**Monthly Service Payment**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.398 “**MTO**” means the Ministry of Transportation of Ontario and its agents and representatives.
- 1.399 “**Multiple Obligee Rider to Labour and Material Payment Bond**” means the Multiple Obligee Rider amending the Labour and Material Payment Bond to add the City and Lenders as additional named Obligees, in the form attached as Exhibit 1 to Appendix C of Schedule 24 – Insurance and Performance Security Requirements.
- 1.400 “**Multiple Obligee Rider to Performance Bond**” means the Multiple Obligee Rider amending the Performance Bond to add the City and Lender as additional named Obligees, in the form attached as Exhibit 1 to Appendix B of Schedule 24 – Insurance and Performance Security Requirements.
- 1.401 “**NCC**” means the National Capital Commission and its agents and representatives.
- 1.402 “**NCC Act**” means the *National Capital Act (Canada)*.
- 1.403 “**NCC FLUDA**” means the federal land use, design approval of the NCC under section 12 of the National Capital Act required in respect of the change of use of, or erection, alteration, extension or demolition of a building or other work on, Crown Lands which are “public lands” within the “National Capital Region” (as such terms are defined in the NCC Act), as indicated in Appendix 2 – Lands – After – Acquired Lands – Crown Lands to this Schedule 1, which approval may include and be subject to conditions.

- 1.404 “**NMI Minor Deficiencies**” has the meaning given to it in “Section 25.13(f) of the Project Agreement.
- 1.405 “**NMI Minor Deficiency Deduction**” has the meaning given in Section 25.13(f) of the Project Agreement.
- 1.406 “**New Agreement**” has the meaning given in Schedule 22 - Compensation on Termination.
- 1.407 “**New Municipal Infrastructure**” means the infrastructure to be installed, relocated, upgraded, reinstated, downsized, restored, designed and/or built by Project Co for the City in accordance with Article 14 of Part 1 of Schedule 15-2 Output Specifications to the Project Agreement.
- 1.408 “**New Municipal Infrastructure Component**” means a component or element of the New Municipal Infrastructure, as set out in the Works Schedule.
- 1.409 “**New Municipal Infrastructure Component Acceptance**” means the point in time at which the City Engineer determines that an individual New Municipal Infrastructure Component has been completed in accordance with the Project Agreement and all requirements for New Municipal Infrastructure Component Acceptance described in the Output Specifications in respect of New Municipal Infrastructure Works have been satisfied, the New Municipal Infrastructure Component Works Requirements have been satisfied and the issuance by the City Engineer of a New Municipal Infrastructure Component Acceptance Certificate.
- 1.410 “**New Municipal Infrastructure Component Acceptance Certificate**” means, in respect of an individual New Municipal Infrastructure Component, the certificate issued by the City Engineer to Project Co confirming acceptance of the applicable New Municipal Infrastructure Component.
- 1.411 “**New Municipal Infrastructure Component Acceptance Date**” means, in respect of an individual New Municipal Infrastructure Component, the date on which the City Engineer has issued a New Municipal Infrastructure Component Acceptance Certificate in respect of such New Municipal Infrastructure Component.
- 1.412 “**New Municipal Infrastructure Component Acceptance Notice**” has the meaning given in Section 25.13(d) of the Project Agreement.
- 1.413 “**New Municipal Infrastructure Component Works Requirements**” has the meaning given in Section 25.13(d) of the Project Agreement.
- 1.414 “**New Municipal Infrastructure Work**” means the temporary and permanent installation, relocation, upgrading, reinstatement, restoration, downsizing, designing and/or building works by Project Co relating to the New Municipal Infrastructure for the City, carried out in connection with or as part of the Project Operations.
- 1.415 “**New Municipal Infrastructure Works Acceptance**” means the receipt by Project Co of New Municipal Infrastructure Component Acceptance Certificates for all New

Municipal Infrastructure Components and completion and satisfaction of all Final New Municipal Infrastructure Works Requirements.

- 1.416 “**New Municipal Infrastructure Works Acceptance Date**” means the date on which New Municipal Infrastructure Works Acceptance is achieved.
- 1.417 “**New Municipal Infrastructure Works Component Countdown Notice**” has the meaning given in Section 25.13(c) of the Project Agreement.
- 1.418 “**New Revenue Vehicles**” means the Revenue Vehicles supplied under the Revenue Vehicle Supply Contract under Section 9.11(a) of the Project Agreement.
- 1.419 “**New Utility Infrastructure**” means the Utility Infrastructure to be installed, relocated, upgraded, reinstated, restored, designed and/or built by Project Co for a Utility Company in accordance with the Project Agreement with reference to the applicable City Standards and Utility Company standards.
- 1.420 “**New Walkley Yard**” has the meaning given in Schedule 15 – Output Specifications.
- 1.421 “**New Walkley Yard Facilities Management Services**” means facilities management services to be delivered by Project Co at the New Walkley Yard as specified in Schedule 15 - Output Specifications.
- 1.422 “**Noise and Vibration Control Plan**” has the meaning given in Schedule 17 – Environmental Obligations.
- 1.423 “**Noise and Vibration Survey**” has the meaning given in Schedule 17 – Environmental Obligations.
- 1.424 “**Non-Conformance**” means any failure by Project Co to perform any of its obligations under the Project Agreement in respect of any aspect of the Works and which failure is not rectified by Project Co within the applicable time period, if any, stipulated in this Project Agreement.
- 1.425 “**Non-Conformance Tracking System**” has the meaning given in Schedule 11 – Integrated Management System Requirements.
- 1.426 “**Non-Default Termination Sum**” has the meaning given in Schedule 22 - Compensation on Termination.
- 1.427 “**Non-Disclosure Agreement**” has the meaning given in Schedule 26 - Dispute Resolution Procedure.
- 1.428 “**Non-Project Co Cause**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.429 “**Non-Resident**” means a person that is, at the relevant time, a non-resident of Canada for the purposes of the *Income Tax Act* (Canada).
- 1.430 “**Non-Revenue Vehicle**” has the meaning given in Schedule 15 – Output Specifications.

- 1.431 “**Notice**” has the meaning given in Section 59.1(a) of the Project Agreement.
- 1.432 “**Notice of Dispute**” has the meaning given in Schedule 26 - Dispute Resolution Procedure.
- 1.433 “**Notice of Pending Claim**” has the meaning given in Section 38.2(a) of the Project Agreement.
- 1.434 “**NRC**” means the National Research Council of Canada and its agents and representatives.
- 1.435 “**OC Transpo**” means OC Transpo and its agents and representatives .
- 1.436 “**Occupational Health and Safety Act (Ontario)**” means the *Occupational Health and Safety Act*, R.S.O. 1990, c. O.1, as amended from time to time.
- 1.437 “**Off-Peak Period**” has the meaning given in Schedule 15 – Output Specifications.
- 1.438 “**OHSAS 18001**” means the international standard for occupational health and safety management systems developed by the Occupational Health and Safety Advisory Services Project Group, a British body formed to develop the standard.
- 1.439 “**OHSAS 18001 Accreditation**” means, in respect of an entity, such entity having received certification in respect of its health and safety management systems that such systems comply with the requirements of OHSAS 18001.
- 1.440 “**Ontario Heritage Act (Ontario)**” means the *Ontario Heritage Act*, R.S.O. 1990, c. O.18, as amended from time to time.
- 1.441 “**Operator**” means any person directly engaged by the City of Ottawa to carry out the Operator Tasks.
- 1.442 “**Operator Tasks**” means all of the tasks to be performed by the Operator in connection with the operation of the Trillium Line as set out in Schedule 15 – Output Specifications.
- 1.443 “**Operator Transition**” has the meaning given in Section 26.7(a) of the Project Agreement.
- 1.444 “**Operator Transition Notice**” has the meaning given in Section 26.7(b) of the Project Agreement.
- 1.445 “**Order**” has the meaning given in Schedule 28 - Insurance Trust Agreement.
- 1.446 “**Other Contractor**” means an Additional Contractor or a Third Party Contractor.
- 1.447 “**Other Works**” means the Additional Works and the Third Party Works.
- 1.448 “**Output Specifications**” means Schedule 15 – Output Specifications, and includes Schedule 15-1 – Technical Terms and Reference Documents, Schedule 15-2 - Design and

Construction Requirements and Schedule 15-3 – Maintenance and Rehabilitation Requirements.

- 1.449 “**Outside Substantial Completion Date**” means August 1, 2022.
- 1.450 “**Ownership**” has the meaning given in Schedule 35 – Intellectual Property.
- 1.451 “**PA Parties**” or “**PA Party**” has the meaning given in Schedule 6 - Independent Certifier Agreement.
- 1.452 “**PAR Meeting**” has the meaning given in Section 11.6(f) of the Project Agreement
- 1.453 “**PAR Meeting Expiry Date**” has the meaning given in Section 11.6(g) of the Project Agreement.
- 1.454 “**Party**” means either the City or Project Co, and “**Parties**” means collectively the City and Project Co, but, for greater certainty, such definitions do not include MOI.
- 1.455 “**Party Representative**” and “**Party Representatives**” have the meanings given in Schedule 26 - Dispute Resolution Procedure.
- 1.456 “**Passenger**” means a natural person using any segment of the Extended Trillium Line.
- 1.457 “**Patents**” includes all national (including the United States and Canada), regional and multinational statutory invention registrations, patents, patent registrations, patent applications, provisional patent applications, industrial designs, industrial models, including all reissues, divisions, continuations, continuations-in-part, extensions and re-examinations, and all rights therein provided by multinational treaties or conventions and all improvements to the inventions disclosed in each such registration, patent or application.
- 1.458 “**Payment Adjustment Report**” has the meaning given in Section 32.6(i)(ii) of the Project Agreement.
- 1.459 “**Payment Certifier**” means the professional architect of record or engineer of record for the Project.
- 1.460 “**Payment Commencement Date**” means the date that is two (2) Business Days after the Substantial Completion Date.
- 1.461 “**Payment Compensation Amount**” means, with respect to an amount and a specified period of time, such amount multiplied by (i) such period of time in days divided by the actual number of days in the current year multiplied by (ii) the rate of interest per annum in effect on each such day equal to [REDACTED]% over the rate of interest per annum quoted by National Bank of Canada from time to time as its reference rate for Canadian Dollar demand loans made to its commercial customers in Canada and which it refers to as its “prime rate”, as such rate may be changed by it from time to time.

- 1.462 “**Payment Mechanism**” means the payment mechanism set out in Schedule 19 - Payment Mechanism.
- 1.463 “**Payment Periods**” means the payment periods of one calendar month (as adjusted in this definition) established by the City for each Contract Year, provided that the first Payment Period in the first Contract Year and the last Payment Period in the last Contract Year may be a shorter period as a result of the timing of the Payment Commencement Date and the Expiry Date within the Payment Periods otherwise established in accordance with the foregoing.
- 1.464 “**PBS**” has the meaning given in Schedule 12 – Works Scheduling Requirements.
- 1.465 “**PBS Update**” has the meaning given in Schedule 12 – Works Scheduling Requirements.
- 1.466 “**PBS Submittal**” has the meaning given in Schedule 12 – Works Scheduling Requirements.
- 1.467 “**Peak Period**” has the meaning given in Schedule 15 – Output Specifications.
- 1.468 “**Performance Audit**” has the meaning given in Section 30.1(a) of the Project Agreement.
- 1.469 “**Performance Bond**” means any of the Performance Bonds described in Section 17 of Schedule 24 – Insurance and Performance Security Requirements.
- 1.470 “**Performance Criteria**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.471 “**Performance Guarantees**” means the guarantees to Project Co in respect of the Construction Contract and the Maintenance and Rehabilitation Contract provided by the Construction Guarantor and the Maintenance and Rehabilitation Guarantor, respectively.
- 1.472 “**Performance Monitoring Program**” means the monitoring of performance by Project Co through the Non-Conformance reporting process detailed in Schedule 11 – Integrated Management System Requirements and the Performance Monitoring Reports prepared and submitted in accordance with Schedule 11 – Integrated Management System Requirements.
- 1.473 “**Performance Monitoring Report**” has the meaning given in Schedule 11 – Integrated Management System Requirements.
- 1.474 “**Performance Security**” means the performance security required pursuant to Article 19 of Schedule 24 – Insurance and Performance Security Requirements.
- 1.475 “**Permits, Licences, Approvals and Authorizations**” means the City Permits, Licences, Approvals and Authorizations and the Project Co Permits, Licences, Approvals and Authorizations.

- 1.476 “**Permitted Borrowing**” means any additional financing approved by the City in accordance with Section 1.9 of Schedule 21 - Variation Procedure to the Project Agreement.
- 1.477 “**Personal Information**” means all personal information (as the term “personal information” is defined in the *Personal Information Protection and Electronic Documents Act* (Canada)) in the custody or control of Project Co or any Project Co Party other than personal information of the employees of Project Co or the Project Co Parties and other than personal information that is wholly unrelated to the Project Operations and not derived directly or indirectly from the City in respect of the Project.
- 1.478 “**Personal Information Protection and Electronic Documents Act (Canada)**” means the *Personal Information Protection and Electronic Documents Act*, S.C. 2000, c. 5, as amended from time to time.
- 1.479 “**Phase 1 and Phase 2 Environmental Site Assessment Reports**” means the reports set out in Appendix B to this Schedule 1 – Definitions and Interpretation.
- 1.480 “**Planned Major Maintenance Activity**” has the meaning given in Section 16.5(c) of the Project Agreement.
- 1.481 “**Planned Value**” has the meaning given in Schedule 12 – Works Scheduling Requirements.
- 1.482 “**Police Service**” means the Royal Canadian Mounted Police, the Ontario Provincial Police, the Ottawa Police Service and any other law enforcement agency with jurisdiction pursuant to Applicable Law, as applicable.
- 1.483 “**Post-Installation Checkout**” or “**PICO**” has the meaning given in Schedule 14 – Testing and Commissioning.
- 1.484 “**Pre-Existing Environmental Site Conditions**” means the environmental condition of the Lands as set out in the Environmental Reports.
- 1.485 “**Pre-Final Design Development**” or “**PFDD**” has the meaning given in Schedule 10 – Review Procedure.
- 1.486 “**Private Capital Advance Confirmations**” has the meaning given in Schedule 20 – Construction Period Payments.
- 1.487 “**Private Capital Funding Confirmations**” has the meaning given in Schedule 20 – Construction Period Payments.
- 1.488 “**Preparatory Activities**” has the meaning given in Schedule 15 – Output Specifications.
- 1.489 “**Proceeding At Risk**” has the meaning given in Section 11.6(g) of the Project Agreement.

- 1.490 “**Proceeding At Risk Matter**” has the meaning given in Section 11.6(a)(ii) of the Project Agreement.
- 1.491 “**Proceeding At Risk Notice**” has the meaning given in Section 11.6(a) of the Project Agreement.
- 1.492 “**Proceedings Against the Crown Act (Ontario)**” means the *Proceedings Against the Crown Act*, R.S.O. 1990, c. P.27, as amended from time to time.
- 1.493 “**Proceeds Account**” means the following account opened at [REDACTED] in the name of Project Co:
- | | |
|------------------------|------------|
| SWIFT: | [REDACTED] |
| Canadian Routing Code: | [REDACTED] |
| Account No.: | [REDACTED] |
| Beneficiary Name: | [REDACTED] |
- 1.494 “**Proceeds Account Cascade**” has the meaning given in Schedule 4 – Wide Equity Funding Requirements.
- 1.495 “**Product**” or “**Products**” means material, machinery, equipment and fixtures forming the New Municipal Infrastructure but does not include machinery and equipment used to prepare, fabricate, convey or erect the New Municipal Infrastructure, which is referred to as construction machinery and equipment.
- 1.496 “**Professional Engineer**” means a professional engineer licensed by Professional Engineers Ontario to practice in the Province of Ontario.
- 1.497 “**Prohibited Act**” has the meaning given in Section 58.1(a) of the Project Agreement.
- 1.498 “**Project**” has the meaning given in the recitals to the Project Agreement.
- 1.499 “**Project Agreement**” has the meaning given in the recitals to the Project Agreement.
- 1.500 “**Project Agreement Arbitration**” has the meaning given in Schedule 26- Dispute Resolution Procedure.
- 1.501 “**Project Co**” means [REDACTED] and any successor or permitted assign.
- 1.502 “**Project Co Assumed Responsibilities for the Dow’s Lake Tunnel Structure**” has the meaning given in Section 16.7(a) of the Project Agreement.
- 1.503 “**Project Co Communications Protocol**” has the meaning given in Schedule 18 – Communications and Stakeholder Engagement Obligations Protocol.
- 1.504 “**Project Co Construction Communications Plan**” has the meaning given in Schedule 18 – Communications and Stakeholder Engagement Obligations Protocol.

- 1.505 “**Project Co Event of Default**” has the meaning given in Section 43.1(a) of the Project Agreement.
- 1.506 “**Project Co Group**” means Project Co together with any person or group of persons, who, either individually or collectively, have Direct or Indirect Power or Control of Project Co.
- 1.507 “**Project Co Operator Transition Services**” has the meaning given in Section 26.7(a) of the Project Agreement.
- 1.508 “**Project Co Party**” means:
- (a) the Construction Contractor;
 - (b) the Maintenance and Rehabilitation Contractor;
 - (c) any person engaged by Project Co, and/or any of the Contractors from time to time as may be permitted by the Project Agreement to procure or manage the provision of the Project Operations (or any of them); and
 - (d) in respect of each of the above, their subcontractors of any tier, agents, employees, officers and directors,
- and “**Project Co Parties**” shall be construed accordingly.
- 1.509 “**Project Co Permits, Licences, Approvals and Authorizations**” means all permissions, consents, approvals, certificates, permits, licences, agreements and authorizations required to perform the Project Operations in accordance with the Project Agreement and as required by Applicable Law, and including those permissions, consents, approvals, certificates, permits, licences, agreements and authorizations which are the responsibility of Project Co to obtain as set out in Schedule 32 – City Permits, Licences, Approvals and Authorizations or which is the responsibility of Project Co to perform or fulfill as set out in Schedule 32 – City Permits, Licences, Approvals and Authorizations, and all necessary consents, approvals, certificates, permits, licences, agreements and authorizations from and with any third parties (including, to the extent applicable, all Development Approvals and Utility Agreements, and the approval of the Fire Marshal of Ontario), needed to perform the Project Operations in accordance with the Project Agreement and as required by Applicable Law, but other than City Permits, Licences, Approvals and Authorizations.
- 1.510 “**Project Co Proposal Extracts**” means the documents attached as Schedule 13 - Project Co Proposal Extracts.
- 1.511 “**Project Co Representative**” means the person designated as such by Project Co on or prior to Commercial Close and any permitted replacement.
- 1.512 “**Project Co Testing and Commissioning**” means the commissioning activities to be carried out by Project Co in order to achieve Readiness for Revenue Service as set forth in Schedule 14 – Testing and Commissioning.

- 1.513 “**Project Co Testing and Commissioning Coordinator**” has the meaning given in Schedule 14 – Testing and Commissioning.
- 1.514 “**Project Co Utility Works**” means the works relating to New Utility Infrastructure carried out by Project Co as part of the Project Operations, including design, construction, installation, commissioning, protection, removal and relocation of duct banks, poles, pole lines, conduits, gas pipes, oil pipes, sewers and telephone and telecommunication lines, and related and ancillary works.
- 1.515 “**Project Co Variation Notice**” has the meaning given in Schedule 21 - Variation Procedure.
- 1.516 “**Project Co’s Expiry Transition Process Asset Preservation Work Schedule**” has the meaning given in Schedule 15 – Output Specifications.
- 1.517 “**Project Data**” has the meaning given in Schedule 35 – Intellectual Property.
- 1.518 “**Project Documents**” means the Ancillary Documents.
- 1.519 “**Project Insurance Change**” has the meaning given in Section 7.1(f) of Schedule 24 - Insurance and Performance Security Requirements.
- 1.520 “**Project Know-How**” means all ideas, concepts, alternatives, methodologies, processes, recommendations and suggestions developed by or through Project Co or any Project Co Party and revealed to or discovered by the City, whether before or after Commercial Close, which may be connected in any way to:
- (a) the Works, including the design and construction of the System Infrastructure;
 - (b) the Maintenance and Rehabilitation Services, including the maintenance, rehabilitation, improvement and testing of the System Infrastructure;
 - (c) any other Project Operations; or
 - (d) the Project Agreement.
- 1.521 “**Project Operations**” means:
- (a) the performance of the Works;
 - (b) the performance of the Maintenance and Rehabilitation Services; and
 - (c) the performance of all other obligations of Project Co under the Project Agreement.
- 1.522 “**Project Term**” means the period commencing on Commercial Close and expiring at midnight on the Termination Date.
- 1.523 “**Project Term Lands**” has the meaning given in Schedule 33 – Lands.

- 1.524 “**Proponent**” has the meaning given in the Request for Proposals.
- 1.525 “**Proprietor**” has the meaning given in Section 50.6(a) of the Project Agreement.
- 1.526 “**Protesters**” has the meaning given in Section 9.7(a) of the Project Agreement.
- 1.527 “**Province**” means Her Majesty the Queen in right of Ontario.
- 1.528 “**Qualifying Tender**” has the meaning given in Schedule 22 - Compensation on Termination.
- 1.529 “**Quality Documentation**” means all documentation to be prepared, submitted (where applicable) and implemented by Project Co in accordance with Schedule 11 – Integrated Management System Requirements.
- 1.530 “**Quality Failure**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.531 “**Quality Manager**” has the meaning given in Schedule 11 – Integrated Management System Requirements.
- 1.532 “**Rail Transit Specific Change in Law**” means any Change in Law which principally affects or principally relates only to the design, construction, maintenance or rehabilitation of rail transit systems.
- 1.533 “**Railway Company**” means CP Rail and any other railway company that owns or operates a rail service, any part of which is on any part of the Lands during the Project Term and “**Railway Companies**” means all of them
- 1.534 “**Readiness for Revenue Service**” has the meaning given in Schedule 14 – Testing and Commissioning.
- 1.535 “**Record Drawings**” means signed and sealed drawings prepared by the inspecting professional engineer, using as-built information, after verifying in detail the actual conditions of the completed project or applicable components as they are constructed, including any changes that were initiated due to site conditions or other causes and where all such changes are clearly identified through redlines or by means of any other format agreed by the City.
- 1.536 “**Recovery Amount**” has the meaning given in Section 54.3(g) of the Project Agreement.
- 1.537 “**Recovery Schedule**” has the meaning given in Schedule 12 – Works Scheduling Requirements.
- 1.538 “**Recovery Schedule Report**” has the meaning given in Schedule 12 – Works Scheduling Requirements.
- 1.539 “**Rectification Time**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.540 “**Refinancing**” has the meaning given in Schedule 27 – Refinancing.

- 1.541 “**Reimbursement Event**” has the meaning given in Section 31.5(a) of the Project Agreement.
- 1.542 “**Reinstatement Plan**” has the meaning given in Section 29.2(a) of the Project Agreement.
- 1.543 “**Reinstatement Work**” has the meaning given in Section 29.1(a) of the Project Agreement.
- 1.544 “**Release**” has the meaning given in Schedule 17 – Environmental Obligations.
- 1.545 “**Relevant Change in Law**” means a Discriminatory Change in Law or a Rail Transit Specific Change in Law.
- 1.546 “**Relevant Conviction**” means a charge or conviction, at any time within the previous 6 years, of any offense: (i) of moral turpitude in Canada or elsewhere; (ii) for which records exist under the *Criminal Records Act*; or (iii) otherwise designated as a Relevant Conviction by the City from time to time, and that conviction remains in effect at that time and is one for which a pardon has not been granted.
- 1.547 “**Relevant Insurance**” has the meaning given in Section 7.1(g) of Schedule 24 - Insurance and Performance Security Requirements.
- 1.548 “**Relevant Insurance Inception Date**” has the meaning given in Section 7.1(h) of Schedule 24 - Insurance and Performance Security Requirements.
- 1.549 “**Relief Event**” has the meaning given in Section 41.1(a) of the Project Agreement.
- 1.550 “**Remaining Works**” means:
- (a) the provision of the remaining New Revenue Vehicles not yet Delivered to the New Walkley Yard in compliance with Schedule 15-2 Part 8;
 - (b) the testing and commissioning of the New Revenue Vehicles in accordance with 15-2 Part 8 and Schedule 14;
 - (c) completion of the training of the City Operators on the New Revenue Vehicles;
 - (d) completion of a 14 day trial running period simulating full revenue service, and safety certification of the New Revenue Vehicles; and
 - (e) the delivery of all manuals, spare parts, and materials associated with the New Revenue Vehicles otherwise required by the Project Agreement.

For greater certainty, Remaining Works do not constitute Minor Deficiencies.

- 1.551 “**Remedial Period**” has the meaning given in Schedule 19 – Payment Mechanism.

- 1.552 “**Request for Proposals**” or “**RFP**” means the request for proposals issued in respect of the Project on February 19, 2016, as amended from time to time.
- 1.553 “**Request for Utility Works Payment**” has the meaning given in Section 20.13(g) of the Project Agreement.
- 1.554 “**Response**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.555 “**Response Time**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.556 “**Restricted Payment Conditions**” has the meaning given in Schedule 4 – Funding Requirements.
- 1.557 “**Restricted Person**” means any person who, or any member of a group of persons acting together, any one of which:
- (a) has, directly or indirectly, its principal or controlling office in a country that is subject to any economic or political sanctions imposed by Canada or Ontario;
 - (b) has as its primary business the illegal manufacture, sale, distribution or promotion of narcotics substances or arms, or is or has been involved in terrorism;
 - (c) in the case of an individual, (i) he or she has been convicted of any indictable offence less than five years prior to the date at which the consideration of whether such individual is a “**Restricted Person**” is made hereunder, whether or not such person received a custodial sentence; or (ii) he or she has been sentenced to a custodial sentence, other than a suspended sentence, for any regulatory offence other than under the *Highway Traffic Act* (Ontario) or corresponding legislation in any other jurisdiction less than five years prior to the date at which the consideration of whether such individual is a “**Restricted Person**” is made hereunder;
 - (d) in the case of a person other than an individual, (i) it or any of the members of its (or its general partner’s) board of directors or its senior executive managers has been convicted of any indictable offence less than five years prior to the date at which the consideration of whether such person is a “**Restricted Person**” is made hereunder, whether or not such person received a custodial sentence; or (ii) any of the members of its (or its general partner’s) board of directors or its senior executive managers has been sentenced to a custodial sentence, other than a suspended sentence, for any regulatory offence other than under the *Highway Traffic Act* (Ontario) or corresponding legislation in any other jurisdiction less than five years prior to the date at which the consideration of whether such person is a “**Restricted Person**” is made hereunder;
 - (e) has as its primary business the acquisition of distressed assets or investments in companies or organizations which are or are believed to be insolvent or in a financial standstill situation or potentially insolvent;

- (f) is subject to a material claim of the City under any proceedings (including regulatory proceedings) which have been concluded or are pending at the time at which the consideration of whether such person is a “Restricted Person” is made hereunder, and which (in respect of any such pending claim, if it were to be successful) would, in the City’s view, in either case, be reasonably likely materially to affect the ability of Project Co to perform its obligations under the Project Agreement; or
- (g) has a material interest in the production of tobacco products.
- 1.558 **“Restrictions and Requirements”** means the restrictions, qualifications and requirements contained in the Lands Table forming part of Schedule 33 – Lands.
- 1.559 **“Revenue Service”** has the meaning given in Schedule 15 – Output Specifications.
- 1.560 **“Revenue Service Commencement”** means the commencement of Passenger service to the public on the System by the City on the Revenue Service Commencement Date.
- 1.561 **“Revenue Service Hours”** has the meaning given in Schedule 15 – Output Specifications.
- 1.562 **“Revenue Service Train Kilometres”** has the meaning given in Schedule 19 – Payment Mechanism.
- 1.563 **“Revenue Vehicle Contract Costs”** has the meaning given in Section 9.11(b) of the Project Agreement.
- 1.564 **“Revenue Vehicle Deficiency”** means a defect or deficiency in a Revenue Vehicle such that the Revenue Vehicle does not meet those Revenue Vehicle Technical Specifications that are not Technical Specifications (Built to Specification).
- 1.565 **“Revenue Vehicles”** has the meaning given in Schedule 15 – Output Specifications.
- 1.566 **“Revenue Vehicle Payment Request”** has the meaning given in Section 9.11(c) of the Project Agreement.
- 1.567 **“Revenue Vehicle Supplier”** means [REDACTED].
- 1.568 **“Revenue Vehicle Supply Contract”** has the meaning given in Section 9.11(a) of the Project Agreement.
- 1.569 **“Review Procedure”** means the procedure set out in Schedule 10 - Review Procedure.
- 1.570 **“Review Procedure Activities”** means:
- (a) performance of the requirements of Schedule 10 – Review Procedure for all Works Submittals required to be delivered prior to Substantial Completion, including:

- (i) all Submittals by Project Co;
 - (ii) City review periods and responses regarding Works Submittals;
 - (iii) amendment by Project Co, if required; and
 - (iv) re-submission by Project Co, if required;
- (b) any other submission activities required by Project Co pursuant to the Project Agreement
- 1.571 **“Review Procedure Activities Register”** means a register of Review Procedure Activities which shall include the submission dates and review periods for all Works Submittals required under Schedule 10 – Review Procedure, Schedule 12 – Work Scheduling Requirements, and elsewhere in the Project Agreement.
- 1.572 **“Revised New System Infrastructure Condition Report”** has the meaning given in Schedule 23 – Expiry Transition Procedure.
- 1.573 **“Road Cut Permit – Major Construction (Civil Works and Utility Relocation)”** has the meaning given in Schedule 15 – Output Specifications.
- 1.574 **“Road Safety Audit”** has the meaning given in Schedule 15-1 of the Output Specifications.
- 1.575 **“Road Sections”** has the meaning given in Schedule 7 – Mobility Matters.
- 1.576 **“RVSC Cash Allowance Account”** means the RVSC Cash Allowance Account to be established in accordance with Section 9.11 of the Project Agreement.
- 1.577 **“RVSC Cash Flow”** means that cash flow defined by the RVSC Milestone dates and corresponding amounts set forth Appendix G.
- 1.578 **“RVSC Fixed Cost Amount”** means \$[REDACTED].
- 1.579 **“RVSC Milestone”** has the meaning assigned to the term Milestone in the Revenue Vehicle Supply Contract.
- 1.580 **“Safety and Security Management Committee”** has the meaning given in Schedule 15 – Output Specifications.
- 1.581 **“Safety Management Plan”** has the meaning given in Schedule 15 – Output Specifications.
- 1.582 **“Schedule”** means a schedule to the Project Agreement.
- 1.583 **“Scheduled Final Completion Date”** means the date that is 202 days following Substantial Completion.

- 1.584 “**Scheduled Passenger Facility Hours**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.585 “**Scheduled Revenue Service Train Kilometres**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.586 “**Scheduled Substantial Completion Date**” means August 10, 2022, as such date may be amended pursuant to Section 38 of the Project Agreement.
- 1.587 “**Security**” has the meaning given in Schedule 41 – Lenders’ Direct Agreement.
- 1.588 “**Security Documents**” has the meaning given in Schedule 41 – Lenders’ Direct Agreement.
- 1.589 “**Sensitive Information**” means financial or commercial information which would, if disclosed to a competitor of Project Co or any Project Co Party, give that competitor a competitive advantage over Project Co or such Project Co Party and thereby prejudice the business of Project Co or such Project Co Party.
- 1.590 “**Service Failure**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.591 “**Severe Market Disruption**” means any occurrence of exceptional circumstances in financial markets in Europe, the United States of America and/or Canada which:
- (a) results in the suspension or cessation of all or substantially all lending activity in national or relevant international capital or interbank markets; and
 - (b) adversely affect access by Project Co to such markets.
- 1.592 “**Shutdown Period**” means the period beginning on May 3, 2020.
- 1.593 “**Shutdown Period Service Obligations**” means the obligations in respect of the care, maintenance and repair of the Existing Trillium Line Assets and the Existing Vehicle Fleet during the Shutdown Period as set out in Schedule 15-3.
- 1.594 “**Shutdown Period Transition and Maintenance Plan**” has the meaning given in Section 10 of the Output Specifications.
- 1.595 “**Signalling and Train Control System**” has the meaning given in Schedule 15 – Output Specifications.
- 1.596 “**Site**” means, at any time and from time to time, that portion of the Lands,
- (a) on which Project Co or any Project Co Party is engaged in any construction or demolition activities or is otherwise engaged in completing the Works;
 - (b) on which any of the Works have been commenced but not completed in their entirety;

- (c) that are hoarded, cordoned, or otherwise fenced off by Project Co, and any Lands immediately surrounding such hoarding, cordons or fencing; or
- (d) within the active construction footprint of the Works.
- 1.597 “**Site Acceptance Test**” or “**SAT**” has the meaning given in Schedule 14 – Testing and Commissioning.
- 1.598 “**Site Conditions**” means the condition of the Lands, including the physical, geophysical, climatic, ecological, environmental, geotechnical and archaeological conditions.
- 1.599 “**Small Works**” means any works, including facilities and equipment, of a minor nature that are requested by the City to be performed having an individual cost or aggregate cost with other linked works, including facilities and equipment, of a minor nature, not exceeding \$[REDACTED] (index linked), or as otherwise agreed from time to time, but excluding any works, including facilities and equipment, which will increase the likelihood of an Availability Failure or Quality Failure, will increase the cost to Project Co of performing the Project Operations or will materially hinder Project Co in the performance of the Maintenance and Rehabilitation Work.
- 1.600 “**Species-at-Risk**” means any member of a species, subspecies, variety or genetically or geographically distinct population of animal, plant or other organism that is listed in the Species at Risk in Ontario List maintained pursuant to the ESA and any analogous federal list under the *Species at Risk Act* (Canada), and any other species that has been classified as being threatened or endangered under Applicable Law.
- 1.601 “**Stakeholders**” means individuals and organizations with an interest in the Project, including those listed in Schedule 15 - Output Specifications, but excluding the City.
- 1.602 “**Standard Operating Procedures**” has the meaning given in Schedule 15 – Output Specifications.
- 1.603 “**Standards & Guidelines for Conservation of Provincial Heritage Properties**” means the Standards & Guidelines for Conservation of Provincial Heritage Properties issued under the *Ontario Heritage Act* (Ontario) on April 28, 2010, as amended from time to time.
- 1.604 “**Start-Up Meeting**” has the meaning given in Section 20.4(a) of the Project Agreement.
- 1.605 “**Station**” or “**Stop**” has the meaning given in Schedule 15 – Output Specifications.
- 1.606 “**Station Plaza**” means a plaza at a Station.
- 1.607 “**Structures**” has the meaning given in Schedule 15 – Output Specifications.
- 1.608 “**Subcontractor**” means any subcontractor of Project Co engaged by or through Project Co to perform any of the Project Operations, including any of the Contractors, any Supplier or consultant, and any subcontractor of any other subcontractor at any tier.

- 1.609 “**Subcontractor Losses**” has the meaning given in Schedule 22 - Compensation on Termination.
- 1.610 “**Subcontracts**” means the contracts entered into by or between Project Co and any Subcontractor or between any Subcontractor at any tier, including any of the Contractors, and any other Subcontractor at any tier in relation to any aspect of the Project Operations.
- 1.611 “**Submittal**” means a Works Submittal or a Maintenance and Rehabilitation Submittal.
- 1.612 “**Substantial Completion**” means the point at which (i) the System Infrastructure, the New Municipal Infrastructure, the New Utility Infrastructure have been completed in accordance with the Project Agreement; (ii) the Payment Certifier appointed pursuant to Section 15.3(g) of the Project Agreement has certified the substantial performance of the Construction Contract and the related certificate of substantial performance of the Works is published pursuant to Section 32(1) of the CLA; and (iii) all requirements for Readiness for Revenue Service described in Schedule 14 - Testing and Commissioning, other than in respect of Minor Deficiencies, have been satisfied in respect of the System Infrastructure and the New Municipal Infrastructure as a whole.
- 1.613 “**Substantial Completion Certificate**” means the certificate to be issued by the Independent Certifier in accordance with Section 25.3 of the Project Agreement.
- 1.614 “**Substantial Completion Countdown Notice**” has the meaning given in Section 25.4(a) of the Project Agreement.
- 1.615 “**Substantial Completion Date**” means the date on which Substantial Completion is achieved as evidenced by the Substantial Completion Certificate, as such date shall be stated therein.
- 1.616 “**Substantial Completion Notice**” has the meaning given in Section 25.3(b) of the Project Agreement.
- 1.617 “**Substantial Completion Payment**” means \$[REDACTED].
- 1.618 “**Substantial Completion Payment Commencement Date**” means the date that is two Business Days after the Substantial Completion Date.
- 1.619 “**Substitute**” has the meaning given in the applicable Direct Agreement.
- 1.620 “**Subsurface Utility Engineering Reports**” or “**SUE**” means the [REDACTED].
- 1.621 “**Supplier**” means a person who supplies to Project Co, or to any Subcontractor, any equipment, materials, supplies or services as part of, or for, the Project Operations.
- 1.622 “**System Event**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.623 “**System Extension**” has the meaning given in Schedule 36 – System Extension.

- 1.624 “**System**” means the rapid transit system to be designed, constructed, supplied, tested, commissioned and maintained by Project Co in accordance with this Project Agreement, in, on, over or under any part of the Lands as part of the Works, including, without limitation, the Vehicles, the System Infrastructure, all site services, utilities, roadways and parking areas required to support such System Infrastructure, all supporting systems and improvements and all other Works, improvements, modifications, additions, demolitions, removals of the Existing Trillium Line Assets required in each case to meet the Output Specifications and all requirements of the Permits, Licenses, Approvals and Authorizations, whether or not in the course of construction, installation, completion or maintenance.
- 1.625 “**System Infrastructure**” at any time means the infrastructure, assets and systems to be designed ,constructed and installed by Project Co in, on, over or under any part of the Lands as part of the Works to create the System in accordance with the Project Agreement, and includes those parts of the Existing Trillium Line Assets which Project Co designs, utilizes, relocates, refurbishes, upgrades, reinstates, restores, rebuilds and integrates into the System, but, for purposes of determining the Maintenance and Rehabilitation Services, excludes the New Municipal Infrastructure.
- 1.626 “**System Infrastructure Condition Report**” has the meaning given in Schedule 23 – Expiry Transition Procedure.
- 1.627 “**System Infrastructure Performance Demonstration**” has the meaning given in Schedule 23 – Expiry Transition Procedure.
- 1.628 “**System User**” means any member of the public, any City Party and any other person that is on or about the New Municipal Infrastructure, the System or is otherwise making use of the System Infrastructure for any purpose.
- 1.629 “**Systems Integration Dispute**” means a dispute related to the integration and function of the communications systems.
- 1.630 “**Systems Integration Test**” or “**SIT**” has the meaning given in Schedule 14 – Testing and Commissioning.
- 1.631 “**Taxes**” means any and all taxes, levies, imposts, duties, fees, withholdings, assessments, deductions or charges whatsoever, imposed, assessed, levied or collected by any Governmental Authority, together with interest thereon and penalties with respect thereto, and includes all HST except where stated to the contrary, provided however that “Taxes” shall not include City Taxes.
- 1.632 “**Technical Information**” has the meaning given in Schedule 35 – Intellectual Property.
- 1.633 “**Technical Reports**” means the Environmental Reports, the Geotechnical Reports and the Archaeological Reports.
- 1.634 “**Technical Submission Deadline**” means August 10, 2018.

- 1.635 “**Temporary Street Occupancy Permit**” means the consent(s) and permit(s) to perform street work and for temporary street occupation as set out in the City of Ottawa Road Activity Bylaw (By-law No. 2003-445) and Encroachments on City Highways (By-law No. 2003-446, Streets and Sidewalks, as such consent(s) and permit(s) are related to those portions of the City Road Allowance required by Project Co for the Works.
- 1.636 “**Terminal Station**” has the meaning given in Schedule 15 – Output Specifications.
- 1.637 “**Termination Date**” means the earlier of the Expiry Date and such other date, if any, on which termination of the Project Agreement takes effect in accordance with its terms.
- 1.638 “**Testing and Commissioning Manuals**” has the meaning given in Section 1.6(f) of Schedule 14 – Testing and Commissioning.
- 1.639 “**Testing and Commissioning Plan**” has the meaning given in Section 1.3(a) of Schedule 14 – Testing and Commissioning.
- 1.640 “**Testing and Commissioning Schedule**” has the meaning given in Section 1.3(m) of Schedule 14 – Testing and Commissioning.
- 1.641 “**Testing and Commissioning Team**” has the meaning given in Schedule 14 – Testing and Commissioning.
- 1.642 “**Third Party Access Agreements**” has the meaning given in Schedule 33 – Lands.
- 1.643 “**Third Party Arbitration**” has the meaning given in Schedule 26 - Dispute Resolution Procedure.
- 1.644 “**Third Party Contractors**” means any person (not being, for the avoidance of doubt, Project Co or any Project Co Party or Additional Contractors) that carries out any Third Party Works.
- 1.645 “**Third Party Litigation**” has the meaning given in Schedule 26 - Dispute Resolution Procedure.
- 1.646 “**Third Party Works**” means any work performed by a Third Party Contractor on the Lands, including works in relation to,
- (a) an Encumbrance; and
 - (b) Utility Work and work pursuant to a Utility Agreement or an encroachment permit or other permitting authority of any Governmental Authority under Applicable Law.
- 1.647 “**Total Capital Cost**” means \$[REDACTED].
- 1.648 “**Threshold Equity Sale Amount**” means an Equity Sale Amount that would result in an Equity Sale IRR equal to the Base Case Equity IRR.

- 1.649 “**Track**” has the meaning given in Schedule 15-1 of the Output Specifications.
- 1.650 “**Trade-Marks**” means all trademarks, service marks, trade dress, logos, distinguishing guises and indicia, trade names, corporate names, business names, domain names, whether or not registered, including all common law rights, and registrations, applications for registration and renewals thereof, including, but not limited to, all marks registered in the Canadian Intellectual Property Office and the trademark offices of other nations throughout the world, and all rights therein provided by multinational treaties or conventions.
- 1.651 “**Train Control System**” has the meaning given in Schedule 15 – Output Specifications.
- 1.652 “**Train Kilometres Availability Failure**” has the meaning given in Schedule 19 – Payment Mechanism
- 1.653 “**Train Kilometres Availability Failure Deduction**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.654 “**Traffic and Transit Management Plan**” or “**TTMP**” has the meaning given in Schedule 15-1 of the Output Specifications.
- 1.655 “**Traffic Control Plan**” has the meaning given in Schedule 15 – Output Specifications.
- 1.656 “**Transit Operations Control Centre**” or “**TOCC**” has the meaning given in Schedule 15 – Output Specifications.
- 1.657 “**Transport Canada Safe Operation Requirements**” means Transport Canada’s track safety standards for safe operation on the Existing Trillium Line at the respective track speeds applicable to the operation of the Existing Trillium Line as set out in Schedule 15-Output Specifications.
- 1.658 “**Trespasser**” has the meaning given in Section 9.7(a) of the Project Agreement.
- 1.659 “**Trial Running**” has the meaning given in Schedule 15-1 of the Output Specifications.
- 1.660 “**Trillium Line Extension**” means the approximately 12km long extension from Greenboro Station to Limebank Station.
- 1.661 “**Tunnels**” has the meaning given in Schedule 15 – Output Specifications.
- 1.662 “**Uninsurable Event**” means any event which arises directly and solely from an Uninsurable Risk.
- 1.663 “**Uninsurable Risk**” has the meaning given in Schedule 24 - Insurance and Performance Security Requirements to the Project Agreement.
- 1.664 “**Unit Rate Price**” has the meaning given in Schedule 7 – Mobility Matters.

- 1.665 “**Unpaid Construction Period Payments**” has the meaning given in Schedule 20 – Construction Period Payments.
- 1.666 “**Updated Shared Use Agreement**” has the meaning given in Schedule 32 – City Permits, Licenses, Approvals and Authorizations.
- 1.667 “**Utilities**” means energy/power supplies, communications, data transmission and waste recovery, including electricity, natural gas/fuel oil, water, sanitary waste and storm water.
- 1.668 “**Utility Agreement**” means any agreement entered into by Project Co with a Utility Company in connection with the design removal, construction, installation, repair, preservation, relocation or maintenance of Utility Infrastructure in, on, under, over or adjacent to the Lands, and includes any site or other permits issued thereunder or pursuant thereto, all as amended, supplemented or replaced from time to time.
- 1.669 “**Utility Baseline Report**” means the Utility Baseline Report submitted by Project Co in its proposal in response to the Request for Proposals and included herein as Schedule 40 – Utility Baseline Report.
- 1.670 “**Utility Company**” means the owner or operator of any Utility Infrastructure.
- 1.671 “**Utility Company Self-Performed Works**” means the temporary and permanent installation, protection, removal, relocation, upgrading, reinstatement, restoration, downsizing, designing, and/or building works relating to Utility Infrastructure or New Utility Infrastructure carried out by a Utility Company under a Utility Agreement in connection with or as part of the Project Operations.
- 1.672 “**Utility Company Works Cash Allowance**” has the meaning given in Section 20.13 of the Project Agreement.
- 1.673 “**Utility Infrastructure**” means privately, publicly or cooperatively owned lines, facilities or systems for transmitting or distributing electricity, lighting, data, communications, gas, oil and petroleum products, water, storm water or sewage, wireless, or other similar commodity or substance which serve the public directly or indirectly, including underground, surface and overhead facilities as well as facilities which use common poles, ducts or conduits on a shared basis, and all related infrastructure.
- 1.674 “**Utility Works**” means, collectively, the Project Co Utility Works and the Utility Company Self Performed Works.
- 1.675 “**Utility Works Cost**” means the actual cost of performing the Utility Company Self Performed Works.
- 1.676 “**Utility Works Fee**” has the meaning given in Section 20.13(f) of the Project Agreement.
- 1.677 “**Variation**” has the meaning given in Schedule 21 - Variation Procedure.
- 1.678 “**Variation Confirmation**” has the meaning given in Schedule 21 - Variation Procedure.

- 1.679 “**Variation Directive**” has the meaning given in Schedule 21 - Variation Procedure.
- 1.680 “**Variation Enquiry**” has the meaning given in Schedule 21 - Variation Procedure.
- 1.681 “**Variation Procedure**” means the procedure set out in Schedule 21 - Variation Procedure.
- 1.682 “**Vehicle Maintenance Records**” has the meaning given in Section 16.5(c) of the Project Agreement.
- 1.683 “**Vehicles**” means , collectively, the Revenue Vehicles and the Maintenance Vehicles.
- 1.684 “**Via Rail**” means Via Rail Canada and its agents and representatives.
- 1.685 “**Volume Payment**” has the meaning given in Schedule 19 – Payment Mechanism.
- 1.686 “**Warning Notice**” has the meaning given in Section 30.4(a) of the Project Agreement.
- 1.687 [Not used]
- 1.688 “**WHMIS**” means the system for labelling, warning and worker education of Hazardous Substances used in the workplace, commonly referred to as workplace hazardous materials information system, prescribed by Applicable Law over the delivery, storage and use of Hazardous Substances in the Province of Ontario.
- 1.689 “**Workplace Safety and Insurance Act, 1997 (Ontario)**” means the *Workplace Safety and Insurance Act, 1997*, S.O. 1997, c. 16, Sch. A, as amended from time to time.
- 1.690 “**Works**” means all design and construction works to be performed by Project Co under the Project Agreement to meet the Output Specifications, including the supply of New Revenue Vehicles, the New Municipal Infrastructure Work, the Project Co Utility Works and the design, construction, refurbishing, alteration, integration, installation, testing, commissioning and completion of the System Infrastructure, including rectification of any Minor Deficiencies, and any other activities required to enable or facilitate the commencement of the Maintenance and Rehabilitation Services, and all other work under the Permits, Licences, Approvals and Authorizations, except for (i) all work which is expressly described in Schedule 32 – City Permits, Licences, Approvals and Authorizations as being the responsibility of the City, and (ii) any City Commissioning.
- 1.691 “**Works Area Micro-Schedule**” has the meaning given in Schedule 12 – Works Scheduling Requirements.
- 1.692 “**Works Change in Law**” means any Change in Law that:
 - (a) is not a Relevant Change in Law;
 - (b) occurs after Commercial Close;

- (c) requires Project Co to perform any work of alteration, addition, demolition, extension or variation in the quality or function of the System Infrastructure which is similar in nature to the Works but is not Works or capital replacement work which Project Co would otherwise be required to perform in order to comply with its obligations under the Project Agreement; and
 - (d) was not reasonably foreseeable at Commercial Close by an experienced contractor carrying out activities and/or performing design and/or other operations similar to those to be carried out and/or performed by any Project Co Party in relation to the Project.
- 1.693 “**Works Committee**” has the meaning given in Section 11.1(a) of the Project Agreement.
- 1.694 “**Works Report**” means those updates and reports to be issued by Project Co in accordance with Schedule 31 – Works Report Requirements.
- 1.695 “**Works Schedules**” has the meaning given in Schedule 12 – Works Scheduling Requirements.
- 1.696 “**Works Submittal**” has the meaning given in Section 1.1 of Schedule 10 - Review Procedure.
- 1.697 “**WSIB**” means the Ontario Workplace Safety and Insurance Board that is responsible for administering the *Workplace Safety and Insurance Act*, 1997 (Ontario).
2. **Interpretation.** The Project Agreement shall be interpreted according to the following provisions, unless the context requires a different meaning:
- 2.1 The tables of contents, headings, marginal notes and references to them in the Project Agreement are for convenience of reference only, shall not constitute a part of the Project Agreement, and shall not be taken into consideration in the interpretation of, or affect the meaning of, the Project Agreement.
 - 2.2 Except where the context requires otherwise (irrespective of whether some, but not all, references in a Schedule specifically refer to that Schedule or to other portions of the Project Agreement) references to specific Sections, Clauses, Paragraphs, Subparagraphs, Schedules, and other divisions of the Project Agreement are references to such Sections, Clauses, Paragraphs, or Subparagraphs of, Schedules to, or divisions of the Project Agreement and the terms “Section” and “Clause” are used interchangeably and are synonymous.
 - 2.3 Except where the context requires otherwise, references to specific Sections, Clauses, Paragraphs, Subparagraphs, Schedules, and other divisions of the Project Agreement followed by a number are references to the whole of the Section, Clause, Paragraph, Subparagraphs, Schedule or other division of the Project Agreement as applicable, bearing that number, including all subsidiary provisions containing that same number as a prefix.

- 2.4 Except where the context requires otherwise, references in the Output Specifications to specific Parts, Sections, Clauses, Paragraphs, Subparagraphs, Schedules, and other divisions of the Output Specifications shall be construed such that each such reference on a page of the Output Specifications will be read to be preceded by and to include the prefix Section number or other reference at the top of the applicable page, and all cross-references to any Section in Schedule 15 - Output Specifications shall be interpreted to include the applicable prefix Section number or other reference.
- 2.5 The Schedules to the Project Agreement are an integral part of the Project Agreement and a reference to the Project Agreement includes a reference to the Schedules.
- 2.6 All references in the Project Agreement to a Schedule shall be to a Schedule of the Project Agreement.
- 2.7 All capitalized terms used in a Schedule shall have the meanings given to such terms in Schedule 1 - Definitions and Interpretation, unless stated otherwise in a particular Schedule in which case such definition shall have the meaning given to it in that Schedule solely for the purposes of that Schedule.
- 2.8 The language of the Output Specifications and other documents comprising the Project Agreement is in many cases written in the imperative for brevity. Clauses containing instructions, directions or obligations are directed to Project Co and shall be construed and interpreted as if the words “Project Co shall” immediately preceded the instructions, directions or obligations.
- 2.9 Words importing persons or parties are to be broadly interpreted and include an individual, corporation, limited liability company, joint stock company, firm, partnership, joint venture, trust, unincorporated organization, Governmental Authority, unincorporated body of persons or association and any other entity having legal capacity, and the heirs, beneficiaries, executors, administrators or other legal representatives of a person in such capacity.
- 2.10 Unless the context otherwise requires, wherever used herein the plural includes the singular, the singular includes the plural, and each of the masculine, feminine and neuter genders include all other genders.
- 2.11 Unless otherwise provided in the Project Agreement, all accounting and financial terms used in the Project Agreement shall be interpreted and applied in accordance with Canadian GAAP.
- 2.12 References to any standard, principle, agreement or document include (subject to all relevant approvals and any other provisions of the Project Agreement concerning amendments) a reference to that standard, principle, agreement or document as amended, supplemented, restated, substituted, replaced, novated or assigned.
- 2.13 References to any Applicable Law, including any statutes or other Applicable Law specifically referred to herein, whether or not amendments or successors to such Applicable Law are referred to herein, are to be construed as references to that Applicable Law as from time to time amended or to any Applicable Law covering the

- same or similar subject matter from time to time replacing, extending, consolidating or amending the same.
- 2.14 References to a statute shall include all regulations, by-laws, ordinances and orders made under or pursuant to the statute.
- 2.15 References to persons shall include their successors and assigns. References to a public organization shall include their successors and assigns, and if a public organization ceases to exist or ceases to perform its functions without a successor or assign, references to such public organization shall be deemed to include a reference to any public organization or any organization or entity which has taken over either or both the functions and responsibilities of such public organization.
- 2.16 A reference in the Project Agreement or in any Project Document to any right, power, obligation or responsibility of any Governmental Authority shall be deemed to be a reference to the Governmental Authority that, pursuant to Applicable Laws has such right, power, obligation or responsibility at the relevant time.
- 2.17 References to a deliberate act or omission or deliberate or negligent act or omission of any City Party shall be construed having regard to the interactive nature of the activities of the City Party and Project Co and further having regard to:
- (a) acts contemplated by the Output Specifications;
 - (b) acts or omissions in the ordinary course of the Governmental Activities and expressly or reasonably inferred from the Output Specifications to be taken into account by Project Co in the performance of the Maintenance and Rehabilitation Services; or
 - (c) acts otherwise provided for in the Project Agreement.
- 2.18 The words in the Project Agreement shall bear their natural meaning.
- 2.19 Each of Project Co's and the City's respective obligations shall be construed as separate obligations owed to the other.
- 2.20 References containing terms such as:
- (a) "hereof", "herein", "hereto", "hereinafter", and other terms of like import are not limited in applicability to the specific provision within which such references are set forth but instead refer to the Project Agreement taken as a whole; and
 - (b) "includes" and "including", whether or not used with the words "without limitation" or "but not limited to", shall not be deemed limited by the specific enumeration of items but shall, in all cases, be deemed to be without limitation and construed and interpreted to mean "includes without limitation" and "including without limitation".

- 2.21 In construing the Project Agreement, the rule known as the *ejusdem generis* rule shall not apply nor shall any similar rule or approach apply to the construction of the Project Agreement and, accordingly, general words introduced or followed by the word "other" or "including" or "such as" or "in particular" shall not be given a restrictive meaning because they are followed or preceded (as the case may be) by particular examples intended to fall within the meaning of the general words.
- 2.22 Where the Project Agreement states that an obligation shall be performed "no later than" or "within" or "by" a stipulated date or event which is a prescribed number of days after a stipulated date or event the latest time for performance shall be 5:00 p.m. on the last day for performance of the obligation concerned, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
- 2.23 Where the Project Agreement states that an obligation shall be performed "no later than" or "by" a prescribed number of days before a stipulated date or event or "by" a date which is a prescribed number of days before a stipulated date or event, the latest time for performance shall be 5:00 p.m. on the last day for performance of the obligation concerned, or if that day is not a Business Day, 5:00 p.m. on the next Business Day.
- 2.24 Where the Project Agreement states that an obligation shall be performed "on" a stipulated date, the latest time for performance shall be 5:00 p.m. on that day, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
- 2.25 Any reference to time of day or date means the local time or date in Ottawa, Ontario. Any reference to a stipulated "day" which is not specifically referred to as a "Business Day" shall be deemed to be a calendar day measured from midnight to midnight.
- 2.26 Unless otherwise indicated, time periods will be strictly construed.
- 2.27 Whenever the terms "will" or "shall" are used in the Project Agreement in relation to Project Co or the City they shall be construed and interpreted as synonymous and to read "Project Co shall" or "the City shall" as the case may be.
- 2.28 Any reference to currency is to Canadian currency and any amount advanced, paid or calculated is to be advanced, paid or calculated in Canadian currency.
- 2.29 Unless otherwise identified in the Project Agreement, all units of measurement in any documents submitted by Project Co to the City shall be in accordance with the SI system of units.
- 2.30 Terms not defined herein and used in the Project Agreement which have a technical meaning commonly understood by the transit system construction and maintenance industry in Ontario will be construed as having that meaning unless the context otherwise requires.
- 2.31 Save where expressly stated otherwise, references to amounts or sums expressed to be "indexed" or "index linked" are references to amounts or sums which require adjustment to reflect the effects of inflation. Such adjustment shall be calculated in accordance with the following formula:

Adjusted amount or sum = Amount or sum x $\frac{\text{CPI}_n}{\text{CPI}_o}$

- 2.32 The terms “properly inferable”, “readily apparent” and “readily discoverable” as used in the Project Agreement, shall be interpreted by taking into consideration Project Co’s and any Project Co Party’s experience and the investigations, inspections and examinations of the Background Information and in respect of the Lands carried out by Project Co or by any Project Co Party during the Request for Proposals process or other due diligence; and by taking into consideration reasonable, normal course and industry standard investigations, inspections or other due diligence; in each case in accordance with Good Industry Practice.

**APPENDIX A
INTENTIONALLY DELETED**

APPENDIX B
PHASE 1 AND PHASE 2 ENVIRONMENTAL SITE ASSESSMENT REPORTS

	Report Title	Author/Firm	Report Date	Report Type & Status
1	[REDACTED]	[REDACTED]	June 14, 2017	Phase II Environmental Site Assessment, Complete
2	[REDACTED]	[REDACTED]	June 14, 2017	Phase II Environmental Site Assessment, Complete
3	[REDACTED]	[REDACTED]	June 6, 2017	Contamination Overview Study, Complete
4	[REDACTED]	[REDACTED]	September 22, 2017	Groundwater Investigation, Complete
5	[REDACTED]	[REDACTED]	December 11, 2017	Limited Phase II Environmental Site Assessment, Complete
6	[REDACTED]	[REDACTED]	December 11, 2017	Limited Phase II Environmental Site Assessment, Complete
7	[REDACTED]	[REDACTED]	December 11, 2017	Limited Phase II Environmental Site Assessment, Complete
8	[REDACTED]	[REDACTED]	December 11, 2017	Limited Phase II Environmental Site Assessment, Complete
9	[REDACTED]	[REDACTED]	January 4, 2018	Limited Phase II Environmental Site Assessment, Complete
10	[REDACTED]	[REDACTED]	January 4, 2018	Limited Phase II Environmental Site Assessment, Complete
11	[REDACTED]	[REDACTED]	January 4, 2018	Limited Phase II Environmental Site Assessment, Complete
12	[REDACTED]	[REDACTED]	January 4, 2018	Limited Phase II Environmental Site Assessment, Complete
13	[REDACTED]	[REDACTED]	January 3, 2018	Limited Phase II Environmental Site Assessment, Complete

14	[REDACTED]	[REDACTED]	January 5, 2018	Limited Phase II Environmental Site Assessment, Complete
15	[REDACTED]	[REDACTED]	January 5, 2018	Limited Phase II Environmental Site Assessment, Complete
16	[REDACTED]	[REDACTED]	March 6, 2018	Limited Phase II Environmental Site Assessment, Complete
17	[REDACTED]	[REDACTED]	January 22, 2018	Limited Phase II Environmental Site Assessment, Complete
18	[REDACTED]	[REDACTED]	2005	Phase I Environmental Site Assessment, Complete
19	[REDACTED]	[REDACTED]	2005	Phase II Environmental Site Assessment, Complete
20	[REDACTED]	[REDACTED]	2006	Phase II Environmental Site Assessment, Complete
21	[REDACTED]	[REDACTED]	2016	Groundwater Investigation, Complete
22	[REDACTED]	[REDACTED]	2016	Soil Sampling Program Report, Complete
23	[REDACTED]	[REDACTED]	2015	Environmental Investigation Report, Complete
24	[REDACTED]	[REDACTED]	2006	Phase I Environmental Site Assessment, Complete
25	[REDACTED]	[REDACTED]	2006	Phase II Environmental Site Assessment, Complete
26	[REDACTED]	[REDACTED]	2013	Soil Sampling Program Report, Complete
27	[REDACTED]	[REDACTED]	2012	Phase I Environmental Site Assessment, Complete
28	[REDACTED]	[REDACTED]	2012	Soil Sampling Program Report, Complete
29	[REDACTED]	[REDACTED]	2015	Phase II Environmental Site Assessment, Complete

30	[REDACTED]	[REDACTED]	2014	Phase II Environmental Site Assessment, Complete
31	[REDACTED]	[REDACTED]	2006	Phase I Environmental Site Assessment, Complete
32	[REDACTED]	[REDACTED]	2011	Limited Phase II Environmental Site Assessment, Complete
33	[REDACTED]	[REDACTED]	2011	Phase I Environmental Site Assessment, Complete
34	[REDACTED]	[REDACTED]	2006	Phase II Environmental Site Assessment, Complete
35	[REDACTED]	[REDACTED]	2012	Phase II Environmental Site Assessment, Complete
36	[REDACTED]	[REDACTED]	2015	Groundwater Investigation, Complete
37	[REDACTED]	[REDACTED]	2005	Remediation Report, Complete
38	[REDACTED]	[REDACTED]	2008	Groundwater Investigation, Complete
39	[REDACTED]	[REDACTED]	2001	Remediation Report, Complete
40	[REDACTED]	[REDACTED]	2004	Groundwater Investigation, Complete
41	[REDACTED]	[REDACTED]	2003	Limited Phase II Environmental Site Assessment, Complete
42	[REDACTED]	[REDACTED]	2005	Monitoring Well Decommissioning Report, Complete
43	[REDACTED]	[REDACTED]	1999	Phase I Environmental Site Assessment, Complete
44	[REDACTED]	[REDACTED]	2004	Phase I Environmental Site Assessment, Complete
45	[REDACTED]	[REDACTED]	2002	Limited Phase II Environmental Site Assessment, Complete
46	[REDACTED]	[REDACTED]	2002	Phase II Environmental Site Assessment, Complete

47	[REDACTED]	[REDACTED]	2009	Supplemental Phase II Environmental Site Assessment, Complete
48	[REDACTED]	[REDACTED]	2006	Phase I Environmental Site Assessment, Complete
49	[REDACTED]	[REDACTED]	2017	Supplemental Phase III Environmental Site Assessment, Complete
50	[REDACTED]	[REDACTED]	2017	Phase II Environmental Site Assessment, Complete
51	[REDACTED]	[REDACTED]	2017	Groundwater Investigation, Complete
52	[REDACTED]	[REDACTED]	2015	Subsurface Investigation Report, Complete
53	[REDACTED]	[REDACTED]	2005	Supplemental Phase II Environmental Site Assessment, Complete
54	[REDACTED]	[REDACTED]	2005	Phase II Environmental Site Assessment, Complete

**APPENDIX C
INTENTIONALLY DELETED**

**APPENDIX D
CULTURAL HERITAGE REPORTS**

[REDACTED]

APPENDIX E
GEOTECHNICAL REPORTS

	Report Title	Author/Firm	Project Component	Report Date	Report Type & Status
1	[REDACTED]	[REDACTED]	Trillium Line Extension	May 2017	Geotechnical Data Report
2	[REDACTED]	[REDACTED]	Trillium Line Extension	June 2017	Geotechnical Data Report
3	[REDACTED]	[REDACTED]	Trillium Line Extension	January 2018	Geotechnical Data Report
4	[REDACTED]	[REDACTED]	Trillium Line Extension	February 2018	Geotechnical Data Report
5	[REDACTED]	[REDACTED]	Trillium Line Extension	January 2018	Geotechnical Data Report
6	[REDACTED]	[REDACTED]	Trillium Line Extension	March 2018	Geotechnical Data Report
7	[REDACTED]	[REDACTED]	Trillium Line Extension	July 2017	Historic Geotechnical Data Report
8	[REDACTED]	[REDACTED]	Trillium Line Extension	February 2018	Historic Geotechnical Data Report
9	[REDACTED]	[REDACTED]	Trillium Line Extension	July 2017	Hydrogeological Data Report
10	[REDACTED]	[REDACTED]	Trillium Line Extension	March 2018	Hydrogeological Data Report
11	[REDACTED]	[REDACTED]	Trillium Line Extension	March 2018	Hydrogeological Data Report
12	[REDACTED]	[REDACTED]	Trillium Line Extension	January 2018	Hydrogeological Data Report

	Report Title	Author/Firm	Project Component	Report Date	Report Type & Status
13	[REDACTED]	[REDACTED]	Trillium Line Extension	February 2018	Hydrogeological Data Report

**APPENDIX F
LISTED PROJECT CO PLAAs**

Listed Project Co PLAA's	Timeline for Final Determination by the City
Site Plan Control - Development Outside of the Public Transit System Right-of-Way	[REDACTED]
Building and Demolition Permits - Stations and MSF	[REDACTED]
Noise By-law Exemption * If approved by ward councillor	[REDACTED]
Approval discharge waste water - Under Sewer Use By-law	[REDACTED]
Road Cut Permit	[REDACTED]
Utility Circulation	
Temporary Construction-Related Encroachment Permit ROW/Property	[REDACTED]
Street or Lane Closing/Opening	[REDACTED]
Zoning By-Law Amendment	[REDACTED]
Sign Permit	[REDACTED]
Permit Under Ontario Heritage Act	[REDACTED]
Emergency Services Approval - Fire and Life Safety	[REDACTED]

**APPENDIX G
RVSC CASH FLOW**

[REDACTED]

SCHEDULE 2
COMPLETION DOCUMENTS

In this Schedule 2, “certified” shall mean that the relevant document is certified as a true and complete copy in full force and effect and unamended as of the date of the relevant certificate by an officer or director of the relevant corporation. Any capitalized term not defined in this Schedule 2 shall have the meaning given to such term in the Project Agreement.

1. DOCUMENTS TO BE DELIVERED BY PROJECT CO

Unless an original document is specifically required, a certified copy of each of the following documents (in each case, executed by the parties to such agreement other than the City and the Independent Certifier and in form and substance satisfactory to the City, acting reasonably) is to be delivered by Project Co to the City on or prior to the Financial Close Target Date:

- 1.1 an original of the Project Agreement;
- 1.2 an original of the Custody Agreement;
- 1.3 an original of the Lenders’ Direct Agreement;
- 1.4 an original of the Construction Contractor’s Direct Agreement;
- 1.5 an original of the Maintenance and Rehabilitation Contractor’s Direct Agreement;
- 1.6 an original of the Independent Certifier Agreement;
- 1.7 an original of the Insurance Trust Agreement;
- 1.8 an original Notice of appointment of the Project Co Representative;
- 1.9 an original of the undertaking and acknowledgement in the form attached as Appendix A to this Schedule 2;
- 1.10 not used;
- 1.11 the Construction Contract;
- 1.12 the Maintenance and Rehabilitation Contract;
- 1.13 a certificate of insurance and draft policies of insurance for the insurances required to be taken out by the Construction Contractor for the period prior to the Substantial Completion Date in accordance with the Project Agreement;
- 1.14 one (1) printed copy of the Financial Model (as revised pursuant to Section 2.3(d) of the Project Agreement, if applicable) and two (2) on universal serial bus (USB) flash drive;
- 1.15 a certificate of an officer of Project Co certifying:

- (a) a true copy of the Financial Model audit report dated [REDACTED] prepared by [REDACTED]; and
 - (b) that the Financial Model algorithms have not changed from the audit report referred to in (a) above;
- 1.16 the PBS-1, in form and substance satisfactory to the City;
- 1.17 a certificate of an officer of Project Co substantially in the form attached as Appendix B to this Schedule 2;
- 1.18 a certificate of an officer of each of the Construction Contractor and the Maintenance and Rehabilitation Contractor substantially in the form attached as Appendix B to this Schedule 2;
- 1.19 an original of the opinion from counsel to Project Co, the Construction Contractor and the Maintenance and Rehabilitation Contractor substantially in the form attached as Appendix C to this Schedule 2 and otherwise acceptable to the City and its counsel;
- 1.20 a final Lane Closure Target Letter;
- 1.21 not used;
- 1.22 [intentionally deleted];
- 1.23 written confirmation that the list of Key Individuals with respect to the Works submitted by Project Co as part of its proposal in the RFP process, is unchanged;
- 1.24 evidence that the COR-Qualified Construction Project Co Party has its COR Certification in good standing (or to the extent that the COR-Qualified Construction Project Co Party does not have its COR Certification by Financial Close, evidence that the COR-Qualified Construction Project Co Party has its current OHSAS 18001 Accreditation in good standing and has made an application to IHSA for its COR Certification);
- 1.25 the form of the following documents:
 - (i) Maintenance and Rehabilitation Contractor:
 - A. the Maintenance LC (as defined in Schedule 4 – Funding Requirements); and
 - B. the Maintenance PCG (as defined in Schedule 4 – Funding Requirements);
- 1.26 a form of the Blocked Accounts Agreement to be dated on the Substantial Completion Date, in form and substance satisfactory to the parties thereto; and
- 1.27 the Equity Contribution Agreement.

2. DOCUMENTS TO BE DELIVERED BY THE CITY

Unless an original document is specifically required, a certified copy of each of the following documents (in each case, where the City is a party to such document, executed by the City and, if applicable, any

City Party or Governmental Authority) is to be delivered by the City to Project Co on or prior to the Financial Close Target Date:

- 2.1 an original of the Project Agreement;
- 2.2 an original of the Custody Agreement;
- 2.3 an original of the Lenders' Direct Agreement;
- 2.4 an original of the Construction Contractor's Direct Agreement;
- 2.5 an original of the Maintenance and Rehabilitation Contractor's Direct Agreement;
- 2.6 an original of the Independent Certifier Agreement (executed by the City and the Independent Certifier);
- 2.7 an original of the Insurance Trust Agreement;
- 2.8 an original Notice of appointment of the City Representative;
- 2.9 such other documents as the Parties may agree, each acting reasonably;
- 2.10 a certificate of an officer of the City confirming that the representations and warranties of the City in Section 5.2(a) of the Project Agreement remain true and correct as of the date of Financial Close in the form attached as Appendix D to this Schedule 2; and
- 2.11 an original opinion from counsel to the City and such other City Parties as Project Co may reasonably require in respect of customary corporate and enforceability matters and otherwise acceptable to Project Co and its counsel, addressed to Project Co, the Lenders' Agent, the Construction Contractor and the Maintenance and Rehabilitation Contractor.

APPENDIX A

FORM OF UNDERTAKING AND ACKNOWLEDGEMENT

TO: City of Ottawa (the “**City**”)

RE: Project agreement (as amended, supplemented or modified from time to time, the “**Project Agreement**”) dated the [●] day of [●], 20● between the City and [●] (“**Project Co**”)

1. The undersigned acknowledges that:

- (a) The Project will proceed as an alternative financing and procurement project and complies with the principles which guide the financing and procurement of public infrastructure projects in Ontario.
- (b) Consistent with the principle of appropriate public ownership/control, public ownership of assets will be preserved in the public sector.

2. Capitalized terms used but not defined herein have the respective meanings ascribed thereto in the Project Agreement.

DATED this _____ day of _____, 20●.

[●]

By:

Name:
Title:

By:

Name:
Title:

I/We have authority to bind the corporation.

APPENDIX B

FORM OF PROJECT CO/PROJECT CO PARTY OFFICER'S CERTIFICATE

Certificate of an Officer of

[•]

(the “Corporation”)

TO: CITY OF OTTAWA (“THE CITY”)

AND TO: NORTON ROSE FULBRIGHT CANADA LLP

AND TO: []

I, [•], being the [•] of the Corporation and an authorized signatory of the Corporation and being duly authorized by the Corporation to deliver this certificate, hereby make the following certifications and confirmations for and on behalf of the Corporation and without incurring personal liability and that the same may be relied upon by you without further inquiry:

1. Constating Documents

- (a) The Corporation is a subsisting corporation duly incorporated under the laws of [the Province of Ontario].
- (b) Attached hereto as **Schedule “A”** are true and complete copies of the articles, together with all amendments thereto, of the Corporation (the “**Articles**”). The Articles are in full force and effect on the date hereof and no other articles have been issued and no proceeding has been taken or is contemplated to the date hereof to authorize the Corporation to amend, surrender or cancel the Articles.
- (c) Attached hereto as **Schedule “B”** are true and complete copies of the by-laws of the Corporation (the “**By-laws**”) enacted on or before the date hereof. The By-laws have been in full force and effect from and after the date thereof as set out therein and are in full force and effect, unamended as of the date hereof. No proceeding has been taken to the date hereof to authorize the Corporation to amend the By-laws and neither the directors nor the shareholders of the Corporation have passed, confirmed or consented to any resolutions amending or varying the By-laws.
- (d) Attached hereto as **Schedule “C”** is a true and complete copy of a unanimous shareholders’ agreement between the shareholders of the Corporation and the Corporation (the “**Unanimous Shareholders’ Agreement**”) executed on or before the date hereof. The Unanimous Shareholders’ Agreement has been in full force and effect from and after the date thereof as set out therein and is in full force and effect, unamended as of the date hereof.
- (e) The minute books and corporate records of the Corporation made available to [•] are the original minute books and corporate records of the Corporation and contain all minutes of meetings, resolutions and proceedings of the shareholders and directors of the

Corporation to the date hereof and there have been no meetings, resolutions or proceedings authorized or passed by the shareholders or directors of the Corporation to the date hereof not reflected in such minute books and corporate records. Such minute books and corporate records are true, complete and correct in all material respects and there are no changes, additions or alterations necessary to be made thereto to make such minute books and corporate records true, complete and correct in all material respects.

- (f) At the date hereof, no winding-up, liquidation, dissolution, insolvency, bankruptcy, amalgamation, arrangement, reorganization or continuation proceedings in respect of the Corporation have been commenced or are being contemplated by the Corporation, and the Corporation has no knowledge of any such proceedings having been commenced or contemplated in respect of the Corporation by any other party.
- (g) At the date hereof, the Corporation is up-to-date in the filing of all returns and other documents required to be filed by it by governmental authorities, including under corporate, securities and tax legislation, and no notice of any proceedings to cancel its certificate of incorporation or otherwise to terminate its existence has been received by the Corporation.
- (h) Pursuant to the Unanimous Shareholders' Agreement, the powers of the directors of the Corporation to manage the business and affairs of the Corporation, whether such powers arise from the [**Business Corporations Act (Ontario)** (the "Act")], the Articles or the By-laws of the Corporation, or otherwise, are restricted to the fullest extent permitted by law, and, in accordance with the Act and the Unanimous Shareholders' Agreement, the shareholders of the Corporation have and enjoy and may exercise and perform all the rights, powers, and duties of the directors of the Corporation to manage the business and affairs of the Corporation.
- (i) There are no provisions in the Articles, By-laws, Unanimous Shareholders' Agreement or in any other agreement binding on the Corporation which:
 - (i) restrict or limit the powers of the Corporation to enter into:
 - (1) a certain project agreement with the City made as of [●], 20● (as the same may be amended, supplemented, restated or otherwise modified from time to time, the "**Project Agreement**") pursuant to which the Corporation will design, build, finance and maintain a new light rail transit system;
 - (2) not used;
 - (3) direct agreements between the Contractors, the Corporation, [**the Guarantors**] and the City;
 - (4) [**Note to Proponents: List other documents delivered at Financial Close.**],
 - (collectively, the "**Documents**"); or

- (ii) restrict or limit the authority of the directors or shareholders of the Corporation by resolution to delegate the powers set out in subparagraph (i) to a director or an officer of the Corporation.

2. Resolutions

- (a) Annexed hereto, forming part hereof and marked as **Schedule “D”** are true and complete copies of the resolutions of the [directors/shareholders] of the Corporation (the “**Resolutions**”), which have been duly and validly passed in accordance with applicable law, constituting authority and approval for the Corporation, *inter alia*, to enter into the Documents. The Resolutions are the only resolutions of the Corporation pertaining to the subject matter thereof and the same are in full force and effect, unamended as of the date hereof.
- (b) The authorization, execution and delivery of each Document contemplated in the Resolutions, and the performance by the Corporation of its obligations thereunder, do not constitute or result in a violation or breach or default under:
- (i) the Articles, By-laws or the Unanimous Shareholders’ Agreement;
 - (ii) to the best of my knowledge and belief after due diligence, any order of any Canadian or [Ontario] governmental body by which it is bound;
 - (iii) to the best of my knowledge and belief after due diligence, the terms of any agreement or instrument under which any of its property or assets is bound; or
 - (iv) to the best of my knowledge and belief after due diligence, any writ, judgment, injunction, determination or award which is binding on the Corporation or any of its properties.
- (c) To the best of my knowledge and belief after due diligence, there are no actions, suits, proceedings, or investigations pending or threatened in writing against the Corporation at law or in equity before any Governmental Authority or arbitral body (whether or not covered by insurance) of which the Corporation has received written notice and that individually or in the aggregate could result in any material adverse effect on the business, properties, or assets, or the condition, financial or otherwise, of the Corporation or in any impairment of its ability to perform its obligations under the Documents, and the Corporation has no knowledge of any violation or default with respect to any order, writ, injunction, or decree of any Governmental Authority or arbitral body that could result in any such material adverse effect or impairment.
- (d) To the best of my knowledge and belief after due diligence, no consent, approval or other order of any Canadian or [Ontario] Governmental Authority which has not been obtained is required to permit the Corporation to execute and deliver the Documents.

3. No Breach or Default

Neither the execution and delivery by the Corporation of the Documents nor the consummation of the transactions therein contemplated nor the fulfilment or compliance with the terms thereof will contravene or result in a breach of any of the terms, conditions or provisions of, or constitute a default under the

Articles, By-laws, Unanimous Shareholders' Agreement or under any other agreement binding on the Corporation.

4. Specimen Signatures

The persons whose names are set forth below are, at the date hereof, officers and/or directors of the Corporation, duly elected or appointed to the office or offices set forth opposite their respective names and authorized to execute the Documents on behalf of the Corporation. The signatures set forth opposite their respective names are the true signatures of those persons:

NAME	POSITION	SIGNATURE

5. Capital

Listed below are all of the issued and outstanding shares in the capital of the Corporation and the registered owner of such shares:

ISSUED SHARES	REGISTERED OWNER

Attached hereto as **Schedule “E”** are true copies of all certificates in respect of such issued and outstanding shares. The Corporation has issued no securities, including (without limitation) securities convertible or exchangeable into shares and/or securities in respect of debt, other than such issued and outstanding shares as are listed above.

DATED this _____ day of _____, 20●.

Name:

Title:

APPENDIX C

FORM OF PROJECT CO/PROJECT CO PARTY OPINION

[INSERT DATE]

City of Ottawa
[Insert Address]

- and -

Norton Rose Fulbright Canada LLP
45 O'Connor Street, Suite 1500
Ottawa, Ontario
K1P 1A4

Dear Sirs/Mesdames:

Re: Trillium Line Extension – Ottawa Stage 2 LRT Project

We have acted as counsel to [•] (“**Project Co**”), [•] (the “**Construction Contractor**”) and [•] (the “**Maintenance and Rehabilitation Contractor**”) in connection with the alternative financing and procurement transaction whereby Project Co has agreed to enter into a design, build, finance and maintain agreement for the extension of the Trillium Line light rail transit system in the City of Ottawa, Ontario. **[Note to Proponents: Additional parties to be added depending on consortium structure and/or the financing package.]**

This opinion is being delivered to the City of Ottawa (the “**City**”) and their counsel pursuant to Section 1.19 of Schedule 2 to the project agreement made as of [•] between the City and Project Co (as the same may be amended, supplemented, restated or otherwise modified from time to time, the “**Project Agreement**”).

All capitalized terms used but not otherwise defined in this opinion shall have the respective meanings ascribed thereto in the Project Agreement.

In our capacity as counsel to Project Co, the Construction Contractor and the Maintenance and Rehabilitation Contractor, we have participated in the preparation and negotiation, and have examined an executed copy, of each of the following documents (unless otherwise indicated, all documents are dated as of [•]):

1. the Project Agreement; and
2. the following project documents (collectively, the “**Implementation Documents**”):
 - (a) the Construction Contract;
 - (b) the Maintenance and Rehabilitation Contract;

- (c) the Lenders' Direct Agreement;
- (d) the Construction Contractor's Direct Agreement;
- (e) the Maintenance and Rehabilitation Contractor's Direct Agreement;
- (f) not used;
- (g) the Insurance Trust Agreement;
- (h) the Custody Agreement;
- (i) the Independent Certifier Agreement; and
- (j) the Performance Guarantees.

The Project Agreement and the Implementation Documents are hereinafter collectively referred to as the “**Documents**”, and each is individually referred to as a “**Document**”. [Note to Proponents: Additional documents to be added depending on consortium structure and/or the financing package.]

We are qualified to practise law in the Province of Ontario. We have made no investigation of the laws of any jurisdiction other than Ontario, and the opinions expressed below are confined to the laws of Ontario and the federal laws of Canada applicable therein as at the date hereof.

We do not act as corporate counsel to [**Project Co, the Construction Contractor or the Maintenance and Rehabilitation Contractor**], nor have we participated in the general maintenance of their corporate records and corporate proceedings. Therefore, in expressing certain of the opinions below, we have, where indicated, relied exclusively, and without any independent investigation or enquiry, on certificates of public officials and a certificate of an officer of each of Project Co, the Construction Contractor and the Maintenance and Rehabilitation Contractor dated as of the date hereof (the “**Officer’s Certificates**”) as to certain factual matters.

Searches and Reliance

We have conducted, or have caused to be conducted, the searches identified in Schedule “A” (the “**Searches**”) for filings or registrations made in those offices of public record listed in Schedule “A”. The Searches were conducted against the current name and all former names of Project Co, the Construction Contractor and the Maintenance and Rehabilitation Contractor (including, in each case, both the English and French versions, if any). The results of the Searches are set out in Schedule “A”.

We have also made such investigations and examined originals or copies, certified or otherwise identified to our satisfaction, of such certificates of public officials and of such other certificates, documents and records as we have considered necessary or relevant for purposes of the opinions expressed below, including, without limitation, the Officer’s Certificates.

We have relied exclusively, and without any independent investigation or enquiry, on the Officer’s Certificates and the certificates of public officials with respect to certain factual matters.

In connection with the opinions set forth in paragraphs 1, 2 and 3 below, we have relied exclusively on certificates of status issued by the [**Ministry of Government Services (Ontario)**] of even date, copies of which are attached as Schedule “B”.

In connection with the opinions set forth in paragraphs 5, 8, 11, 17 and 20 below, we have relied exclusively, and without any independent investigation or enquiry, upon the opinion of [●] dated [●] (the “**CC Opinion**”), a copy of which has been delivered to you. To the extent that the CC Opinion contains assumptions, qualifications, limitations or definitions, or is expressed as relying on any certificate(s) or other documents identified therein, the opinions herein expressed in reliance on the CC Opinion should be read as incorporating the identical assumptions, qualifications, limitations, definitions and reliances.

In connection with the opinions set forth in paragraphs 6, 9, 12, 18 and 21 below, we have relied exclusively, and without any independent investigation or enquiry, upon the opinion of [●] dated [●] (the “**Maintenance Contractor Opinion**”), a copy of which has been delivered to you. To the extent that the Maintenance Contractor Opinion contains assumptions, qualifications, limitations or definitions, or is expressed as relying on any certificate(s) or other documents identified therein, the opinions herein expressed in reliance on the Maintenance Contractor Opinion should be read as incorporating the identical assumptions, qualifications, limitations, definitions and reliances.

Assumptions

For the purposes of the opinions expressed herein, we have assumed:

1. The genuineness of all signatures, the authenticity of all documents submitted to us as originals, the conformity to originals of all documents submitted to us as certified, true, conformed, photostatic or notarial copies or facsimiles thereof and the authenticity of the originals of such certified, true, conformed, photostatic or notarial copies or facsimiles.
2. Each of the parties (other than Project Co, the Construction Contractor and the Maintenance and Rehabilitation Contractor) to each of the Documents is and was, at all relevant times, a subsisting corporation, partnership, limited partnership, limited liability company or trust, as applicable, under the laws of its jurisdiction of formation.
3. Each of the parties (other than Project Co, the Construction Contractor and the Maintenance and Rehabilitation Contractor) has (and had) the corporate power, authority and capacity to own its property and assets and to carry on its business as such business is now (or as was then) being carried on by it, has (or had) all requisite corporate power, authority and capacity to execute and deliver each Document to which it is party and to perform its obligations thereunder, has taken all necessary corporate action, as applicable, to authorize the execution and delivery of each Document to which it is a party and the performance of its obligations thereunder, and has duly executed and delivered each Document to which it is a party and each Document to which it is a party is a legal, valid and binding obligation of such party enforceable against it in accordance with its terms.
4. The completeness, truth and accuracy of all facts set forth in the Officer’s Certificates.
5. The completeness, truth and accuracy of all facts set forth in official public records and certificates and other documents supplied by public officials.
6. Value has been given by each of the parties (other than Project Co, the Construction Contractor and the Maintenance and Rehabilitation Contractor) to Project Co, the Construction Contractor and the Maintenance and Rehabilitation Contractor.

Opinions

Based upon and subject to the foregoing, and to the qualifications, exceptions and limitations hereinafter expressed, we are of the opinion that, as of the date hereof:

INCORPORATION AND EXISTENCE

1. Project Co is a corporation incorporated under the laws of [the Province of Ontario] and has not been dissolved.
2. The Construction Contractor is a corporation incorporated under the laws of [the Province of Ontario] and has not been dissolved.
3. The Maintenance and Rehabilitation Contractor is a corporation incorporated under the laws of [the Province of Ontario] and has not been dissolved.

CORPORATE POWER AND CAPACITY

4. Project Co has the corporate power and capacity to own or lease its properties and assets, to carry on its business as it is currently being conducted and as it is contemplated to be conducted under the Project Agreement, and to enter into and perform its obligations under each of the Documents to which it is a party.
5. The Construction Contractor has the corporate power and capacity to own or lease its properties and assets, to carry on its business as it is currently being conducted and as it is contemplated to be conducted under the Documents, and to enter into and perform its obligations under each of the Documents to which it is a party.
6. The Maintenance and Rehabilitation Contractor has the corporate power and capacity to own or lease its properties and assets, to carry on its business as it is currently being conducted and as it is contemplated to be conducted under the Documents, and to enter into and perform its obligations under each of the Documents to which it is a party.

CORPORATE AUTHORIZATION

7. Project Co has taken all necessary corporate action to authorize the execution and delivery of, and the performance of its obligations under, each of the Documents to which it is a party.
8. The Construction Contractor has taken all necessary corporate action to authorize the execution and delivery of, and the performance of its obligations under, each of the Documents to which it is a party.
9. The Maintenance and Rehabilitation Contractor has taken all necessary corporate action to authorize the execution and delivery of, and the performance of its obligations under, each of the Documents to which it is a party.

EXECUTION AND DELIVERY

10. Project Co has duly executed and delivered each of the Documents to which it is a party.

11. The Construction Contractor has duly executed and delivered each of the Documents to which it is a party.
12. The Maintenance and Rehabilitation Contractor has duly executed and delivered each of the Documents to which it is a party.

ENFORCEABILITY

13. Each of the Documents to which Project Co is a party constitutes a legal, valid and binding obligation of Project Co, enforceable against it in accordance with its terms.
14. Each of the Documents to which the Construction Contractor is a party constitutes a legal, valid and binding obligation of the Construction Contractor, enforceable against it in accordance with its terms.
15. Each of the Documents to which the Maintenance and Rehabilitation Contractor is a party constitutes a legal, valid and binding obligation of the Maintenance and Rehabilitation Contractor, enforceable against it in accordance with its terms.

NO BREACH OR DEFAULT

16. The execution and delivery by Project Co of the Documents to which it is a party does not, and the performance by Project Co of its obligations under each such Document in accordance with its terms will not, breach or constitute a default under (i) its articles, by-laws or unanimous shareholders' agreement, or (ii) the provisions of any law, statute, rule or regulation to which Project Co is subject.
17. The execution and delivery by the Construction Contractor of the Documents to which it is a party does not, and the performance by the Construction Contractor of its obligations under each such Document in accordance with its terms will not, breach or constitute a default under (i) its articles, by-laws or unanimous shareholders' agreement, or (ii) the provisions of any law, statute, rule or regulation to which the Construction Contractor is subject.
18. The execution and delivery by the Maintenance and Rehabilitation Contractor of the Documents to which it is a party does not, and the performance by the Maintenance and Rehabilitation Contractor of its obligations under each such Document in accordance with its terms will not, breach or constitute a default under (i) its articles, by-laws or unanimous shareholders' agreement, or (ii) the provisions of any law, statute, rule or regulation to which the Maintenance and Rehabilitation Contractor is subject.

REGULATORY APPROVALS

19. No authorization, consent, permit or approval of, or other action by, or filing with or notice to, any governmental agency or authority, regulatory body, court, tribunal or other similar entity having jurisdiction is required in connection with the execution and delivery by Project Co of the Documents to which it is a party and the performance of its obligations thereunder.
20. No authorization, consent, permit or approval of, or other action by, or filing with or notice to, any governmental agency or authority, regulatory body, court, tribunal or other similar entity having jurisdiction is required in connection with the execution and delivery by the Construction

Contractor of the Documents to which it is a party and the performance of its obligations thereunder.

- 21.** No authorization, consent, permit or approval of, or other action by, or filing with or notice to, any governmental agency or authority, regulatory body, court, tribunal or other similar entity having jurisdiction is required in connection with the execution and delivery by the Maintenance and Rehabilitation Contractor of the Documents to which it is a party and the performance of its obligations thereunder.

Qualifications

Our opinions herein are subject to the following qualifications and reservations, namely:

- 1.** The enforceability of any Document and the rights and remedies set out therein or any judgment arising out of or in connection therewith is subject to and may be limited by any applicable bankruptcy, reorganization, winding-up, insolvency, moratorium or other laws of general application affecting creditors' rights from time to time in effect.
- 2.** The enforceability of each of the Documents and the rights and remedies set out therein is subject to and may be limited by general principles of equity, and no opinion is given as to any specific remedy that may be granted, imposed or rendered, including equitable remedies such as those of specific performance and injunction, or the availability of equitable defences.
- 3.** The enforceability of any Document will be subject to the limitations contained in the *Limitations Act, 2002* (Ontario), and we express no opinion as to whether a court may find any provision of any Document to be unenforceable as an attempt to vary or exclude a limitation period under that Act.
- 4.** Pursuant to the *Currency Act* (Canada), a judgment in money rendered by a court in the Province of Ontario must be awarded in Canadian currency and such judgment may be based on a rate of exchange in effect other than the day of payment of the judgment.
- 5.** To the extent that a particular contractual provision is characterized by a court as a penalty and not as a genuine pre-estimate of damages, it will not be enforceable.
- 6.** A court may not treat as conclusive those certificates and determinations which the Documents state are to be so treated.
- 7.** A receiver or receiver and manager appointed pursuant to the provisions of any Document, for certain purposes, may not be treated by a court as being solely the agent of Project Co notwithstanding any agreement to the contrary.
- 8.** The ability to recover or claim for certain costs or expenses may be subject to judicial discretion.
- 9.** With respect to any provisions of the Documents pursuant to which the parties to such Documents are permitted or required to submit a dispute arising out of such Documents to arbitration, we express no opinion as to the enforceability of such arbitration provisions in all circumstances since under the *Arbitration Act, 1991* (Ontario) a court of competent jurisdiction in Ontario may, in its discretion and upon certain grounds, refuse to stay judicial proceedings in which event an arbitration under such arbitration provisions may not be commenced or continued.

In addition, the *Arbitration Act, 1991* (Ontario) provides that a court may hear an appeal of an arbitration award on a question of law, or set aside an arbitration award or declare it invalid, in each case on certain prescribed grounds.

10. Any requirement in any of the Documents that interest be paid at a higher rate after than before default may not be enforceable.
11. The effectiveness of provisions which purport to relieve a person from a liability or duty otherwise owed may be limited by law, and provisions requiring indemnification or reimbursement may not be enforced by a court, to the extent that they relate to the failure of such person to perform such duty or liability.
12. No opinion is expressed as to the enforceability of any provision contained in any Document which purports to sever from the Document any provision therein which is prohibited or unenforceable under applicable law without affecting the enforceability or validity of the remainder of the document.
13. No opinion is expressed regarding any waiver of service of process, presentment, demand, protest or notice of dishonour which may be contained in any of the Documents.
14. Any award of costs is in the discretion of a court of competent jurisdiction.
15. The enforceability of rights of indemnity set out in the Documents may be limited under applicable law to the extent that they directly or indirectly relate to liabilities imposed by law on the City for which it would be contrary to public policy to require Project Co to indemnify the City or to the extent that they constitute the indirect enforcement of a foreign revenue or penal law.

This opinion is being delivered solely in connection with the transaction addressed herein and may not be relied upon by any person other than the addressees, and their successors and permitted assigns, or for any purpose other than the transaction addressed herein.

Yours very truly,

[INSERT NAME OF LAW FIRM]

APPENDIX D

FORM OF OFFICER'S CERTIFICATE

[●]
(the "City")

TO: []

AND TO: []

AND TO: []

AND TO: []

RE: Project agreement (as amended, supplemented or modified from time to time, the "**Project Agreement**") dated the [●] day of [●], 201[●] between **THE CITY OF OTTAWA** ("City"), and [] ("Project Co")

I, [●], the [●] of the City and an authorized signatory of the City and being duly authorized by the City to deliver this certificate, hereby make the following certifications and confirmations for and on behalf of the City and without incurring personal liability and that the same may be relied upon by you without further inquiry:

1. Attached hereto as [●] is a true and complete copy of (i) the resolutions of the directors of the City regarding the execution of public works projects assigned to the City and certain other matters set forth therein; and (ii) an excerpt of the resolutions of the directors of the City relating to delegation of signing authority (collectively, the "[●]"), which have been duly and validly passed in accordance with applicable law. The Execution Resolutions are the only resolutions of the City pertaining to the subject matter thereof and the same is in full force and effect, unamended as of the date hereof.
2. Attached hereto as **Schedule "B"** is a true and complete copy of the resolutions of the directors of the Corporation approving the selection of Project Co as the designated proponent for the Project (the "**Project Resolutions**"). The Project Resolutions are the only resolutions of the City pertaining to the subject matter thereof and the same is in full force and effect, unamended as of the date hereof.
3. The following named persons, on or as of the date hereof, are duly elected or appointed officers of the City, as evidenced by the holding of the office or offices set forth opposite their names, are proper signing officers of the City and are authorized to execute and deliver Contracts Documents (as such a term is defined in the Execution Resolutions referenced in Item 1(i) above) relating to the Project (as defined in the Project Agreement) on behalf of the City.

The signatures set forth opposite their respective names are the true signatures of those persons.

Name	Position	Signature
[●]	_____	_____
[●]	_____	_____
[●]	_____	_____
[●]	_____	_____

DATED this _____ day of _____, 201[●].

Name:
Title:

SCHEDULE 3

CUSTODY AGREEMENT

THIS AGREEMENT is made as of the 28th day of March, 2019

BETWEEN:

THE CITY OF OTTAWA

(the “**City**”)

AND:

[REDACTED]

(the “**Custodian**”)

AND:

[REDACTED]

(the “**Lenders’ Agent**”)

AND:

TRANSITNEXT GENERAL PARTNERSHIP [REDACTED]

(“**Project Co**”)

WHEREAS:

- A. The City and Project Co (collectively, the “**PA Parties**” and each, a “**PA Party**”) have entered into the Project Agreement.
- B. Pursuant to the terms of the Project Agreement, the PA Parties wish to appoint the Custodian, and the Custodian wishes to accept such appointment, to perform certain services in connection with the Project Agreement.
- C. The PA Parties and the Custodian wish to enter into this Custody Agreement in order to record the terms by which the Custodian shall perform such services, in accordance with Applicable Law.

NOW THEREFORE in consideration of the mutual covenants and agreements of the PA Parties and the Custodian herein contained and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the PA Parties and the Custodian covenant and agree as follows:

1. DEFINITIONS

In this Custody Agreement, including the recitals and appendices, unless the context indicates a contrary intention, terms which are defined in the Project Agreement (and not otherwise defined in this Custody Agreement) shall have meanings given to them in the Project Agreement. Any capitalized term not defined in this Schedule 3 shall have the meaning given to such term in the Project Agreement and the following terms shall have the following meanings:

- (a) “**City Signatories**” has the meaning given in Section 6(a)(i).
- (b) “**Material**” means hard and electronic copies of the Financial Model.
- (c) “**PA Parties**” means the City and Project Co, and “**PA Party**” means the City or Project Co, as the context requires.
- (d) “**Party**” means the City, the Custodian, Project Co or the Lenders’ Agent, and “**Parties**” means the City, the Custodian, Project Co and the Lenders’ Agent.
- (e) “**Project Agreement**” means the project agreement made on or about March 28, 2019 between the City and Project Co.
- (f) “**Project Co Signatory**” has the meaning given in Section 6(a)(ii).
- (g) “**Step-Out Date**” has the meaning given in Section 14(e).

2. Interpretation

This Custody Agreement shall be interpreted according to the following provisions, unless the context requires a different meaning:

- (a) The headings in this Custody Agreement are for convenience of reference only, shall not constitute a part of this Custody Agreement, and shall not be taken into consideration in the interpretation of, or affect the meaning of, this Custody Agreement.
- (b) Unless the context otherwise requires, references to specific Sections, Paragraphs, Subparagraphs, and other divisions are references to such Sections, Paragraphs, Subparagraphs, or divisions of this Custody Agreement and the terms “Section” and “Clause” are used interchangeably and are synonymous.
- (c) Words importing persons or parties are to be broadly interpreted and include an individual, corporation, firm, partnership, joint venture, trust, unincorporated organization, Governmental Authority, unincorporated body of persons or association and any other entity having legal capacity, and the heirs, beneficiaries, executors, administrators or other legal representatives of a person in such capacity.
- (d) Unless the context otherwise requires, wherever used herein the plural includes the singular, the singular includes the plural, and each of the masculine, feminine and neuter genders include all other genders.

- (e) References to any standard, principle, agreement or document include (subject to all relevant approvals and any other provisions of this Custody Agreement concerning amendments) a reference to that standard, principle, agreement or document as amended, supplemented, restated, substituted, replaced, novated or assigned.
- (f) The words in this Custody Agreement shall bear their natural meaning.
- (g) References containing terms such as:
 - (i) “hereof”, “herein”, “hereto”, “hereinafter”, and other terms of like import are not limited in applicability to the specific provision within which such references are set forth but instead refer to this Custody Agreement taken as a whole; and
 - (ii) “includes” and “including”, whether or not used with the words “without limitation” or “but not limited to”, shall not be deemed limited by the specific enumeration of items but shall, in all cases, be deemed to be without limitation and construed and interpreted to mean “includes without limitation” and “including without limitation”.
- (h) In construing this Custody Agreement, the rule known as the *ejusdem generis* rule shall not apply nor shall any similar rule or approach to the construction of this Custody Agreement and, accordingly, general words introduced or followed by the word “other” or “including” or “in particular” shall not be given a restrictive meaning because they are followed or preceded (as the case may be) by particular examples intended to fall within the meaning of the general words.
 - (i) Where this Custody Agreement states that an obligation shall be performed “no later than” or “within” or “by” a stipulated date or event which is a prescribed number of days after a stipulated date or event, the latest time for performance shall be 5:00 p.m. on the last day for performance of the obligation concerned, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
 - (j) Where this Custody Agreement states that an obligation shall be performed “on” a stipulated date, the latest time for performance shall be 5:00 p.m. on that day, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
 - (k) Any reference to time of day or date means the local time or date in Ottawa, Ontario.
 - (l) Unless otherwise indicated, time periods will be strictly construed.
 - (m) Whenever the terms “will” or “shall” are used in this Custody Agreement they shall be construed and interpreted as synonymous and to read “shall”.

3. Project Co's Duties and Warranties

- (a) The City will, together with Project Co, verify the identity and consistency of one copy of the Material, which shall be delivered by Project Co to the Custodian on the date of this Custody Agreement.
- (b) Project Co shall at all times ensure that the Material as delivered to the Custodian is capable of being used to generate the latest version of the Financial Model issued to the City and shall deliver further copies of the Material to the Custodian as and when necessary.

- (c) Upon creation of any new versions of the Financial Model and within 30 days from receipt of a notice served upon it by the Custodian under the provisions of Section 4(a)(v), the replacement copy of the Material shall be verified by the PA Parties in accordance with Section 3(a) and delivered by Project Co to the Custodian.
- (d) Project Co warrants that:
 - (i) it owns the Intellectual Property Rights in the Material and has authority to enter into this Custody Agreement;
 - (ii) the use of the Materials by the City under the terms of this Custody Agreement shall not infringe any Intellectual Property Rights of any person; and
 - (iii) the Material delivered under Section 3(a) shall contain all information in human-readable form and on suitable media to enable a reasonably skilled programmer or analyst to understand, maintain and correct the Material without the assistance of any other person.

4. Custodian's Duties

- (a) The Custodian shall:
 - (i) hold in safe custody all versions of the Financial Model delivered to it pursuant to the terms hereof, and the provisions of this Custody Agreement shall apply (with any necessary changes being made) to any revised Financial Model;
 - (ii) hold the Material in a safe and secure environment;
 - (iii) inform Project Co and the City of the receipt of any copy of the Material;
 - (iv) at all times retain a copy of the latest verified deposit of the Material; and
 - (v) promptly notify Project Co and the City if it becomes aware at any time during the term of this Custody Agreement that any copy of the Material held by it has been lost, damaged or destroyed.
- (b) The Custodian shall not be responsible for procuring the delivery of the Material in the event of failure by Project Co to do so.
- (c) In accordance with Section 10, the Custodian shall allow the PA Parties, the Lenders' Agent and the auditor retained by the Lenders' Agent to inspect and audit the Financial Model from time to time.

5. Payment

- (a) In consideration of the Custodian performing the services contemplated by this Custody Agreement, Project Co shall pay the Custodian's fees as agreed from time to time between the Custodian and Project Co.

6. Release Events

- (a) The Custodian shall hold the Material to the order of the PA Parties and shall honour the instructions and signatures of:
- (i) the designated signing officers of the City or such other persons nominated by them and notified to the Custodian and Project Co in writing (the “**City Signatories**”); and
 - (ii) the president & chief executive officer and designated signing officers of Project Co or such other person nominated by it and notified to the Custodian and the City in writing (the “**Project Co Signatory**”);

and shall, subject to Section 6(b), upon receiving signed joint instructions from the City Signatories and the Project Co Signatory, release one copy of the Material to the person either named in such instructions or previously identified in writing by the City Signatories and the Project Co Signatory.

- (b) The PA Parties each agree that they shall give joint instructions to the Custodian for the release of the Material, in accordance with Section 6(a), on each occasion that the Material is required to be released pursuant to the Project Agreement or that the Material must be released to allow the Material to be maintained and/or corrected.
- (c) The Custodian shall release the Material to a duly authorized representative of the City on any termination of the Project Agreement prior to the Expiry Date.

7. Records

- (a) The PA Parties shall be entitled, at reasonable hours and upon giving the Custodian reasonable notice, to inspect any records kept by the Custodian in accordance with this Custody Agreement.

8. Confidentiality

- (a) The Material shall remain the confidential property of Project Co and, in the event that the Custodian provides a copy of the Material to the City, the City shall be permitted to use the Material only in accordance with the intellectual property and confidentiality obligations in the Project Agreement.
- (b) The Custodian agrees for itself, its directors, officers, employees, sub-contractors and agents, to maintain all information and/or documentation in whatever form coming into its possession or to its knowledge under or in connection with this Custody Agreement in strictest confidence and secrecy. The Custodian further agrees not to make use of such information and/or documentation other than for the purposes of this Custody Agreement and will not disclose or release it other than in accordance with the terms of this Custody Agreement.
- (c) In the event that the Material is released under Section 6, the City shall:
- (i) use the Material only for the purpose of understanding, maintaining and correcting the Financial Model exclusively on behalf of the City;

- (ii) not use the Material for any other purpose nor disclose it to any person, save such of its employees or contractors who need to know the same in order to understand, maintain and correct the Financial Model exclusively on behalf of the City;
- (iii) hold all media containing the Material in a safe and secure environment when not in use; and
- (iv) forthwith destroy the same should the City cease to be entitled to use the Financial Model.

9. Intellectual Property Rights

- (a) The release of the Material to the City and to the Custodian will not act as an assignment of any Intellectual Property Rights that Project Co possesses in the Material.

10. Inspection

- (a) Subject to the following provisions of this Section 10, the Custodian shall bear no obligation or responsibility to any person, firm, company or entity whatsoever to determine the existence, relevance, completeness, accuracy, effectiveness or any other aspect of the Financial Model.
- (b) The PA Parties shall be entitled, at reasonable hours and upon giving the Custodian reasonable notice, to inspect and audit or to procure the inspection and audit of the Financial Model in accordance with this Section 10.
- (c) The Custodian shall, upon receiving duly signed instructions from both of the PA Parties (but only upon receiving such instructions), provide facilities for the City and/or Project Co and/or such person identified in the duly signed written instructions to inspect and audit the Financial Model.
- (d) The Custodian shall maintain a record of any inspection and audit made pursuant to Section 10(b), including details of the person who made the inspection and/or audit and the date of the same.

11. Custodian's Liability

- (a) The Custodian shall not be liable for any loss or damage caused to Project Co or the City either jointly or severally except to the extent that such loss or damage is caused by the negligent acts or omissions of or a breach of any contractual duty by the Custodian, its employees, agents or sub-contractors, and in such event, the Custodian's total liability in respect of all claims arising under or by virtue of this Custody Agreement shall not (except in the case of claims for personal injury or death) exceed the sum of \$[REDACTED] (index-linked).
- (b) The Custodian shall in no circumstances be liable to Project Co or the City for indirect or consequential loss of any nature whatsoever whether for loss of profit, loss of business or otherwise.
- (c) Subject to complying with the provisions of Section 6, and save in the case of manifest error, the Custodian shall be protected in acting upon any written request, waiver, consent, receipt or other document furnished to it pursuant to this Custody Agreement, not only in assuming its due

execution and the validity and effectiveness of its provisions but also as to the truth and acceptability of any information contained in it, which the Custodian in good faith believes to be genuine and what it purports to be.

- (d) The duties, responsibilities and obligations of the Custodian shall be limited to those expressly set forth herein and no duties, responsibilities or obligations shall be inferred or implied. The Custodian shall not be subject to, nor required to comply with, any other agreement between or among any or all of the other Parties or to which any Party is a party, even though reference thereto may be made herein, or to comply with any direction or instruction (other than those contained herein or delivered in accordance herewith). The Custodian shall not be required to expend or risk any of its own funds or otherwise incur any financial liability in the performance of any of its duties hereunder except ordinary corporate costs incurred in the performance of such duties.
- (e) If at any time the Custodian is served with any judicial or administrative order, judgment, decree, writ or other form of judicial or administrative process which in any way affects the Material (including, but not limited to, orders of attachment or garnishment or other forms of levies or injunctions or stays relating to the transfer of property), the Custodian is authorized to comply therewith in any manner as it or its legal counsel deems appropriate, acting reasonably; provided that the Custodian, when so served, shall promptly notify Project Co and the City, in writing, of such process and the Custodian's intended action in order to provide Project Co and the City a reasonable opportunity to intervene or challenge such process in a court or tribunal of competent jurisdiction.
- (f) The Custodian may consult with legal counsel at the expense of Project Co and the City as to any matter relating to this Custody Agreement, and the Custodian shall not incur any liability in acting in good faith in accordance with any advice from such counsel. All reasonable fees and disbursements incurred by the Custodian shall be added to the fees otherwise payable hereunder.
- (g) The Custodian shall not incur any liability for not performing any act or fulfilling any duty, obligation or responsibility hereunder by reason of any occurrence beyond the control of the Custodian (including, but not limited to, any act or provision of any present or future law or regulation or governmental authority, any act of God or war, or the unavailability of any wire or communication facility).
- (h) The Custodian shall not be responsible in any respect for the form or content of the Material delivered to it hereunder.
- (i) In the event of any ambiguity or uncertainty hereunder or in any notice, instruction or other communication received by the Custodian hereunder, the Custodian shall notify Project Co and the City in writing of such ambiguity or uncertainty and request instructions to eliminate such ambiguity or uncertainty. The Custodian may, acting reasonably, refrain from taking any action other than to retain possession of the Material, unless the Custodian receives written instructions, signed by Project Co and the City, which eliminates such ambiguity or uncertainty.
- (j) In the event of any dispute between or conflicting claims by or among the PA Parties and/or any other person or entity with respect to the Material, the Custodian shall be entitled, acting reasonably, to refuse to comply with any and all claims, demands or instructions with respect to the Material so long as such dispute or conflict shall continue, and the Custodian shall promptly

notify Project Co and the City of its intention to do so. In such circumstances, the Custodian shall not be or become liable in any way to Project Co or the City for failure or refusal to comply with such conflicting claims, demands or instructions. The Custodian shall be entitled to refuse to act until, acting reasonably, either (i) such conflicting or adverse claims or demands shall have been determined by a final order, judgment or decree of a court of competent jurisdiction, which order, judgment or decree is not subject to appeal, or settled by agreement between the conflicting parties as evidenced in writing satisfactory to the Custodian or (ii) the Custodian shall have received security or an indemnity satisfactory to it acting reasonably sufficient to hold it harmless from and against any and all losses which it may incur by reason of so acting. The Custodian may, in addition, elect, acting reasonably, to commence an interpleader action or seek other judicial relief or orders as it may deem, acting reasonably, necessary, including, without limiting the generality of the foregoing, depositing all or any part of the Material into court. The costs and expenses (including reasonable attorneys' fees and expenses) incurred in connection with such proceeding shall be paid by, and shall be deemed a joint and several obligation of, Project Co and the City.

- (k) Each of Project Co and the City shall provide to the Custodian an incumbency certificate setting out the names and sample signatures of persons authorized to give instructions to the Custodian hereunder. The Custodian shall be entitled to rely on such certificate until a revised certificate is provided to it hereunder. The Custodian shall be entitled to refuse to act upon any instructions given by a party which are signed by any person other than a person described in the incumbency certificate provided to it pursuant to this Section 11.
- (l) The Custodian shall be entitled to rely, and act upon, on any direction, order, instruction, notice or other communication provided to it hereunder which is sent to it by facsimile transmission.
- (m) This Section 11 shall survive the termination of this Custody Agreement.

12. Indemnity

- (a) Save for any claim falling within the provisions of Section 11(a), Project Co and the City, on a joint and several basis, shall be liable for and shall indemnify and hold harmless the Custodian, and its officers, directors and employees, from and against any and all claims, losses, liabilities, costs, damages or expenses (including reasonable attorneys' fees and expenses) arising from or in connection with or related to this Custody Agreement or acting as Custodian hereunder (including, but not limited to, losses incurred by the Custodian in connection with its successful defense of any claim of negligence or willful misconduct on its part), provided, however, that nothing contained herein shall require the Custodian to be indemnified for losses caused by its negligence or willful misconduct.
- (b) Claims made by a third person against a party having, or claiming to have, the benefit of an indemnity pursuant to this Custody Agreement, shall be conducted in accordance with the conduct of claims procedure described in Appendix A – Conduct of Claims to this Custody Agreement.

13. Termination

- (a) The Custodian may terminate this Custody Agreement for failure by Project Co to pay any outstanding fee provided for herein within 30 days of receipt of written notice in respect thereof.

- (b) The Custodian may terminate this Custody Agreement by giving 120 days' prior written notice to Project Co and the City. In that event, Project Co and the City shall appoint a mutually acceptable new custodian on terms similar to those contained in this Custody Agreement.
- (c) If the Custodian is not notified of the new custodian within the notice period given in Section 13(b), the Custodian will destroy the Material.
- (d) The City may terminate this Custody Agreement by giving 30 days' prior written notice to the Custodian and Project Co.
- (e) Project Co may, with the prior written consent of the City, terminate this Custody Agreement by giving 30 days' prior written notice to the Custodian and the City.
- (f) This Custody Agreement shall terminate upon release of the Material to the City in accordance with Section 6(c).
- (g) Upon termination under the provisions of Sections 13(d) or 13(e), the Custodian will deliver the Material to Project Co. If the Custodian is unable to trace Project Co within 60 days of writing to the last registered address notified by Project Co to the Custodian, the Custodian will destroy the Material.
- (h) Upon termination under the provisions of Section 13(a), the Material will be available for collection by Project Co from the Custodian for 60 days from the date of termination. After such 60-day period, the Custodian will destroy the Material.
- (i) The Custodian may forthwith terminate this Custody Agreement and destroy the Material if it is unable to trace Project Co within 60 days of writing to the last registered address notified by Project Co to the Custodian having used all reasonable endeavours to do so.
- (j) The provisions of Sections 8, 11 and 12 shall continue in full force and effect after termination of this Custody Agreement.
- (k) The Agreement shall terminate on the Expiry Date, at which time Project Co will write to the Custodian requesting the release of the Materials to it. The Custodian agrees that it will notify the City of Project Co's request and, failing receipt of any notice of objection from the City within 30 days of the receipt of the notice by the City, it shall release the Materials to Project Co.
- (l) On termination of this Custody Agreement, Project Co shall remain liable to the Custodian for payment in full of any fee which has become due but which has not been paid as at the date of termination.

14. Step-In Rights

- (a) The Custodian shall, from time to time:
 - (i) permit the City to perform or discharge any obligation of Project Co under this Custody Agreement, where Project Co is in breach of the same;
 - (ii) permit Project Co to perform or discharge any obligation of the City under this Custody Agreement, where the City is in breach of the same; and

- (iii) following notification by the Lenders' Agent (who at the same time shall provide a copy of any such notification to the City), permit the Lenders' Agent or another person specified in such notice with effect from the date specified in the same to perform or discharge all the obligations of Project Co under this Custody Agreement, provided that the Lenders' Agent shall have the benefit of and be entitled to enforce against the Custodian any and all of the Custodian's obligations to Project Co under this Custody Agreement and the Custodian undertakes to perform such obligations in favour of the Lenders' Agent.
- (b) Project Co consents to the performance or discharge of its obligations by the City pursuant to Section 14(a)(i).
- (c) The City consents to the performance or discharge of its obligations by Project Co pursuant to Section 14(a)(ii).
- (d) The PA Parties consent to the performance or discharge of Project Co's obligations by the Lenders' Agent pursuant to Section 14(a)(iii).
- (e) The City or the Lenders' Agent shall be entitled to terminate the Lenders' Agent's obligations pursuant to Section 14(a)(iii) on giving the Custodian prior notice (the City or the Lenders' Agent at the same time shall provide a copy of any such notification to the other party) of at least 15 Business Days. On and from the date of expiry of such notice (the "**Step-Out Date**"), the Lenders' Agent shall be automatically released from all obligations pursuant to this Custody Agreement, except for any which have fallen due for performance or discharge on or before the Step-Out Date and which have not been fully and unconditionally performed or discharged.
- (f) The occurrence of the Step-Out Date shall not affect the continuation of Project Co's obligations towards the Custodian under this Custody Agreement.
- (g) The Lenders' Agent is a Party to this Custody Agreement solely for the purposes of taking the benefit of its rights under Section 4(c) and this Section 14 and shall have no rights or obligations or liabilities hereunder, except pursuant to the operation of Section 4(c) and this Section 14.

15. Assignment

- (a) This Custody Agreement shall be binding on, and enure to the benefit of, the Custodian, Project Co and the City and their respective successors and permitted transferees and assigns.
- (b) Project Co may assign, transfer or otherwise dispose of the benefit of this Custody Agreement to any person to whom Project Co assigns, transfers or otherwise disposes of its interest in the Project Agreement pursuant to Section 57.1 of the Project Agreement.
- (c) The City may assign, transfer or otherwise dispose of the benefit of this Custody Agreement to any person to whom the City assigns, transfers or otherwise disposes of its interest in the Project Agreement pursuant to Section 57.2 of the Project Agreement.
- (d) The Custodian shall not, without the prior written consent of the PA Parties assign, transfer or otherwise dispose of the benefit of this Custody Agreement to any person.

- (e) The Custodian acknowledges that Project Co has granted a security interest over its rights under this Custody Agreement to the Lenders' Agent.

16. Notices

- (a) All notices, requests, demands, instructions, certificates, consents and other communications required or permitted under this Custody Agreement shall be in writing (whether or not "written notice" or "notice in writing" is specifically required by the applicable provision of this Custody Agreement) and served by sending the same by registered mail, facsimile or by hand (in each case, with a copy by electronic transmission), as follows:

If to the City:

City of Ottawa
110 Laurier Ave West
Ottawa, Ontario K1P 1J1

Email: [REDACTED]
Attn.: [REDACTED]

If to Project Co:

**TransitNEXT General Partnership
[REDACTED]**

Email: [REDACTED]
Attn.: [REDACTED]

If to the Custodian:

[REDACTED]

Fax: [REDACTED]

Attn.: [REDACTED]

If to the Lenders' Agent:

[REDACTED]

Attention: [REDACTED]

Facsimile: [REDACTED]

Email: [REDACTED]

Email. [REDACTED]

- (b) Where any notice is provided or submitted to a Party via facsimile, an original of the notice sent via facsimile shall promptly be sent by regular mail or registered mail. For greater certainty, a notice given via facsimile shall not be invalid by reason only of a Party's failure to comply with this Section 16(b).
 - (c) Any Party to this Custody Agreement may, from time to time, change any of its contact information set forth in Section 16(a) by prior notice to the other Parties, and such change shall be effective on the Business Day that next follows the recipient Party's receipt of such notice unless a later effective date is given in such notice.

- (d) Subject to Sections 16(e), 16(f) and 16(g):
- (i) a notice given by registered mail shall be deemed to have been received on the third Business Day after mailing;
 - (ii) a notice given by hand delivery shall be deemed to have been received on the day it is delivered; and
 - (iii) a notice given by facsimile shall be deemed to have been received on the day it is transmitted by facsimile.
- (e) If the Party giving the notice knows or ought reasonably to know of difficulties with the postal system which might affect negatively the delivery of mail, any such notice shall not be mailed but shall be made or given by personal delivery or by facsimile transmission in accordance with this Section 16.
- (f) If any notice delivered by hand or transmitted by facsimile is so delivered or transmitted, as the case may be, either on a day that is not a Business Day or on a Business Day after 4:00 p.m. (recipient's local time), then such notice shall be deemed to have been received by such recipient on the next Business Day.
- (g) A notice given by facsimile shall be deemed to have been received by the recipient on the day it is transmitted only if a facsimile transmission report (maintained by the sender) indicates that the transmission of such notice was successful.

17. [Intentionally deleted]

18. Amendments

- (a) This Custody Agreement may not be varied, amended or supplemented except by an agreement in writing signed by duly authorized representatives of the Parties and stating on its face that it is intended to be an amendment, restatement or other modification, as the case may be, to this Custody Agreement.

19. Waiver

- (a) No waiver made or given by a Party under or in connection with this Custody Agreement shall be binding or effective unless the waiver is in writing, signed by an authorized representative of the Party giving such waiver, and delivered by such Party to the other Parties. No waiver made with respect to any right, power or remedy in one instance will be deemed to be a waiver with respect to any other instance involving the exercise of such right, power, or remedy or with respect to any other right, power, or remedy.
- (b) Failure by any Party to exercise any of its rights, powers or remedies hereunder or its delay to do so shall not constitute a waiver of those rights, powers or remedies. The single or partial exercise of a right, power or remedy shall not prevent its subsequent exercise or the exercise of any other right, power or remedy.

20. Relationship Between the Parties

- (a) The Parties are independent contractors. This Custody Agreement is not intended to and does not create or establish between the Parties any relationship as partners, joint venturers, trustee and beneficiary, employer and employee, master and servant, or principal and Lenders' Agent.

21. Entire Agreement

- (a) Except where provided otherwise in this Custody Agreement, this Custody Agreement and the Project Agreement constitute the entire agreement between the Parties in connection with the subject matter of this Custody Agreement and supersede all prior representations, communications, negotiations and understandings, whether oral, written, express or implied, concerning the subject matter of this Custody Agreement.

22. Severability

- (a) Each provision of this Custody Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Custody Agreement is declared invalid, unenforceable or illegal by the courts of a competent jurisdiction, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Custody Agreement. If any such provision of this Custody Agreement is invalid, unenforceable or illegal, the Parties shall, acting in good faith, promptly negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Custody Agreement as near as possible to its original intent and effect.

23. Enurement

- (a) This Custody Agreement shall enure to the benefit of, and be binding on, each of the Parties and their respective successors and permitted transferees and assigns.

24. Governing Law and Jurisdiction

- (a) This Custody Agreement shall be governed by and construed in accordance with the laws of Ontario and the laws of Canada applicable therein and shall be treated in all respects as an Ontario contract, without regard to conflict of laws principles.
- (b) The Parties agree that the courts of the Province of Ontario and all courts competent to hear appeals therefrom shall have exclusive jurisdiction to hear and settle any action, suit, proceeding or dispute in connection with this Custody Agreement and hereby irrevocably attorn to the exclusive jurisdiction of such courts.

25. Further Assurance

- (a) Each Party shall do all things, from time to time, and execute all further documents necessary to give full effect to this Custody Agreement.

26. Language of Agreement

- (a) Each Party acknowledges having requested and being satisfied that this Custody Agreement and related documents be drawn in English. Chacune des parties reconnaît avoir demandé que ces documents soient rédigés en anglais et s'en déclare satisfaite.

27. Proof of Authority

- (a) The City reserves the right to require any person executing this Custody Agreement on behalf of Project Co or the Lenders' Agent to provide proof, in a form acceptable to the City, that such person has the requisite authority to execute this Custody Agreement on behalf of and to bind Project Co or the Lenders' Agent, respectively.

28. Counterparts

- (a) This Custody Agreement may be executed in one or more counterparts. Any single counterpart or a set of counterparts executed, in either case, by all the Parties shall constitute a full, original and binding agreement for all purposes. Counterparts may be executed either in original or faxed form provided that any Party providing its signature in faxed form shall promptly forward to such Party an original signed copy of this Custody Agreement which was so faxed.

IN WITNESS WHEREOF the Parties have executed this Custody Agreement as of the date first above written.

CITY OF OTTAWA

Per:

Name: [REDACTED]
Title: [REDACTED]

[REDACTED]

Per:

Name:
Title:

Per:

Name:
Title:

I/We have authority to bind the corporation.

[REDACTED]

Per:

Name: [REDACTED]
Title: [REDACTED]

I/We have authority to bind the corporation.

TRANSITNEXT GENERAL PARTNERSHIP
[REDACTED]

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the corporation.

[REDACTED]

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the corporation.

APPENDIX A

CONDUCT OF CLAIMS

This Appendix A shall apply to the conduct of claims, made by a third person against a party having, or claiming to have, the benefit of an indemnity pursuant to this Custody Agreement. The party having, or claiming to have, the benefit of the indemnity is referred to as the “**Beneficiary**” and the City and Project Co are referred to, collectively, as the “**Indemnifier**”.

- (1) If the Beneficiary receives any notice, demand, letter or other document concerning any claim for which it appears that the Beneficiary is, or may become entitled to, indemnification under Section 12 of the Custody Agreement, the Beneficiary shall give written notice to the Indemnifier as soon as reasonably practicable and in any event within 10 Business Days of receipt of the same. Such notice shall specify with reasonable particularity, to the extent that information is available, the factual basis for the claim and the amount of the claim.
- (2) Subject to Sections (3), (4) and (5) of this Appendix A, on the giving of such notice by the Beneficiary, where it appears that the Beneficiary is or may be entitled to indemnification from the Indemnifier in respect of all, but not part only, of the liability arising out of the claim, the Indemnifier shall be entitled to dispute the claim in the name of the Beneficiary at the Indemnifier’s own expense and take conduct of any defence, dispute, compromise, or appeal of the claim and of any incidental negotiations. In such case, the City may, but shall not be obligated to, assume (on prior written notice to Project Co) control of any such defence for and on behalf of itself and Project Co, and Project Co hereby consents to such assumption. The Beneficiary shall give the Indemnifier all reasonable cooperation, access and assistance for the purposes of considering and resisting such claim. The Beneficiary shall have the right to employ separate counsel in respect of such claim at its own cost and expense.
- (3) With respect to any claim conducted by the Indemnifier:
 - (i) the Indemnifier shall keep the Beneficiary fully informed and consult with it about material elements of the conduct of the claim;
 - (ii) the Indemnifier shall not bring the name or reputation of the Beneficiary into disrepute;
 - (iii) the Indemnifier shall not pay, compromise or settle such claims without the prior consent of the Beneficiary, such consent not to be unreasonably withheld or delayed;
 - (iv) the Indemnifier shall not admit liability or fault to any third party without the prior consent of the Beneficiary, such consent not to be unreasonably withheld or delayed; and
 - (v) the Indemnifier shall use commercially reasonable efforts to have the Beneficiary named as a beneficiary under any release given by the persons bringing the claim to which Section (3) of this Appendix A relates.
- (4) The Beneficiary shall be free to pay or settle any such claim on such terms as it thinks fit and without prejudice to its rights and remedies under this Custody Agreement if:
 - (i) the Indemnifier is not entitled to take conduct of the claim in accordance with Section (2) of this Appendix A; or

- (ii) the Indemnifier fails to notify the Beneficiary of its intention to take conduct of the relevant claim as soon as reasonably practicable and in any event within 10 Business Days of the notice from the Beneficiary under Section (1) of this Appendix A or the Indemnifier notifies the Beneficiary that the Indemnifier does not intend to take conduct of the claim.
- (5) The Beneficiary shall be free at any time to give notice to the Indemnifier that the Beneficiary is retaining or taking over, as the case may be, the conduct of any defence, dispute, compromise or appeal of any claim, or of any incidental negotiations, to which Section (2) of this Appendix A applies. On receipt of such notice the Indemnifier shall promptly take all steps necessary to transfer the conduct of such claim to the Beneficiary, and shall provide to the Beneficiary all relevant documentation and all reasonable cooperation, access and assistance for the purposes of considering and resisting such claim. If the Beneficiary gives any notice pursuant to this Section (5) of this Appendix A, then the Indemnifier shall be released from any liabilities arising under the applicable indemnity hereunder in respect of the applicable claim.
- (6) If the Indemnifier pays to the Beneficiary an amount in respect of an indemnity and the Beneficiary subsequently recovers, whether by payment, discount, credit, saving, relief or other benefit or otherwise, a sum or anything else of value (the “**Recovery Amount**”), the Beneficiary shall forthwith repay to the Indemnifier whichever is the lesser of:
- (i) an amount equal to the Recovery Amount less any out-of-pocket costs and expenses properly incurred by the Beneficiary in recovering the same; and
 - (ii) the amount paid to the Beneficiary by the Indemnifier in respect of the claim under the relevant indemnity,
- provided that there shall be no obligation on the Beneficiary to pursue any Recovery Amount and that the Indemnifier shall be repaid only to the extent that the Recovery Amount, aggregated with any sum recovered from the Indemnifier, exceeds the loss sustained by the Beneficiary except, however, that if the Beneficiary elects not to pursue a Recovery Amount, the Indemnifier shall be entitled to require an assignment to it of the right to do so.
- (7) Any person taking any of the steps contemplated by this Appendix A shall comply with the requirements of any insurer who may have an obligation to provide an indemnity in respect of any liability arising under this Custody Agreement.

SCHEDULE 4
FUNDING REQUIREMENTS

1. Definitions

Any capitalized term not defined in this Schedule 4 shall have the meaning given to such term in the Project Agreement. In this Schedule 4, unless the context otherwise requires:

- (a) **“Actual Monthly Project Co Costs”** means all costs incurred by Project Co in a given Contract Month including, without being limited to, maintenance expenses, lifecycle expenses, payments to the Maintenance and Rehabilitation Contractor, insurance premiums, administrative costs (including Special Purpose Vehicle expenses). For clarity, Distributions to Equity Capital shall not be included as part of the Actual Monthly Project Co Costs.
- (b) **“Actual Monthly Project Co Payments”** means the Monthly Service Payment received by Project Co from the City in a given Contract Month in accordance with Schedule 19.
- (c) **“Capital Coverage Ratio”** has the meaning set out in Section 2.3.
- (d) **“Capital Coverage Ratio Calculation Period”** on a given calculation date shall be the period which ends on the last day of the Contract Month that is 2 Contract Months prior to such date, and commences on the later of (i) the start of the Contract Month that is 11 (eleven) Contract Months prior to such period end date and (ii) the Payment Commencement Date. For clarity, the Capital Coverage Ratio Calculation Period shall capture a twelve (12) month period other than in respect of reporting for the first 13 Contract Months.
- (e) **“Capital Coverage Ratio Reporting Period”** means the period commencing on the first day of Contract Month three (3) and ending on the Expiry Date.
- (f) **“Maintenance Fee Reference Amount”** means with respect to any Contract Year, the total Annual Service Payment (excluding any Lifecycle Payments payable in that year) PLUS the average annual Lifecycle Payments over the Maintenance Period, in each case indexed in accordance with the provisions of the Project Agreement, all amounts being exclusive of HST.
- (g) **“Threshold Capital Coverage Ratio”** has the meaning set out in Section 2.1.

2. Financing of the Project

- 2.1 At Financial Close, the Financial Model shall show Project Co maintaining a minimum annual Capital Coverage Ratio equal to [REDACTED] or, for Service Levels other than Service Level 1, such lower value as indicated in the Financial Model (“**Threshold Capital Coverage Ratio**”). Project Co’s Performance Monitoring Report during the Capital Coverage Ratio Reporting Period shall include confirmation of Project Co’s actual Capital Coverage Ratio.

For clarity, in no cases shall the Threshold Capital Coverage Ratio be less than [REDACTED].

- 2.2 For each month during the Capital Coverage Ratio Reporting Period, confirmation of Project Co's actual Capital Coverage Ratio shall be based on data from monthly unaudited financial statements. Where audited financial statements are available, Project Co shall use such statements for purposes of calculating the Capital Coverage Ratio. The City reserves the right to request from Project Co evidence validating the calculation of the Capital Coverage Ratio for any given Contract Month within the Capital Coverage Ratio Reporting Period.
- 2.3 **“Capital Coverage Ratio”** shall be calculated as the quotient of (i) the aggregate Actual Monthly Project Co Payments for the relevant Capital Coverage Ratio Calculation Period, and (ii) the aggregate Actual Monthly Project Co Costs for the relevant Capital Ratio Calculation Period.

3. Positive Covenants

- 3.1 Project Co shall provide to the City:
- (a) for Project Co:
- (i) within forty-five (45) days of Project Co's first three (3) fiscal quarter ends, quarterly unaudited management financial statements prepared in accordance with Canadian GAAP or International Financial Reporting Standards; and
- (b) for Maintenance and Rehabilitation Guarantor:
- (i) within sixty (60) days of the second and fourth quarter ends, semi-annual unaudited financial statements prepared in accordance with Canadian GAAP or International Financial Reporting Standards; and
- (ii) within one hundred and eighty (180) days of Maintenance and Rehabilitation Guarantor's fiscal year-end, annual audited financial statements prepared in accordance with Canadian GAAP or International Financial Reporting Standards;
- (c) from the Project Co Parties and the Maintenance and Rehabilitation Guarantor, as applicable, the security set out in Section 4;
- (d) For each of the accounts specified in Sections 3.2, 3.3 and 3.4:
- (i) within thirty days following each calendar month following Substantial Completion, an account statement showing all transactions, including, without being limited to, any deposits, draws, interest earned and balance changes, issued by the financial institution holding such account.
- 3.2 Project Co shall establish and maintain following Substantial Completion, at its sole expense, the Proceeds Account which shall be opened in the name of Project Co and the balance of which, including all income and returns thereon, shall be for the benefit of Project Co which, save as provided below, shall be subject to Project Co control at all times, but shall be subject to the relevant Blocked Accounts Agreement in favour of the City. Project Co shall deposit, or cause to be deposited, to the Proceeds Account (a) any interest income from investments; (b) all revenues; (c) all payments by the City under the Project Agreement; (d) all other monies paid to or received by Project Co (including liquidated damages and insurance proceeds) and (e) the Equity

Contributions. On the occurrence and during the continuation of a Project Co Event of Default, the City will control the Proceeds Account. For greater certainty, so long as a Project Co Event of Default is not continuing, Project Co shall be entitled to deal with amounts in the Proceeds Account in its sole discretion.

- 3.3 Project Co shall establish and maintain following Substantial Completion, at its sole expense, the Distribution Account which shall be opened in the name of Project Co and the balance of which, including all income and returns, shall be for the benefit of Project Co and which shall not be subject to the control of the City under and in accordance with the relevant Blocked Accounts Agreement and shall not be subject to the security in favour of the City. Distributions on Equity Capital shall be made to the Distribution Account.
- 3.4 Project Co shall establish and maintain, at its sole expense, the Equity Lock-Up Account which shall be opened in the name of Project Co and the balance of which, including all income and returns, shall be for the benefit of Project Co and which shall be subject to the relevant Blocked Accounts Agreement and subject to the security in favour of the City. Amounts which would otherwise be capable of being transferred from the Proceeds Account to the Distribution Account shall be deposited into the Equity Lock-Up Account where any failure to meet the Restricted Payment Conditions has occurred and is continuing. So long as the Restricted Payment Conditions are not met, funds on deposit in the Equity Lock-Up Account shall be available, at the discretion of Project Co, to cover any costs or other amounts payable by Project Co (other than for certainty, Distributions) to provide or otherwise remediate Maintenance and Rehabilitation Services. Once the Restricted Payment Conditions are satisfied, amounts in the Equity Lock-Up Account shall be available for distribution to the Distribution Account.
- 3.5 Project Co shall not make any payment or distribution from the Proceeds Account to the Distribution Account unless at such time each of the following conditions (the “**Restricted Payment Conditions**”) are satisfied:
 - (a) Substantial Completion has been achieved; and
 - (b) the Capital Coverage Ratio is greater than or equal to [REDACTED].

4. Security

- 4.1 Project Co shall cause the Maintenance and Rehabilitation Contractor to deliver the following documents and agreements no later than Substantial Completion:
 - (a) a letter of credit as security for Maintenance and Rehabilitation Services, in form and content satisfactory to the Parties, each acting reasonably (each a “**Maintenance LC**”);
 - (b) a parent company guarantee, in form and substance satisfactory to the Parties, each acting reasonably and executed by Maintenance and Rehabilitation Guarantor with respect to the Maintenance and Rehabilitation Services (the “**Maintenance PCG**”);
 - (c) the Blocked Accounts Agreement; and
 - (d) such other documents and agreements as the City may require, acting reasonably, based on the financial structure proposed in the Financial Model.

The letter of credit will be delivered to, and held by, the Insurance Trustee.

- 4.2 With respect to any Contract Year, the Maintenance LC amount shall be established at the start of the Contract Year (no later than 20 days from the start of such Contract Year) and will be equal to [REDACTED]% of the Maintenance Fee Reference Amount.
- 4.3 With respect to any year, the Maintenance PCG amount shall be equal to [REDACTED]% of the Maintenance Fee Reference Amount.
- 4.4 Security requirements identified in Section 4.1(a) and (b) may be submitted by the Maintenance and Rehabilitation Contractor identifying both Project Co and the City as joint beneficiaries of such security. Any Maintenance LC and the Maintenance PCG shall be released on or after the Expiry Date once Project Co's responsibilities with respect to the Maintenance and Rehabilitation Services have been completed.

SCHEDULE 5-1

CONSTRUCTION CONTRACTOR'S DIRECT AGREEMENT

THIS AGREEMENT is made as of the 28th day of March, 2019

BETWEEN:

CITY OF OTTAWA

(the “City”)

- AND -

TRANSIT NEXT GENERAL PARTNERSHIP, [REDACTED]

(“Project Co”)

- AND -

[REDACTED]

(the “Construction Contractor”)

- AND -

[REDACTED]

(the “Construction Guarantor”)

WHEREAS:

- A. The City and Project Co have entered into the Project Agreement dated March 28, 2019, which requires Project Co to enter into, and to cause the Construction Contractor and the Construction Guarantor to enter into, this Construction Contractor's Direct Agreement with the City.
- B. Project Co and the Construction Contractor have entered into the Construction Contract, which requires the Construction Contractor and the Construction Guarantor to enter into this Construction Contractor's Direct Agreement with the City.
- C. In consideration of the City entering into the Project Agreement with Project Co, the Contractor agrees to enter into this agreement with the City

NOW THEREFORE in consideration of the mutual covenants and agreements of the Parties hereinafter contained and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties covenant and agree as follows:

1. DEFINITIONS

In this Construction Contractor's Direct Agreement, unless the context otherwise requires:

- (a) “Applicable Law” has the meaning given in the Project Agreement.

- (b) “**Business Day**” has the meaning given in the Project Agreement.
- (c) “**Construction Contract**” has the meaning given in the Project Agreement.
- (d) “**Construction Contractor’s Direct Agreement**” means this Construction Contractor’s Direct Agreement.
- (e) “**Default Notice**” has the meaning given in Section 5(a).
- (f) “**Governmental Authority**” has the meaning given in the Project Agreement.
- (g) “**Lenders**” has the meaning given in the Project Agreement.
- (h) “**Lenders’ Direct Agreement**” has the meaning given in the Project Agreement.
- (i) “**Party**” means the City, the Construction Contractor, the Construction Guarantor or Project Co, and “**Parties**” means the City, the Construction Contractor, the Construction Guarantor and Project Co.
- (j) “**Project**” has the meaning given in the Project Agreement.
- (k) “**Project Agreement**” means the project agreement made on or about March 28, 2019 between the City and Project Co.
- (l) “**Step-In Notice**” has the meaning given in Section 6(a).
- (m) “**Substitute**” has the meaning given in Section 6(a).
- (n) “**Variation**” has the meaning given in the Project Agreement.

2. INTERPRETATION

This Construction Contractor’s Direct Agreement shall be interpreted according to the following provisions, unless the context requires a different meaning:

- (a) The headings in this Construction Contractor’s Direct Agreement are for convenience of reference only, shall not constitute a part of this Construction Contractor’s Direct Agreement, and shall not be taken into consideration in the interpretation of, or affect the meaning of, this Construction Contractor’s Direct Agreement.
- (b) Unless the context otherwise requires, references to specific Sections, Clauses, Paragraphs, Subparagraphs, and other divisions are references to such Sections, Clauses, Paragraphs, Subparagraphs, or divisions of this Construction Contractor’s Direct Agreement and the terms “Section” and “Clause” are used interchangeably and are synonymous.
- (c) Words importing persons or parties are to be broadly interpreted and include an individual, corporation, firm, partnership, joint venture, trust, unincorporated organization, Governmental Authority, unincorporated body of persons or association and any other entity having legal capacity, and the heirs, beneficiaries, executors, administrators or other legal representatives of a person in such capacity.

- (d) Unless the context otherwise requires, wherever used herein the plural includes the singular, the singular includes the plural, and each of the masculine, feminine and neuter genders include all other genders.
- (e) References to any standard, principle, agreement or document include (subject to all relevant approvals and any other provisions of this Construction Contractor's Direct Agreement concerning amendments) a reference to that standard, principle, agreement or document as amended, supplemented, restated, substituted, replaced, novated or assigned.
- (f) The words in this Construction Contractor's Direct Agreement shall bear their natural meaning.
- (g) References containing terms such as:
 - (i) “hereof”, “herein”, “hereto”, “hereinafter”, and other terms of like import are not limited in applicability to the specific provision within which such references are set forth but instead refer to this Construction Contractor's Direct Agreement taken as a whole; and
 - (ii) “includes” and “including”, whether or not used with the words “without limitation” or “but not limited to”, shall not be deemed limited by the specific enumeration of items but shall, in all cases, be deemed to be without limitation and construed and interpreted to mean “includes without limitation” and “including without limitation”.
- (h) In construing this Construction Contractor's Direct Agreement, the rule known as the *ejusdem generis* rule shall not apply nor shall any similar rule or approach to the construction of this Construction Contractor's Direct Agreement and, accordingly, general words introduced or followed by the word “other” or “including” or “in particular” shall not be given a restrictive meaning because they are followed or preceded (as the case may be) by particular examples intended to fall within the meaning of the general words.
 - (i) Where this Construction Contractor's Direct Agreement states that an obligation shall be performed “no later than” or “within” or “by” a stipulated date or event which is a prescribed number of days after a stipulated date or event, the latest time for performance shall be 5:00 p.m. on the last day for performance of the obligation concerned, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
 - (j) Where this Construction Contractor's Direct Agreement states that an obligation shall be performed “on” a stipulated date, the latest time for performance shall be 5:00 p.m. on that day, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
 - (k) Any reference to time of day or date means the local time or date in Ottawa, Ontario.
 - (l) Unless otherwise indicated, time periods will be strictly construed.
 - (m) Whenever the terms “will” or “shall” are used in this Construction Contractor's Direct Agreement they shall be construed and interpreted as synonymous and to read “shall”.

3. CONFLICT IN DOCUMENTS

- (a) In the event of ambiguities, conflicts or inconsistencies between or among this Construction Contractor's Direct Agreement, the Project Agreement and the Construction Contract, this Construction Contractor's Direct Agreement shall prevail.
- (b) In the event of ambiguities, conflicts or inconsistencies between or among this Construction Contractor's Direct Agreement and the Lenders' Direct Agreement, the Lenders' Direct Agreement shall prevail.

4. AGREEMENTS

- (a) Project Co and the Construction Contractor shall not amend, modify, or depart from the terms of the Construction Contract without the prior written consent of the City, acting reasonably, which consent shall not be withheld or delayed where such amendment, modification or departure does not materially and adversely affect the ability of Project Co to perform its obligations under this Construction Contractor's Direct Agreement and does not have the effect of increasing any liability of the City, whether actual or potential. Project Co and the Construction Contractor shall provide to the City a written copy of all such amendments, modifications or departures. The Parties acknowledge and agree that this Section 4(a) shall not apply to Variations provided for under the Project Agreement.
- (b) Each of the Parties acknowledges having received a copy of the Project Agreement and the Construction Contract.
- (c) If the Construction Contractor gives Project Co any notice of any default(s) under the Construction Contract that may give the Construction Contractor a right to terminate the Construction Contract or to treat it as having been repudiated by Project Co or to discontinue the Construction Contractor's performance thereunder, then the Construction Contractor shall concurrently provide the City with a copy of such notice and set out in reasonable detail the default(s).

5. NO TERMINATION BY CONSTRUCTION CONTRACTOR WITHOUT DEFAULT NOTICE

The Construction Contractor shall not exercise any right it may have to terminate the Construction Contract or to treat it as having been repudiated by Project Co or to discontinue the Construction Contractor's performance thereunder unless:

- (a) the Construction Contractor first delivers a written notice (a "**Default Notice**") to the City setting out in reasonable detail the default(s) on which the Construction Contractor intends to rely in terminating the Construction Contract or to treat it as having been repudiated by Project Co or to discontinue the Construction Contractor's performance thereunder; and
- (b) within a period of 5 Business Days of the City receiving the Default Notice:
 - (i) the default(s) on which the Construction Contractor intends to rely in terminating the Construction Contract or to treat it as having been repudiated by Project Co

or to discontinue the Construction Contractor's performance thereunder have not been remedied; and

- (ii) the Construction Contractor has not received a Step-In Notice from the City,

provided that if, within such period of 5 Business Days, the City agrees to pay the Construction Contractor's reasonable costs of continued performance, such period of 5 Business Days shall be extended to 45 days.

6. STEP-IN RIGHTS

- (a) The City may at any time:

- (i) within 5 Business Days or, if such period has been extended in accordance with Section 5, 45 days of the City receiving a Default Notice; or
- (ii) if the City has not received a Default Notice and if the City's right to terminate the Project Agreement has arisen and is continuing,

deliver a notice (a "Step-In Notice") electing to replace Project Co under the Construction Contract either with the City or a third party designated by the City in the Step-In Notice (the "Substitute"), provided that the City can demonstrate to the Construction Contractor, acting reasonably, that the Substitute shall have sufficient financial resources, or shall be supported by a satisfactory guarantee, to carry out the obligations of the Substitute under the Construction Contract.

- (b) Subject to Section 6(d), upon receipt by the Construction Contractor of a Step-In Notice:

- (i) Project Co and the Construction Contractor will be deemed to be released from their existing and future obligations under the Construction Contract to each other (except with respect to any and all indemnities from Project Co or the Construction Contractor to the other in respect of the period prior to the receipt of the Step-In Notice), and the City or the Substitute, as applicable, and the Construction Contractor will be deemed to assume those same existing and future obligations towards each other (except in respect of the aforesaid indemnities);
- (ii) the existing and future rights of Project Co against the Construction Contractor under the Construction Contract and vice versa will be deemed to be cancelled (except with respect to any and all indemnities from Project Co or the Construction Contractor to the other in respect of the period prior to the receipt of the Step-In Notice), and the City or the Substitute, as applicable, and the Construction Contractor will be deemed to acquire those same existing and future rights against each other (except in respect of the aforesaid indemnities), subject to any applicable credit from the Construction Contractor to the City if the City pays for the Construction Contractor's reasonable costs of continued performance pursuant to Section 5;
- (iii) any guarantee, bond, covenant, letter of credit or similar performance security in favour of Project Co from any third party in respect of any term, provision, condition, obligation, undertaking or agreement on the part of the Construction

Contractor to be performed, observed or carried out by the Construction Contractor as contained in, referred to, or inferred from the Construction Contract, except for the “Additional Letter of Credit” (as defined in the Construction Contract) provided in accordance with the Construction Contract, shall be assigned, novated or granted, as required by the City or the Substitute, as applicable, each acting reasonably, to the City or the Substitute, as applicable, and the Construction Contractor shall cause such assignment, novation or grant on substantially the same terms and conditions as the original guarantee, bond, covenant, letter of credit or similar performance security, provided however that where Project Co shall continue to hold, or shall continue to be entitled to or have rights under, such guarantee, bond, covenant, letter of credit or similar performance security as security for any obligations of the Construction Contractor, the assignment, novation or grant of the guarantee, bond, covenant, letter of credit or similar performance security to the extent of any such obligations to Project Co shall be conditional on the satisfaction of those obligations to Project Co; and

- (iv) at the City’s request, the Construction Contractor shall enter into, and shall cause the Construction Guarantor and any other guarantor, covenantor or surety under any guarantee, bond or covenant referred to in Section 6(b)(iii) to enter into, and the City shall or shall cause the Substitute to enter into, as applicable, all such agreements or other documents as reasonably necessary to give effect to the foregoing, including an agreement between the City or the Substitute, as applicable, and the Construction Contractor, acceptable to the City and the Construction Contractor, each acting reasonably, on substantially the same terms as the Construction Contact.
- (c) Subject to Section 6(d), Project Co shall, at its own cost, cooperate fully with the City and the Substitute in order to achieve a smooth transfer of the Construction Contract to the City or the Substitute, as applicable, and to avoid or mitigate in so far as reasonably practicable any inconvenience, including the administration of the Construction Contract, ongoing supervisory activities and scheduling.
- (d) The rights granted by Sections 6(b) and 6(c) shall be of no force or effect if, at any time the Construction Contractor receives a Step-In Notice, the Construction Contractor has already received notice in writing from another entity entitled to the benefit of step-in rights relating to the Construction Contract that it is or has validly exercised those step-in rights. If the Construction Contractor receives any such notice on the same day as a Step-In Notice, the Step-In Notice shall be effective, except where the other notice is given by the Lenders, in which case such other notice and not the Step-In Notice shall be effective.
- (e) If the City gives a Step-In Notice within the time provided hereunder at any time after the Construction Contractor has terminated the Construction Contract or treated it as having been repudiated by Project Co or discontinued the Construction Contractor’s performance thereunder in accordance with the terms of this Construction Contractor’s Direct Agreement, the Construction Contractor agrees that the Construction Contract shall be reinstated and deemed to have continued despite any termination or treatment as having been repudiated, and the City shall pay the Construction Contractor’s reasonable costs for re-commencing the obligations it has under the Construction Contract and the Construction Contractor shall be entitled to reasonable compensation and/or relief for re-

commencing such obligations, having regard to the additional costs and delays incurred as a result of having terminated the Construction Contract or having treated it as being repudiated by Project Co or having discontinued its performance thereunder.

7. CONSTRUCTION CONTRACTOR LIABILITY

- (a) The liability of the Construction Contractor hereunder shall not be modified, released, diminished or in any way affected by:
 - (i) any independent inspection, investigation or enquiry into any matter which may be made or carried out by or for the City, or by any failure or omission to carry out any such inspection, investigation or enquiry; or
 - (ii) the appointment by the City of any other person to review the progress of or otherwise report to the City in respect of the Project, or by any action or omission of such person whether or not such action or omission might give rise to any independent liability of such person to the City,

provided always that nothing in this Section 7 shall modify or affect any rights which the Construction Contractor might have otherwise had to claim contribution from any other person whether under statute or common law.

- (b) In the event the City delivers a Step-In Notice, the Construction Contractor shall have no greater liability to the City or any Substitute than it would have had to Project Co under the Construction Contract, and the Construction Contractor shall be entitled in any proceedings by the City or any Substitute to rely on any liability limitations in the Construction Contract.

8. PROJECT CO AS PARTY

Project Co acknowledges and agrees that the Construction Contractor shall not be in breach of the Construction Contract by complying with its obligations hereunder.

9. CONSTRUCTION GUARANTOR AS PARTY

The Construction Guarantor agrees with the City that the Construction Guarantor has entered into a guarantee or covenant referred to in Section 6(b)(iii), hereby consents to the assignment, novation or grant (including any conditional assignment, novation or grant) as provided herein immediately upon receipt by the Construction Contractor of a Step-In Notice and without the requirement of any further action on the part of the City, and agrees that the Construction Guarantor shall in accordance with Section 6 enter into all such agreements or other documents as reasonably necessary to give effect to the foregoing. The Construction Guarantor enters into this Construction Contractor's Direct Agreement solely for the purposes of this Section 9.

10. ASSIGNMENT

- (a) Project Co shall not, without the prior written consent of the City, assign, transfer, charge, subcontract, subparticipate or otherwise dispose of any interest in this Construction Contractor's Direct Agreement except to the extent entitled to do so under the Project Agreement.

- (b) The City may assign or otherwise dispose of the benefit of the whole or part of this Construction Contractor's Direct Agreement to any person to whom the City may assign or otherwise dispose of its interest in the Project Agreement pursuant to Section 59.2 of the Project Agreement but only in conjunction therewith, and shall provide written notice to Project Co and the Construction Contractor of such assignment or disposition.
- (c) The Construction Contractor shall not, without the prior written consent of the City and Project Co, assign, transfer, charge, subcontract, subparticipate or otherwise dispose of any interest in this Construction Contractor's Direct Agreement except as may be permitted under the Construction Contract.

11. NOTICES

- (a) All notices, requests, demands, instructions, certificates, consents and other communications required or permitted under this Construction Contractor's Direct Agreement shall be in writing (whether or not "written notice" or "notice in writing" is specifically required by the applicable provision of this Construction Contractor's Direct Agreement) and served by sending the same by registered mail, facsimile or by hand (in each case, with a copy by electronic transmission), as follows:

If to the City:

City of Ottawa
110 Laurier Ave West
Ottawa, Ontario K1P 1J1
Mail code: [REDACTED]

Attention: [REDACTED]
Email: [REDACTED]

If to Project Co:

TransitNEXT General Partnership
[REDACTED]
Email: [REDACTED]
Attn: [REDACTED]

If to the Construction Contractor:

[REDACTED]
Fax: [REDACTED]
Email: [REDACTED]
Attn: [REDACTED]

If to the Construction Guarantor:

[REDACTED]
Attention: [REDACTED]
Title: [REDACTED]
Email: [REDACTED]
With copy to: [REDACTED]

- (b) Where any notice is provided or submitted to a Party via facsimile, an original of the notice sent via facsimile shall promptly be sent by regular mail or registered mail. For greater certainty, a notice given via facsimile shall not be invalid by reason only of a Party's failure to comply with this Section 11(b).

- (c) Any Party to this Construction Contractor's Direct Agreement may, from time to time, change any of its contact information set forth in Section 11(a) by prior notice to the other Parties, and such change shall be effective on the Business Day that next follows the recipient Party's receipt of such notice unless a later effective date is given in such notice.
- (d) Subject to Sections 11(e), 11(f) and 11(g):
 - (i) a notice given by registered mail shall be deemed to have been received on the third Business Day after mailing;
 - (ii) a notice given by hand delivery shall be deemed to have been received on the day it is delivered; and
 - (iii) a notice given by facsimile shall be deemed to have been received on the day it is transmitted by facsimile.
- (e) If the Party giving the notice knows or ought reasonably to know of difficulties with the postal system which might affect negatively the delivery of mail, any such notice shall not be mailed but shall be made or given by personal delivery or by facsimile transmission in accordance with this Section 11.
- (f) If any notice delivered by hand or transmitted by facsimile is so delivered or transmitted, as the case may be, either on a day that is not a Business Day or on a Business Day after 4:00 p.m. (recipient's local time), then such notice shall be deemed to have been received by such recipient on the next Business Day.
- (g) A notice given by facsimile shall be deemed to have been received by the recipient on the day it is transmitted only if a facsimile transmission report (maintained by the sender) indicates that the transmission of such notice was successful.

12. AMENDMENTS

This Construction Contractor's Direct Agreement may not be varied, amended or supplemented except by an agreement in writing signed by duly authorized representatives of the Parties and stating on its face that it is intended to be an amendment, restatement or other modification, as the case may be, to this Construction Contractor's Direct Agreement.

13. WAIVER

- (a) No waiver made or given by a Party under or in connection with this Construction Contractor's Direct Agreement shall be binding or effective unless the waiver is in writing, signed by an authorized representative of the Party giving such waiver, and delivered by such Party to the other Parties. No waiver made with respect to any right, power or remedy in one instance will be deemed to be a waiver with respect to any other instance involving the exercise of such right, power, or remedy or with respect to any other right, power, or remedy.
- (b) Failure by any Party to exercise any of its rights, powers or remedies hereunder or its delay to do so shall not constitute a waiver of those rights, powers or remedies. The

single or partial exercise of a right, power or remedy shall not prevent its subsequent exercise or the exercise of any other right, power or remedy.

14. RELATIONSHIP BETWEEN THE PARTIES

The Parties are independent contractors. This Construction Contractor's Direct Agreement is not intended to and does not create or establish between the Parties any relationship as partners, joint venturers, employer and employee, master and servant, or, except as provided in this Construction Contractor's Direct Agreement, of principal and agent.

15. ENTIRE AGREEMENT

Except where provided otherwise in this Construction Contractor's Direct Agreement, this Construction Contractor's Direct Agreement constitutes the entire agreement between the Parties in connection with its subject matter and supersedes all prior representations, communications, negotiations and understandings, whether oral, written, express or implied, concerning the subject matter of this Construction Contractor's Direct Agreement.

16. SEVERABILITY

Each provision of this Construction Contractor's Direct Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Construction Contractor's Direct Agreement is declared invalid, unenforceable or illegal by the courts of a competent jurisdiction, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Construction Contractor's Direct Agreement. If any such provision of this Construction Contractor's Direct Agreement is invalid, unenforceable or illegal, the Parties shall, acting in good faith, promptly negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Construction Contractor's Direct Agreement as near as possible to its original intent and effect.

17. ENUREMENT

This Construction Contractor's Direct Agreement shall enure to the benefit of, and be binding on, each of the Parties and their respective successors and permitted transferees and assigns.

18. GOVERNING LAW AND JURISDICTION

- (a) This Construction Contractor's Direct Agreement shall be governed by and construed in accordance with the laws of Ontario and the laws of Canada applicable therein and shall be treated in all respects as an Ontario contract, without regard to conflict of laws principles.
- (b) The Parties agree that the courts of the Province of Ontario and all courts competent to hear appeals therefrom shall have exclusive jurisdiction to hear and settle any action, suit, proceeding or dispute in connection with this Construction Contractor's Direct Agreement and hereby irrevocably attorn to the exclusive jurisdiction of such courts.

19. [INTENTIONALLY DELETED]

20. FURTHER ASSURANCE

Each Party shall do all things, from time to time, and execute all further documents necessary to give full effect to this Construction Contractor's Direct Agreement.

21. LANGUAGE OF AGREEMENT

Each Party acknowledges having requested and being satisfied that this Construction Contractor's Direct Agreement and related documents be drawn in English. Chacune des parties reconnaît avoir demandé que ce document et ses annexes soient rédigés en anglais et s'en declare satisfaite.

22. COUNTERPARTS

This Construction Contractor's Direct Agreement may be executed in one or more counterparts. Any single counterpart or a set of counterparts executed, in either case, by all the Parties shall constitute a full, original and binding agreement for all purposes. Counterparts may be executed either in original or faxed form provided that any Party providing its signature in faxed form shall promptly forward to such Party an original signed copy of this Construction Contractor's Direct Agreement which was so faxed.

IN WITNESS WHEREOF the Parties have executed this Construction Contractor's Direct Agreement as of the date first above written.

THE CITY OF OTTAWA

Per: _____
Name: [REDACTED]
Title: [REDACTED]

TRANSITNEXT GENERAL PARTNERSHIP

Per: _____
Name:
Title:

Per: _____
Name:
Title:

I/We have authority to bind the corporation.

[REDACTED]

Per: _____
Name:
Title:

Per: _____
Name:
Title:

I/We have authority to bind the corporation.

[REDACTED]

Per: _____
Name:
Title:

Per: _____
Name:
Title:

I/We have authority to bind the corporation.

SCHEDULE 5-2

MAINTENANCE AND REHABILITATION CONTRACTOR'S DIRECT AGREEMENT

THIS AGREEMENT is made as of the 28th day of March, 2019

BETWEEN:

THE CITY OF OTTAWA

(the “City”)

- AND -

TRANSIT NEXT GENERAL PARTNERSHIP, [REDACTED]

(“Project Co”)

- AND -

[REDACTED]

(the “Maintenance and Rehabilitation Contractor”)

- AND -

[REDACTED]

(the “Maintenance and Rehabilitation Guarantor”)

WHEREAS:

- A. The City and Project Co have entered into the Project Agreement, which requires Project Co to enter into, and to cause the Maintenance and Rehabilitation Contractor and the Maintenance and Rehabilitation Guarantor to enter into, this Maintenance and Rehabilitation Contractor's Direct Agreement with the City.
- B. Project Co and the Maintenance and Rehabilitation Contractor have entered into the Maintenance and Rehabilitation Contract, which requires the Maintenance and Rehabilitation Contractor and the Maintenance and Rehabilitation Guarantor to enter into this Maintenance and Rehabilitation Contractor's Direct Agreement with the City.

NOW THEREFORE in consideration of the mutual covenants and agreements of the Parties hereinafter contained and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties covenant and agree as follows:

1. DEFINITIONS

In this Maintenance and Rehabilitation Contractor's Direct Agreement, unless the context otherwise requires:

- (a) “Applicable Law” has the meaning given in the Project Agreement.

- (b) “**Business Day**” has the meaning given in the Project Agreement.
- (c) “**Default Notice**” has the meaning given in Section 5(a).
- (d) “**Governmental Authority**” has the meaning given in the Project Agreement.
- (e) “**Maintenance and Rehabilitation Contract**” has the meaning given in the Project Agreement.
- (f) “**Maintenance and Rehabilitation Contractor’s Direct Agreement**” means this Maintenance and Rehabilitation Contractor’s Direct Agreement.
- (g) “**Party**” means the City, the Maintenance and Rehabilitation Contractor, the Maintenance and Rehabilitation Guarantor or Project Co, and “**Parties**” means the City, the Maintenance and Rehabilitation Contractor, the Maintenance and Rehabilitation Guarantor and Project Co.
- (h) “**Project**” has the meaning given in the Project Agreement.
- (i) “**Project Agreement**” means the project agreement made on or about March 28, 2019 between the City and Project Co.
- (j) “**Step-In Notice**” has the meaning given in Section 6(a).
- (k) “**Substitute**” has the meaning given in Section 6(a).
- (l) “**Variation**” has the meaning given in the Project Agreement.

2. INTERPRETATION

This Maintenance and Rehabilitation Contractor’s Direct Agreement shall be interpreted according to the following provisions, unless the context requires a different meaning:

- (a) The headings in this Maintenance and Rehabilitation Contractor’s Direct Agreement are for convenience of reference only, shall not constitute a part of this Maintenance and Rehabilitation Contractor’s Direct Agreement, and shall not be taken into consideration in the interpretation of, or affect the meaning of, this Maintenance and Rehabilitation Contractor’s Direct Agreement.
- (b) Unless the context otherwise requires, references to specific Sections, Clauses, Paragraphs, Subparagraphs, and other divisions are references to such Sections, Clauses, Paragraphs, Subparagraphs, or divisions of this Maintenance and Rehabilitation Contractor’s Direct Agreement and the terms “Section” and “Clause” are used interchangeably and are synonymous.
- (c) Words importing persons or parties are to be broadly interpreted and include an individual, corporation, firm, partnership, joint venture, trust, unincorporated organization, Governmental Authority, unincorporated body of persons or association and any other entity having legal capacity, and the heirs, beneficiaries, executors, administrators or other legal representatives of a person in such capacity.

- (d) Unless the context otherwise requires, wherever used herein the plural includes the singular, the singular includes the plural, and each of the masculine, feminine and neuter genders include all other genders.
- (e) References to any standard, principle, agreement or document include (subject to all relevant approvals and any other provisions of this Maintenance and Rehabilitation Contractor's Direct Agreement concerning amendments) a reference to that standard, principle, agreement or document as amended, supplemented, restated, substituted, replaced, novated or assigned.
- (f) The words in this Maintenance and Rehabilitation Contractor's Direct Agreement shall bear their natural meaning.
- (g) References containing terms such as:
 - (i) "hereof", "herein", "hereto", "hereinafter", and other terms of like import are not limited in applicability to the specific provision within which such references are set forth but instead refer to this Maintenance and Rehabilitation Contractor's Direct Agreement taken as a whole; and
 - (ii) "includes" and "including", whether or not used with the words "without limitation" or "but not limited to", shall not be deemed limited by the specific enumeration of items but shall, in all cases, be deemed to be without limitation and construed and interpreted to mean "includes without limitation" and "including without limitation".
- (h) In construing this Maintenance and Rehabilitation Contractor's Direct Agreement, the rule known as the *ejusdem generis* rule shall not apply nor shall any similar rule or approach to the construction of this Maintenance and Rehabilitation Contractor's Direct Agreement and, accordingly, general words introduced or followed by the word "other" or "including" or "in particular" shall not be given a restrictive meaning because they are followed or preceded (as the case may be) by particular examples intended to fall within the meaning of the general words.
 - (i) Where this Maintenance and Rehabilitation Contractor's Direct Agreement states that an obligation shall be performed "no later than" or "within" or "by" a stipulated date or event which is a prescribed number of days after a stipulated date or event, the latest time for performance shall be 5:00 p.m. on the last day for performance of the obligation concerned, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
 - (j) Where this Maintenance and Rehabilitation Contractor's Direct Agreement states that an obligation shall be performed "on" a stipulated date, the latest time for performance shall be 5:00 p.m. on that day, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
 - (k) Any reference to time of day or date means the local time or date in Ottawa, Ontario.
 - (l) Unless otherwise indicated, time periods will be strictly construed.

- (m) Whenever the terms “will” or “shall” are used in this Maintenance and Rehabilitation Contractor’s Direct Agreement they shall be construed and interpreted as synonymous and to read “shall”.

3. CONFLICT IN DOCUMENTS

- (a) In the event of ambiguities, conflicts or inconsistencies between or among this Maintenance and Rehabilitation Contractor’s Direct Agreement, the Project Agreement and the Maintenance and Rehabilitation Contract, this Maintenance and Rehabilitation Contractor’s Direct Agreement shall prevail.

4. AGREEMENTS

- (a) Project Co and the Maintenance and Rehabilitation Contractor shall not amend, modify, or depart from the terms of the Maintenance and Rehabilitation Contract without the prior written consent of the City, acting reasonably, which consent shall not be withheld or delayed where such amendment, modification or departure does not materially and adversely affect the ability of Project Co to perform its obligations under this Maintenance and Rehabilitation Contractor’s Direct Agreement and does not have the effect of increasing any liability of the City, whether actual or potential. Project Co and the Maintenance and Rehabilitation Contractor shall provide a written copy of all such amendments, modifications or departures. The Parties acknowledge and agree that this Section 4(a) shall not apply to Variations provided for under the Project Agreement.
- (b) Each of the Parties acknowledges having received a copy of the Project Agreement and the Maintenance and Rehabilitation Contract.
- (c) If the Maintenance and Rehabilitation Contractor gives Project Co any notice of any default(s) under the Maintenance and Rehabilitation Contract that may give the Maintenance and Rehabilitation Contractor a right to terminate the Maintenance and Rehabilitation Contract or to treat it as having been repudiated by Project Co or to discontinue the Maintenance and Rehabilitation Contractor’s performance thereunder, then the Maintenance and Rehabilitation Contractor shall concurrently provide the City with a copy of such notice and set out in reasonable detail the default(s).

5. NO TERMINATION BY MAINTENANCE AND REHABILITATION CONTRACTOR WITHOUT DEFAULT NOTICE

The Maintenance and Rehabilitation Contractor shall not exercise any right it may have to terminate the Maintenance and Rehabilitation Contract or to treat it as having been repudiated by Project Co or to discontinue the Maintenance and Rehabilitation Contractor’s performance thereunder unless:

- (a) the Maintenance and Rehabilitation Contractor first delivers a written notice (a “**Default Notice**”) to the City setting out in reasonable detail the default(s) on which the Maintenance and Rehabilitation Contractor intends to rely in terminating the Maintenance and Rehabilitation Contract or to treat it as having been repudiated by Project Co or to discontinue the Maintenance and Rehabilitation Contractor’s performance thereunder; and

- (b) within the period ending 30 days after the Maintenance and Rehabilitation Contractor notifies the City of the expiry of any relevant period for the exercise of step-in or similar rights, then 30 days after the later of the City receiving Default Notice or the expiry of the applicable cure period under the Maintenance and Rehabilitation Contract:
- (i) the default(s) on which the Maintenance and Rehabilitation Contractor intends to rely in terminating the Maintenance and Rehabilitation Contract or to treat it as having been repudiated by Project Co or to discontinue the Maintenance and Rehabilitation Contractor's performance thereunder have not been remedied; and
 - (ii) the Maintenance and Rehabilitation Contractor has not received a Step-In Notice from the City,

provided that, until such time as the City gives the Maintenance and Rehabilitation Contractor a notice that the City will not be exercising its step-in rights, the City shall pay the Maintenance and Rehabilitation Contractor's reasonable costs of continued performance.

6. STEP-IN RIGHTS

- (a) The City may at any time:
- (i) within the period referred to in Section 5(b); or
 - (ii) if the City has not received a Default Notice and if the City's right to terminate the Project Agreement has arisen and is continuing,
- deliver a notice (a “**Step-In Notice**”) electing to replace Project Co under the Maintenance and Rehabilitation Contract either with the City or a third party designated by the City in the Step-In Notice (the “**Substitute**”), provided that the City can demonstrate to the Maintenance and Rehabilitation Contractor, acting reasonably, that the Substitute shall have sufficient financial resources, or shall be supported by a satisfactory guarantee, to carry out the obligations of the Substitute under the Maintenance and Rehabilitation Contract.
- (b) Subject to Section 6(d), upon receipt by the Maintenance and Rehabilitation Contractor of a Step-In Notice:
- (i) Project Co and the Maintenance and Rehabilitation Contractor will be deemed to be released from their existing and future obligations under the Maintenance and Rehabilitation Contract to each other (except with respect to any and all indemnities from Project Co or the Maintenance and Rehabilitation Contractor to the other in respect of the period prior to the receipt of the Step-In Notice), and the City or the Substitute, as applicable, and the Maintenance and Rehabilitation Contractor will be deemed to assume those same existing and future obligations towards each other (except in respect of the aforesaid indemnities);
 - (ii) the existing and future rights of Project Co against the Maintenance and Rehabilitation Contractor under the Maintenance and Rehabilitation Contract and vice versa will be deemed to be cancelled (except with respect to any and all

indemnities from Project Co or the Maintenance and Rehabilitation Contractor to the other in respect of the period prior to the receipt of the Step-In Notice), and the City or the Substitute, as applicable, and the Maintenance and Rehabilitation Contractor will be deemed to acquire those same existing and future rights against each other (except in respect of the aforesaid indemnities), subject to any applicable credit from the Maintenance and Rehabilitation Contractor to the City if the City pays for the Maintenance and Rehabilitation Contractor's reasonable costs of continued performance pursuant to Section 5;

- (iii) any guarantee, bond, covenant, letter of credit or similar performance security in favour of Project Co from any third party in respect of any term, provision, condition, obligation, undertaking or agreement on the part of the Maintenance and Rehabilitation Contractor to be performed, observed or carried out by the Maintenance and Rehabilitation Contractor as contained in, referred to, or inferred from the Maintenance and Rehabilitation Contract, except for the "Additional Letter of Credit" (as defined in the Maintenance and Rehabilitation Contract) provided in accordance with the Maintenance and Rehabilitation Contract, shall be assigned, novated or granted, as required by the City or the Substitute, as applicable, each acting reasonably, to the City or the Substitute, as applicable, and the Maintenance and Rehabilitation Contractor shall cause such assignment, novation or grant on substantially the same terms and conditions as the original guarantee, bond, covenant, letter of credit or similar performance security, provided however that where Project Co shall continue to hold, or shall continue to be entitled to have rights under, such guarantee, bond, covenant, letter of credit or similar performance security as security for any obligations of the Maintenance and Rehabilitation Contractor, the assignment, novation or grant of the guarantee, bond, covenant, letter of credit or similar performance security to the extent of any such obligations to Project Co shall be conditional on the satisfaction of those obligations to Project Co; and
 - (iv) at the City's request, the Maintenance and Rehabilitation Contractor shall enter into, and shall cause the Maintenance and Rehabilitation Guarantor and any other guarantor, covenantor or surety under any guarantee, bond or covenant referred to in Section 6(b)(iii) to enter into, and the City shall or shall cause the Substitute to enter into, as applicable, all such agreements or other documents as reasonably necessary to give effect to the foregoing, including an agreement between the City or the Substitute, as applicable, and the Maintenance and Rehabilitation Contractor, acceptable to the City and the Maintenance and Rehabilitation Contractor, each acting reasonably, on substantially the same terms as the Maintenance and Rehabilitation Contract.
- (c) Subject to Section 6(d), Project Co shall, at its own cost, cooperate fully with the City and the Substitute in order to achieve a smooth transfer of the Maintenance and Rehabilitation Contract to the City or the Substitute, as applicable, and to avoid or mitigate in so far as reasonably practicable any inconvenience, including the administration of the Maintenance and Rehabilitation Contract, ongoing supervisory activities and scheduling.

- (d) The rights granted by Sections 6(b) and 6(c) shall be of no force or effect if, at any time the Maintenance and Rehabilitation Contractor receives a Step-In Notice, the Maintenance and Rehabilitation Contractor has already received notice in writing from another entity entitled to the benefit of step-in rights relating to the Maintenance and Rehabilitation Contract that it is or has validly exercised those step-in rights. If the Maintenance and Rehabilitation Contractor receives any such notice on the same day as a Step-In Notice, the Step-In Notice shall be effective.
- (e) If the City gives a Step-In Notice within the time provided hereunder at any time after the Maintenance and Rehabilitation Contractor has terminated the Maintenance and Rehabilitation Contract or treated it as having been repudiated by Project Co or discontinued the Maintenance and Rehabilitation Contractor's performance thereunder in accordance with the terms of this Maintenance and Rehabilitation Contractor's Direct Agreement, the Maintenance and Rehabilitation Contractor agrees that the Maintenance and Rehabilitation Contract shall be reinstated and deemed to have continued despite any termination or treatment as having been repudiated, and the City shall pay the Maintenance and Rehabilitation Contractor's reasonable costs for re-commencing the obligations it has under the Maintenance and Rehabilitation Contract and the Maintenance and Rehabilitation Contractor shall be entitled to reasonable compensation and/or relief for re-commencing such obligations, having regard to the additional costs and delays incurred as a result of having terminated the Maintenance and Rehabilitation Contract or having treated it as being repudiated by Project Co or having discontinued its performance thereunder.

7. MAINTENANCE AND REHABILITATION PROVIDER LIABILITY

- (a) The liability of the Maintenance and Rehabilitation Contractor hereunder shall not be modified, released, diminished or in any way affected by:
 - (i) any independent inspection, investigation or enquiry into any matter which may be made or carried out by or for the City, or by any failure or omission to carry out any such inspection, investigation or enquiry;
 - (ii) the appointment by the City of any other person to review the progress of or otherwise report to the City in respect of the Project, or by any action or omission of such person whether or not such action or omission might give rise to any independent liability of such person to the City,

provided always that nothing in this Section 7 shall modify or affect any rights which the Maintenance and Rehabilitation Contractor might have otherwise had to claim contribution from any other person whether under statute or common law.

- (b) In the event the City delivers a Step-In Notice, the Maintenance and Rehabilitation Contractor shall have no greater liability to the City or any Substitute than it would have had to Project Co under the Maintenance and Rehabilitation Contract, and the Maintenance and Rehabilitation Contractor shall be entitled in any proceedings by the City or any Substitute to rely on any liability limitations in the Maintenance and Rehabilitation Contract.

8. PROJECT CO AS PARTY

Project Co acknowledges and agrees that the Maintenance and Rehabilitation Contractor shall not be in breach of the Maintenance and Rehabilitation Contract by complying with its obligations hereunder.

9. MAINTENANCE AND REHABILITATION GUARANTOR AS PARTY

The Maintenance and Rehabilitation Guarantor agrees with the City that the Maintenance and Rehabilitation Guarantor has entered into a guarantee or covenant referred to in Section 6(b)(iii), hereby consents to the assignment, novation or grant (including any conditional assignment, novation or grant) as provided herein immediately upon receipt by the Maintenance and Rehabilitation Contractor of a Step-In Notice and without the requirement of any further action on the part of the City, and agrees that the Maintenance and Rehabilitation Guarantor shall in accordance with Section 6 enter into all such agreements or other documents as reasonably necessary to give effect to the foregoing. The Maintenance and Rehabilitation Guarantor enters into this Maintenance and Rehabilitation Contractor's Direct Agreement solely for the purposes of this Section 9.

10. ASSIGNMENT

- (a) Project Co shall not, without the prior written consent of the City, assign, transfer, charge, subcontract, subparticipate or otherwise dispose of any interest in this Maintenance and Rehabilitation Contractor's Direct Agreement except to the extent entitled to do so under the Project Agreement.
- (b) The City may assign or otherwise dispose of the benefit of the whole or part of this Maintenance and Rehabilitation Contractor's Direct Agreement to any person to whom the City may assign or otherwise dispose of its interest in the Project Agreement pursuant to Section 59.2 of the Project Agreement but only in conjunction therewith, and shall provide written notice to Project Co and the Maintenance and Rehabilitation Contractor of such assignment or disposition.
- (c) The Maintenance and Rehabilitation Contractor shall not, without the prior written consent of the City and Project Co, assign, transfer, charge, subcontract, subparticipate or otherwise dispose of any interest in this Maintenance and Rehabilitation Contractor's Direct Agreement, except as may be permitted under the Maintenance and Rehabilitation Contract.

11. NOTICES

- (a) All notices, requests, demands, instructions, certificates, consents and other communications required or permitted under this Maintenance and Rehabilitation Contractor's Direct Agreement shall be in writing (whether or not "written notice" or "notice in writing" is specifically required by the applicable provision of this Maintenance and Rehabilitation Contractor's Direct Agreement) and served by sending the same by registered mail, facsimile or by hand (in each case, with a copy by electronic transmission), as follows:

If to the City:

City of Ottawa
110 Laurier Ave West
Ottawa, Ontario K1P 1J1
Mail code: [REDACTED]

Attention: [REDACTED]
Email: [REDACTED]

If to Project Co:

TransitNEXT General Partnership
[REDACTED]

Email: [REDACTED]
Attn: [REDACTED]

If to the Maintenance and Rehabilitation Contractor:

[REDACTED]

Attention: [REDACTED]
Fax: [REDACTED]
Email: [REDACTED]
Copy to: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

If to the Maintenance and Rehabilitation Guarantor:

[REDACTED]

Attention: [REDACTED]
Title: [REDACTED]
Email: [REDACTED]
With copy to: [REDACTED]

- (b) Where any notice is provided or submitted to a Party via facsimile, an original of the notice sent via facsimile shall promptly be sent by regular mail or registered mail. For greater certainty, a notice given via facsimile shall not be invalid by reason only of a Party's failure to comply with this Section 11(b).
- (c) Any Party to this Maintenance and Rehabilitation Contractor's Direct Agreement may, from time to time, change any of its contact information set forth in Section 11(a) by prior notice to the other Parties, and such change shall be effective on the Business Day that next follows the recipient Party's receipt of such notice unless a later effective date is given in such notice.
- (d) Subject to Sections 11(e), 11(f) and 11(g):
 - (i) a notice given by registered mail shall be deemed to have been received on the third Business Day after mailing;
 - (ii) a notice given by hand delivery shall be deemed to have been received on the day it is delivered; and
 - (iii) a notice given by facsimile shall be deemed to have been received on the day it is transmitted by facsimile.

- (e) If the Party giving the notice knows or ought reasonably to know of difficulties with the postal system which might affect negatively the delivery of mail, any such notice shall not be mailed but shall be made or given by personal delivery or by facsimile transmission in accordance with this Section 11.
- (f) If any notice delivered by hand or transmitted by facsimile is so delivered or transmitted, as the case may be, either on a day that is not a Business Day or on a Business Day after 4:00 p.m. (recipient's local time), then such notice shall be deemed to have been received by such recipient on the next Business Day.
- (g) A notice given by facsimile shall be deemed to have been received by the recipient on the day it is transmitted only if a facsimile transmission report (maintained by the sender) indicates that the transmission of such notice was successful.

12. AMENDMENTS

This Maintenance and Rehabilitation Contractor's Direct Agreement may not be varied, amended or supplemented except by an agreement in writing signed by duly authorized representatives of the Parties and stating on its face that it is intended to be an amendment, restatement or other modification, as the case may be, to this Maintenance and Rehabilitation Contractor's Direct Agreement.

13. WAIVER

- (a) No waiver made or given by a Party under or in connection with this Maintenance and Rehabilitation Contractor's Direct Agreement shall be binding or effective unless the waiver is in writing, signed by an authorized representative of the Party giving such waiver, and delivered by such Party to the other Parties. No waiver made with respect to any right, power or remedy in one instance will be deemed to be a waiver with respect to any other instance involving the exercise of such right, power, or remedy or with respect to any other right, power, or remedy.
- (b) Failure by any Party to exercise any of its rights, powers or remedies hereunder or its delay to do so shall not constitute a waiver of those rights, powers or remedies. The single or partial exercise of a right, power or remedy shall not prevent its subsequent exercise or the exercise of any other right, power or remedy.

14. RELATIONSHIP BETWEEN THE PARTIES

The Parties are independent contractors. This Maintenance and Rehabilitation Contractor's Direct Agreement is not intended to and does not create or establish between the Parties any relationship as partners, joint venturers, employer and employee, master and servant, or, except as provided in this Maintenance and Rehabilitation Contractor's Direct Agreement, of principal and agent.

15. ENTIRE AGREEMENT

Except where provided otherwise in this Maintenance and Rehabilitation Contractor's Direct Agreement, this Maintenance and Rehabilitation Contractor's Direct Agreement constitutes the entire agreement between the Parties in connection with its subject matter and supersedes all prior representations, communications, negotiations and understandings, whether oral, written, express or implied, concerning the subject matter of this Maintenance and Rehabilitation Contractor's Direct

Agreement.

16. SEVERABILITY

Each provision of this Maintenance and Rehabilitation Contractor's Direct Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Maintenance and Rehabilitation Contractor's Direct Agreement is declared invalid, unenforceable or illegal by the courts of a competent jurisdiction, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Maintenance and Rehabilitation Contractor's Direct Agreement. If any such provision of this Maintenance and Rehabilitation Contractor's Direct Agreement is invalid, unenforceable or illegal, the Parties shall, acting in good faith, promptly negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Maintenance and Rehabilitation Contractor's Direct Agreement as near as possible to its original intent and effect.

17. ENUREMENT

This Maintenance and Rehabilitation Contractor's Direct Agreement shall enure to the benefit of, and be binding on, each of the Parties and their respective successors and permitted transferees and assigns.

18. GOVERNING LAW AND JURISDICTION

- (a) This Maintenance and Rehabilitation Contractor's Direct Agreement shall be governed by and construed in accordance with the laws of Ontario and the laws of Canada applicable therein and shall be treated in all respects as an Ontario contract, without regard to conflict of laws principles.
- (b) The Parties agree that the courts of the Province of Ontario and all courts competent to hear appeals therefrom shall have exclusive jurisdiction to hear and settle any action, suit, proceeding or dispute in connection with this Maintenance and Rehabilitation Contractor's Direct Agreement and hereby irrevocably attorn to the exclusive jurisdiction of such courts.

19. [INTENTIONALLY DELETED]

20. FURTHER ASSURANCE

Each Party shall do all things, from time to time, and execute all further documents necessary to give full effect to this Maintenance and Rehabilitation Contractor's Direct Agreement.

21. LANGUAGE OF AGREEMENT

Each Party acknowledges having requested and being satisfied that this Maintenance and Rehabilitation Contractor's Direct Agreement and related documents be drawn in English. Chacune des parties reconnaît avoir demandé que ce document et ses annexes soient rédigés en anglais et s'en déclare satisfaite.

22. COUNTERPARTS

This Maintenance and Rehabilitation Contractor's Direct Agreement may be executed in one or more counterparts. Any single counterpart or a set of counterparts executed, in either case, by all the Parties shall constitute a full, original and binding agreement for all purposes. Counterparts may be executed either in original or faxed form provided that any Party providing its signature in faxed form shall promptly forward to such Party an original signed copy of this Maintenance and Rehabilitation Contractor's Direct Agreement which was so faxed.

IN WITNESS WHEREOF the Parties have executed this Maintenance and Rehabilitation Contractor's Direct Agreement as of the date first above written.

THE CITY OF OTTAWA

Per: _____
Name: [REDACTED]
Title: [REDACTED]

TRANSITNEXT GENERAL PARTNERSHIP

Per: _____
Name:
Title:

Per: _____
Name:
Title:

I/We have authority to bind the corporation.

[REDACTED]

Per: _____
Name:
Title:

Per: _____
Name:
Title:

I/We have authority to bind the corporation.

[REDACTED]

Per: _____
Name:
Title:

Per: _____
Name:
Title:

I/We have authority to bind the corporation.

SCHEDULE 6
INDEPENDENT CERTIFIER AGREEMENT

THIS AGREEMENT is made as of the 28th day of March, 2019

BETWEEN:

THE CITY OF OTTAWA

(the “**City**”)

AND

TRANSITNEXT GENERAL PARTNERSHIP, [REDACTED]

(“**Project Co**”)

AND

[REDACTED]

(the “**Independent Certifier**”)

WHEREAS:

- A. The City and Project Co (collectively, the “**PA Parties**” and each, a “**PA Party**”) have entered into the Project Agreement.
- B. Pursuant to the terms of the Project Agreement, the PA Parties wish to appoint the Independent Certifier, and the Independent Certifier wishes to accept such appointment, to perform certain services in connection with the Project Agreement.
- C. The PA Parties and the Independent Certifier wish to enter into this Independent Certifier Agreement in order to record the terms by which the Independent Certifier shall perform such services.

NOW THEREFORE in consideration of the mutual covenants and agreements of the PA Parties and the Independent Certifier herein contained and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the PA Parties and the Independent Certifier covenant and agree as follows:

1. DEFINITIONS

1.1 Definitions

- (a) In this Independent Certifier Agreement, including the recitals and appendices, unless the context indicates a contrary intention, terms which are defined in the Project Agreement (and not otherwise defined in this Independent Certifier Agreement) shall have meanings given to them in the Project Agreement and the following terms shall have the following meanings:

- (i) **“Certification Services”** means:
 - (A) all of the functions and obligations described in the Project Agreement as being the responsibility of the Independent Certifier;
 - (B) all of the functions and obligations conferred on the Independent Certifier under this Independent Certifier Agreement, including the functions described in Appendix A to this Independent Certifier Agreement; and
 - (C) all other functions or tasks which the Independent Certifier must do to comply with its obligations under this Independent Certifier Agreement.
- (ii) **“Certification Services Variation”** is any change to the Certification Services.
- (iii) **“Contract Material”** means all material:
 - (A) provided to the Independent Certifier or created or required to be created by either PA Party; and
 - (B) provided by or created or required to be created by the Independent Certifier as part of, or for the purpose of, performing the Certification Services,
including documents, equipment, reports, technical information, plans, charts, drawings, calculations, tables, schedules and data (stored and recorded by any means).
- (iv) **“Contribution Agreement”** means either the agreement entered into by the City and the Government of Canada, represented by the Ministry of Infrastructure and Communities, or the agreement entered into by the City and the Government of Ontario, represented by the Ministry of Transportation, for the contribution of funding for the Project, and **“Contribution Agreements”** means both.
- (v) **“Contribution Agreement Party”** means either the Government of Canada, represented by the Ministry of Infrastructure and Communities, or the Government of Ontario, represented by the Ministry of Transportation, and **“Contribution Agreement Parties”** means both.
- (vi) **“Earned Value Measurement Techniques”** means the techniques used to measure Earned Value established by Project Co and agreed with the Independent Certifier in accordance with the “Practice Standard for Earned Value Management” (2nd Edition, published in 2011 by the Project Management Institute, Inc.).
- (vii) **“Fee”** means the fees payable by the City and Project Co to the Independent Certifier for the Certification Services, as such fees are specified and made payable in accordance with Appendix B to this Independent Certifier Agreement.
- (viii) **“IC Monthly Report”** has the meaning given in Appendix A to this Independent Certifier Agreement.
- (ix) **“IC Quarterly Report”** has the meaning given in Appendix A to this Independent Certifier Agreement.

- (x) “**Intellectual Property**” means any and all intellectual property rights, whether subsisting now or in the future, including rights of any kind in inventions, patents, copyright, trademarks, service marks, industrial designs, integrated circuit topography rights, applications for registration of any of the foregoing, and know-how, trade secrets, confidential information and trade or business names.
- (xi) “**PA Parties**” means both the City and Project Co, and “**PA Party**” means either the City or Project Co, as the context requires.
- (xii) “**Project Agreement**” means that certain project agreement made on or about the date hereof between the City and Project Co with respect to the design, construction, financing, maintenance and rehabilitation of the Trillium Line Extension Project.

2. INTERPRETATION

2.1 Interpretation

- (a) In this Independent Certifier Agreement, unless the context indicates a contrary intention:
 - (i) words denoting the singular number include the plural and vice versa;
 - (ii) words denoting individuals include corporations and vice versa;
 - (iii) headings are for convenience only and do not affect interpretation;
 - (iv) references to Clauses, Sections or Parts are references to Clauses, Sections or Parts of this Independent Certifier Agreement;
 - (v) references to this Independent Certifier Agreement or any contract, agreement or instrument are deemed to include references to this Independent Certifier Agreement or such other contract, agreement or instrument as amended, novated, supplemented, varied or replaced from time to time;
 - (vi) references to any party to this Independent Certifier Agreement includes its successors or permitted assigns;
 - (vii) words denoting any gender include all genders;
 - (viii) references to any legislation or to any section or provision of any legislation include any statutory modification or re-enactment of any statutory provision substituted for legislation, section or provision, and ordinances, by laws, regulations and other statutory instruments issued under that legislation, section or provision;
 - (ix) a reference to “\$” is to Canadian currency;
 - (x) the terms “including” and “include” mean “including” or “include” (as applicable) without limitation;
 - (xi) if a word or phrase is defined, then other parts of speech and grammatical forms of that word or phrase have a corresponding meaning; and
 - (xii) unless otherwise indicated, all time periods will be strictly construed.

2.2 Obligations and Exercise of Rights by PA Parties

- (a) The obligations of the PA Parties under this Independent Certifier Agreement shall be several.
- (b) Except as specifically provided for in this Independent Certifier Agreement or the Project Agreement, the rights of the PA Parties under this Independent Certifier Agreement shall be jointly exercised by the PA Parties.

3. ROLE OF THE INDEPENDENT CERTIFIER

3.1 Engagement

- (a) The PA Parties hereby appoint the Independent Certifier, and the Independent Certifier hereby accepts such appointment, to carry out the Certification Services in accordance with this Independent Certifier Agreement. The Independent Certifier shall perform the Certification Services in accordance with this Independent Certifier Agreement.
- (b) Nothing in this Independent Certifier Agreement will be interpreted as giving the Independent Certifier any responsibility for performance of the design or construction, or for the certifications of the professionals of record.
- (c) Neither PA Party shall, without the prior written consent of the other PA Party, enter into any separate agreement with the Independent Certifier in connection with the Project, and Project Co shall ensure that no Project Co Party enters into any separate agreement with the Independent Certifier in connection with the Project. The Independent Certifier shall not enter into any separate agreement with either PA Party in connection with the Project without the prior written consent of the other PA Party.
- (d) The Independent Certifier shall make such observations and evaluations of any Works pursuant to a Variation in order to certify any monthly progress payment to Project Co of the value of work performed, provided the Independent Certifier shall be entitled to a Certification Services Variation Order pursuant to Sections 9.4 and 9.5 of this Independent Certifier Agreement.
- (e) The PA Parties acknowledge and agree that the Independent Certifier may rely on the assessment report prepared by the Independent Safety Assessor with respect to the safety certification of the System Infrastructure. The Independent Certifier acknowledges and agrees that, in carrying out the Certification Services, it shall be bound to the assessment report and shall consider the Independent Safety Assessor's views with respect to the safety of the System Infrastructure in making its determination as to whether Project Co has satisfied the conditions of Substantial Completion.
- (f) The PA Parties acknowledge and agree that, notwithstanding anything to the contrary in this Agreement, the Certification Services described in paragraph (hh) of Appendix A do not, nor shall such Certification Services be construed so as to, change, modify or have any impact whatsoever on the PA Parties' respective rights, entitlements and obligations as against each other pursuant to the provisions of the Project Agreement.

3.2 Acknowledgement of Independent Certifier

- (a) The Independent Certifier hereby acknowledges in favour of the PA Parties that it has received a copy of the Project Agreement.

3.3 Standard of Care

- (a) The Independent Certifier must exercise the standard and skill, care and diligence in the performance of the Certification Services that would be expected of an expert professional experienced in providing services in the nature of the Certification Services for projects similar to the Project.

3.4 Duty of Independent Judgment

- (a) In exercising its Certification Services, the Independent Certifier must:
- (i) act impartially, honestly and independently in representing the interests of both PA Parties in accordance with the terms of the Project Agreement and this Independent Certifier Agreement;
 - (ii) act reasonably and professionally;
 - (iii) act in a timely manner:
 - (A) in accordance with the times prescribed in this Independent Certifier Agreement and the Project Agreement; or
 - (B) where no times are prescribed, within 10 days or such earlier time so as to enable the PA Parties to perform their respective obligations under the Project Agreement; and
 - (iv) act in accordance with the joint directions of the PA Parties provided that the directions are not inconsistent with the other terms of this Independent Certifier Agreement or the terms of the Project Agreement and do not vary or prejudice the Independent Certifier's authority or responsibilities or the exercise by the Independent Certifier of its professional judgment under this Independent Certifier Agreement.
- (b) Although the Independent Certifier may take account of any opinions or representations made by the PA Parties, the Independent Certifier shall not be bound to comply with any opinions or representations made by either of them in connection with any matter on which the Independent Certifier is required to exercise its professional judgment.
- (c) The Independent Certifier acknowledges that the PA Parties may rely on the Certification Services, including determinations, findings and certifications made by the Independent Certifier, and accordingly, the Independent Certifier represents and warrants that will use its best skill and judgment in providing the Certification Services, and that information provided and/or submitted to the PA Parties in accordance with this Independent Certifier Agreement is true and accurate, and prepared in good faith to the best of the Independent Certifier's skill, judgment and knowledge.
- (d) The Independent Certifier acknowledges that all Certification Services, Contract Material and all determinations, findings, reports, certificates and other information delivered by the Independent Certifier to the City pursuant to the Project Agreement may be relied upon by the Contribution Agreement Parties, and that the Independent Certifier shall owe each an equal duty of care as is owed to the City hereunder, notwithstanding the fact that the Contribution Agreement Parties are not parties to this Independent Certifier Agreement or the Project Agreement. The Independent

Certifier will confirm the foregoing directly to either Contribution Agreement Party, if requested by the City.

3.5 Authority to Act

- (a) The Independent Certifier:
- (i) is an independent consultant and is not, and must not purport to be, a partner, joint venturer or agent of either PA Party;
 - (ii) other than as expressly set out in this Independent Certifier Agreement or the Project Agreement, has no authority to give any directions to a PA Party or its officers, directors, members, employees, contractors, consultants or agents; and
 - (iii) has no authority to waive or alter any terms of the Project Agreement, nor to discharge or release a party from any of its obligations under the Project Agreement unless jointly agreed by the PA Parties in writing.

- (b) The Independent Certifier will confirm the foregoing directly to either Contribution Agreement Party, if requested by the City.

3.6 Knowledge of the PA Parties' Requirements

- (a) The Independent Certifier warrants that:
- (i) it has informed and will be deemed to have informed itself fully of the requirements of the Project Agreement;
 - (ii) it will inform itself fully of the requirements of such other documents and materials as may become relevant from time to time to the performance of the Certification Services;
 - (iii) without limiting Sections 3.6(a)(i) or 3.6(a)(ii), it has and will be deemed to have informed itself fully of all time limits and other requirements for any Certification Service which the Independent Certifier carries out under the Project Agreement and this Independent Certifier Agreement;
 - (iv) it has and will be deemed to have informed itself completely of the nature of the work necessary for the performance of the Certification Services and the means of access to and facilities at or on the Lands and Site including restrictions on any such access or protocols that are required; and
 - (v) it has satisfied itself as to the correctness and sufficiency of its proposal for the Certification Services and that the Fee covers the cost of complying with all of the obligations under this Independent Certifier Agreement and of all matters and things necessary for the due and proper performance and completion of the Certification Services.

3.7 Co-ordination and Information by Independent Certifier

- (a) The Independent Certifier must:
- (i) fully cooperate with the PA Parties and their consultants and advisors;

- (ii) carefully co-ordinate the Certification Services with the work and services performed by the PA Parties;
- (iii) carefully co-ordinate the Certification Services with the safety assessment performed by the Independent Safety Assessor;
- (iv) without limiting its obligations under Sections 3.4 and 3.7(a)(ii), perform the Certification Services so as to avoid unreasonably interfering with, disrupting or delaying the work and services performed by the PA Parties;
- (v) include both PA Parties in all discussions, meetings, or any other communications regarding the Project;
- (vi) provide copies to the PA Parties of all reports, communications, certificates and other documentation that it provides to either PA Party; and
- (vii) provide a copy of the Contract Material to each of the Contribution Agreement Parties at the same time as it is provided to the PA Parties. In respect of such Contract Material, either Contribution Agreement Party may make inquiries of the Independent Certifier and request further investigation or clarification in connection with, and subject to, its contribution agreement.

3.8 Conflict of Interest

- (a) The Independent Certifier warrants that:
 - (i) at the date of this Independent Certifier Agreement, no conflict of interest exists or is likely to arise in the performance of its obligations under this Independent Certifier Agreement, and the Independent Certifier further warrants that it has not been retained as an advisor to either of the PA Parties or any of their respective related entities in respect of the Project Agreement (including, but not limited to, acting as a transaction advisor to either PA Party); and
 - (ii) if, during the term of this Independent Certifier Agreement, any such conflict or risk of conflict of interest arises, the Independent Certifier will notify the PA Parties immediately in writing of that conflict or risk of conflict and take such steps as may be required by either of the PA Parties to avoid or mitigate that conflict or risk.

3.9 Independent Certifier Personnel

- (a) The Independent Certifier shall make reasonable efforts to ensure that the individuals listed in Appendix C remain involved in the performance of the Certification Services and, in particular, will not, for the duration of this Independent Certifier Agreement, require any such person to be involved in any other project on behalf of the Independent Certifier if, in the reasonable opinion of the PA Parties, such involvement would have a material adverse effect on the performance of the Certification Services.
- (b) Any replacement of the individuals listed in Appendix C is subject to the PA Parties' prior written approval.

- (c) The Independent Certifier shall ensure that its personnel providing the Certification Services in respect of the Works shall:
- (i) possess a current professional designation of not less than membership in Professional Engineers Ontario (PEO), the Ontario Association of Certified Engineering Technicians and Technologists or such similar professional or consulting designation recognized in North America for Mechanical, Electrical, Civil, Structural, Transportation, Geotechnical, Mining, Tunnels, Environmental, Utilities, Rail Systems, and Vehicles and Industrial leads;
 - (ii) possess a current professional designation of not less than Professional Quantity Surveyors (PQS) for the cost estimator and any individuals who will prepare and evaluate construction and development information for the cost control and Works measurements for Payment;
 - (iii) have demonstrated competence in the planning, design, construction and commissioning of comparable and complex facilities and in having completed or monitored the planning, design, construction and commissioning of a comparable light rail transit systems;
 - (iv) have an understanding of the appropriate standards, guidelines and policies related to planning, design, construction and commissioning for light rail transit systems,;
 - (v) have an understanding of any documentation to be provided pursuant to this Independent Certifier Agreement and the Project Agreement, including not only the start-up procedures but any pre-commissioning and post-commissioning activities; and
 - (vi) have the relevant qualifications for their specified area of expertise and membership to the relevant professional bodies which licences them to give their opinions and carry out the relevant works as detailed within this agreement.
- (d) The Independent Certifier shall furnish the City with evidence satisfactory to the City of any such personnel's compliance with the foregoing requirements within a reasonable time prior to the proposed commencement of the Certification Services in respect of the Works.
- (e) The Independent Certifier shall engage the personnel listed in Appendix C in all day-to-day activities relevant to their area of expertise for the Certification Services.

3.10 Minimize Interference

- (a) The Independent Certifier shall perform the Certification Services in such a way as to minimize any undue interference with the progress of the Works.

4. ROLE OF THE PA PARTIES

4.1 Assistance

- (a) The PA Parties agree to cooperate with and provide reasonable assistance to the Independent Certifier to familiarize the Independent Certifier with all necessary aspects of the Project to enable the Independent Certifier to carry out its obligations under this Independent Certifier Agreement.

4.2 Instructions in Writing

- (a) Unless otherwise provided in this Independent Certifier Agreement or the Project Agreement, all instructions to the Independent Certifier by the PA Parties shall be given in writing and accepted or endorsed by both of the PA Parties.

4.3 Information and Services

- (a) The PA Parties shall make available to the Independent Certifier, as soon as practicable from time to time, all information, documents and particulars necessary for the Independent Certifier to carry out the Certification Services, including such information, documents and particulars required in order for the Independent Certifier to certify Construction Period Payments and to determine whether Substantial Completion and Final Completion have occurred, and shall provide copies of all such information, documents and particulars to the other party hereto.
- (b) Project Co shall promptly provide all information received from the Independent Safety Assessor, including the assessment report, required in order for the Independent Certifier to determine whether Substantial Completion and Final Completion have occurred.

4.4 Additional Information

- (a) If any information, documents or particulars are reasonably required to enable the Independent Certifier to perform the Certification Services and have not been provided by the PA Parties, then:
- (i) the Independent Certifier must give notice in writing to the Project Co Representative or the City Representative, as the case may be, of the details of the information, documents or particulars demonstrating the need and the reasons why they are required; and
- (ii) Project Co or the City, as the case may be, must arrange the provision of the required information, documents or particulars.

4.5 Right to Enter and Inspect

- (a) Upon giving reasonable notice to the Project Co Representative, the Independent Certifier (and any person authorized by it) may enter and inspect the Lands, the System Infrastructure or the Works at any reasonable time in connection with the exercise or proposed exercise of rights under this Independent Certifier Agreement, subject to:
- (i) observance of the reasonable rules of Project Co as to safety and security for the Lands, the System Infrastructure and the Works;
- (ii) not causing unreasonable delay to the carrying out of the Works by reason of its presence on the Lands, the System Infrastructure or the Works; and
- (iii) not causing any damage to the Lands, the System Infrastructure or the Works.

4.6 PA Parties Not Relieved

- (a) Neither PA Party shall be relieved from performing or observing its obligations, or from any other liabilities, under the Project Agreement as a result of either the appointment of, or any act or omission by, the Independent Certifier.

4.7 PA Parties not Liable

- (a) On no account will a PA Party be liable to another PA Party for any act or omission by the Independent Certifier whether under or purportedly under a provision of the Project Agreement, this Independent Certifier Agreement or otherwise, provided that any such act or omission shall not extinguish, relieve, limit or qualify the nature or extent of any right or remedy of either PA Party against or any obligation or liability of either PA Party to the other PA Party which would have existed regardless of such act or omission.

5. CERTIFICATION QUALITY PLAN

5.1 Certification Quality Plan

- (a) The Independent Certifier must:

- (i) develop and implement a certification quality plan identifying the processes and outcomes of the Certification Services, including but not limited to timelines, deliverables and input required from the PA Parties, that complies with all requirements of the Independent Certifier's quality assurance accreditation, and is otherwise satisfactory to each of the City Representative and the Project Co Representative;
- (ii) within 15 days after the date of this Independent Certifier Agreement, provide a draft of such certification quality plan to each of the City Representative and the Project Co Representative;
- (iii) within 30 days after the date of this Independent Certifier Agreement, provide the final certification quality plan to each of the City Representative and the Project Co Representative;
- (iv) if satisfactory to each of the City Representative and the Project Co Representative, implement such certification quality plan; and
- (v) if not satisfactory to each of the City Representative and the Project Co Representative, within 7 days after receiving notice thereof from either PA Party to that effect, revise and resubmit the certification quality plan to each of the City Representative and the Project Co Representative, and implement it if satisfactory to each of the City Representative and the Project Co Representative.

5.2 Certification Quality Plan not to Relieve Independent Certifier

- (a) The Independent Certifier will not be relieved of any responsibilities or obligations in respect of the performance of the Certification Services and will remain solely responsible for them notwithstanding:
- (i) the obligation of the Independent Certifier to develop and implement a certification quality plan; or
 - (ii) any comment or direction upon, review or acceptance of, approval to proceed with or request to vary any part of the certification quality plan by either the City Representative or the Project Co Representative.

6. SUSPENSION

6.1 Notice

- (a) The Certification Services (or any part) may be suspended at any time by the PA Parties:
- (i) if the Independent Certifier fails to comply with its obligations under this Independent Certifier Agreement, immediately by the PA Parties giving joint notice in writing to the Independent Certifier; or
 - (ii) in any other case, by the PA Parties giving 7 days' joint notice in writing to the Independent Certifier.

6.2 Costs of Suspension

- (a) The Independent Certifier will:
- (i) subject to the Independent Certifier complying with Article 9, be entitled to recover the extra costs incurred by the Independent Certifier by reason of a suspension directed under Section 6.1(a)(ii) valued as a Certification Services Variation under Section 9; and
 - (ii) have no entitlement to be paid any costs, expenses, losses or damages arising from a suspension under Section 6.1(a)(i).

6.3 Recommencement

- (a) The Independent Certifier must immediately recommence the carrying out of the Certification Services (or any part) on receipt of a joint written notice from the PA Parties requiring it to do so.

7. INSURANCE AND LIABILITY

7.1 Independent Certifier's Insurance

- (a) The Independent Certifier must have in place at all times during the term of this Independent Certifier Agreement:
- (i) professional liability insurance:
 - (A) in the amount of \$[REDACTED] per claim and \$[REDACTED] in the aggregate, a deductible of not more than \$[REDACTED] per claim and from an insurer and on terms satisfactory to each of the PA Parties; and
 - (B) covering liability which the Independent Certifier might incur as a result of a breach by it of its obligations owed by the Independent Certifier in a professional capacity to the PA Parties, or either of them, under or in connection with this Independent Certifier Agreement or the provision of the Certification Services; and
 - (ii) commercial general liability insurance in the amount of \$[REDACTED] per claim and in the aggregate, no deductible for personal injury or bodily injury, a deductible of not more than \$[REDACTED] per occurrence for property damage and from an insurer and on terms satisfactory to each of the PA Parties.

- (b) The Independent Certifier must provide copies of its insurance policies to each of the PA Parties upon execution of this Independent Certifier Agreement, and, at least 5 Business Days prior to the expiry date of any such insurance policy, the Independent Certifier must provide evidence of the renewal of any such insurance policy satisfactory to the PA Parties, acting reasonably.

7.2 Workers' Compensation Insurance

- (a) The Independent Certifier must, at its own cost and at all times during the term of this Independent Certifier Agreement, insure its liability (including its common law liability) as required under any applicable workers compensation statute or regulation in relation to its employees engaged in the Certification Services.

8. PAYMENT FOR SERVICES

8.1 Payment of Fee

- (a) In consideration of the Independent Certifier performing the Certification Services in accordance with this Independent Certifier Agreement, each PA Party shall pay one-half of the Fee to the Independent Certifier in accordance with the payment schedule specified in Appendix B.
- (b) The obligation of each PA Party to pay one-half of the Fee to the Independent Certifier is: (i) a several obligation, and neither PA Party shall have any liability in respect of the non-payment by the other PA Party of any fees or costs payable by such other PA Party under this Independent Certifier Agreement, and (ii) contingent upon the Independent Certifier issuing a separate invoice to each PA Party for its one-half share of a given payment and providing each PA Party with a copy of the related separate invoice issued to the other PA Party.
- (c) The Fee includes all taxes (except for HST), overheads and profit, all labour and materials, insurance costs, travel, hospitality, food and incidental expenses, and all other overhead including any fees or other charges required by law to perform the Certification Services.
- (d) The PA Parties acknowledge and agree that if any approved amount due and payable by the PA Parties to the Independent Certifier in excess of \$[REDACTED] is outstanding for more than 60 days, the Independent Certifier shall not have any obligation to make any certification under the Project Agreement.

9. CERTIFICATION SERVICES VARIATIONS

9.1 Notice of Certification Services Variation

- (a) If the Independent Certifier believes, other than a “Certification Services Variation Order” under Section 9.4(c), that any direction by the PA Parties constitutes or involves a Certification Services Variation it must:
- (i) within 7 days after receiving the direction and before commencing work on the subject matter of the direction, give notice to the PA Parties that it considers the direction constitutes or involves a Certification Services Variation; and
- (ii) within 21 days after giving the notice under Section 9.1(a)(i), submit a written claim to each of the City Representative and the Project Co Representative which includes detailed particulars of the claim, the amount of the claim and how it was calculated.

- (b) Regardless of whether the Independent Certifier considers that such a direction constitutes or involves a Certification Services Variation, the Independent Certifier must continue to perform the Certification Services in accordance with this Independent Certifier Agreement and all directions, including any direction in respect of which notice has been given under this Section 9.1.

9.2 No Adjustment

- (a) If the Independent Certifier fails to comply with Section 9.1, the Fee will not be adjusted as a result of the relevant direction.

9.3 External Services

- (a) In the event that external personnel or consultants are required for expert opinion with respect to a Certification Services Variation, then, with the prior written approval of the PA Parties, any additional fees relating to such external personnel or consultants will be payable by the PA Parties at the agreed upon amount.

9.4 Certification Services Variation Procedure

- (a) The City Representative and the Project Co Representative may jointly issue a document titled “Certification Services Variation Price Request” to the Independent Certifier which will set out details of a proposed Certification Services Variation which the PA Parties are considering.
- (b) Within 7 days after the receipt of a “Certification Services Variation Price Request”, the Independent Certifier must provide each of the City Representative and the Project Co Representative with a written notice in which the Independent Certifier sets out the effect which the proposed Certification Services Variation will have on the Fee.
- (c) Each of the City Representative and the Project Co Representative may then jointly direct the Independent Certifier to carry out a Certification Services Variation by written document titled “Certification Services Variation Order” which will state either that:
- (i) the Fee is adjusted as set out in the Independent Certifier’s notice; or
 - (ii) the adjustment (if any) to the Fee will be determined under Section 9.5.

9.5 Cost of Certification Services Variation

- (a) Subject to Section 9.2, the Fee will be adjusted for all Certification Services Variations or suspensions under Section 6.1(a)(ii) carried out by the Independent Certifier by:
- (i) the amount (if any) stated in the “Certification Services Variation Order” in accordance with Section 9.4(c);
 - (ii) if Section 9.5(a)(i) is not applicable, an amount determined pursuant to the fee schedule in Appendix B; or
 - (iii) where such rates or prices are not applicable, a reasonable amount to be agreed between the PA Parties and the Independent Certifier or, failing agreement, determined by the City Representative and the Project Co Representative jointly.

- (b) Any reductions in the Fee shall be calculated on the same basis as any increases.

10. TERM AND TERMINATION

10.1 Term

- (a) Subject to earlier termination, this Independent Certifier Agreement will commence on the date of the Project Agreement and continue in full force until:
- (i) the completion of the Works and the performance of the Certification Services set forth herein; or
 - (ii) such other date as may be mutually agreed between the PA Parties and the Independent Certifier.

10.2 Notice of Breach

- (a) If the Independent Certifier commits a breach of this Independent Certifier Agreement, the PA Parties may give written notice to the Independent Certifier:
- (i) specifying the breach; and
 - (ii) directing its rectification in the period specified in the notice being a period not less than 7 days from the date of service of the notice.

10.3 Termination for Breach

- (a) If the Independent Certifier fails to rectify the breach within the period specified in the notice issued under Section 10.2, the PA Parties may, without prejudice to any other rights of the PA Parties or either of them, immediately terminate this Independent Certifier Agreement.

10.4 Termination for Financial Difficulty or Change in Control

- (a) The PA Parties may, without prejudice to any other rights which the PA Parties or either of them may have, terminate this Independent Certifier Agreement immediately if:
- (i) events have occurred or circumstances exist which, in the opinion of the PA Parties, may result in or have resulted in an insolvency or a Change in Control of the Independent Certifier; or
 - (ii) the Independent Certifier has communications with its creditors with a view to entering into, or enters into, any form of compromise, arrangement or moratorium of any debts whether formal or informal, with its creditors.

10.5 Termination for Convenience

- (a) Notwithstanding anything to the contrary in this Independent Certifier Agreement, the PA Parties may, at any time, jointly terminate this Independent Certifier Agreement upon 30 days written notice to the Independent Certifier. The PA Parties and the Independent Certifier agree that, notwithstanding the 30 days' notice of termination, the Independent Certifier shall continue on a day-to-day basis thereafter until a new Independent Certifier is appointed.

10.6 Independent Certifier's Rights upon Termination for Convenience

- (a) Upon a termination under Section 10.5, the Independent Certifier will:
- (i) be entitled to be reimbursed by the PA Parties for the value of the Certification Services performed by it to the date of termination; and
 - (ii) not be entitled to any damages or other compensation in respect of the termination and (without limitation) any amount in respect of:
 - (A) the lost opportunity to earn a profit in respect of the Certification Services not performed at the date of termination; and
 - (B) any lost opportunity to recover overheads from the turnover which would have been generated under this Independent Certifier Agreement but for it being terminated.

10.7 Procedure upon Termination

- (a) Upon completion of the Independent Certifier's engagement under this Independent Certifier Agreement or earlier termination of this Independent Certifier Agreement (whether under Section 10.3, 10.4 or 10.5 or otherwise), the Independent Certifier must:
- (i) cooperate with the PA Parties with respect to the transition of the Certification Services to a replacement certifier;
 - (ii) deliver to the PA Parties all Contract Material and all other information concerning the Project held or prepared by the Independent Certifier during the execution of work under this Independent Certifier Agreement; and
 - (iii) as and when required by the PA Parties, meet with them and such other persons nominated by them with a view to providing them with sufficient information to enable the PA Parties to execute the Project or the persons nominated to provide the Certification Services.

10.8 Effect of Termination

- (a) Except as otherwise expressly provided in this Independent Certifier Agreement, termination of this Independent Certifier Agreement shall be without prejudice to any accrued rights and obligations under this Independent Certifier Agreement as at the date of termination (including the right of the PA Parties to recover damages from the Independent Certifier).

10.9 Survival

- (a) Termination of this Independent Certifier Agreement shall not affect the continuing rights and obligations of the PA Parties and the Independent Certifier under Sections 7, 8, 10.6, 10.7, 10.8, 11, 12.7 and 12.8 and this Section 10.9 or under any other provision which is expressed to survive termination or which is required to give effect to such termination or the consequences of such termination.

11. INDEMNITY

11.1 PA Parties to Save Independent Certifier Harmless

- (a) The PA Parties hereby indemnify and save the Independent Certifier completely harmless from any actions, causes of action, suits, debts, costs, damages, expenses, claims and demands whatsoever, at law or in equity, arising directly or indirectly in whole or in part out of any action taken by the Independent Certifier within the scope of its duties or authority hereunder.
- (b) The indemnity provided under this Section 11.1 shall not extend:
 - (i) to any breach of this Independent Certifier Agreement, or any part or parts hereof, by the Independent Certifier, its employees, servants, agents or persons for whom it is in law responsible, or any negligent or unlawful act or omission or willful misconduct of the Independent Certifier, its employees, servants or persons for whom it is in law responsible (in respect of which the Independent Certifier shall indemnify the PA Parties, as referred to in Section 11.2);
 - (ii) to any action taken by the Independent Certifier outside the scope of authority set forth in this Independent Certifier Agreement, or any part or parts hereof; or
 - (iii) to any debt, cost, expense, claim or demand for which insurance proceeds are recoverable by the Independent Certifier.
- (c) This indemnity shall survive the termination of this Independent Certifier Agreement.

11.2 Independent Certifier to Save PA Parties Harmless

- (a) The Independent Certifier hereby indemnifies and saves the PA Parties, and their affiliated entities, subsidiaries and their respective directors, officers, employees, agents, permitted successors and assigns, completely harmless from any actions, causes of action, suits, debts, costs, damages, expenses, claims and demands whatsoever, at law or in equity, arising directly or indirectly in whole or in part out of any breach of this Independent Certifier Agreement, or any part or parts hereof, by the Independent Certifier, its employees, servants, agents or persons for whom it is in law responsible, or any negligent or unlawful act or omission or willful misconduct of the Independent Certifier, its employees, servants or persons for whom it is in law responsible.
- (b) The indemnity provided under this Section 11.2 to a PA Party shall not extend:
 - (i) to any negligent or unlawful act or omission or willful misconduct of such PA Party, its employees, servants or persons for whom it is in law responsible (in respect of which such PA Parties shall indemnify the Independent Certifier, as referred to in Section 11.1) directly caused the losses described in Section 11.2(a); or
 - (ii) to any debt, cost, expense, claim or demand for which insurance proceeds are recoverable by such PA Party.
- (c) This indemnity shall survive the termination of this Independent Certifier Agreement.

11.3 Conduct of Claims

- (a) Claims made by a third person against a party having, or claiming to have, the benefit of an indemnity pursuant to this Independent Certifier Agreement shall be conducted in accordance with the conduct of claims procedure described in Appendix D – Conduct of Claims to this Independent Certifier Agreement.

12. GENERAL

12.1 Entire Agreement

- (a) Except where provided otherwise in this Independent Certifier Agreement, this Independent Certifier Agreement constitutes the entire agreement between the parties in connection with its subject matter and supersedes all prior representations, communications, negotiations and understandings, whether oral, written, express or implied, concerning the subject matter of this Independent Certifier Agreement.

12.2 Negation of Employment

- (a) The Independent Certifier, its officers, directors, members, employees, servants and agents and any other persons engaged by the Independent Certifier in the performance of the Certification Services will not by virtue of this Independent Certifier Agreement or the performance of the Certification Services become in the service or employment of the PA Parties for any purpose.
- (b) The Independent Certifier will be responsible for all matters requisite as employer or otherwise in relation to such officers, directors, members, employees, servants and agents and other persons who are engaged by the Independent Certifier.

12.3 Waiver

- (a) No waiver made or given by a party under or in connection with this Independent Certifier Agreement shall be binding or effective unless the waiver is in writing, signed by an authorized representative of the party giving such waiver, and delivered by such party to the other parties. No waiver made with respect to any right, power or remedy in one instance will be deemed to be a waiver with respect to any other instance involving the exercise of such right, power, or remedy or with respect to any other right, power, or remedy.
- (b) Failure by any party to exercise any of its rights, powers or remedies hereunder or its delay to do so shall not constitute a waiver of those rights, powers or remedies. The single or partial exercise of a right, power or remedy shall not prevent its subsequent exercise or the exercise of any other right, power or remedy.

12.4 Notices

- (a) All notices, requests, demands, instructions, certificates, consents and other communications required or permitted under this Independent Certifier Agreement shall be in writing (whether or not “written notice” or “notice in writing” is specifically required by the applicable provision of this Independent Certifier Agreement) and served by sending the same by registered mail, facsimile or by hand, (in each case, with a copy by electronic transmission), as follows:

If to the City:

City of Ottawa

110 Laurier Ave West
Ottawa, Ontario
K1P 1J1

Email: [REDACTED]

Attn.: [REDACTED]

If to Project Co:

TransitNEXT General Partnership

[REDACTED]

Email: [REDACTED]

Attn.: [REDACTED]

If to the Independent Certifier:

[REDACTED]

[REDACTED]

Email: [REDACTED]

Attn.: [REDACTED]

- (b) Where any notice is provided or submitted to a party via facsimile, an original of the notice sent via facsimile shall promptly be sent by regular mail or registered mail. For greater certainty, a notice given via facsimile shall not be invalid by reason only of a party's failure to comply with this Section 12.4(b).
- (c) Any party to this Independent Certifier Agreement may, from time to time, change any of its contact information set forth in Section 12.4(a) by prior notice to the other Parties, and such change shall be effective on the Business Day that next follows the recipient party's receipt of such notice unless a later effective date is given in such notice.
- (d) Subject to Sections 12.4(e), 12.4(f) and 12.4(g):
 - (i) a notice given by registered mail shall be deemed to have been received on the third Business Day after mailing;
 - (ii) a notice given by hand delivery shall be deemed to have been received on the day it is delivered; and
 - (iii) a notice given by facsimile shall be deemed to have been received on the day it is transmitted by facsimile.
- (e) If the party giving the notice knows or ought reasonably to know of difficulties with the postal system which might affect negatively the delivery of mail, any such notice shall not be mailed but shall be made or given by personal delivery or by facsimile transmission in accordance with this Section 12.4.

- (f) If any notice delivered by hand or transmitted by facsimile is so delivered or transmitted, as the case may be, either on a day that is not a Business Day or on a Business Day after 4:00 p.m. (recipient's local time), then such notice shall be deemed to have been received by such recipient on the next Business Day.
- (g) A notice given by facsimile shall be deemed to have been received by the recipient on the day it is transmitted only if a facsimile transmission report (maintained by the sender) indicates that the transmission of such notice was successful.

12.5 Transfer and Assignment

- (a) The Independent Certifier:
 - (i) must not assign, transfer, mortgage, charge or encumber any right or obligation under this Independent Certifier Agreement without the prior written consent of the PA Parties, which each PA Party may give or withhold in its absolute discretion (including, in respect of the City, if so required pursuant to a Contribution Agreement); and
 - (ii) agrees that any assignment, transfer, mortgage, charge or encumbrance will not operate to release or discharge the Independent Certifier from any obligation or liability under this Independent Certifier Agreement.
- (b) For the purposes of this Section 12.5, an assignment will be deemed to have occurred where there is a Change in Control of the Independent Certifier after the date of this Independent Certifier Agreement.
- (c) Each of the PA Parties may assign, transfer, mortgage, charge or encumber any right or obligation under this Independent Certifier Agreement in accordance with the terms of the Project Agreement.

12.6 Governing Laws and Jurisdictions

- (a) This Independent Certifier Agreement shall be governed by and construed in accordance with the laws of Ontario and the laws of Canada applicable therein and shall be treated in all respects as an Ontario contract, without regard to conflict of laws principles.
- (b) The PA Parties and the Independent Certifier agree that the courts of the Province of Ontario and all courts competent to hear appeals therefrom shall have exclusive jurisdiction to hear and settle any action, suit, proceeding or dispute in connection with this Independent Certifier Agreement and hereby irrevocably attorn to the exclusive jurisdiction of such courts.
- (c) Nothing in this Independent Certifier Agreement affects the rights, protections and immunities of the Crown under the *Proceedings Against the Crown Act* (Ontario).

12.7 City Designate

- (a) At any time and from time to time, the Crown may designate any ministry, branch, agency, division, department or office of the Government of Ontario to carry out administrative responsibility for the rights and obligations of the City under this Independent Certifier Agreement and Project Co and the Independent Certifier may deal exclusively with the designated person in respect of all such matters and is entitled to rely on the actions, directions, requests, notices, consents, approvals, waivers, comments relating to the review of documentation

and other administrative matters and decisions determined by such designated person from time to time, until the Crown has notified Project Co and the Independent Certifier in writing that such designated person is no longer the person designated by the Crown hereunder and such notice shall have effect on the later of the date of delivery of such notice and the date specified in the written notice. The Crown shall advise Project Co and the Independent Certifier in writing of any designation hereunder. The rights and obligations of the parties to this Independent Certifier Agreement shall be in no way affected by reason of any such designation. Project Co and the Independent Certifier acknowledge the right of the Crown to delegate administrative responsibilities hereunder as set forth in this Section 12.7.

12.8 Confidentiality

- (a) The Independent Certifier must ensure that:
 - (i) neither it nor any of its officers, directors, members, employees, servants and agents disclose, or otherwise make public, any Contract Material or any other information or material acquired in connection with or during the performance of the Certification Services without prior written approval of the PA Parties; and
 - (ii) no Contract Material is used, copied, supplied or reproduced for any purpose other than for the performance of the Certification Services under this Independent Certifier Agreement.
- (b) The PA Parties may at any time require the Independent Certifier to give and to arrange for its officers, directors, members, employees, servants and agents engaged in the performance of the Certification Services to give written undertakings, in the form of confidentiality agreements on terms required by the PA Parties, relating to the non-disclosure of confidential information, in which case the Independent Certifier must promptly arrange for such agreements to be made.

12.9 Contract Material

- (a) The PA Parties and the Independent Certifier agree that the Independent Certifier does not and will not have any rights, including any Intellectual Property, in any Contract Material provided to the Independent Certifier or created or required to be created by either PA Party.
- (b) As between the PA Parties and the Independent Certifier, all title and ownership, including all Intellectual Property, in and to the Contract Material created or required to be created by the Independent Certifier as part of, or for the purposes of performing the Certification Services, is hereby assigned jointly to the PA Parties on creation, or where such title, ownership and Intellectual Property cannot be assigned before creation of the Contract Material, it will be assigned to the PA Parties on creation. In addition, to the extent that copyright may subsist in such Contract Material so created by the Independent Certifier, the Independent Certifier hereby waives all past, present and future moral rights therein and the Independent Certifier shall ensure that any agent or employee of Independent Certifier shall have waived all such moral rights. The PA Parties acknowledge and agree that as between the PA Parties, title, ownership and other rights to the foregoing shall be governed by the Project Agreement.
- (c) The Independent Certifier will do all such things and execute all such documents as reasonably requested by either of the PA Parties in order to confirm or perfect the assignment of Intellectual Property in the Contract Material referred to in Section 12.9(b).

12.10 Amendment

- (a) This Independent Certifier Agreement may not be varied, amended or supplemented except by an agreement in writing signed by duly authorized representatives of the PA Parties (provided that, in respect of the City, such agreement may be subject to its obligations under a Contribution Agreement and require the consent of a Contribution Agreement Party) and the Independent Certifier and stating on its face that it is intended to be an amendment, restatement or other modification, as the case may be, to this Independent Certifier Agreement.

12.11 Severability

- (a) Each provision of this Independent Certifier Agreement shall be valid and enforceable to the fullest extent permitted by law. If the courts of a competent jurisdiction shall declare any provision of this Independent Certifier Agreement invalid, unenforceable or illegal, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Independent Certifier Agreement. If any such provision of this Independent Certifier Agreement is invalid, unenforceable or illegal, the parties shall, acting in good faith, promptly negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Independent Certifier Agreement as near as possible to its original intent and effect.

12.12 Enurement

- (a) This Independent Certifier Agreement shall enure to the benefit of, and be binding on, each of the parties and their respective successors and permitted transferees and assigns.

12.13 Counterparts

- (a) This Independent Certifier Agreement may be executed in one or more counterparts. Any single counterpart or a set of counterparts executed, in either case, by all the parties shall constitute a full, original and binding agreement for all purposes. Counterparts may be executed either in original or faxed form provided that any party providing its signature in faxed form shall promptly forward to such party an original signed copy of this Independent Certifier Agreement which was so faxed.

12.14 Maintenance of Records

- (a) The Independent Certifier shall retain and maintain in safe storage, at its expense, complete and accurate records related to all work performed under this Independent Certifier Agreement (i) for a minimum period of 7 years after Substantial Completion or such longer period as required by Applicable Law, or (ii) until delivery of such Contract Material to the PA Parties in accordance with Section 10.7(a)(ii), and such records will be made available to the PA Parties and/or Contribution Agreement Parties upon request.

[EXECUTION PAGES IMMEDIATELY FOLLOW]

IN WITNESS WHEREOF the parties have executed this Independent Certifier Agreement as of the date first above written.

CITY OF OTTAWA

Per:

Name: [REDACTED]

Title: [REDACTED]

TRANSITNEXT GENERAL PARTNERSHIP

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the partnership.

[REDACTED]

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the corporation.

APPENDIX A

CERTIFICATION SERVICES

Without limiting the other provisions of this Independent Certifier Agreement and the Project Agreement, the Independent Certifier shall provide the following:

- (a) Develop and implement a certification quality plan identifying the processes and outcomes of the Certification Services including timelines, deliverables and a description of the input required from the PA Parties to carry out the Certification Services.
- (b) Receive, monitor and review all relevant Project documentation including drawings, plans, reports, certifications, schedules, letters, notices and test results as necessary for the Independent Certifier to be informed as to the progress of the Works (including, for certainty, the reports described in Section 22.2(b) and Section 22.3 of the Project Agreement), and to provide an opinion in the event of a Dispute related to the development of the design. The Independent Certifier personnel listed in Appendix C shall be up to date with all Project documentation relevant to their area of expertise.
- (c) Review information relating to Construction Period Quality Failures, Delay Events and the events described in Section 40.2 of the Project Agreement, and Compensation Events.
- (d) Review information relating to Variation Enquiries, Project Co Variation Notices, Variations, Estimates, claims for extension of time and compensation and consult with the relevant party.
- (e) In accordance with Section 11.1(b) of the Project Agreement, attend all meetings of and participate, as necessary, in the activities of the Works Committee.
- (f) Identify any risks that may impede the issuance of the Substantial Completion Certificate or the Final Completion Certificate and inform the PA Parties thereof.
- (g) In accordance with Section 25.13(b)(ii) of the Project Agreement, certify the cost of remediation and correction of Warranty Work related to New Municipal Infrastructure.
- (h) In accordance with Section 11.6 of the Project Agreement, perform all responsibilities of the Independent Certifier in connection with Proceeding At Risk Matters, including attending all meetings and deliberations of the Works Committee with respect to Proceeding At Risk Matters.
- (i) Issue its opinion as to whether the City acted reasonably in delivering the subject Proceeding At Risk Notice pursuant to Section 11.6(e) of the Project Agreement.
- (j) Review the draft Testing and Commissioning Submittals and the detailed test, test methodology and expected test results proposed by Project Co, including any review comments from the City, and provide a report on the effectiveness of the Testing and Commissioning Program, to identify any errors or omissions and to report any risks.
- (k) Monitor, and report on, the implementation of the Testing and Commissioning Plan (as indicatively described in Schedule 14 – Testing and Commissioning to the Project Agreement) and other tests, including re-tests, to be performed as set out in the Testing and Commissioning Program or as otherwise required for Project Co to achieve Substantial Completion and Final Completion.

- (l) In accordance with Schedule 14 – Testing and Commissioning, validate Trial Running acceptance for the System Infrastructure.
- (m) Witness the implementation of a sample of the Commissioning Tests and a sample of the other testing and commissioning procedures at random times, locations and frequencies, in each case to the extent required for the Independent Certifier to verify that the requirements of Substantial Completion and Final Completion have been met.
- (n) In accordance with Sections 20.13(j) and 20.13(k), assist the City with determinations related to Cash Allowances in respect of Utility Works, including certifying any Utility Works undertaken by Project Co and evaluating all Requests for Utility Works Payment Approvals submitted by Project Co.
- (o) In accordance with Sections 25.13 of the Project Agreement, make a determination with respect to unresolved Testing and Commissioning or Handover issues.
- (p) Prior to any certification, consider the views and comments of Project Co, the City (including their consultants and advisors) and the Independent Safety Assessor, as applicable, in relation to the satisfaction of the conditions for certification.
- (q) Employing the relevant personnel, conduct regular inspections of the Works and attend site progress meetings at a minimum on a monthly basis or more regularly as deemed necessary for the Independent Certifier to be satisfied that the Works are proceeding in accordance with the requirements of the Project Agreement. Report on the observations, findings and potential risks to certification as a result of the regular inspections as part of the IC Monthly Report.
- (r) Upon receipt of notice from Project Co requesting the issuance of an IC Initial Capital Investment Certificate, Substantial Completion Certificate (or Interim Substantial Completion Certificate as the case may be) or Final Completion Certificate, consider such request and, within the time period set out in the Project Agreement and in accordance with the Project Agreement, either:
 - (i) issue the applicable certificate; or
 - (ii) issue a report detailing the matters that the Independent Certifier considers are required to be performed prior to issuing the applicable certificate.
- (s) Upon notice from Project Co that the matters required to be performed prior to issuing the applicable certificate have been completed, re-inspect the Works or re-consider the matters specified to be performed, and repeat the procedures in Section (o) of this Appendix A until the issuance of the applicable certificate.
- (t) In accordance with Sections 25.7, 25.8 and 25.9 of the Project Agreement, perform all responsibilities of the Independent Certifier in connection with the Minor Deficiencies regime.
- (u) After Substantial Completion, reconcile Project Co invoices for expenditure recovery against the budgets of the City.
- (v) Review and monitor the installation of all equipment, fixtures, information technology, communication equipment, telephone equipment and anything similar to the foregoing (collectively, the “**Installed Equipment**”) into the System Infrastructure by the City or any agent or contractor of the City either before or after Substantial Completion and provide a report to the City and Project Co identifying any damage to the System Infrastructure which has been caused

as a result of the installation of such Installed Equipment into the System Infrastructure by the City, its contractors and/or agents.

- (w) Provide any determinations contemplated in the Project Agreement, which determinations may be subject to final resolution between the PA Parties pursuant to Schedule 26 – Dispute Resolution Procedure to the Project Agreement.
- (x) Participate in and give the PA Parties and their counsel reasonable cooperation, access and assistance (including providing or making available documents, information and witnesses for attendance at hearings and other proceedings) in connection with any proceedings between the PA Parties that relate to the Certification Services.
- (y) Provide periodic reports to the PA Parties, as follows:
 - (i) a progress report on the progress of the Works no later than fifteen Business Days following the end of each month of the Construction Period in respect of the previous month or as otherwise agreed by the PA Parties (the “**IC Monthly Report**”) which includes the following:
 - (A) summary of activities carried out by the Independent Certifier, making specific reference to each of the Independent Certifier’s obligations;
 - (B) the status of any risks that may impede the issuance of the Substantial Completion Certificate or the Final Completion Certificate;
 - (C) an opinion on Non-Conformances, if any, and whether or not such Non-Conformances are of the extent and nature that would normally be expected on projects of this kind;
 - (D) progress on all aspects of the Works; and
 - (E) Commencing no less than 180 days prior to Scheduled Substantial Completion Date, the IC Monthly Report shall contain specific reference to and listing of the work that needs to be done before a Substantial Completion Certificate or Final Completion Certificate can be issued;
 - (ii) Accompanying the IC Monthly Reports delivered for the months of May, August, November and February, a quarterly report (the “**IC Quarterly Report**”) for the quarters ending March 31st, June 30th, September 30th and December 31st respectively, in substantially the form as that in Appendix E and that contains the following information certified in accordance with the standard of care set out in Section 3.3 of the Independent Certifier Agreement:
 - (A) the extent (expressed as a percentage) of completion of the Works as of the last day of the applicable quarter;
 - (B) the value of the Works completed as of the last day of the applicable quarter;
 - (C) the forecasted extent (expressed as a percentage) of completion of the Works as of the last day of the applicable quarter and for the next four quarters; and
 - (D) the forecasted value of the Works anticipated to be completed as of the last day of the applicable quarter and for the next four quarters.

- (z) Participate in meetings with the PA Parties as required for the Independent Certifier to perform Certification Services.
- (aa) Acknowledge receipt of all Design Certificates and Construction Certificates delivered by Project Co in accordance with Schedule 10 – Review Procedure to the Project Agreement.
- (bb) Provide the Certification Services with respect to Construction Period Payments set out in Schedule 20 – Construction Payments, including use and application of the Earned Value Measurement Techniques and the Credit Rules attached hereto as Appendix F;
- (cc) In accordance with Section 16.2(i) of the Project Agreement, make a determination (or appoint an independent and suitably qualified person to make such determination) with respect to the party responsible for any Contamination located on, in or under or migrating to or from the Lands;
- (dd) In accordance with Section 16.3(f) of the Project Agreement, make a determination (or appoint an independent and suitably qualified person to make such determination) with respect to the nature or extent of the actions required to be performed by Project Co to not disturb any and all fossils, artifacts and other objects having artistic, historic, archaeological or monetary value, including human remains and burial sites, which may be found on or at the Lands, including:
 - (i) ceasing any Project Operations in so far as performing such Project Operations would endanger the item or prevent or impede its excavation;
 - (ii) take all necessary steps to preserve and ensure the preservation of the item in the same position and condition in which it was found; and
 - (iii) ensure compliance by all Project Co Parties, with Applicable Law and all requirements of Governmental Authorities.
- (ee) In accordance with Section 16.5(e) of the Project Agreement, make a determination (or appoint an independent and suitably qualified person to make such determination) with respect to the nature or extent of the actions required to be performed by the City to meet the requirements of the Existing Vehicle Maintenance Standard, as defined in Schedule 1 – Definitions and Interpretation.
- (ff) In accordance with Section 9.11 of the Project Agreement, provide the Certification Services with respect to the RVSC Fixed Cost Amount under the Revenue Vehicle Supply Contract.
- (gg) Provide advice on other matters that may arise that both PA Parties may jointly require.
- (hh) To the extent not already contemplated in the other Certification Services or otherwise in this Agreement, review and certify the determination of eligible costs under the Contribution Agreements to the Contribution Agreement Parties, including:
 - (i) conducting a due diligence assessment of the schedule and cash flow forecast and certifying that this schedule and cash flow forecast is achievable, reviewing and certifying that eligible costs are reasonable and meet the eligible cost criteria in a Contribution Agreement, and reviewing and certifying the percentage of a Contribution Agreement Party's eligible costs of the total eligible costs under a Contribution Agreement;

- (ii) reviewing and certifying for each claim by the City under a Contribution Agreement, including interim claims, that all costs are eligible costs and that the work has been constructed and completed in accordance with the terms and conditions of the Contribution Agreement;
- (iii) confirming to the Contribution Agreement Parties that all information provided and/or submitted to the PA Parties and/or the Contribution Agreement Parties in accordance with this Agreement is true and accurate and prepared in good faith to the best of its skill, judgement and knowledge;
- (iv) Executing and delivering certificates in the form attached hereto as Appendix G when requested by the City.

APPENDIX B

INDEPENDENT CERTIFIER FEE

The Fee shall be invoiced by the Independent Certifier to each PA Party in accordance with Section 8 of the Independent Certifier Agreement, using invoices in form and substance acceptable to the PA Parties, acting reasonably, on a monthly basis. The total fixed fee of **\$[REDACTED]**, plus HST, for all Certification Services described in Appendix A (other than item (gg) in Appendix A), shall be accounted for and invoiced in accordance with monthly billing schedule attached to this Appendix B. Such fixed fee shall not be subject to escalation or adjustment except by Certification Services Variation. Each monthly invoice shall also include, and separately identify, any amounts claimed for services performed pursuant to any Certification Services Variation, and/or Certification Services jointly required by the PA Parties in accordance with item (gg) in Appendix A, for such payment period, and shall set out as a separate line item the HST payable. Each PA Party shall pay its respective portion of the Fee within 30 days of receipt of a complete and valid invoice.

The following hourly rates shall apply for Certification Services jointly required by the PA Parties in accordance with item (gg) in Appendix A, and may apply to Certification Services Variations in accordance with Sections 9.4 and 9.5 of the Independent Certifier Agreement. Hourly rates set out below are all inclusive and include applicable taxes (other than HST), all labour and materials, insurance costs, disbursements (examples: duplicating, delivery and communications) and all other overhead including any fees or other charges required by law. The PA Parties will not reimburse the Independent Certifier for any costs or expenses for hospitality, food or other incidental expenses.

<u>Independent Certifier Personnel (Appendix C)</u>	<u>Hourly Rate</u>
Team Lead [REDACTED]	\$[REDACTED]
Back-up Team Lead [REDACTED]	\$[REDACTED]
Project Manager / Schedule Advisor / Payment Certifier [REDACTED]	\$[REDACTED]
Chief Estimator [REDACTED]	\$[REDACTED]
Lead Electrical & Commissioning [REDACTED]	\$[REDACTED]
Lead Mechanical & Commissioning [REDACTED]	\$[REDACTED]
Back-up Electrical & Commissioning [REDACTED]	\$[REDACTED]
Project Coordinator & Document Control [REDACTED]	\$[REDACTED]
Project Coordinator & Document Control [REDACTED]	\$[REDACTED]
Back-up Mechanical & Commissioning [REDACTED]	\$[REDACTED]
Engineer – Advisory and Support	\$[REDACTED]
<u>Other Independent Certifier Personnel</u>	
Senior Partner	\$[REDACTED]
Electrical QS Partner	\$[REDACTED]
Architectural / Structural QS Partner	\$[REDACTED]
Sr. Construction Specialist	\$[REDACTED]
Engineer	\$[REDACTED]
Mechanical Quantity Surveyor	\$[REDACTED]
Senior Associate	\$[REDACTED]
Associate	\$[REDACTED]
Senior Quantity Surveyor	\$[REDACTED]
Intermediate Quantity Surveyor	\$[REDACTED]
Junior Quantity Surveyor	\$[REDACTED]
Technical Support	\$[REDACTED]

APPENDIX C
INDEPENDENT CERTIFIER PERSONNEL

The following personnel shall be involved in the performance of the Certification Services:

Name	Position
[REDACTED]	Team Lead
[REDACTED]	Back-up Team Lead
[REDACTED]	Project Manager / Schedule Advisor / Payment Certifier
[REDACTED]	Chief Estimator
[REDACTED]	Lead Electrical & Commissioning
[REDACTED]	Lead Mechanical & Commissioning
[REDACTED]	Back-up Electrical & Commissioning
[REDACTED]	Project Coordinator & Document Control
[REDACTED]	Project Coordinator & Document Control
[REDACTED]	Back-up Mechanical & Commissioning

APPENDIX D

CONDUCT OF CLAIMS

This Appendix D shall apply to the conduct of claims, made by a third person against a party having, or claiming to have, the benefit of an indemnity pursuant to this Independent Certifier Agreement. The party having, or claiming to have, the benefit of the indemnity is referred to as the “**Beneficiary**” and a party giving the indemnity is referred to as an “**Indemnifier**”.

- (1) If the Beneficiary receives any notice, demand, letter or other document concerning any claim for which it appears that the Beneficiary is, or may become entitled to, indemnification under Section 11 of the Independent Certifier Agreement, the Beneficiary shall give written notice to each Indemnifier potentially obligated in respect thereof, as soon as reasonably practicable and in any event within 10 Business Days of receipt of the same. Such notice shall specify with reasonable particularity, to the extent that information is available, the factual basis for the claim and the amount of the claim.
- (2) Subject to Sections (3), (4) and (5) of this Appendix D, on the giving of such notice by the Beneficiary, where it appears that the Beneficiary is or may be entitled to indemnification from an Indemnifier in respect of all, but not part only, of the liability arising out of the claim, such Indemnifier shall (subject to providing the Beneficiary with a secured indemnity to the Beneficiary’s reasonable satisfaction against all costs and expenses that the Beneficiary may incur by reason of such action) be entitled to dispute the claim in the name of the Beneficiary at the Indemnifier’s own expense and take conduct of any defence, dispute, compromise, or appeal of the claim and of any incidental negotiations. The Beneficiary shall give such Indemnifier all reasonable cooperation, access and assistance for the purposes of considering and resisting such claim. The Beneficiary shall have the right to employ separate counsel in respect of such claim and the reasonable fees and expenses of such counsel shall be to the account of the Indemnifier only where representation of both the Indemnifier and the Beneficiary by common counsel would be inappropriate due to any actual or potential conflicting interests between the Indemnifier and the Beneficiary. If and to the extent that both the City and Project Co are given notice in respect of the same claim, they shall cooperate in the conduct of the claim and give each other such reasonable access and assistance as may be necessary or desirable for purposes of considering, resisting and defending such claim.
- (3) With respect to any claim conducted by an Indemnifier:
 - (i) the Indemnifier shall keep the Beneficiary fully informed and consult with it about material elements of the conduct of the claim;
 - (ii) the Indemnifier shall not bring the name or reputation of the Beneficiary into disrepute;
 - (iii) the Indemnifier shall not pay, compromise or settle such claims without the prior consent of the Beneficiary, such consent not to be unreasonably withheld or delayed;
 - (iv) the Indemnifier shall not admit liability or fault to any third party without the prior consent of the Beneficiary, such consent not to be unreasonably withheld or delayed; and
 - (v) the Indemnifier shall use commercially reasonable efforts to have the Beneficiary named as a beneficiary under any release given by the persons bringing the claim to which Section (3) of

this Appendix D relates.

- (4) The Beneficiary shall be free to pay or settle any such claim on such terms as it thinks fit and without prejudice to its rights and remedies under this Independent Certifier Agreement if:
 - (i) none of the Indemnifiers is entitled to take conduct of the claim in accordance with Section (2) of this Appendix D;
 - (ii) none of the Indemnifiers notifies the Beneficiary of its intention to take conduct of the relevant claim as soon as reasonably practicable and in any event within 10 Business Days of the notice from the Beneficiary under Section (1) of this Appendix D or each of the Indemnifiers notifies the Beneficiary that it does not intend to take conduct of the claim; or
 - (iii) none of the Indemnifiers complies in any material respect with Section (3) of this Appendix D.
- (5) The Beneficiary shall be free at any time to give notice to the applicable Indemnifier that the Beneficiary is retaining or taking over, as the case may be, the conduct of any defence, dispute, compromise or appeal of any claim, or of any incidental negotiations, to which Section (2) of this Appendix D applies. For greater certainty, the Independent Certifier acknowledges and agrees that where the City is the Beneficiary, the City may retain or take over such conduct in any matter involving Personal Information or any matter involving public policy. On receipt of such notice the applicable Indemnifier shall promptly take all steps necessary to transfer the conduct of such claim to the Beneficiary, and shall provide to the Beneficiary all relevant documentation and all reasonable cooperation, access and assistance for the purposes of considering and resisting such claim. If the Beneficiary gives any notice pursuant to Section (5) of this Appendix D, then the applicable Indemnifier shall be released from any liabilities arising under the applicable indemnity hereunder in respect of the applicable claim.
- (6) If an Indemnifier pays to the Beneficiary an amount in respect of an indemnity and the Beneficiary subsequently recovers, whether by payment, discount, credit, saving, relief or other benefit or otherwise, a sum or anything else of value (the "**Recovery Amount**") which is directly referable to the fact, matter, event or circumstances giving rise to the claim under the indemnity, the Beneficiary shall forthwith repay to that Indemnifier whichever is the lesser of:
 - (i) an amount equal to the Recovery Amount less any out-of-pocket costs and expenses properly incurred by the Beneficiary in recovering the same; and
 - (ii) the amount paid to the Beneficiary by such Indemnifier in respect of the claim under the relevant indemnity,
- (7) Any person taking any of the steps contemplated by this Appendix D shall comply with the requirements of any insurer who may have an obligation to provide an indemnity in respect of any liability arising under this Independent Certifier Agreement.

APPENDIX E
FORM OF IC QUARTERLY REPORT
[ON THE INDEPENDENT CERTIFIER'S LETTERHEAD]

[date]

City of Ottawa
[insert address]

and to:

[Project Co]
[Project Co address]
Attention: [•]

Dear [•], [•] and [•]:

This report, for the quarter ending [•], is delivered to you pursuant to Section v(ii) of Appendix A of the Independent Certifier Agreement between the City of Ottawa and **[Project Co]** and is dated [•] (the “**IC Agreement**”). Terms not otherwise defined herein have the meaning ascribed to them in the IC Agreement.

All values stated herein are based on the cost of the Works and are exclusive of HST. This report has taken into account the following information: **[insert particulars of sources of information (e.g., works reports, site visits) used to prepare the report].**

Based on our analysis of the foregoing, we confirm the following to the best of our professional knowledge and judgment:

- As of the date hereof, the value of the Works is \$• and the Works are •% complete.
- At the end of this quarter, the estimated value of the Works will be \$• and the Works are forecasted to be •% complete.

We estimate that the value of the Works and the extent of their completion will be as follows for the next four quarters (not including the present quarter):

	[quarter end date]	[quarter end date]	[quarter end date]	[quarter end date]
\$				
%				

We have prepared this report for the specific use of the City of Ottawa and **[Project Co]**. This letter is not intended for general circulation, publication or reproduction for any other person or purpose without express written permission to each specific instance.

Yours truly,
[Name and Signature of Independent Certifier]

APPENDIX F
CREDIT RULES

1. CREDIT RULES FOR THE EVALUATION OF EARNED VALUE

1.1 Purpose of Credit Rules

- (a) The Credit Rules set out requirements agreed between the City and Project Co for use and interpretation of the Earned Value Measurement Techniques, pursuant to Schedule 20 of the Project Agreement.

1.2 Change of Credit Rules

- (a) In the event that Project Co or the City propose a change to the Credit Rules, the Independent Certifier may agree to such proposed change to the Credit Rule, provided that:

- (i) any proposed change the Credit Rules will result in revised Credit Rules that:
 - (A) continue to meet the Earned Value Measurement Techniques; and
 - (B) follow the principles, guidance, and intent of the Credit Rules set out in this Attachment F, wherever possible;
- (ii) any proposed change to the Credit Rules is subject to consultation with the City and Project Co at least three months prior to the first Construction Period that uses those revised Credit Rules;
- (iii) the Independent Certifier considers any responses made by the City and Project Co to a proposed change to the Credit Rules and the Independent Certifier provides a report justifying its decision regarding acceptance or rejection of any proposal to change the Credit Rules; and
- (iv) prior to the start of the first Construction Period that is to use the revised Credit Rules for the evaluation of Earned Value:
 - (A) the proposed changes to the Credit Rules are agreed to by the Independent Certifier; and
 - (B) both the City and Project Co receive the revised Credit Rules from the Independent Certifier.

1.3 Selection of Measurement Methods

- (a) In principle, when selecting the appropriate measurement methods from the Earned Value Measurement Techniques, the following principles shall be applied:
- (i) for tangible work or tasks taking three Construction Periods or more to perform, the measurement methods shall be considered in the following decreasing order of preference:
 - (A) firstly, physical measurement;

- (B) secondly, weighted milestone; and
- (C) thirdly, percent complete;
- (ii) for tangible work or tasks taking one or two Construction Periods to perform, the measurement methods shall be considered in the following decreasing order of preference:
- (A) fixed formula using the 0/100 method or 0/50/100 method; and
- (iii) for intangible work or tasks, the measurement methods shall be considered in the following decreasing order of preference:
- (A) firstly, apportioned effort; and
- (B) secondly, only where apportioned effort is not possible, level of effort.
- (b) Table 1 sets out the measurement methods that shall be used from the Earned Value Measurement Techniques for specific cost categories, unless there are technical reasons preventing these measurement methods from being used. The specific cost categories in Table 1 are set out in ‘Standard Cost Codes for Capital Projects – Definitions’, US Federal Transportation Administration.

Table 1: Earned Value measurement methods for specific cost categories

Standard Cost Code	Description	Measurement Method from the Earned Value Measurement Techniques
10	Guideway	
10.01	Guideway: at-grade exclusive right-of-way (including trackwork)	Activity completion and physical measurement using the fixed formula 0/100 method
10.04	Guideway: aerial structure (including trackwork)	Activity completion and physical measurement using the fixed formula 0/100 method
10.05	Guideway: Built-up fill	Activity completion and physical measurement using the fixed formula 0/100 method
10.06	Guideway: underground cut & cover (including trackwork)	Activity completion and physical measurement using the fixed formula 0/100 method
10.07	Guideway: underground tunnel (including trackwork)	Activity completion and physical measurement using the fixed formula 0/100 method
10.09	Track: Direct fixation	Activity completion and physical measurement using the fixed formula 0/100 method
10.10	Track: Embedded	Activity completion and physical

Table 1: Earned Value measurement methods for specific cost categories

Standard Cost Code	Description	Measurement Method from the Earned Value Measurement Techniques
		measurement using the fixed formula 0/100 method
10.11	Track: Ballasted	Activity completion and physical measurement using the fixed formula 0/100 method
10.12	Track: Special (switches, turnouts)	Activity completion and physical measurement using the fixed formula 0/100 method
20	Stations, Stops, Terminals, Intermodals	
20.01	At-grade station; stop; shelter; mall; terminal; platform	Activity completion and physical measurement using the fixed formula 0/100 method
20.03	Underground station; stop; shelter; mall; terminal; platform	Activity completion and physical measurement using the fixed formula 0/100 method
20.05	Joint development	Activity completion and physical measurement using the fixed formula 0/100 method
30	Support Facilities: Yards, Shops and Admin Buildings	
30.01	Administration Building: Office, sales, storage, revenue counting	Activity completion and physical measurement using the fixed formula 0/100 method
30.03	Heavy maintenance facility	Activity completion and physical measurement using the fixed formula 0/100 method
30.05	Yard and Yard Track	Activity completion and physical measurement using the fixed formula 0/100 method
40	Sitework and Special Conditions	
40.01	Demolition; clearing; earthwork	Activity completion and physical measurement using the fixed formula 0/100 method
40.02	Site utilities; utility relocation	Activity completion and physical measurement using the fixed formula 0/100 method
40.03	Hazardous material; contaminated soil mitigation; ground water treatments	Activity completion and physical measurement using the fixed formula 0/100 method
40.04	Environmental mitigation, e.g. wetlands,	Activity completion and physical

Table 1: Earned Value measurement methods for specific cost categories

Standard Cost Code	Description	Measurement Method from the Earned Value Measurement Techniques
	historic/archeologic, parks	measurement using the fixed formula 0/100 method
40.05	Site structures including retaining walls; sound walls and other structures	Activity completion and physical measurement using the fixed formula 0/100 method
40.06	Pedestrian and bike access and accommodation; landscaping	Activity completion and physical measurement using the fixed formula 0/100 method
40.07	Automobile; bus; van access ways including roads; parking lots	Activity completion and physical measurement using the fixed formula 0/100 method
40.08	Temporary facilities	Activity completion and physical measurement using the fixed formula 0/100 method
50	Systems	
50.01	Train control and signals	Activity completion and physical measurement using the fixed formula 0/100 method
50.02	Traffic signals and crossing protection	Activity completion and physical measurement using the fixed formula 0/100 method
50.03	Traction power supply and substations	Activity completion and physical measurement using the fixed formula 0/100 method
50.04	Traction power distribution and catenary	Activity completion and physical measurement using the fixed formula 0/100 method
50.05	Communications	Activity completion and physical measurement using the fixed formula 0/100 method
50.06	Fare collection system and equipment	Activity completion and physical measurement using the fixed formula 0/100 method
50.07	Central control	Activity completion and physical measurement using the fixed formula 0/100 method
80	Professional Services and Agency Costs	
80.01	Preliminary design	Weighted milestone
80.02	Final design	Weighted milestone

Table 1: Earned Value measurement methods for specific cost categories

Standard Cost Code	Description	Measurement Method from the Earned Value Measurement Techniques
80.03	Project management for design and construction	Apportioned effort
80.04	Construction administration and management	Apportioned effort
80.05	Professional liability and other insurance costs	Weighted milestone
80.06	Legal; permits; review fees by other agencies, cities, etc;	Weighted milestone
80.07	Surveys, testing (quality related), investigation, inspection	Weighted milestone or apportioned effort
80.08	Start up; testing and commissioning	Weighted milestone or apportioned effort

Table 1: Earned Value measurement methods for specific cost categories

Standard Cost Code	Description	Measurement Method from the Earned Value Measurement Techniques
10	Guideway	
10.01	Guideway: at-grade exclusive right-of-way (including trackwork)	Physical measurement
10.04	Guideway: aerial structure (including trackwork)	Physical measurement
10.06	Guideway: underground cut & cover (including trackwork)	Physical measurement
10.07	Guideway: underground tunnel (including trackwork)	Physical measurement
20	Stations, Stops, Terminals, Intermodals	
20.01	At-grade station; stop; shelter; mall; terminal; platform	Physical measurement
20.03	Underground station; stop; shelter; mall; terminal; platform	Physical measurement
30	Support Facilities: Yards, Shops and Admin Buildings	
30.03	Heavy maintenance facility	Physical measurement
40	Sitework and Special Conditions	
40.01	Demolition; clearing; earthwork	Physical measurement
40.02	Site utilities; utility relocation	Physical measurement
40.03	Hazardous material; contaminated soil mitigation; ground water treatments	Physical measurement or weighted milestone
40.05	Site structures including retaining walls; sound walls and other structures	Physical measurement
40.06	Pedestrian and bike access and	Physical measurement or weighted

Table 1: Earned Value measurement methods for specific cost categories

Standard Cost Code	Description	Measurement Method from the Earned Value Measurement Techniques
	accommodation; landscaping	milestone
40.07	Automobile; bus; van access ways including roads; parking lots	Physical measurement or weighted milestone
40.08	Temporary facilities	Physical measurement or weighted milestone
50	Systems	
50.01	Train control and signals	Physical measurement or weighted milestone
50.02	Traffic signals and crossing protection	Physical measurement or weighted milestone
50.03	Traction power supply and substations	Physical measurement or weighted milestone
50.04	Traction power distribution and catenary	Physical measurement or weighted milestone
50.05	Communications	Physical measurement or weighted milestone
50.06	Fare collection system and equipment	Physical measurement or weighted milestone
50.07	Central control	Physical measurement or weighted milestone
80	Professional Services and Agency Costs	
80.01	Preliminary design	Weighted milestone
80.02	Final design	Weighted milestone
80.03	Project management for design and construction	Apportioned effort
80.04	Construction administration and management	Apportioned effort
80.05	Professional liability and other insurance costs	Weighted milestone
80.06	Legal; permits; review fees by other agencies, cities, etc;	Weighted milestone
80.07	Surveys, testing (quality related), investigation, inspection	Weighted milestone or apportioned effort
80.08	Start up; testing and commissioning	Weighted milestone or apportioned effort

- (c) The measurement methods associated with procurement of materials shall be in accordance with the following principles:
 - (i) except as set out in Section 1.3(c)(ii), the costs of materials used in construction shall be included in the cost of each construction task and shall be evaluated for the purposes of Earned Value as part of each construction task using physical measurement; and
 - (ii) the costs of rail and large long-lead equipment manufactured off-site before installation, such as transformers and packaged air conditioning units, shall be evaluated for the purposes of Earned Value using the fixed formula measurement method, based on the payment terms of the supply contract, except that [REDACTED]% of any payments made by Project Co to the supplier will not be credited for the purposes of Earned Value until the rail or large equipment manufactured off-site is delivered to the Lands or a bonded warehouse.
- (d) The measurement methods associated with procurement of plant, such as cranes and road vehicles, shall be in accordance with the following principles:
 - (i) the costs of plant, such as cranes and road vehicles, shall be evaluated for the purposes of Earned Value using the fixed formula measurement method, based on the payment terms of the supply contract, except that [REDACTED]% of any payments made by Project Co to the supplier will not be credited for the purposes of Earned Value until the plant is delivered to the Lands or a bonded warehouse.
- (e) The measurement method to be used for the procurement of the Revenue Vehicles shall be evaluated and paid in accordance with Section 9.11 of the Project Agreement.
- (f) In order to make the measurement of Earned Value more efficient during mobilization, Project Co may choose to identify a tranche of its mobilization cost, the amount of which will be equal to the mobilization cost agreed to between Project Co and the Lenders or Lenders' Consultant of the Total Capital Cost that shall be automatically credited for the purposes of measuring Earned Value at Financial Close (the "**Mobilization Credit**"), where:
 - (i) the sum of the costs identified to the Mobilization Credit and the costs identified to the cost codes from Table 1 shall remain equal to the Total Capital Cost;
 - (ii) the Mobilization Credit shall not include costs associated with the following cost codes from Table 1:
 - (A) 80.09 Other Transaction Costs during Bid and Construction Period; and
 - (B) 100.01 Financing Costs during Construction Period;
 - (iii) the scope of activity associated with the Mobilization Credit shall be documented by Project Co to the satisfaction of the Independent Certifier before the end of the first Construction Period Month in order to avoid double counting with the Earned Value for activities that are not included within the Mobilization Credit; and
 - (iv) the Earned Value for the activities included within the Mobilization Credit shall be credited as Earned Value without using a measurement method from the Earned Value Management Techniques.

APPENDIX G
CONTRIBUTION AGREEMENT CERTIFICATES

[Federal and Provincial certificates to be appended upon execution.]

SCHEDULE 7
MOBILITY MATTERS

1. DEFINITIONS

Any capitalized term not defined in this Schedule 7 shall have the meaning given to such term in the Project Agreement. In this Schedule 7, the following definitions shall have the following meanings:

- 1.1 “**Aggregate Actual Lane Closures**” or “AALC” means the actual number of Lane Closures, measured in hours per hour type (“Peak,” Off Peak,” and “Night”).
- 1.2 “**Aggregate Actual Lane Closures Cost**” or “AALCC” means the total cost of Lane Closures.
- 1.3 “**Aggregate Target Lane Closures**” or “ATLC” means the total target Lane Closures, which,
 - (a) are set forth in the Lane Closure Target Letter; and
 - (b) include and account for all requirements of Schedule 15 - Output Specifications.
- 1.4 “**Aggregate Target Lane Closure Cost**” or “ATLCC” means the total cost of the target Lane Closures, as set forth in the Lane Closure Target Letter submitted by Project Co at Commercial Close and which has been accepted by the City.
- 1.5 “**Arterial**” has the meaning given in the City of Ottawa’s Road Classification System (City of Ottawa).
- 1.6 “**Blocks**” are the physical units upon which Lane Closure Costs are to be calculated for the purposes of this Schedule 7, and,
 - (a) for any streets proposed to be occupied by Project Co are delineated between two adjacent intersections, irrespective of whether the intersections are signalized or unsignalized.

For clarity, a laneway opening shall not constitute an intersection for the purposes of this Section 1.6.
- 1.7 “**Carleton University Roadways**” meaning roadways under the ownership and operations of Carlton University
- 1.8 “**Collector**” has the meaning given in the City of Ottawa’s Road Classification System (City of Ottawa).
- 1.9 “**Federal Roadways**” means roadways under the ownership and operation of the Federal Government and Ottawa International Airport Authority (OIAA).
- 1.10 “**High Cost Measures**” means, in respect of a Milestone period, discrete Lane Closure saving measures that incur capital expenditure greater than [REDACTED]1% of the discrete Lane Closure savings cost.

- 1.11 **“Lane Closure” or “Lane Closures”** “means any restriction or closure of a lane in any Block, as a result of Works, to bus or vehicular traffic or parking and loading between two intersecting streets, including tapers with the exception of where an equivalent facility to the one that has been closed has been provided in accordance with Section 1.11(c). All partial restrictions or closures within any Block will be considered as a full Lane Closure. Lane Closures will be measured on a per Block, per hour basis. “Peak” means Monday through Friday between the hours of 0630h – 0930h, or 1500h – 1830h. “Night” means the hours between 2200h – 0500h. “Off Peak” means all other hours not defined as “Peak” or “Night”. Lane Closures will no longer be in effect once Substantial Completion has been achieved:
- (a) lanes that have limited openings such as “local traffic only” shall be considered not available for use for the purpose of this Section 1.11; and
 - (b) any restriction or closure of a lane that is solely as a result of a Utility Company carrying out activities with respect to its own New Utility Company Infrastructure following the Handover of the applicable New Utility Company Infrastructure to such Utility Company shall be deemed not to constitute a Lane Closure or contribute to any Lane Closure for the purposes of this Schedule 7.
 - (c) where the traffic management associated with a lane closure provides an equivalent facility to the one closed with respect to a) traffic level of service, b) truck level of service, c) transit level of service, d) lane width, e) posted speed, and f) on-road cycling facilities, such a lane closure shall not be considered a “Lane Closure” for the purposes of this Schedule 7.
- 1.12 **“Lane Closure Adjustment”** or **“LCA”** means the deduction which may be made by The City from Project Co (which amount will be deducted from the Substantial Completion Payment) as calculated pursuant to Section 5.
- 1.13 **“Lane Closure Analysis Report”** has the meaning given to it in Section 2.2.
- 1.14 **“Lane Closure Measurement and Verification Plan”** has the meaning given to it in Section 7.2(j) of Part 7 to Schedule 15-2 – Design and Construction Requirements – Traffic Management and Construction Access of the Project Agreement.
- 1.15 **“Lane Closure Target Letter”** means the letter set out in Appendix D.
- 1.16 **“Left Turn Lane Closure”** means any restriction of an exclusive left turn lane within the Road Sections, of Arterial or Collector road classification, at the Site, such that the lane is not available for use by the public due to the Works. For clarity, lanes that have limited openings such as “local traffic only” shall be considered not available for use by the public for the purposes of this Section 1.16.
- 1.17 **“Local”** has the meaning given in City of Ottawa’s Road Classification System (City of Ottawa).
- 1.18 **“Arterial”** has the meaning given in the City of Ottawa’s Road Classification System (City of Ottawa).
- 1.19 **“Major Collector”** has the meaning given in the City of Ottawa’s Road Classification System (City of Ottawa).

- 1.20 “**Mobility Matters Review Meeting**” has the meaning given in Section 3.7.
- 1.21 “**Monthly Lane Closure Adjustment Contribution**” means the value for any given month that shall contribute to the Lane Closure Adjustment as calculated pursuant to Section 5.
- 1.22 “**Peak Hour Lane Interruptions**” means unplanned interruptions to the operation of roadway lanes, excluding BRT lanes, during Peak periods by either an unplanned event or a planned event exceeding the time restrictions granted. For further clarity Peak Hour Lane Interruptions would only be for interruptions caused by the actions of Project Co or their subcontractors.. Peak Hour Lane Interruptions as defined above are not included in AALC.
- 1.23 “**Right Turn Lane Closure**” means any restriction of an exclusive right turn lane within the Road Sections, of Arterial or Collector road classification, at the Site, such that it is not available for use by the public due to the Works. For clarity, lanes that have limited openings such as “local traffic only” shall be considered “not available for use by the public” for the purposes of this Section 1.23.
- 1.24 “**Road Sections**” means the defined portions of the Site where Works are to be undertaken in which the Unit Rate Prices for Lane Closure are to be applied for any Lane Closure, Left Turn Lane Closure or Right Turn Lane Closure. Each of the Road Sections has a Unit Price structure for Lane Closure costs per Block, defined in Appendix B to this Schedule, and based on the City’s roadway classification. Any portion of an individual roadway requiring Lane Closures shall be considered a Road Section. A Road Section can be a single isolated block, or a continuous stretch of adjacent blocks having the same roadway classification.. The Road Sections are delineated as follows:
- (a) Road Section 1 – Leitrim Road-Albion Road to Bowesville Road;
 - (b) Road Section 2 - Lester Road –Albion Road to Alert Road ;
 - (c) Road Section 3 – Hunt Club Road – Mac Street to McCarthy Road ;
 - (d) Road Section 4 – Uplands Drive – Breadner Blvd to Alert Road;
 - (e) Road Section 5 - Airport Parkway – Hunt Club Road to Lester Road/Uplands Drive;
 - (f) Road Section 6 – Earl Armstrong Road – Bowesville Road to High Road;
 - (g) Road Section 7 – Bowesville Road – Leitrim Road to Ficko Crescent;
 - (h) Road Section 8 - Carleton University Roadways;
 - (i) Road Section 9 – Federal Roadways (Ottawa International Airport); and
 - (j) Project Co shall include any additional Road Sections not identified in this Schedule 7, where Project Co identified lane closures requirements.
- 1.25 “**Traffic and Transit Management Plan**” or “**TTMP**” means the plan for the manner in which traffic and transit will be managed during construction activities and the method used to determine the magnitude of the impacts.

- 1.26 “**Unit Rate Price**” for each Lane Closure, Left Turn Lane Closure or Right Turn Lane Closure means the prices for each Block of each Road Section, and for each type of lane, as set out in Appendix B. The prices are hourly rates.

2. CONTENT AND FORMAT OF THE LANE CLOSURE ANALYSIS REPORT

- 2.1 Project Co shall quantify its projected occupation of lanes on City roadways on the basis of the formulae and procedures contained in this Schedule 7. Project Co shall monitor its occupation of the lanes on a monthly basis.
- 2.2 Project Co shall deliver to the City a report summarizing the findings of AALC (the “**Lane Closure Analysis Report**”), on a monthly basis, no later than 5 Business Days after the end of each month.
- 2.3 Project Co shall include copies of all documents to fully support the Lane Closure Analysis Report.
- 2.4 The Lane Closure Analysis Report shall, at a minimum, include the following information for the relevant month:
- (a) using the template shown in Appendix A to this Schedule, a summary of target and actual Lane Closures by Road Section and breakdown by road classification (Arterial, Major Collector, Collector, Local), location, time, date and duration, indicating Weekday Peak, Weekday Off Peak or Night/Weekend, including any exceptional changes forecasted for the upcoming monthly period (being changes of plus or minus [REDACTED]%);
 - (b) projected Lane Closures for the remaining duration of the Construction Period along with trends and potential risks associated with these Lane Closures;
 - (c) accurate and precise data in support of the items set out in Sections 2.4(a) and 2.4(b);
 - (d) presentation of AALC and the AALCC for the applicable month, and on a cumulative basis as of the applicable month;
 - (e) establishment of a basis for continued monitoring of Lane Closures and adjustments to the AALC;
 - (f) outline of any outstanding issues from any previous Lane Closure Analysis Reports and mitigating strategies to address those issues;
 - (g) adjustments to the ATLCC and the ATLCC for the applicable month, and on a cumulative basis as of the applicable month;
 - (h) Project Co’s estimate of the Monthly Lane Closure Adjustment Contribution;
 - (i) measurement and verification of lane closures in accordance with Lane Closure Measurements and Verification Plan in Section 3.6; and
 - (j) summary tables from all previous Lane Closure Analysis Reports delivered by Project Co to the City.

- 2.5 Following the review of the final Lane Closure Analysis Report by the City Representative, the data set out in the Lane Closure Analysis Report will be used by the City to determine the Monthly Lane Closure Adjustment Contribution.

3. PROCEDURES FOR DETERMINING MONTHLY LANE CLOSURE ADJUSTMENT CONTRIBUTIONS

- 3.1 The City shall not consider the following closures of lanes to be Lane Closures for the purposes of this Schedule 7, and such closures of lanes shall not contribute to the Monthly Lane Closure Adjustment Contribution:

- (a) where an existing lane width is less than the minimum lane width requirements during construction, specified in Schedule 15-2 Part 7 Table 7-1.3, maintaining the lane as open for traffic operations at its existing width.

- 3.2 Project Co shall not use lane configurations that will remain after Substantial Completion to determine Lane Closures. For clarity, the lane configuration of each roadway as of Financial Close shall be the configuration used to calculate Lane Closures.

- 3.3 The City shall assess Project Co for the cost of Lane Closures based on the total Lane Closures that occur during Peak, Off Peak, and Night hours. All Lane Closures shall be included in the calculation of the Monthly Lane Closure Adjustment Contribution as provided in Section 5.

- 3.4 The ATLC shall form the benchmark for calculating the Lane Closure cost with respect to the AALC. The AALCC shall be used to calculate the Monthly Lane Closure Adjustment Contribution. The Lane Closure Target shall not be amended, altered or adjusted except by the process described in Section 4.

- 3.5 No later than 30 calendar days prior to the first Lane Closure, Project Co shall deliver to the City the initial Traffic and Transit Management Plan (TTMP). Following the acceptance of the initial TTMP by the City, Project Co shall submit all subsequent proposed changes to the TTMP to the City in accordance with Schedule 10 – Review Procedure. Project Co shall deliver to the City the Traffic Control Plans that address the Lane Closure(s) associated with the initial areas of the Site at which it plans to commence Works as part of the initial TTMP submission.

- 3.6 No later than 30 days prior to the initial Lane Closure within any Road Section, Project Co shall provide The City with a Lane Closure Measurement and Verification Plan. All subsequent Lane Closure Analysis Reports are to be based on this plan.

- 3.7 No later than 5 Business Days following the submission of the Lane Closure Analysis Report (or as agreed to between the Parties), Project Co and the City shall convene a review meeting (the “**Mobility Matters Review Meeting**”) to be attended by the Project Co Representative and the City Representative. At the Mobility Matters Review Meeting, Project Co shall present the Lane Closure Analysis Report to the City. The City and Project Co shall discuss the Aggregate Actual Lane Closure for the preceding period as well as review any proposed “equivalent facilities” as described in Section 1.10(c). Project Co’s measurement and verification of Lane Closure(s) shall be reviewed and confirmed by the City Representative.

- 3.8 Project Co shall assist the City Representative by providing information with respect to Lane Closures and access to the Lane Closure records, and by other means as may reasonably be

required to confirm the information in the Lane Closure Analysis Report. The City shall promptly give Notice to Project Co of the details of any disagreement with respect to all or any aspect of the Lane Closure Analysis Report, and the Parties shall then seek to agree to any matters in dispute. The process shall be as follows:

- (a) AALC and ATLCC shall be determined at the Mobility Matters Review Meeting.
 - (b) No later than 20 Business Days following each Mobility Matters Review Meeting, or within such period as may be otherwise agreed between the City Representative and the Project Co Representative, acting reasonably:
 - (i) The City shall confirm their acceptance of all or any aspect of the Lane Closure Analysis Report; and
 - (ii) Subject to Section 4, Project Co and the City shall agree to any adjustments to the ATLC and ATLCC.
 - (c) If the City dispute Project Co's estimate of the Monthly Lane Closure Adjustment Contribution in the Lane Closure Analysis Report, the City shall, no later than 10 Business Days following receipt of the Lane Closure Analysis Report, or within such other period as may be agreed by the City Representative and Project Co, acting reasonably, submit an account to Project Co setting out their calculations and justifying the quantification of Project Co's estimate of the Monthly Lane Closure Adjustment Contribution. If either Project Co or the City wish to dispute any account presented pursuant this Section 3.8(c), they must do so by written Notice to the other Party no later than ten Business Days following receipt of such account. The City Representative and the Project Co Representative shall use reasonable efforts to resolve the dispute for an additional ten Business Days. If there is no agreement within a further 10 Business Days, then either Party may refer the matter to the Dispute Resolution Procedure.
 - (d) If neither Party objects in accordance with Section 3.8(c), or, following final determination of the disputed account in accordance with Section 3.8(c), Project Co shall use the relevant Monthly Lane Closure Adjustment Contribution to determine the Lane Closure Adjustment. The Lane Closure Adjustment shall be shown as a separate item within the invoice for the Substantial Completion Payment.
- 3.9 For the purpose of calculating the Lane Closure Adjustment, the calculation shall be completed 60 days prior to the Scheduled Substantial Completion Date (or at a later date as mutually agreed to by the City Representative and Project Co), comparing the total AALCC of each Road Section for the entire Construction Period to the total ALTCC for that same Road Section for the entire Construction Period. If, subsequent to this calculation being completed, there is a change to the Scheduled Substantial Completion Date, Project Co shall amend their Lane Closure Target (in accordance with Section 4) and the Lane Closure Adjustment. For clarity, over-performance of any one Road Section cannot be added to underperformance of any other.

4. PROCESS FOR AMENDING THE AGGREGATE TARGET LANE CLOSURE AND ASSOCIATED COST

- 4.1 In all cases, corrections to the ATLC and ATLCC must be consistent with the principles outlined in the TTMP.

- 4.2 Project Co and the City shall, acting reasonably, agree to make any adjustments to the ATLC, ATLCC, AALC and AALCC, but only in the event of changes implemented due to an amendment of the Project Agreement or a Variation that would cause Lane Closure changes. The City, at its discretion, may allow a revision to the Target Letters to reflect an agreed-upon change in the project schedule, in the absence of an amendment of the Project Agreement or a Variation.
- 4.3 The Party requesting an amendment to the ATLC in accordance with Section 4.2 shall initiate a Variation in accordance with Schedule 21 – Variation Procedure. The amended TTMP shall include a detailed analysis of the impacts to traffic and transit services, including an analysis of Lane Closure requirements. The amended TTMP shall include a recommendation regarding amendments to the ATLC. Both the City and Project Co shall agree to the amended ATLC no later than 20 Business Days following receipt of amended TTMP. If there is no agreement within a further 10 Business Day period, then either Party may refer the matter to the Dispute Resolution Procedure.

5. CALCULATION OF MONTHLY LANE CLOSURE ADJUSTMENT CONTRIBUTION AND LANE CLOSURE ADJUSTMENT

5.1 Comparing Aggregate Actual Lane Closures Costs to Aggregate Target Lane Closure Costs:

- (a) After the acceptance of the final Lane Closure Analysis Report described in Section 0 and no later than 30 Business Days before the Scheduled Substantial Completion Date, Project Co shall compare the total AALCC for each Road Section to the total ATLCC for each Road Section, and if the AALCC is more than [REDACTED]% greater than the ATLCC, for any Road Section, then Project Co shall calculate the Monthly Lane Closure Adjustment Contribution set out in Section 5.2 and deduct the amount of the Lane Closure Adjustment from the Substantial Completion Payment to be made in accordance with the Project Agreement. For clarity, the Lane Closure Adjustment deduction from the Substantial Completion Payment shall not be subject to the limitations set out in Section 55.4 of the Project Agreement.
- (b) If the AALCC is greater than [REDACTED]% of the ATLCC for any monthly period for any Road Section, then Project Co shall submit a detailed remediation plan no later than 10 Business Days following the end of the month to explain how it will reduce the AALCC for the Road Section in subsequent period(s), such that the variance will not exceed the [REDACTED]% for the subsequent periods. Project Co shall present progress and achievements of the remediation plan at subsequent Mobility Matters Review Meeting(s).

5.2 The formulae to calculate the Monthly Lane Closure Adjustment Contribution are set out in this Section 5.2.

- (a) For the purposes of Section 5.2(b), in respect of each Road Section:

A = the AALCC for each Road Section in the relevant month

B = the ATLCC for each Road Section in the relevant month

- (b) In respect of any given month during the period leading up to Substantial Completion for each Road Section:
- (i) If [REDACTED], then Monthly Lane Closure Adjustment Contribution = [REDACTED];
 - (ii) If [REDACTED], then Monthly Lane Closure Adjustment Contribution = [REDACTED];
 - (iii) If [REDACTED], then Monthly Lane Closure Adjustment Contribution = \$[REDACTED];
 - (iv) if the sum of all Monthly Lane Closure Adjustment Contributions in each month prior to Substantial Completion <\$[REDACTED], then Lane Closure Adjustment for that Road Section = \$[REDACTED]; and
 - (v) if the sum of all Monthly Lane Closure Adjustment Contributions in each month prior to Substantial Completion >\$[REDACTED], then Lane Closure Adjustment for that Road Section = the sum of all Monthly Lane Closure Adjustment Contributions in each month prior to Substantial Completion.

5.3 For the purposes of calculating the Lane Closure Adjustment in accordance with this Schedule 7, the Parties shall have regard to Sections 38.2(k) and 42.2(e) of the Project Agreement.

6. PEAK HOUR LANE INTERRUPTIONS

6.1 The City will assess Project Co for Peak Hour Lane Interruptions in accordance with Table 6.1 for the following non-performance measures per lane that is not open.

Table 6.1

ROAD CLASSIFICATION* INCLUDING TRANSIT ROUTES AND LANES	Initial value to be assessed if lane is not open as required	Additional value to be assessed at the end of each additional 10 minute period that the lane is not open.
Federal Roadways	\$[REDACTED]	\$[REDACTED]
Federal Roadways with Transit	\$[REDACTED]	\$[REDACTED]
Carleton University Roadways	\$[REDACTED]	\$[REDACTED]
Carleton University Roadways with Transit	\$[REDACTED]	\$[REDACTED]
Arterial	\$[REDACTED]	\$[REDACTED]
Arterial with Transit	\$[REDACTED]	\$[REDACTED]
Major Collector	\$[REDACTED]	\$[REDACTED]
Major Collector with Transit	\$[REDACTED]	\$[REDACTED]
Collector	\$[REDACTED]	\$[REDACTED]
Collector with Transit	\$[REDACTED]	\$[REDACTED]
Transit Only Lane	\$[REDACTED]	\$[REDACTED]

* See the following link for City Road Classifications: <http://ottawa.ca/en/city-hall/planning-and-development/official-plan-and-master-plans/official-plan/volume-1-official-11>

6.2 Any time assessed in the cost associated with Peak Hour Lane Interruptions will not be included in calculations of Lane Closure Adjustments.

- 6.3 The City shall assess Project Co for the cost of Peak Hour Lane Interruptions. All Peak Hour Lane Interruptions shall be formulated into a Monthly Peak Hour Lane Interruption Report to be submitted by Project Co with the Lane Closure Analysis Report.
- 6.4 Project Co shall calculate the cost of Peak Hour Lane Interruptions and the City shall deduct this amount from the next Construction Period Payment or Substantial Completion Payment, as applicable, following the most recent Monthly Peak Hour Lane Interruption Report in accordance with Schedule 20 – Construction Period Payments.

7. APPLICATION

- 7.1 The Lane Closure provisions of this Schedule 7 will no longer be in effect once Substantial Completion has been achieved.

APPENDIX A
LANE CLOSURE REPORT SUBMITTAL REQUIREMENTS

Total Lane Closure Summary	Lane Closure Unit Rate	Lane Closure Target		Actual Lane Closures		Percent Variance between columns v and iii of this table	Monthly Lane Closure Adjustment Contribution
	Unit Rate based on roadway classification and time of day	Number of Target Closures	Cost of Lane Closure for monthly period (calculated based on number of closures multiplied by Unit Price Rate, multiplied by number of hours)	Usage	Cost of Lane Closures for monthly period (calculated based on number of closures multiplied by Unit Price Rate, multiplied by number of hours)		
Column reference	i	ii	iii	iv	v	vi	vii
Road Section 1 Peak							
Road Section 1 Off Peak							
Road Section 1 Night							
<i>Sub-total: Road Section 1</i>							
Road Section 2 Peak							
Road Section 2 Off Peak							
Road Section 2 Night							
<i>Subtotal: Road</i>							

<i>Section 2</i>							
Road Section 3 Peak							
Road Section 3 Off Peak							
Road Section 3 Night							
<i>Subtotal:-Road Section 3</i>							
Road Section 4 Peak							
Road Section 4 Off Peak							
Road Section 4 Night							
<i>Subtotal: Road Section 4</i>							
Road Section 5 Peak							
Road Section 5 Off Peak							
Road Section 5 Night							
<i>Subtotal: Road Section 5</i>							
Road Section 6 Peak							
Road Section 6 Off Peak							
Road Section 6 Night							
<i>Subtotal: Road</i>							

<i>Section 6</i>							
Road Section 7 Peak							
Road Section 7 Off Peak							
Road Section 7 Night							
<i>Subtotal: Road Section 7</i>							
Road Section 8 Peak							
Road Section 8 Off Peak							
Road Section 8 Night							
<i>Subtotal: Road Section 8</i>							
Road Section 9 Peak							
Road Section 9 Off Peak							
Road Section 9 Night							
<i>Subtotal: Road Section 9</i>							
Substantial Completion Weekday Peak							
Substantial Completion Weekday Off Peak							

Substantial Completion Night/Weekend							
<i>Total: Substantial Completion</i>							

APPENDIX B**UNIT RATES FOR EACH LANE CLOSURE, LEFT TURN LANE CLOSURE AND RIGHT TURN LANE CLOSURE****1. UNIT RATE PRICES FOR LANE CLOSURES (Price per Hour per Block)**

	Unit Rates (\$)		
	Peak *	Off Peak **	Night ***
Arterial			
Major Collector / Carleton University Roadways			
Collector / Federal Roadways (Ottawa International Airport) / Local Roadways			

* As defined in Section 1.11

** As defined in Section 1.11

*** As defined in Section 1.11

UNIT RATES FOR EACH LANE CLOSURE, LEFT TURN LANE CLOSURE AND RIGHT TURN LANE CLOSURE

APPENDIX C

LANE CLOSURE COSTING BLOCK DELINEATION ALONG CITY, FEDERAL AN CARLETON UNIVERSITY ROADWAYS

ROAD SECTION	BLOCK	Roadway Classification	BLOCK DELINEATION
Road Section 1 – Leitrim Road-Albion Road to Bowesville Road	1-A	Arterial	Albion Road to Gilligan Road
	1-B	Arterial	Gilligan Road to Bowesville Road
Road Section 2 – Lester Road – Albion Road to Alert Road	2-A	Arterial	Albion Road to Alert Road
Road Section 3 – Hunt Club Road – Mac Street to McCarthy Road	3-A	Arterial	Mac Street to Transitway
	3-B	Arterial	Transitway to Airport Parkway Ramps east of Airport Parkway
	3-C	Arterial	Airport Parkway Ramps east of Airport Parkway to Airport Parkway Ramps west of Airport Parkway
	3-D	Arterial	Airport Parkway Ramps west of Airport Parkway to McCarthy Road
	4-A	Collector	Breadner Blvd to north road entrance to EY Centre
	4-B	Collector	North road entrance to EY Centre to Research Road
Road Section 4 – Uplands Drive – Breadner Blvd to Airport Parkway	4-C	Arterial	Research Road to Airport Parkway Off Ramp
	4-D	Arterial	Airport Parkway Off Ramp to Alert Road
Road Section 5 – Airport Parkway – Hunt Club Road to Lester Road/Uplands Drive	5-A	Arterial	Hunt Club Road to Lester Road/Uplands Drive
6-A	Arterial	Limebank Road to Bowesville Road	
Road Section 6 – Earl Armstrong Road – Bowesville Road to High Road	6-B	Local	Bowesville Road to High Road
Road Section 7 – Bowesville Road – Leitrim Road to Ficko Crescent	7-A	Collector	Leitrim Road to Earl Armstrong Road
	7-B	Local	Earl Armstrong Road to Ficko Crescent
Roadway Section 8- Carleton University Roadways	8-A	Major Collector	University Drive North to Library Road
Campus Avenue – University Drive N to University Drive South	8-B	Major Collector	Library Road to University Drive West

ROAD SECTION	BLOCK	Roadway Classification	BLOCK DELINEATION
	8-C	Major Collector	University Drive West to University Drive East
Road Section 9 – Federal Roadways (OIAA)	9-A	Collector	Canadair Private -Kiowa Private to Silver Star Private
9A Canadair Private –Kiowa Private to Silver Star Private 9B Tracker Private –Silver Star Private to Airport Parkway Private 9C Airport Parkway Private – Tracker Private to Airport 2 Avenue	9-B	Collector	Tracker Private –Silver Star Private to Airport Parkway Private
	9-C	Collector	Airport Parkway Private – Tracker Private to Airport 2 Avenue

APPENDIX D
LANE CLOSURE TARGET LETTER

[Attached]

March 20, 2019

Attention: [REDACTED]
Norton Rose Fulbright Canada LLP
45 O'Connor Street, Suite 1500
Ottawa, ON
K1P 1A4

Canada

Re: Trillium Line Extension Project - Lane Closure Target Letter

Dear Sir/Madam:

As per the requirements of Schedule 3, Part 1, TransitNEXT is pleased to provide this Lane Closure Target Letter as part of our technical and financial submission for the Trillium Line Extension Project (the Project). This letter adheres to the requirements of Schedule 3, Part 1 of this RFP.

Primary Traffic and Transit Management Plan (TTMP) Features and Construction Management Plans

We have explored construction staging options that will minimize lane closures, traffic impacts, and associated costs by adopting the following approaches. We will:

- Design structural elements as far from traffic as practical
- Use construction methodologies that allow the shortest occupancy of traffic lanes
- Schedule just-in-time material deliveries during off-peak hours when feasible
- Schedule major-impact construction on weekends or during off-peak hours
- Maximize progress during shutdown periods for trains and airport roads
- Provide detours where possible

By designing all bridge structures as rail-over-road, construction interference will be minimized compared to the road over rail method. This will simplify the required traffic control requirements, lowering the impact on traffic, and consequently reducing the number of lane closures required to complete the project. This also de-risks the project with respect to potential delays and safety hazards.

The traffic impact zones in this project are mostly localized to structure sites on the alignment of the proposed track extension. Because of the physical separation between sites, there will be no traffic interference between adjacent sites; hence, individual sites should have their own TTMPs. Based on our proposed construction staging approach, the individual TTMP sites are listed below:

- Rail-over-road structure at Transitway for the Ellwood Diamond grade separation
- Hunt Club Road rail-over-road and MUP bridge structures
- Lester Road rail-over-road and MUP bridge structures
- Leitrim Road rail-over-road and MUP bridge structures
- Earl Armstrong Road rail-over-road and MUP bridge structures and Earl Armstrong/Bowesville Road intersection reconfiguration
- Bowesville Road rail-over-road bridge structure
- Uplands Road rail-over-road bridge structure
- Airport Road rail-over-road bridge structure
- Airport elevated guideway adjacent to Airport Station
- Limebank Road rail-over-road bridge structure

Target Lane Closure Estimate Process including Software and Calculations Used

From our preliminary TTMPs of each site and stage of this Project, TransitNEXT has extracted the Total Target Lane Closures with respect to sections and prices as defined in PA Schedule 7 - Mobility Matters, and RFP Schedule 8 - Price Form. Using several macro-enabled spreadsheets with linkages to construction dates, we estimated the Aggregate Target Lane Closure Cost (ATLCC) to be \$[REDACTED]. The ATLC values estimated include closures for lanes, left turns and right turns. We will update these closures according to any change of dates in the construction schedule, enabling the monthly Aggregate Target Lane Closure summaries to be calculated.

During execution of the Project, TransitNEXT will use this same tool for lane closure tracking, allowing monthly Aggregate Actual Lane Closures (AALC) summaries and Monthly Lane Closure Adjustment Contributions to be made.

Variation between TTMP and Aggregate Target Lane Closure

The Traffic Control Plans (TCPs) in each site-specific TTMP submission will depict the lane closures specific to each stage of construction on the individual site. We will also summarize these in the Lane Closure Measurement and Verification Plan as part of each site-specific TTMP submission. The ATLCs derived from these TCPs do not include the closures required for the following short duration tasks as their locations are unknown at this phase of the Project. However, the necessity for these is foreseeable and may or may not cause variation between the AALCCs and ATLCs. These activities may include:

- Additional site investigations
- Closed-circuit television installation as required by the City for monitoring a construction site
- Deficiency rectification
- Emergency safety mitigations
- Changes in construction schedule
- Any work delay caused by third parties not affiliated with TransitNEXT

Sincerely,

TransitNEXT

**CONFIDENTIAL AND
PROPRIETARY**

SCHEDULE 8

[Intentionally Deleted]

SCHEDULE 9

KEY INDIVIDUALS

Project Co may propose multiple Key Individuals where multiple Key Individuals are allowed, as set out in this Schedule 9. Where multiple Key Individuals are allowed, Project Co shall identify the lead for each position. The lead for that position would be responsible for all functions of each Key Individual listed for that position. The functions listed below for each Key Individual position are not intended to be an exhaustive list of the functions expected to be performed by each Key Individual position.

A. Key Individuals – Works

Project Co Party	Position	Function / Responsibility	Qualifications	Name and Contact Information	Liquidated Damages Amount
Project Co	Project Co Representative	Project Co Representative shall have full authority to act on behalf of Project Co, and shall be responsible for overall authority and leadership of Project Co, and all Project Co parties, in accordance with the Project Agreement.	The Project Co Representative shall have a minimum of 10 years' experience. This shall include executive and P3 experience. *Project Co Representative	[REDACTED]	- [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement
Construction Contractor	Design Build Director	The Design Build Director shall be responsible for ensuring that all activities with respect to the Works are fully integrated with each other.	The Design Build Director shall have a minimum of 15 years' experience. This shall include design, construction, and P3 or Design-Build experience on projects of similar scope and complexity.	[REDACTED]	- [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement

Project Co Party	Position	Function / Responsibility	Qualifications	Name and Contact Information	Liquidated Damages Amount
Construction Contractor	Design Manager	<p>The Design Manager shall be responsible for:</p> <ul style="list-style-type: none"> (i) coordinating all designs produced by the Design Team; ensuring the schedule for Design Development Submittals is reflected in each update of the Works Schedule; (ii) coordinating with the City Representative, or its designate, to prioritize the review of each of the Works Submittals, if necessary; and (iii) ensuring obligations set out in Schedule 10 – Review Procedure are fulfilled for each Works Submittal. 	<p>The Design Manager shall be a Professional Engineer with a minimum 15 years of design experience. This should include Design Build or P3 experience on rail projects of similar scope and complexity.</p> <p>*Design Manager</p>	[REDACTED]	<ul style="list-style-type: none"> - [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement

Project Co Party	Position	Function / Responsibility	Qualifications	Name and Contact Information	Liquidated Damages Amount
Construction Contractor	Systems Integration Manager	The Systems Integration Manager shall have the responsibility for all activities as outlined in Article 11 of Part 1 of Schedule 15-2 of the Output Specifications and Schedule 14 Testing and Commissioning.	The Systems Integration Manager shall have a degree in engineering from a recognized university and a minimum of 15 years' experience in systems design, requirements traceability, interface capture and management, integration management plan development, systems test plan and procedure development, test program management and systems commissioning. Experience managing and coordinating systems integration activities. *System Integration	[REDACTED]	- [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement
Construction Contractor	Utility Work Manager	The Utility Work Manager shall be responsible for all activities required to fulfill Project Co's obligations as set out in Article 8 to Part 2 of Schedule 15-2 of the Output Specifications and will act as a single point of contact on all utility related matters.	The Utility Work Manager shall have a minimum of 10 years' experience in Utility Works on rail projects. *Utility Coordination	[REDACTED]	- [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement

Project Co Party	Position	Function / Responsibility	Qualifications	Name and Contact Information	Liquidated Damages Amount
Construction Contractor	Design Architect	The Design Architect shall have the qualifications and responsibilities as set out in Schedule 15-2, Part 4	The Design Architect shall be a licensed Architect and have a minimum of 15 years' experience designing transit projects of similar scope and complexity *Architecture	[REDACTED]	- [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement
Construction Contractor	Environmental Manager	The Environmental Manager shall have the responsibilities set out in Schedule 17 – Environmental Obligations.	The Environmental Manager shall have a relevant Sciences degree from a recognized university and a minimum of 15 years' experience including environmental management on projects of similar scope and complexity. The Environmental Manager shall have successfully completed a recognized ISO 14001 Lead Auditor Course.	[REDACTED]	- [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement

Project Co Party	Position	Function / Responsibility	Qualifications	Name and Contact Information	Liquidated Damages Amount
Construction Contractor	Director of Communications and Stakeholder Engagement	The Director of Communications and Stakeholder Engagement shall be responsible for all activities required to fulfill Project Co's obligations as set out in Schedule 18 – Communication and Stakeholder Engagement Obligations.	The Director of Communications and Stakeholder Engagement shall have a degree from a recognized university and or college in communications, media relations or other relevant speciality, with a minimum of 10 years' experience leading communications and stakeholder engagement on transit or transportation construction projects of similar scope and complexity, and is bilingual in Canada's two official languages (English and French). *Stakeholder Communications and Public Engagement	[REDACTED]	<ul style="list-style-type: none"> - [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement

Project Co Party	Position	Function / Responsibility	Qualifications	Name and Contact Information	Liquidated Damages Amount
Construction Contractor	Construction Manager	The Construction Manager shall be responsible for all Construction Activities and compliance of Construction Activities with the Project Agreement.	The Construction Manager shall have a degree from a recognized university or technical college in engineering, management, or other relevant specialty, with a minimum of 15 years of heavy civil transit orientated construction experience on projects of similar scope and complexity. *Construction Manager	[REDACTED]	- [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement
ProjectCo	IMS Director	The IMS Director shall have the responsibilities set out in Schedule 11 – Integrated Management System.	The IMS Director shall be a certified QMS 2000 series Auditor, or at a minimum will have successfully completed a recognized ISO 9001, 14001, or OHSAS 18001 Lead Auditor Course and have at least 15 years of experience including IMS/Quality Management experience on projects of similar scope, and complexity.	[REDACTED]	- [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement

Project Co Party	Position	Function / Responsibility	Qualifications	Name and Contact Information	Liquidated Damages Amount
Construction Contractor	Maintenance Director	The Maintenance Director shall have the responsibilities set out in Part 1 of Schedule 15-3 of the Output Specifications.	The Maintenance Director shall have a degree from a recognized university or technical college and have a minimum of 15 years' experience in the maintenance of vehicles, systems and/or infrastructure on projects of similar scope and complexity. *Maintenance Director	[REDACTED]	- [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement
Construction Contractor	Safety and Security Certification Manager	The Safety and Security Certification Manager shall have the responsibilities set out in Part 1, Article 7 of Schedule 15-2 of the Output Specifications.	The Safety and Security Certification Manager shall have a minimum of 15 years' experience in the development and implementation of an SSCP.	[REDACTED]	- [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement
Construction Contractor	Project Co Testing and Commissioning Coordinator	The Testing and Commissioning Coordinator shall have the responsibilities set out in Schedule 14 – Testing and Commissioning.	The Testing & Commissioning Coordinator shall have a minimum of 10 years' experience in the management and oversight of the testing and commissioning of System Infrastructure of similar scope and complexity.	[REDACTED]	- [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement

Project Co Party	Position	Function / Responsibility	Qualifications	Name and Contact Information	Liquidated Damages Amount
Project Co	OHS Manager	The OHS Manager shall have the responsibilities set out in Schedule 11.	The OHS Manager shall be a Canadian Registered Safety Professional (CRSP) having successfully completed the courses required under the COR program and OHSAS 18001 Lead Auditor course with a minimum of 10 years' experience in the development, implementation, and audit of an IMS-OHS for projects of similar scope and complexity. *Health and Safety	[REDACTED]	- [REDACTED] pursuant to Section 10.4 (a) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement

B. Key Individuals – Maintenance Period

Project Co Party	Position	Function / Responsibility	Qualifications	Name and Contact Information	Liquidated Damages Amount
Project Co	Project Co Representative	Project Co Representative shall have full authority to act on behalf of Project Co, and shall be responsible for overall authority and leadership of Project Co, and all Project Co parties, in accordance with the Project Agreement.	The Project Co Representative shall have a minimum of 10 years' experience. This shall include executive and P3 experience. *Project Co Representative	[REDACTED]	- [REDACTED] pursuant to Section 10.4(b) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement

Project Co Party	Position	Function / Responsibility	Qualifications	Name and Contact Information	Liquidated Damages Amount
Project Co	IMS Director	The IMS Director shall have the responsibilities set out in Schedule 11 – Integrated Management System.	The IMS Director shall be a certified QMS 2000 series Auditor, or at a minimum will have successfully completed a recognized ISO 9001, 14001, or OHSAS 18001 Lead Auditor Course and have at least 15 years of experience including IMS/Quality Management experience on projects of similar scope, and complexity.	[REDACTED]	<ul style="list-style-type: none"> - [REDACTED] pursuant to Section 10.4(b) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement
Maintenance and Rehabilitation Contractor	Maintenance Director	The Maintenance Director shall have the responsibilities set out in Part 1 of Schedule 15-3 of the Output Specifications.	The Maintenance Director shall have a degree from a recognized university or technical college and have a minimum of 15 years' experience in the maintenance of vehicles, systems and/or infrastructure on projects of similar scope and complexity. *Maintenance Director	[REDACTED]	<ul style="list-style-type: none"> - [REDACTED] pursuant to Section 10.4(b) of the Project Agreement - [REDACTED] per day, pursuant to Section 10.4 (c) and 10.4(d) of the Project Agreement

* Notes a role to be filled by the same Key Individual qualified for such role as part of the RFQ process. If, given the required qualifications indicated herein, the Proponent determines that any Key Individual qualified for such role as part of the RFQ process does not meet the required qualifications for the particular role, pursuant to Section 3.6(3) of the RFP, any changes in Identified Proponent Parties from the RFQ must be made no later than the deadline set out in the RFP Timetable.

SCHEDULE 10

REVIEW PROCEDURE

PART A – DESIGN AND CONSTRUCTION REQUIREMENTS

ARTICLE 1 WORKS SUBMITTALS

- 1.1. The provisions of Part A of this Schedule 10 shall apply to the Design Development Submittals, the Construction Document Submittals, the Design Data and any and all items, documents and anything else required or specified by the Project Agreement, including all Works Submittals listed in Appendix A to this Schedule 10, in respect of the Works to be submitted to, reviewed or otherwise processed by the City in accordance with the Review Procedure prior to Substantial Completion, or after Substantial Completion in respect of the completion of Minor Deficiencies, including any and all subsequent revisions, amendments and changes thereto (collectively and individually, “Works Submittal” or “Works Submittals” as applicable in Part A of this Schedule 10).
- 1.2. For clarity, the provisions of Part A of this Schedule 10, including any deadlines for submission or review set out herein, shall not apply to any processing or review of any Permits, Licences, Approvals and Agreements.
- 1.3. Subject to Article 1.2, if the City fails to meet the timelines set out in this Schedule 10 with respect to its review of any Submittals, such failure shall be deemed to be a breach by the City to comply with the timelines set out in this Schedule 10.
- 1.4. In general, Works Submittals shall consist of the following. Specific requirements for each of these Work Submittals are detailed further in Appendix A.
 - (a) Design Development Submittals:
 - (i) Basis of design reports

Prior to the preparation of each Pre-Final Design Development Submission, Project Co shall develop a basis of design report for each discipline, based on the PA and PSOS project requirements. The basis of design report shall describe the technical approach planned for the project as well as the technical requirements, security mitigation and measures to be employed, design codes and parameters to be used.
 - (ii) Pre-Final Design Development (PFDD), which is the stage of design development where the design details of the relevant Works Submittal are established and drawings and specifications for construction have been developed, but are not yet fully finalized.
 - (iii) Final Design Development (FDD), which is the stage of design development where the design details of the relevant Works Submittal are finalised and the construction drawings and construction specifications for the designed element

are also finalized.

- (b) Construction Document Submittals;
 - (c) Other reports, studies, matrices and plans listed in this Schedule 10 and in Appendix A to this Schedule 10;
 - (d) Other reports, studies, matrices and plans listed in the relevant sections of the Project Agreement; and
 - (e) Works Schedules, in accordance with Schedule 12 – Works Scheduling Requirements and as per Article 3.13.
- 1.5. Project Co shall be responsible for determining any and all necessary Works Submittals, as specified in the relevant sections of the Project Agreement.
- 1.6. Other reports, studies and plans shall be submitted as follows:
- (a) Project Co shall be responsible for determining the timing of the preparation of reports, studies and plans required in the preparation of the PFDD, FDD and Construction Document Submittals, unless timing of these reports, studies and plans are identified in this Schedule 10 or in other relevant sections of the Project Agreement. Project Co shall include the timing and submission sequence of all reports, studies and plans which will inform the Design Development Submittals in the schedule of Works Submittals pursuant to Section 20.4(b)(v) of the Project Agreement. Project Co shall prepare a minimum of two hard copies and one electronic upload of submissions of reports, studies, matrices and plans for review by the City as follows:
 - (i) Draft format; and,
 - (ii) Final format (signed and sealed).
 - (b) Project Co shall be responsible for preparing and submitting additional updated submissions of reports, studies and plans, if the validity of such is altered due to design changes or if more frequent submissions are identified in this Schedule 10 or in other relevant sections of the Project Agreement.
- 1.7. [Intentionally Deleted]
- 1.8. Requirement for a Compliance Verification & Validation Matrix:
- (a) Project Co. shall use the Requirements Management tool to develop reports on compliance with the Output Specifications and other requirements (e.g. new rail vehicle interface) in the form of Compliance Verification & Validation Matrix. The Compliance Verification & Validation Matrix shall provide line by line reporting of all applicable requirements and shall provide full traceability between requirements and compliance demonstration including preliminary and final design references, quality assurance & control, testing & commissioning (including but not limited to FAT, PICO, SAT, SIT, and system wide testing); and
 - (b) Project Co shall submit the Compliance Verification & Validation Matrix in accordance with this

Schedule 10 a as part of the Basis for Design submittal, at the Pre-Final Design Development stage, Final Design Development stage, and prior to system wide testing.

- (c) [Intentionally Deleted]

1.9. Design review workshops

- (a) Project Co shall schedule and coordinate design review workshops in advance of issuing Pre-Final Design Development Submittals;
- (b) The Project Co Representative shall arrange the design review workshops in consultation with the City Representative;
- (c) The Parties shall cooperate to develop a reasonable schedule for the design review workshops and shall incorporate such schedule into the Current PBS;
- (d) Project Co shall circulate to the City Representative an agenda for each of the design review workshops no later than 5 Business Days prior to the relevant design review workshop;
- (e) The design review workshops shall be held in person in the City of Ottawa, Ontario, except where otherwise agreed by the Parties, acting reasonably; and
- (f) In advance of a design review workshop, Project Co may submit to the City Design Team for comment any interim drafts of any designs or plans required under this Project Agreement, which submissions shall be used to inform the City on the development of New City Infrastructure design and provide an opportunity for dialog on compliance with the requirements of the Project Agreement. For greater certainty, interim submissions shall be informal and shall not be reviewed in accordance with Schedule 10 - Review Procedure.

ARTICLE 2 SCHEDULE FOR WORKS SUBMITTALS

- 2.1. Project Co shall schedule the Review Procedure Activities, including the submission dates for all Works Submittals and the City review period in accordance with Part A of this Schedule 10.**
- 2.2. The Works Schedule and any amendment to the Works Schedule shall allow:**
- (a) A period of 15 Business Days (or such longer period as the Parties may agree) from the date of receipt for the City's review of and response to each Works Submittal for all Works; and
 - (b) A period of 20 Business Days (or such longer period as the Parties may agree) from the date of receipt for the City's review of and response to each Works Submittal containing elements of the Works to be constructed within or adjacent to MTO and NCC Lands. Refer to the Lands Table in Schedule 33 – Lands for the extent of these Lands.

This period of time may be subject to modification as agreed upon with the City.

- 2.3. Project Co shall submit all Works Submittals to the City no later than the dates identified in the Current PBS, as defined in Schedule 12 – Works Scheduling Requirements. The City Representative shall review and respond to each Works Submittal in accordance with the review time periods specified in Article 2.2 of this Schedule 10 – Review Procedure, or as otherwise agreed to between the Parties.
- 2.4. If, at any time, any or all of:
 - (a) Revised PBS is under review by the City;
 - (b) Project Co submits a volume of Works Submittals not contemplated by the Current PBS; or
 - (c) a Works Submittal was, or Works Submittals were, received for review later than indicated in the Current PBS, such that the City Representative cannot review the Works Submittal or Works Submittals within the time permitted in the Current PBS,

then the City Representative shall, within five Business Days of receipt of such Works Submittal or Works Submittals, provide Project Co with a reasonable estimate of the time necessary for processing such Works Submittal or Works Submittals which estimate Project Co shall take into account for the purposes of Schedule 12 – Works Scheduling Requirements, provided that an extension shall not be greater than 5 Business Days.

ARTICLE 3 GENERAL REQUIREMENTS FOR WORKS SUBMITTALS

- 3.1. Unless otherwise specified by the City Representative, Project Co shall issue all Works Submittals to the City in the format described in Appendix A to this Schedule 10, and one printed copy of each Works Submittal to the Independent Certifier.
- 3.2. Project Co shall, at its own cost and risk, compile and maintain a Review Procedure Activities Register, to be uploaded to the Electronic Data Management System (EDMS) as detailed in Article 4.10 and Appendix A, to track the status of each Works Submittal through every stage of preparation, submission, and review by the City, and approval by the applicable third party, including for clarity, approval from the City. Project Co shall submit documentation on the proposed design, functionality, and usage of the Review Procedure Activities Register to the City Representative in accordance with Schedule 10 – Review Procedure no later than Financial Close.
- 3.3. The Review Procedure Activities Register shall:
 - (a) be updated on a daily basis by Project Co and be accessible by the City, any other entity as requested by the City and Project Co, in real time, through a web-based project management system, unless otherwise permitted by the City;
 - (b) be in place and operational no later than 30 days after Financial Close; and
 - (c) include identification of each of the following:

- (i) the submittal date and contents of all Works Submittals;
- (ii) the date of receipt and content of all returned Works Submittals;
- (iii) status of comments on all Work Submittals in accordance with Article 4.1 of this Schedule 10;
- (iv) vulnerability or security breaches
- (v) review and update City's SSCP and SSeCP to be submitted 30 days after Financial Close; and
- (vi) tracking ID's (in a format reasonably acceptable to the City) supporting the requirements of Article 3.7; and
- (vii) include a tracking log to monitor the resolution of comments that arise during the Review Procedure, as per Article 4.10 of this Schedule 10.

- 3.4. All Works Submittals shall be in English.
- 3.5. All Works Submittals required by the Project Agreement or by Applicable Law to be signed or sealed by persons with professional designations, registered in the Province of Ontario (including, where applicable, by registered professional engineers, professional geo-scientists, architects or landscape architects) shall be so signed and sealed.
- 3.6. All Works Submittals shall:
 - (a) include copies of all documents to be reviewed;
 - (b) be uploaded to the EDMS and are to include an electronic file-naming convention acceptable to the City; and
 - (c) shall clearly identify the purpose of the Works Submittal, Project Co's proposed course of action relating to the Works Submittal and the Project Operations that are the subject of the Works Submittal.
- 3.7. All Works Submittals shall, where applicable, refer to and be in accordance with the relevant provisions of the Output Specifications, any other applicable Schedule to the Project Agreement and to any Design Data that has previously been subject to review.
- 3.8. Each Works Submittal shall be clearly identified as a Works Submittal and shall be delivered with appropriate covering documentation, which shall include:
 - (a) a summary table which lists all revisions or changes from previous Works Submittals; and
 - (b) a list of all attached Works Submittals and for each Works Submittal;

- (i) identification of whether the Works Submittal contains System Infrastructure, New Municipal Infrastructure, and elements of Works on or adjacent to MTO and NCC Lands.
 - (ii) the document number(s) or drawing number(s);
 - (iii) revision numbers (if applicable);
 - (iv) document or drawing title(s);
 - (v) name of entity that prepared the Works Submittal;
 - (vi) name and signature of the Design Manager and other Key Individual(s) responsible for content of the Works Submittal;
 - (vii) quality control documentation in accordance with Schedule 11 – Integrated Management System Requirements;
 - (viii) the Works Submittal history, including reviewer and checker initials, date and delivery information, log number of all previous submissions of that Works Submittal, Project Agreement provisions, comments from reviewers from the previous Works Submittal, all outstanding comments, and responses to addressing those comments, all submitted in a format reasonably acceptable to the City; and
 - (ix) identification of any previous Works Submittal superseded by the current Works Submittal.
- 3.9. To facilitate the City's distribution of Works Submittals to the NCC and MTO, all Works Submittals that are to be reviewed by the NCC and MTO, shall be separated accordingly and submitted individually.
- 3.10. Each Works Submittal shall be organized into relevant sections. Each Work Submittal shall contain pertinent correspondence, shall be arranged by subject matter in chronological order, and shall include the final calculations, reports and backup information. All Works Submittals shall, without limitation, include copies of all final approvals, design reports, correspondence and calculations, in both electronic and hard copy.
- 3.11. [Intentionally Deleted]
- 3.12. Issued For Construction Works Submittals
- (a) Construction Document Submittals submitted in accordance with this Schedule 10 – Review Procedure and assigned comments “NO COMMENT” or “MINOR COMMENT” with all of the comments resolved, shall become Issued For Construction and Project Co shall stamp them as “Issued For Construction”. Works Submittals used for the construction of any part or parts of the Project prior to being entitled to proceed, as noted above, shall not be stamped as Issued For Construction.
 - (b) Project Co shall submit copies of all drawings that are Issued For Construction, together with manuals and instructions, to the City Representative and to the Independent Certifier.
 - (c) Revisions to Issued For Construction documents shall be submitted for review as

Construction Document Submittals, being stamped “Issued For Construction” upon being entitled to proceed in accordance with this Schedule 10 – Review Procedure. Issued For Construction documents are required for the certification of construction detailed in Appendix A of this Schedule 10.

3.13. Works Schedule Re-baseline Submittals

- (a) Project Co shall prepare Works Schedules re-baselined in accordance with Schedule 12 – Works Scheduling Requirements. Project Co shall submit the Works Schedules re-baselined for review in accordance with this Schedule 10.
- (b) All non-draft submissions shall include Project Co Representative’s dated signature on the front cover of each document.
- (c) All Works Schedules submitted to the City shall be submitted in two electronic file formats. The first format shall be in the native file format of the software used to generate and manage the Works Schedules, which shall be the exported .XER file for the latest version of Primavera Professional Project Management (PPM). The second format shall be a word-searchable high resolution colour PDF version. Upon City’s request, Project Co shall provide the details of the software and any additional software plug-ins used by Project Co, a copy of any templates, and the details for any software settings it has used in its scheduling software, such as calendar settings, user and administrative preferences, schedule settings, and any other information required to enable the City to replicate the Works Schedules submitted by Project Co using the native file formats provided by Project Co.
- (d) At each submission, Project Co shall provide at least two hardcopies of the PBS printed in colour in a reasonable scale and on an appropriate paper size. Project Co shall submit one .XER file used to generate the Works Schedule re-baseline and the resultant PDF.
- (e) All tabular information including numerical data or calculations shall be submitted in two electronic file formats. The first format shall be in the Microsoft Excel file format that would allow the City to review formulas and manipulate the data for the purpose of evaluation and the second format shall be a high resolution PDF version.
- (f) The filename of each of the electronic files submitted shall indicate the project name acronym, schedule type, revision number and the schedule status date in the format ‘YYYYMMDD’ - e.g. PBS-4 shall be named “TRI PBS-4 – 20180731”.
- (g) The requirements of Article 3 shall apply to all PBS Submittals.

ARTICLE 4 COMMENTS

- 4.1. The City Representative shall review and respond to each Works Submittal in accordance with the time periods specified in Article 2.2. The City Representative shall return Works Submittals to Project Co with a copy to the Independent Certifier and assign one of the following four comments:

- (a) “NO COMMENT”;
 - (b) “MINOR COMMENT”;
 - (c) “MAJOR COMMENT”; or
 - (d) “CRITICAL COMMENT”.
- 4.2. The comment “NO COMMENT” will be assigned to those Works Submittals that, in the opinion of the City Representative, generally conform to the requirements of the Project Agreement, and recognizing the degree of design development. Project Co shall comply with and implement such Works Submittals.
- 4.3. The comment “MINOR COMMENT” will be assigned to those Works Submittals that, in the opinion of the City Representative, generally conform to the requirements of the Project Agreement, recognizing the degree of design development, but in which non-material deficiencies have been found by the City Representative’s review. Project Co shall correct these Works Submittals in the submission immediately subsequent, and shall comply with and implement such Works Submittals after correction, including in accordance with the comments. If the City Representative assigns to a Works Submittal the additional comment “RE-SUBMIT”, then,
- (a) Project Co shall correct and re-submit such Works Submittal, in its entirety and at its own cost, to the City Representative no later than 20 Business Days after the comment has been provided to Project Co, or as agreed between Project Co and the City Representative, and as set out in writing.
 - (b) If at any time it is discovered that Project Co has not corrected the deficiencies on Works Submittals stamped “MINOR COMMENT”, then Project Co will be required to modify the Works Submittals and Project Operations as required to ensure that the Works comply with the Output Specifications, any other applicable Schedule to the Project Agreement, and the Project Co Proposal Extracts and Project Co may be required, at the City Representative’s discretion, to resubmit the relevant Works Submittals.
 - (c) In such circumstances the City Representative shall act promptly in considering whether such deficiencies have been corrected. At the City Representative’s discretion, comments addressed as “MINOR COMMENT” that have not been addressed in the subsequent submission may be escalated to “MAJOR COMMENT” or “CRITICAL COMMENT”.
 - (d) No extension of time will be given or additional compensation paid in respect of any such modification or re-submittal.
- 4.4. The comment “MAJOR COMMENT” or “CRITICAL COMMENT” will be assigned to those Works Submittals that, in the opinion of the City Representative, contain significant deficiencies or do not generally conform to the requirements of the Project Agreement, including this Schedule 10.

- (a) Project Co shall correct and re-submit these Works Submittals within 20 Business Days after the comment has been provided to Project Co, or such other time period as agreed between Project Co and the City Representative, and as set out in writing.
 - (b) The City Representative will then review such re-submitted Works Submittals and assign a comment to the corrected Works Submittal. The Works Submittals shall be corrected, revised and resubmitted as often as may be required to obtain a comment that permits Project Co to proceed.
 - (c) No extension of time will be given or additional compensation paid in respect of any such modification or re-submittal. In addition to the above, a Works Submittal with a “CRITICAL COMMENT” comment will be a Proceeding At Risk Matter in accordance with Section 11.6(a) of the Project Agreement.
- 4.5. Where the City Representative issues the comment “MINOR COMMENT”, “MAJOR COMMENT” or “CRITICAL COMMENT”, the City Representative shall provide reasons for the comment, referencing the particulars of the Section(s) of the Project Agreement that the Works Submittal fails to satisfy. Project Co shall schedule a meeting between the Project Co Representative and the City Representative to discuss the resolution of “MAJOR COMMENT” and “CRITICAL COMMENT” comments. At the City Representative’s discretion, a meeting may be requested to resolve “MINOR COMMENT” comments.
- 4.6. If, at any time after assigning any comment to a Works Submittal, the City Representative or Project Co discovers any significant deficiencies or any failure to conform to the requirements of the Project Agreement, the City Representative may revise the comment assigned to any Works Submittal. If the Parties agree or it is determined in accordance with Article 5 of this Schedule that the revised comment is correct, Project Co shall make all such corrections to the Works Submittals and the Project Operations. No extension of time will be given or additional compensation paid in respect of any such modification or re-submittal.
- 4.7. For the purpose of facilitating and expediting the review and correction of Works Submittals, the City Representative and the Project Co Representative shall meet, as may be mutually agreed, to discuss and review any outstanding Works Submittals and any comments thereon.
- 4.8. Where a Works Submittal is voluminous, the City Representative at his or her discretion may elect to stamp only the cover page or first sheet of the Works Submittal with the appropriate comment, if any, and return to Project Co the cover page or first page together with individual pages or sheets on which comments are made, together with an explanation of the status of all pages not returned to Project Co. Any pages returned without such an explanation as to their status shall be deemed to be “NO COMMENT” by the City.
- 4.9. In lieu of returning a Works Submittal, the City Representative may notify Project Co of the comment assigned to the Works Submittal and if such comment is “MINOR COMMENT”, “MAJOR COMMENT” or “CRITICAL COMMENT”, then the notification shall contain comments in sufficient detail for Project Co to identify the correction sought.
- 4.10. Project Co shall be responsible for creating and maintaining an EDMS as defined in Appendix A, as a tracking log to monitor, as a minimum, the approval of submittals and the resolution of

comments (in a format reasonably acceptable to the City) which is to be available to the City, as described in Article 3. The EDMS will also be used as a repository for all other electronic submittal uploads and document control. The EDMS shall be in place and operational the earlier of, the date upon which the first Works Submittal is submitted or 60 days after Financial Close. The EDMS shall be deemed reasonably acceptable to the City prior to implementation.

- (a) The City accepts that there may be an occasional requirement for routine system shutdowns and/or maintenance. This maintenance shall take place when it will minimize the effect on the obligations as set out in this Project Agreement.
- 4.11. At the City Representative's discretion, Project Co may be requested to attend a meeting to discuss the resolution of any unresolved comments.

ARTICLE 5 DISPUTES

- 5.1. If Project Co disputes any act of the City or the City Representative in respect of a Works Submittal under this Part A of Schedule 10, Project Co shall promptly notify the City Representative and the Independent Certifier of the details of such Dispute and shall submit the reasons why Project Co believes a different comment should be assigned, together with appropriate supporting documentation. The City Representative shall review the Works Submittal, the reasons and supporting documentation and within five Business Days after receipt thereof shall either confirm the original comment or notify Project Co of a revised comment. If the City Representative confirms the original comment, Project Co may request that the Independent Certifier resolve the Dispute and render a decision within five Business Days of such request.
- 5.2. If either Party is not satisfied, acting reasonably, with the resolution of the Independent Certifier, subject to Article 10.2 of Part A of Schedule 10, either Party may refer the matter for determination in accordance with Schedule 26 - Dispute Resolution Procedure.
- 5.3. Notwithstanding the provisions of Articles 5.1 and 5.2, the City Representative may direct that Project Co revise the Works Submittals in accordance with the comments of the City Representative and proceed to perform and complete the Works on the basis of such revised Works Submittals. For clarity, such direction shall be considered a Dispute and Project Co may proceed in accordance with this Article 5 and Schedule 26 – Dispute Resolution Procedure.

ARTICLE 6 EFFECT OF REVIEW

- 6.1. Any review and comment by the City or the City Representative of any Works Submittals are for general conformity to the obligations and requirements of the Project Agreement, and any such review and comment shall not relieve Project Co of the risk and responsibility for the Project Operations and for meeting all of Project Co's obligations under and requirements of the Project Agreement, and shall not create any new or additional obligations or liabilities for the City. Without limiting the generality of the foregoing, any and all errors or omissions in Works Submittals or of any review and comment shall not exclude or limit Project Co's obligations or liabilities in respect of the Works under the Project Agreement or exclude or limit the City' rights in respect of the Works under the Project Agreement.

ARTICLE 7 WORKS SUBMITTAL EXPLANATION

- 7.1 At any time, the City Representative may, acting reasonably, require Project Co or any Project Co Parties, including Project Co's consultants and any other relevant personnel, at no additional cost to the City, to explain to the City Representative and the City advisors the intent of Project Co's Works Submittals, including in relation to any design and any associated documentation and as to its satisfaction of the Output Specifications or any other Schedule to the Project Agreement, as applicable. Project Co shall provide the explanation to the City Representative within five Business Days (or such longer period as the Parties may agree) from the date of receipt of the request from the City Representative.

ARTICLE 8 REVISIONS

- 8.1. Project Co shall ensure that each Works Submittal keeps the same unique reference number throughout the review process, and that subsequent revisions of the same Works Submittal are identified by a sequential revision number. Correspondence related to such Works Submittal shall reference the reference number and revision number.
- 8.2. Re-submittals shall clearly show all revisions from the previous Works Submittal. Bound documents, including reports and manuals, shall contain a preface that clearly states how revisions are marked and the previous revision number against which the revisions have been marked. A consistent format for mark-ups of documents shall be used (e.g. deletions struck out and additions underscored). Revised portions of drawings shall be clearly marked (with appropriate means to visually distinguish between the parts of the drawing that are revised and the parts that are not revised) and the revision number and description of the revision shall be included on the drawing. Drawings produced during Design Development shall be exempt from the requirements in Article 8.2.
- 8.3. All revisions on print media shall be initialled by hand by the individual designer, design checker and, where applicable, by the drafter and the drafting checker and shall identify the persons who initialled the Works Submittal. Electronic versions of the Works Submittal shall identify the persons who initialled the revisions to the printed version of the Works Submittal. All such revisions must be able to be integrated into the As-built Drawings and the Record Drawings.
- 8.4. Project Co shall keep all Design Data current. If any Design Data is revised as part of a Works Submittal, all other Design Data relying on or based on that Design Data shall also be revised accordingly. All such revised Design Data shall also be submitted with the Works Submittal to which it relates.
- 8.5. [Intentionally Deleted]

ARTICLE 9 AUDIT BY THE CITY REPRESENTATIVE

- 9.1. Without limiting any other right under the Project Agreement, the City Representative shall have the right to audit all Works Submittals, including comparing all Works Submittals to previous Works Submittals.

- 9.2. If during an audit or at any other time it is discovered by the City or Project Co (or resolved pursuant to Article 9.3) that any Works Submittals were not correctly implemented, Project Co shall at its sole cost immediately take all necessary steps to correct and modify the applicable Works Submittals and the Project Operations to which they relate and shall advise the City Representative of all such corrections and modifications.
- 9.3. Any Dispute concerning the implementation of a Works Submittal, subject to Article 5.1, shall be referred in the first instance to the Independent Certifier for resolution.

ARTICLE 10 VARIATIONS

- 10.1. [Not used]
- 10.2. If, having received comments from the City Representative on any Works Submittal, Project Co considers that compliance with those comments would amount to a Variation, Project Co shall, within ten (10) Business Days of receipt of and before complying with the comments, provide written Notice to the City of the same and, if it is agreed by the Parties that a Variation would arise if the comments were complied with, the City may, at their election, issue a Variation Enquiry (which shall be dealt with in accordance with Schedule 21 - Variation Procedure) or amend their comment on the Works Submittal. If the Parties do not agree that a Variation would arise if the comments were complied with, either party may proceed to resolve the matter in accordance with Article 5, including for clarity, the exercise by the City of their rights under Article 5. Subject to the foregoing sentence, any failure by Project Co to notify the City in accordance with this Article 10.2 that Project Co considers that compliance with any comments of the City Representative would amount to a Variation shall constitute an irrevocable acceptance by Project Co that any compliance with the City Representative's comments shall be without cost to the City and without any extension of time.

ARTICLE 11 GENERAL

- 11.1. Any capitalized terms used in the appendices to this Schedule 10 that are not defined in this Schedule 10, the Project Agreement or in Schedule 1 – Definitions and Interpretation, shall have the meanings given to them in Schedule 15-1 – Technical Terms and Reference Documents.

SCHEDULE 10
REVIEW PROCEDURE
PART B – MAINTENANCE PERIOD

ARTICLE 1 MAINTENANCE AND REHABILITATION SUBMITTALS

- 1.1. The provisions of Part B of this Schedule 10 shall apply to any and all items, documents and anything else required or specified by the Project Agreement (other than the Design Development Submittals, the Construction Document Submittals and the Design Data) and the Maintenance and Rehabilitation Submittals listed in Appendix B, to be submitted to, reviewed or otherwise processed by the City in accordance with the Review Procedure in respect of the Project, after Substantial Completion, except in respect of the completion of Minor Deficiencies, including any and all subsequent revisions, amendments and changes thereto (collectively and individually, “Maintenance and Rehabilitation Submittal” or “Maintenance and Rehabilitation Submittals” as applicable in Part B of this Schedule 10).
- 1.2. All Works Schedules required under Part B shall be prepared and submitted in accordance with Schedule 12 – Works Scheduling Requirements, and Schedule 15-3 – Maintenance & Rehabilitation Requirements.
- 1.3. For clarity, the provisions of Part B of this Schedule 10, including any deadlines for submission or review set out herein, shall not apply to any processing or review of any Permit, Licences, Approval or Agreements.
- 1.4. Project Co shall allow a period of 15 Business Days (or such longer period as the Parties may agree) from the date of receipt for the review of and response to each Maintenance and Rehabilitation Submittal.
- 1.5. Project Co shall, in scheduling Maintenance and Rehabilitation Submittals and in the performance of the Project Operations, allow adequate time prior to performing the Project Operations that are the subject of the Maintenance and Rehabilitation Submittals, for review of the Maintenance and Rehabilitation Submittals and for Project Co to make changes to Maintenance and Rehabilitation Submittals that may be required if comments are received on the Maintenance and Rehabilitation Submittals, such review and required changes to be in accordance with Part B of this Schedule 10.
- 1.6. Requirement for a Compliance Verification & Validation Matrix:
 - (a) Project Co. shall use the Requirements Management tool to develop reports on compliance with the Output Specifications and other requirements in the form of a Maintenance & Rehabilitation Compliance Verification & Validation Matrix. The Compliance Verification & Validation Matrix shall provide line by line reporting of all PSOS requirements and shall provide full traceability between maintenance and rehabilitation requirements and compliance demonstration including preliminary and final design references (where applicable), maintenance procedures and plans, demonstration of training plans and training delivery, final design of the performance

- reporting requirements including testing of the performance reporting system, and compliance with any other maintenance related deliverables; and
- (b) Project Co shall submit the Maintenance & Rehabilitation Compliance Verification & Validation Matrix in accordance with this Schedule 10 at two intervals: 6 months prior to Trial Running and 30 days prior to Trial Running.
 - (c) [Intentionally Deleted].

ARTICLE 2 GENERAL REQUIREMENTS FOR MAINTENANCE AND REHABILITATION SUBMITTALS

- 2.1. Unless otherwise specified by the City Representative, Project Co shall issue three printed copies of all Maintenance and Rehabilitation Submittals to the City, together with an electronic copy to the EDMS in a format agreed by the Parties acting reasonably.
- 2.2. Project Co shall utilize the Review Procedure Activities Register provided in accordance with the requirements of Article 3.2 of Part A of this Schedule 10, to track the status of each Maintenance and Rehabilitation Submittal through every stage of preparation, submission, review by the City, and approval by the applicable third party, including for clarity, approval from the City. The Review Procedure Activities Register shall be maintained in respect of Maintenance and Rehabilitation Submittals at all times during the Maintenance Period and shall:
 - (a) be maintained up-to-date by Project Co and be accessible by the City, any other entity as requested by the City and Project Co in real time, through a web-based project management system, unless otherwise permitted by the City;
 - (b) include identification of the following:
 - (i) the submittal date and contents of all Maintenance and Rehabilitation Submittals;
 - (ii) the date of receipt and content of all returned Maintenance and Rehabilitation Submittals;
 - (iii) the status of comments on all Maintenance and Rehabilitation Submittals in accordance with Article 3.1 of this Part B of Schedule 10; and
 - (iv) tracking ID's (in a format reasonably acceptable to the City) supporting the requirements of Article 2.7.
- 2.3. All Maintenance and Rehabilitation Submittals shall be in English.
- 2.4. All Maintenance and Rehabilitation Submittals required by the Project Agreement or by Applicable Law to be signed or sealed by persons with professional designations registered in the Province of Ontario (including, where applicable, by registered professional engineers, geoscientists, architects or landscape architects) shall, where applicable, be so signed and sealed.
- 2.5. All Maintenance and Rehabilitation Submittals shall:
 - (a) include copies of all documents to be reviewed;

- (b) include an electronic file-naming convention acceptable to the City, acting reasonably; and
 - (c) clearly identify the purpose of the Maintenance and Rehabilitation Submittal, Project Co's proposed course of action relating to the Maintenance and Rehabilitation Submittal and the Project Operations that are the subject of the Maintenance and Rehabilitation Submittal.
- 2.6. All Maintenance and Rehabilitation Submittals shall, where applicable, refer to the relevant provisions of the Output Specifications and/or any other applicable Schedule to the Project Agreement.
- 2.7. All Maintenance and Rehabilitation Submittals shall be clearly identified as a Maintenance and Rehabilitation Submittal and shall be delivered with appropriate covering documentation, which shall include a list of all attached Maintenance and Rehabilitation Submittals, and for each Maintenance and Rehabilitation Submittal:
- (a) the document number(s) or drawing number(s);
 - (b) revision numbers (if applicable);
 - (c) document or drawing title(s);
 - (d) name of entity that prepared the Maintenance and Rehabilitation Submittal;
 - (e) name and signature of the Maintenance Director and other Key Individual(s) responsible for content of the Maintenance and Rehabilitation Submittal;
 - (f) Quality control documentation in accordance with Schedule 11 – Integrated Management System Requirements;
 - (g) the Maintenance and Rehabilitation Submittal history showing date and delivery information and/or log number of all previous submissions of that Maintenance and Rehabilitation Submittal as per the EDMS as detailed in 4.10 in Part A; and
 - (h) identification of any previous Maintenance and Rehabilitation Submittal superseded by the current Maintenance and Rehabilitation Submittal.
- 2.8. Each Maintenance and Rehabilitation Submittal shall be organized and shall have indexes and sectional dividers. The Maintenance and Rehabilitation Submittals shall contain pertinent correspondence, shall be arranged by subject matter in chronological order, and shall include the final calculations, reports and backup information. Submissions shall include copies of all final approvals, design reports, correspondence and calculations.

ARTICLE 3 COMMENTS

- 3.1. The City Representative shall review and respond to each Maintenance and Rehabilitation Submittal in accordance with the time periods specified in Article 1.4. The City Representative shall return Maintenance and Rehabilitation Submittals to Project Co and assign one of the following four comments:
- (a) “NO COMMENT”;
 - (b) “MINOR COMMENT”;
 - (c) “MAJOR COMMENT” or
 - (d) “CRITICAL COMMENT”.
- 3.2. The comment “NO COMMENT” will be assigned to those Maintenance and Rehabilitation Submittals that, in the opinion of the City Representative, conform to the requirements of the Project Agreement. Project Co shall comply with and implement such Maintenance and Rehabilitation Submittals.
- 3.3. For Maintenance and Rehabilitation Submittals that require approval from third parties, including, for clarity, approval from the City, the City Representative may not issue a “NO COMMENT” or a “MINOR COMMENT” comment if the applicable third party has not approved those Maintenance and Rehabilitation Submittals.
- 3.4. The comment “MINOR COMMENT” will be assigned to those Maintenance and Rehabilitation Submittals that, in the opinion of the City Representative, generally conform to the requirements of the Project Agreement, but in which non-material deficiencies have been found by the City Representative’s review. Project Co shall correct these Maintenance and Rehabilitation Submittals and shall comply with and implement such Maintenance and Rehabilitation Submittals after correction, including in accordance with the comments. If the City Representative assigns to a Maintenance and Rehabilitation Submittal the additional comment “RE-SUBMIT”, then,
- (a) Project Co shall correct and re-submit such Maintenance and Rehabilitation Submittal, in its entirety and at its own cost to the City Representative no later than 20 Business Days after the comment has been provided to Project Co, or such other time period as determined by the City Representative, acting in its sole discretion and as set out in writing.
 - (b) If at any time it is discovered that Project Co has not corrected the deficiencies on Maintenance and Rehabilitation Submittals stamped “MINOR COMMENT”, then Project Co will be required to modify the Maintenance and Rehabilitation Submittals and Project Operations as required to ensure that the Project Operations comply with the Output Specifications and Project Co may be required, at the City Representative’s discretion, to resubmit relevant Maintenance and Rehabilitation Submittals.
 - (c) In such circumstances, the City Representative shall act promptly in considering whether such deficiencies have been corrected. At the City Representative’s discretion,

- comments addressed as “MINOR COMMENT” that have not been addressed in the subsequent submission may be escalated to “MAJOR COMMENT” or “CRITICAL COMMENT”.
- (d) No extension of time will be given or additional compensation paid in respect of any such modification or re-submittal.
- 3.5. The comment “MAJOR COMMENT” or “CRITICAL COMMENT” will be assigned to those Maintenance and Rehabilitation Submittals that, in the opinion of the City Representative, contain significant deficiencies or do not generally conform to the requirements of the Project Agreement, including this Schedule 10.
- (a) Project Co shall correct and re-submit these Maintenance and Rehabilitation Submittals within 15 Business Days after the comment has been provided to Project Co, or such other time period, as determined by the City Representative, acting in its sole discretion and as set out in writing.
- (b) The City Representative will then review such re-submitted Maintenance and Rehabilitation Submittals and assign a comment to the corrected Maintenance and Rehabilitation Submittal. The Maintenance and Rehabilitation Submittals shall be corrected, revised and resubmitted, in their entirety, as often as may be required to obtain a comment that permits Project Co to proceed.
- (c) No extension of time will be given or additional compensation paid in respect of any such modification or re-submittal. In addition to the above, a Maintenance and Rehabilitation Submittal with a “CRITICAL COMMENT” comment shall be escalated to the Maintenance Committee.
- 3.6. Where the City Representative issues the comment “MINOR COMMENT”, “MAJOR COMMENT” or “CRITICAL COMMENT”, the City Representative shall provide reasons for the comment, referencing the particulars of the Section(s) of the Project Agreement that the Maintenance and Rehabilitation Submittal fails to satisfy, and, if requested by the Project Co Representative, the City Representative shall meet with the Project Co Representative to discuss the reasons for the comment.
- 3.7. If, at any time after assigning any comment to a Maintenance and Rehabilitation Submittal, the City Representative or Project Co discovers any significant deficiencies or any failure to conform to the requirements of the Project Agreement, the City Representative may revise the comment assigned to any Maintenance and Rehabilitation Submittal. If the Parties agree or it is determined in accordance with Article 3.11 of this Schedule 10 that the revised comment is correct, Project Co shall make all such corrections to the Maintenance and Rehabilitation Submittals and the Project Operations. No extension of time will be given or additional compensation paid in respect of any such modification or re-submittal.
- 3.8. For the purpose of facilitating and expediting the review and correction of Maintenance and Rehabilitation Submittals, the City Representative and the Project Co Representative shall meet as may be mutually agreed to discuss and review any outstanding Maintenance and Rehabilitation Submittals and any comments thereon.

- 3.9. Where a Maintenance and Rehabilitation Submittal is voluminous, the City Representative at his or her discretion may elect to stamp only the cover page or first sheet of the Maintenance and Rehabilitation Submittal with the appropriate comment, if any, and provide Project Co with the cover page or first page together with individual pages or sheets on which comments are made, together with an explanation of the status of all pages not returned to Project Co. Any pages returned without such an explanation as to their status shall be deemed to be "NO COMMENT" by the City.
- 3.10. In lieu of returning a Maintenance and Rehabilitation Submittal, the City Representative may notify Project Co of the comment assigned to the Maintenance and Rehabilitation Submittal and if such comment is "MINOR COMMENT", "MAJOR COMMENT" or "CRITICAL COMMENT", then the notification shall contain comments in sufficient detail for Project Co to identify the correction sought.
- 3.11. Project Co shall be responsible for creating and maintaining a tracking log to monitor the resolution of comments (in a format reasonably acceptable to the City) which is to be available to the City, as described in Article 2.
- 3.12. At the City Representative's discretion, Project Co may be requested to attend a meeting to discuss the resolution of any unresolved comments.

ARTICLE 4 DISPUTES

- 4.1. If Project Co disputes any act of the City or the City Representative in respect of a Maintenance and Rehabilitation Submittal under this Part B, Project Co shall promptly notify the City Representative of the details of such Dispute and shall submit the reasons why Project Co believes a different comment should be assigned, together with appropriate supporting documentation. The City Representative shall review the Maintenance and Rehabilitation Submittal, the reasons and supporting documentation and within five (5) Business Days after receipt thereof shall either confirm the original comment or notify Project Co of a revised comment.
- 4.2. If after such review by the City Representative Project Co disputes the comment on a Maintenance and Rehabilitation Submittal, subject to Article 9.1, Project Co may refer the matter for determination in accordance with Schedule 26 - Dispute Resolution Procedure.

ARTICLE 5 EFFECT OF REVIEW

- 5.1. Any review and comment by the City or the City Representative of any Maintenance and Rehabilitation Submittals are for general conformity to the obligations and requirements of the Project Agreement, and any such review and comment shall not relieve Project Co of the risk and responsibility for the Project Operations and for meeting all of its obligations under and requirements of the Project Agreement, and shall not create any new or additional obligations or liabilities for the City. Without limiting the generality of the foregoing any and all errors or omissions in Maintenance and Rehabilitation Submittals or of any review and comment shall not exclude or limit Project Co.'s obligations or liabilities under the Project Agreement in respect of matters related to the Maintenance and Rehabilitation Submittal or exclude or limit the City's

rights under the Project Agreement in respect of matters related to the Maintenance and Rehabilitation Submittal.

ARTICLE 6 MAINTENANCE AND REHABILITATION SUBMITTAL EXPLANATION

- 6.1 At any time, the City Representative may, acting reasonably, require Project Co or any Project Co Parties at no additional cost to the City, to explain to the City Representative and the City' advisors the intent of Project Co.'s Maintenance and Rehabilitation Submittals, including as to its satisfaction of the Output Specifications and its impact on the Project Operations.

ARTICLE 7 REVISIONS

- 7.1. Project Co shall ensure that Maintenance and Rehabilitation Submittals keep the same, unique reference number throughout the review process, and that subsequent revisions of the same Maintenance and Rehabilitation Submittal are identified by a sequential revision number. Correspondence related to such Maintenance and Rehabilitation Submittal shall reference the reference number and revision number.
- 7.2. Re-submittals shall clearly show all revisions from the previous Maintenance and Rehabilitation Submittal. Bound documents, including reports and manuals, shall contain a preface that clearly states how revisions are marked and the previous revision number against which the revisions have been marked. A consistent format for mark-ups of documents shall be used (e.g. deletions struck out and additions underscored). Revised portions of drawings shall be clearly marked (with appropriate means to visually distinguish between the parts of the drawing that are revised and the parts that are not revised) and the revision number and description of the revision shall be included on the drawing.
- 7.3. All revisions on print media shall be initialled by hand by the individual designer, design checker and, where applicable, by the drafter and the drafting checker and shall identify the persons who initialled the Maintenance and Rehabilitation Submittal. Electronic versions of the Maintenance and Rehabilitation Submittal shall identify the persons who initialled the revisions to the printed version of the Maintenance and Rehabilitation Submittal.

ARTICLE 8 AUDIT BY THE CITY REPRESENTATIVE

- 8.1 Without limiting any other right under the Project Agreement, the City Representative shall have the right to audit all Maintenance and Rehabilitation Submittals, including comparing all Maintenance and Rehabilitation Submittals to previous Maintenance and Rehabilitation Submittals.
- 8.2 If during an audit or at any other time it is discovered by the City or Project Co that any Maintenance and Rehabilitation Submittals were not correctly implemented, Project Co shall at its sole cost immediately take all necessary steps to correct and modify the applicable Maintenance and Rehabilitation Submittals and the Project Operations to which they relate and shall advise the City Representative of all such corrections and modifications.

ARTICLE 9 VARIATIONS

9.1 If, having received comments from the City Representative on any Maintenance and Rehabilitation Submittal, Project Co considers that compliance with those comments would amount to a Variation, Project Co shall, within 10 Business Days of receipt of and before complying with the comments, provide written Notice to the City of the same and, if it is agreed by the Parties, or is determined pursuant to Schedule 26 - Dispute Resolution Procedure, that a Variation would arise if the comments were complied with, the City may at their election, either issue a Variation Enquiry and it shall be dealt with in accordance with Schedule 21 - Variation Procedure or amend their comment on the Maintenance and Rehabilitation Submittal. Any failure by Project Co to notify the City in accordance with this Article 9.1 that Project Co considers compliance with any comments of the City Representative would amount to a Variation shall constitute an irrevocable acceptance by Project Co that any compliance with the City Representative's comments shall be without cost to the City and without any extension of time.

ARTICLE 10 GENERAL

10.1 Any capitalized terms used in the appendices to this Schedule 10 – Review Procedure, that are not defined in this Schedule 10 – Review Procedure or in Schedule 1 – Definitions and Interpretation of the Project Agreement, shall have the meanings given to them in Schedule 15-1 – Technical Terms and Reference Documents.

APPENDIX A - MINIMUM WORKS SUBMITTAL REQUIREMENTS

ARTICLE 1 FORMAT FOR WORKS SUBMITTALS

1.1 All Works Submittals shall be submitted to the City in hardcopy and electronic format as follows:

(a) Hardcopy requirements:

- (i) three sets of all Work Submittals shall be submitted in reduced format drawings (11" x 17", fold-outs, folded to 8.5" x 11") and design briefs, included in 3-hole ring binders; and
- (ii) three sets of Works Submittals which are not drawings shall be submitted in 8.5" x 11" format, unless otherwise specified.

(b) All other Submittals not otherwise specified shall be submitted to an EDMS as detailed below. In addition to hard copies, all Works Submittals (or as otherwise agreed upon by the Parties) shall be submitted to an EDMS and in an electronic format that is deemed reasonably acceptable to the City. As a minimum, this system shall comprise the following:

- (i) a cloud-based single platform which provides an easily configurable solution;
- (ii) user group security and restricted authorization function;
- (iii) browsing by project, folder or file name with drag and drop function;
- (iv) collaboration functions with the ability to electronically approve and stamp documents;
- (v) text searchable functions for PDF and native files;
- (vi) seamless integration;
- (vii) audit trail;
- (viii) pre-defined workflow & quality management systems;
- (ix) read-only, real-time access for the City Representative and their nominated personnel;

- (x) version control and notification capability;
 - (xi) analytics and reporting function; and
 - (xii) a review function with customizable mark-up tools.
- (c) CAD drawings shall be provided in accordance with the City of Ottawa's CADD Standards Manual; and
- (d) All Works Submittals shall be uploaded to the web based project management system, in text-searchable PDF and in their native format, simultaneously with the submission to the City.
- 1.2 All Works Submittals shall also be provided in the format set forth in Appendix A.

ARTICLE 2 SUBMITTALS

- 2.1. The following is a detailed list of the Works Submittals that Project Co is required to provide to the City for review and comment in accordance with this Schedule 10.
- 2.2. Additional Works Submittals may be requested by the City Representative at any time in order to understand the Works, and Project Co shall be required to provide same to the City for review in accordance with this Schedule 10. A description of the minimum content of each Work Submittal provided is set out in the following sections.
- 2.3. [Intentionally Deleted].
- 2.4. Works Submittal deliverables which are applicable to satisfying the requirements of multiple Works Submittal sections are permitted to be reused, granted they meet all the requirements of each Works Submittal section they are applied to.
- 2.5. Submission Requirements
 - (a) The Works Submittal Requirements are detailed in the tables below.

[REDACTED]

ATTACHMENT 1

Sample Design Certificates

Certificate Ref No. []

DESIGN CERTIFICATE (GENERAL)

In respect of :.....

(Provide submittal details)

Project Agreement between the City and Project Co dated XX XX, XXXX (“the Project Agreement”) relating to the Project. Defined terms and expressions used in the Project Agreement have the same meanings in this Certificate.

Form of Certificate to be used by the Design Team for certifying the design of the Works to the extent that such Works components have been constructed, installed, altered, upgraded, and/or augmented, in accordance with Schedule 15-2 – Design and Construction Requirements.

1. We certify that we have the requisite professional qualifications, skill and experience to prepare the Design Data referred to herein in accordance with the requirements of the Project Agreement and all relevant Output Specifications.
2. We certify that we have prepared the Design Data for [.....] listed in the Schedule hereto in accordance with all applicable requirements contained in the Design Management Plan and utilizing the standards of care, skill and diligence that, in accordance with the standards of our profession, are required of experienced professionals undertaking the preparation of such Design Data, and that in our professional opinion such Design Data:
 - (a) complies with all applicable Output Specifications, as amended by the following:
 - (i) **[List, if any, the changes made by the issue of Variation(s)];**
 - (b) complies with all applicable design requirements of the Project Agreement;
 - (c) complies with all applicable standards, codes and current Good Industry Practice; and
 - (d) accurately describes and depicts the Works to be undertaken.

SCHEDULE

[Include here drawing numbers and titles, reports, calculations, etc.]

Certified by:

Design Team (representative)

Name:

Title:

Date:

Professional Registration Number:

Affix Professional Seal

Signed:

Construction Contractor representative

Name:

Date:

This Certificate is:

- i. reviewed*
- ii. reviewed as noted as follows*
- iii. returned marked “rejected” as follows:*

* delete as appropriate

Signed:

City Representative

Name:

Date:

Certificate Ref No. []

DESIGN CERTIFICATE (ENVIRONMENTAL)

Project Agreement between the City and Project Co dated XX XX, XXXX (“the Project Agreement”) relating to the Project. Defined terms and expressions used in the Project Agreement have the same meanings in this Certificate.

Form of certificate to be used by the Design Team and the Environmental Director for certifying the design of environmental works incorporated in the Works in accordance with the Project Agreement.

- 1) We certify that we have the requisite professional qualifications, skill and experience to prepare the Design Data referred to herein in accordance with the requirements of the Project Agreement and all relevant Output Specifications.
- 2) We certify that we have prepared the Design Data for [.....] [Name and list of all elements of the environmental works] in the Schedule hereto in accordance with all applicable requirements contained in the Design Quality Management Plan and utilizing the standards of care, skill and diligence that, in accordance with the standards of our profession, are required of experienced professionals undertaking the preparation of such Design Data, and that in our professional opinion:
 - a) the said Design Data complies with all applicable Output Specifications, including Technical Appraisal Form No. [.....] dated [.....], as amended by the following:
 - i) **[List, if any, the changes made by the issue of Variation(s), and any Addenda to the foregoing Technical Appraisal Form];**
 - b) the said Design Data complies with all applicable design requirements of the Project Agreement;
 - c) the said Design Data complies with all applicable standards, codes, environmental permits licences approvals and authorizations, and current Good Industry Practice; and
 - d) the said Design Data accurately describes and depicts the Works to be undertaken.

SCHEDULE

[Include here drawing numbers and titles and reports, calculations, etc.]

Certified by:

Design Team (representative)

Name:

Title:

Date:

Professional Registration Number:

Affix Professional Seal

Signed:

Environmental Director

Name:

Title:

Date:

Professional Registration Number:

Affix Professional Seal

This Design Certificate is:

- i. reviewed*
- ii. reviewed as noted as follows*
- iii. returned marked “rejected” as follows:*

* delete as appropriate

Signed:

City Representative

Name:

Date:

ATTACHMENT 2

Sample Construction Certificate

Certificate Ref. No. []

CONSTRUCTION CERTIFICATE

Project Agreement between the City and Project Co dated XX XX, XXXX (“the Project Agreement”) relating to the Project. Defined terms and expressions used in the Project Agreement have the same meanings in this Certificate.

Form of Certificate to be used by the Design Team for certifying, as applicable:

- a) the substantial completion of construction activities in respect of those components of the Works set out in paragraph 1 of this Construction Certificate;
- b) the Total Completion of construction activities in respect of the Works, including Minor Deficiencies; or
- c) the total completion of construction activities in respect of any Reinstatement Work carried out by the Construction Contractor pursuant to Section 30 **[Damage and Destruction]** in accordance with a Reinstatement Plan.

in accordance with Schedule 15-2 – Design and Construction Requirements.

Construction Contractor’s Statement

We certify that **[name and element of the Works in respect of the Substantial Completion Certificate][the Works in respect of the Final Completion Certificate][the Works in respect of the Final Completion Certificate (Reinstatement Work)]** has been designed, constructed, **[substantially completed], [totally completed]**, commissioned and tested in all respects in accordance with: **[Note to Proponents: Inapplicable language to be deleted.]**

- a) the relevant Design Data and Design Certificates in each case to which there has been no objection under the Review Procedure; and
- b) the provisions of the Project Agreement, including all applicable Output Specifications, as amended by the following Variation(s):
 - (i) **[List, if any, the changes made by the issue of Variation(s), and any Addenda to the foregoing Technical Appraisal Form];**

Signed.....

Construction Contractor representative

Name.....

Date.....

Design Team's Statement

1. We certify that we have examined the [name and element of the Works in respect of the Substantial Completion Certificate][the Works in respect of the Final Completion Certificate][the Works in respect of the Final Completion Certificate (Reinstatement Work)] in accordance with the requirements for examination of the Works contained in the Design Quality Management Plan and the Construction Quality Management Plan and utilizing the standards of care, skill and diligence that, in accordance with the standards of our profession, are required of experienced professionals undertaking such examinations, and that in our professional opinion [the said element of the Works][the Works] has been designed, constructed, [substantially completed][totally completed], commissioned and tested in all respects in accordance with: **[Note to Proponents: Inapplicable language to be deleted.]**
 - (a) the relevant Design Data and Design Certificates in each case to which there has been no objection under the Review Procedure; and
 - (b) the provisions of the Project Agreement, including all applicable Output Specifications, as amended by the following Variation(s):

[List, if any, the changes made by the issue of Variation(s), and any Addenda to the foregoing Technical Appraisal Form];

Signed.....

Design Team (representative)

Name.....

Title.....

Date.....

Professional Registration Number:

Affix Professional Seal

Receipt of this Certificate is acknowledged.

Signed.....

Independent Certifier

Name.....

Date.....

Professional Registration Number:

Affix Professional Seal

This Certificate is:

- i. reviewed*
- ii. reviewed as noted as follows*
- iii. returned marked “rejected” as follows:*

* delete as appropriate

Signed:

City Representative

Name:

Date:

APPENDIX B - MINIMUM MAINTENANCE AND REHABILITATION

SUBMITTAL REQUIREMENTS

1. FORMAT FOR MAINTENANCE AND REHABILITATION SUBMITTALS

1.1 All Maintenance and Rehabilitation Submittals shall be submitted to the City in hardcopy and electronic format as follows:

(a) Hardcopy Requirements

- (i) three sets of all Maintenance and Rehabilitation Submittals shall be submitted in reduced format drawings (11" x 17", fold-outs, folded to 8.5" x 11"), included in 3-hole ring binders; and
- (ii) three sets of Maintenance and Rehabilitation Submittals which are not drawings shall be submitted in 8.5" x 11" format, unless otherwise specified.

(b) All other Submittals not otherwise specified shall be submitted to an EDMS as detailed below. In addition to hard copies, all Works Submittals (or as otherwise agreed upon by the Parties) shall be submitted to an EDMS and in an electronic format that is deemed reasonably acceptable to the City. As a minimum, this system shall comprise the following:

- (i) a cloud-based single platform which provides an easily configurable solution;
- (ii) user group security and restricted authorization function;
- (iii) browsing by project, folder or file name with drag and drop function;
- (iv) collaboration functions with the ability to electronically approve and stamp documents;
- (v) text searchable functions for PDF and native files;
- (vi) seamless integration;
- (vii) audit trail;

- (viii) pre-defined workflow & quality management systems;
 - (ix) read-only, real-time access for the City Representative and their nominated personnel;
 - (x) version control and notification capability;
 - (xi) analytics and reporting function; and
 - (xii) a review function with customizable mark-up tools.
- (c) CAD drawings (where applicable) shall be provided in accordance with the City of Ottawa's CADD Standards Manual; and
- (d) All Maintenance and Rehabilitation Submittals shall be uploaded to the web based project management system, in text-searchable PDF and in their native format, simultaneously with the submission to the City.
- 1.2 For a Maintenance and Rehabilitation Submittal to have been completed, all of the requirements of Article 1.1 shall be met.
- 2. SUBMITTALS**
- 2.1. The following is a detailed list of the Maintenance and Rehabilitation Submittals that Project Co is required to provide to the City for review and comment in accordance with this Schedule 10. Additional Maintenance and Rehabilitation Submittals may be requested by the City Representative at any time in order to understand the Maintenance and Rehabilitation Services, and Project Co shall be required to provide same to the City for review in accordance with this Schedule 10. A description of the minimum content of each Maintenance and Rehabilitation Submittal provided is set forth in Section 2.3 of this Appendix B.
- 2.2. Requirement for a Compliance Verification & Validation Matrix:
- (a) Project Co. shall report on PSOS compliance with a Compliance Verification & Validation Matrix. Compliance Verification & Validation Matrix should provide line by line reporting of all PSOS requirements and should provide full traceability between requirements and compliance demonstration including preliminary and final design references, quality assurance & control, testing & commissioning (including but not limited to FAT, PICO, SAT, SIT, and system wide testing).
 - (b) The Compliance Verification & Validation Matrix should be submitted under Schedule 10 at three intervals: PDR, FDR, and prior

to system wide testing.

2.3. Unless otherwise specified in the table below, or an alternate date is mutually agreed with the City and confirmed in writing by the City in advance, the following definitions apply in the table below:

- (a) “Annually in advance” means:
 - (i) submit at least ninety (90) days prior to the commencement of Testing and Commissioning;
 - (ii) re-submitted at least sixty (60) days prior to the commencement of each Contract Year;
- (b) “Annually in retrospect” means submitted within thirty (30) days of the final day of each Contract Year;
- (c) “Monthly” means submitted within seven (7) days of the end of each calendar month; and
- (d) “Quarterly” means submitted within thirty (30) days of the final day of each consecutive period of three (3) calendar months, starting from Substantial Completion.

2.4. Submission Requirements

- (a) Submission Requirements are detailed in the table below:

[REDACTED]

SCHEDULE 11

INTEGRATED MANAGEMENT SYSTEM REQUIREMENTS

[REDACTED]

**SCHEDULE 12
WORKS SCHEDULING REQUIREMENTS**

[REDACTED]

SCHEDULE 13
PROJECT CO PROPOSAL EXTRACTS
[REDACTED]

SCHEDULE 14

TESTING AND COMMISSIONING

1.1 Applicable Standards

- (a) Project Co shall plan, schedule, coordinate and execute the testing and commissioning of the Works. The testing and commissioning of the Works shall be in accordance with the Project Agreement and the standards set out in this Schedule 14.
- (b) Project Co Testing and Commissioning includes required work for LEED Certification at the New Walkley Yard. Project Co shall be responsible for achieving all testing and commissioning prerequisites and credits to achieve the LEED Certification of the New Walkley Yard administration building and maintenance building.
- (c) Project Co Testing and Commissioning includes all New Municipal Infrastructure and New Utility Infrastructure in accordance with the Project Agreement. Without limiting the foregoing or any other provision of the Project Agreement, Project Co shall also comply with:
 - (i) all requirements in Appendix A of this Schedule 14 – Testing and Commissioning in respect of, among other things, testing and commissioning of New Municipal Infrastructure; and
 - (ii) all requirements in Appendix B of this Schedule 14 – Testing and Commissioning in respect of, among other things, testing and commissioning of New Utility Infrastructure.

- (d) Project Co shall comply with Good Industry Practice for all Project Co Testing and Commissioning activities. Project Co shall provide all of the documentation to the City in accordance with the requirements of Schedule 10 – Review Procedure.

1.2 Project Co Testing and Commissioning Coordinator

- (a) Project Co shall appoint a testing and commissioning coordinator (the “**Project Co Testing and Commissioning Coordinator**”) to perform the testing and commissioning obligations of Project Co. The Testing and Commissioning Coordinator shall have the qualifications as set out in Schedule 9 – Key Individuals.

1.3 Project Co Testing and Commissioning Parameters

- (a) Project Co shall be responsible for preparing and executing a testing and commissioning plan/strategy required to successfully demonstrate the performance of the System Infrastructure in accordance with the Project Agreement (the “**Testing and Commissioning Plan**”). The scope of the Testing and Commissioning Plan will include all aspects of factory and site testing, static testing, systems integration testing and Trial

Running of the System Infrastructure as a fully integrated system to demonstrate the functional capability and safety of the System Infrastructure.

- (b) The Testing and Commissioning Plan shall include, but not be limited to, the following:
 - (i) Relationship to safety and security management and other related System safety and security requirements;
 - (ii) Resumes of key personnel involved detailing years of experience;
 - (iii) Organization chart of the testing and commissioning team and their discipline responsibilities;
 - (iv) Planned resources;
 - (v) Specific requirements for the City interfaces;
 - (vi) Specific requirements for other third party interfaces;
 - (vii) Testing regime and test documentation procedures; and
 - (viii) Testing and Commissioning Schedule.
- (c) The Testing and Commissioning Plan shall demonstrate how Project Co intends to validate and verify that the functional and technical requirements, Trial Running, performance criteria, Maintenance and Rehabilitation Requirements, quality and safety aspects of the Expanded Trillium Line have been met or exceeded to allow the City to operate and Project Co to maintain the Expanded Trillium Line.
- (d) The Testing and Commissioning Plan shall be developed and modified as required to address the evolution of the Project.
- (e) Project Co is solely responsible for all checking and verification activities relating to individual components, sub-systems, Vehicles, communication and train control systems, all associated equipment and facilities required prior to the formal testing and commissioning and acceptance testing programs necessary to demonstrate the fully integrated operation of the System Infrastructure to the satisfaction of Independent Certifier. Project Co is responsible for providing all test procedures and test reports for all subsystems including FAI, FAT, SAT, SIT, and System Integration testing. The City shall be responsible for the checking and verification activities relating to the communication system components, subsystems and equipment installed by the City at the TOCC and BCC.
- (f) Project Co shall prepare and formally submit the PFD Testing and Commissioning Plan within six months of Financial Close in accordance with Schedule 12 – Works Scheduling Requirements. The Testing and Commissioning Plan shall be subject to review and acceptance by the City, in accordance with Schedule 10 - Review Procedure.

The Testing and Commissioning Plan shall undergo review and modification as the project progresses as agreed by the City and Project Co. The IFC Testing and Commissioning Plan shall be submitted no less than 300 days prior to testing.

- (g) The Testing and Commissioning Plan shall permit the oversight and monitoring of Project Co Testing and Commissioning activities for the duration of the Project.
- (h) With the exception of the testing and commissioning of communication system components, subsystems and equipment installed by the City at the TOCC and BCC and the obligation to supply operators and controllers for Project Co Testing and Commissioning activities, the City accepts no responsibility for Project Co Testing and Commissioning of other System Infrastructure. Each sub-system of the System Infrastructure shall be, wherever possible, thoroughly tested and commissioned as standalone subsystems operating in simulated worst case environments prior to being placed into service. This shall be demonstrated at FAI, FAT or SAT, whichever is applicable.
- (i) [Intentionally Deleted].
- (j) In addition to the Commissioning Tests specified in Schedule 15-2, the City (and its representatives) shall have the right, when acting reasonably, to identify specific Commissioning testing requirements that will require validation.
- (k) Project Co shall prepare individual Commissioning Test plans for each Commissioning Test, and provide advance notice to the City 60 days prior to such testing in accordance with Schedule 12 – Works Scheduling Requirements. Individual test plans shall be subject to review and acceptance by the City, in accordance with Schedule 10 - Review Procedure.
- (l) The Project Co Testing and Commissioning Coordinator shall convene a meeting of the Testing and Commissioning Team to review the Project Co Testing and Commissioning Plan, set testing and commissioning parameters, designate the responsibilities of the various parties and establish the documentation requirements for each stage of the Works and the Project Co Testing and Commissioning.
- (m) Project Co shall create a schedule of testing and commissioning activities (the “**Testing and Commissioning Schedule**”) and shall incorporate the Testing and Commissioning Schedule into the Works Schedule.
- (n) The Project Co Testing and Commissioning Coordinator shall submit monthly reports to the City in regards to progress of Project Co Testing and Commissioning.
- (o) Project Co is responsible for the supply, installation, start-up, testing, adjustment and cleaning of each item of the System Infrastructure provided as part of the Works with the exception of the communication system components, subsystems and equipment installed by the City at the TOCC and BCC, at Bayview Confederation Line station, and along the

Confederation Line alignment. Where applicable, Project Co Testing and Commissioning shall be completed in accordance with the equipment vendor's guidance.

- (p) Project Co, in implementing the Project Co Testing and Commissioning Plan, shall verify that:
 - (i) the System Infrastructure installed by Project Co has been installed and is operating in accordance with the requirements of this Project Agreement;
 - (ii) the Existing Trillium Line Assets have been rehabilitated, maintained and are operating, each in accordance with the requirements of this Project Agreement;
 - (iii) the System Infrastructure performance meets or exceeds the requirements of the Output Specifications and this Project Agreement;
 - (iv) training has been provided and meets or exceeds the requirements of this Project Agreement;
 - (v) Record Drawings and operating and maintenance manuals have been provided in accordance with this Project Agreement;
 - (vi) LEED testing and commissioning documentation required for achieving the LEED Certification has been prepared and copied to the City;
 - (vii) LEED testing and commissioning documentation for achieving the LEED Certification has been submitted per the requirements of LEED;
 - (viii) New Municipal Infrastructure meets or exceeds the requirements of the Project Agreement;
 - (ix) New Utility Infrastructure meets or exceeds the requirements of the Project Agreement; and
 - (x) Maintenance & Rehabilitation Compliance Verification & Validation Matrix has been completed pursuant to Schedule 10 – Review Procedure, Part “B”.
- (q) Project Co shall provide System Infrastructure orientation to the Ottawa Emergency Services, including; the Fire Departments, Paramedics, and Police pursuant to Schedule 15-2, Part 1, Article 26.
- (r) The City shall appoint an arm's length independent third party expert (the “**Systems Integration Verifier**”) to:
 - (i) provide a fast track dispute process for Project Co and any City Party as it related to the integration and function of the communications systems as outlined in Schedule 26 – Dispute Resolution Procedure; and

- (ii) during the installation, testing, and commissioning phases, review and comment for compliance and clarity on all Submittals related to communications and Train Control System and will be provided upon request any documents that pertain to:
 - (A) integration, testing and commissioning plans, (B) traceability documents, and
 - (C) test and commissioning procedures.

1.4 Testing and Commissioning Team

- (a) The **Testing and Commissioning Team** shall be comprised of:
 - (i) a representative of Project Co including, where applicable, subcontractors;
 - (ii) a representative of the City;
 - (iii) the Project Co Testing and Commissioning Coordinator;
 - (iv) the Independent Certifier; and
 - (v) where applicable, representatives of the relevant Vehicle manufacturers and equipment manufacturers.
- (b) Project Co and each of its Subcontractors shall assign, where applicable, individuals from each relevant trade to the Testing and Commissioning Team and shall ensure that representatives of the relevant equipment manufacturers and testing agencies are present during the relevant Project Co Testing and Commissioning meetings.
- (c) Project Co shall provide all necessary labour, materials, equipment, testing apparatus and incidentals necessary to completely start-up, verify, performance test and commission each item of the System Infrastructure provided as part of the Works.
- (d) After Financial Close, the Project Co Testing and Commissioning Coordinator shall establish a schedule for regular meetings of the Testing and Commissioning Team to review the progress of the Project Co Testing and Commissioning.

1.5 Project Co Testing and Commissioning Procedures

- (a) Project Co shall ensure that all regulation and code references in the Reference Documents, in addition to the provisions of Part 1 of Schedule 15-2 – Design and Construction, have been fully complied with.
- (b) Project Co and the Project Co Testing and Commissioning Coordinator shall plan, prepare documentation and execute the Project Co Testing and Commissioning Plan, process and procedures.
- (c) Project Co shall ensure that each of the requirements set out in this Schedule 14 and those identified in Schedule 15 – Output Specifications are completed.

(d) Training:

- (i) Project Co shall provide a training schedule and agenda for each training session to the City for acceptance in accordance with Schedule 10 - Review Procedure and Schedule 12 – Works Scheduling Requirements. Operational and maintenance training shall be provided for all System Infrastructure. Operations and maintenance training manuals shall be submitted in accordance with Schedule 10 - Review Procedure and Schedule 12 – Works Scheduling Requirements. A complete listing of all training programs that Project Co is responsible for is located in Schedule 15-2, Part 1, Article 12.
- (ii) The Project Co Testing and Commissioning Coordinator or designated delegate shall attend a sample of every training session to ensure the agenda is maintained and that quality training is provided. One training session for each category shall be video recorded in digital format. The video shall be submitted to the City and labelled accordingly.
- (iii) Project Co's design consultants shall provide an overview of the System Infrastructure, including an explanation as to why the solutions and equipment were selected, identification of the design intent and discussion of the operating procedures required to maintain the design intent. These sessions shall be video recorded in digital format.
- (iv) Training sessions for equipment shall be conducted at the location of the equipment or such Project Co supplied equipment.
- (v) A portion of the training sessions for the System Infrastructure shall be conducted at the operating stations (workstations).
- (vi) All training sessions shall be logged and personnel shall be recorded as receiving training. Further refreshers shall be scheduled in line with safety, quality and training requirements.

(e) Trial Running:

- (i) Trial Running Objectives
 - (A) Project Co shall conduct Trial Running when:
 - (I) the integrated System Infrastructure has been tested;
 - (II) the complete fleet is fully tested and ready for passenger service;
 - (III) the complete signalling and train control system and associated TOCC equipment is fully tested and ready for passenger service;

- (IV) there are no outstanding defects (major or minor) affecting rail systems functionality, including track, signals and communications;
 - (V) there are no major defects, safety defects, or incomplete vehicle modification programs;
 - (VI) all Stations are substantially complete with only Minor Deficiencies remaining;
 - (VII) Project Co is fully mobilized and ready to commence maintenance services in accordance with Schedule 15-3 – Maintenance and Rehabilitation Requirements, including availability of required maintenance staff, parts, maintenance equipment, CMMS, and completion of training;
 - (VIII) Project Co has submitted the Maintenance & Rehabilitation Compliance Verification & Validation Matrix pursuant to Schedule 10 – Review Procedure, Part “B”; and
 - (IX) the City is fully mobilized, trained and ready to operate the System.
- (B) Trial Running will be the final step in confirming Readiness for Revenue Service.
- (C) The fundamental objective of Trial Running is to exercise the complete integrated System Infrastructure, including all subsystems, operating personnel and operating procedures, to confirm Readiness for Revenue Service. This can be subdivided into the following key objectives:
- (I) to validate the performance of the System Infrastructure with operating and maintenance staff who are trained on the operation of the System Infrastructure and Standard Operating Procedures;
 - (II) to exercise and validate the operating schedules and operational performance requirements; and
 - (III) to exercise and confirm the operating reliability of the subsystems simulated under various operating conditions (normal and emergency). The basic design requirements and safety and security requirements will have been verified through the testing and commissioning phase prior to this stage of Trial Running.
- (ii) Performance Criteria for Trial Running Acceptance

- (A) Project Co shall conduct the Trial Running for final acceptance which will be conducted for a period of 21 consecutive days following successful completion of the Commissioning Tests and verification by Project Co that there are no deficiencies to prevent safe running of the System Infrastructure, verification that they have an adequate number of trained staff and resources to maintain the System Infrastructure and verification from the City that they have an adequate number of trained staff available to support Trial Running operating requirements. When all of the requirements in this Schedule 14 have been satisfactorily completed and are in place, the System Infrastructure will be ready for Revenue Service (“**Readiness for Revenue Service**”).
- (B) Trial Running shall be reviewed on a day to day basis by the Testing and Commissioning Team.
- (C) Project Co shall communicate with the City Representative to review daily performance, resolve service availability and delay issues and coordinate all Maintenance and Rehabilitation Services on the System that could potentially affect System operation, public safety or concerns and all other related issues.
- (D) Trial Running shall operate a full regular scheduled service on the full line for a 14 day period. Passengers will not be carried. Additional tests during the 21 day period referred to in (A) above shall include a variety of failure management scenarios that could reasonably be expected to occur in regular Revenue Service. The City shall have the opportunity to review and approve the failure management scenarios that will be tested during Trial Running.
- (E) Project Co shall achieve the Service Reliability Standard outlined in Schedule 15-2, Part 1, Article 3.5 wherein the 98.5% on-time performance must be achieved over a 14-day period within the 21 day Trial Running period.
- (F) Project Co shall use the Trial Running period to collect operating data and evaluate system reliability, availability, and maintainability performance and to demonstrate that the process to collect, evaluate, and validate the operating data has been properly established. Using prescribed procedures, data on service deviations will be collected and assigned against the Vehicles and specific subsystems down to the Line Replaceable Unit (LRU) level. The database shall provide verification of system reliability to the LRU level. If the cumulative failure of any LRU exceeds 10% of the total LRU population, up to and including the completion of Trial Running, Project Co shall redesign and replace the defective LRU's.

- (G) Project Co shall demonstrate that the integrated System (vehicles, stations, and infrastructure) perform reliably through the Trial Running period such that the Performance Criteria for Trial Running are achieved and that would otherwise lead to zero performance deductions during the Maintenance Period.
- (H) Validation of the Trial Running acceptance shall be performed by the Independent Certifier.
- (I) The Trial Running of the System Infrastructure will demonstrate to the satisfaction of the Independent Certifier that the specified travel times, headways and operational performance requirements can be achieved.

1.6 Project Co Testing and Commissioning Submittals

- (a) Project Co shall prepare a design brief describing the System Infrastructure design and performance requirements, including the requirements of the Output Specifications prior to beginning the construction process.
- (b) Project Co shall prepare and submit to the City the Testing and Commissioning Plan identified in this Schedule 14 in accordance with Schedule 10 - Review Procedure and Schedule 12 – Works Scheduling Requirements.
- (c) Project Co shall prepare and submit to the City test forms, verification forms and performance test forms for all equipment, communication systems and train control systems. Test procedures should include but not be limited to the following:
 - (i) Test objectives;
 - (ii) Required Safety methods and prerequisite training required;
 - (iii) Associated tests and pass/fail criteria;
 - (iv) Reference specifications /standards and supporting literature;
 - (v) Staffing required, including requirements from the City;
 - (vi) Test methods;
 - (vii) Test equipment, jigs and supporting systems required;
 - (viii) Test schedule;
 - (ix) Test location;
 - (x) Identification of professional personnel and resumes of those responsible for sign-off;

- (xi) Certified test reports including test results and recommendations; and
 - (xii) Compliance matrix to detail contract requirements being tested.
- (d) Project Co shall prepare and submit to the City the performance testing and commissioning progress management forms and the commissioning summary forms to be used for monthly reporting.
- (e) Project Co shall prepare and submit to the City a Testing and Commissioning Schedule of each item of the System Infrastructure, New Municipal Infrastructure and New Utility Infrastructure provided as part of the Works.
- (f) Project Co shall prepare and submit to the City detailed testing and commissioning manuals for each item of the System Infrastructure, New Municipal Infrastructure and New Utility Infrastructure provided as part of the Works (the “**Testing and Commissioning Manuals**”) in accordance with Schedule 10 - Review Procedure and Schedule 12 – Works Scheduling Requirements.
- (g) All Testing and Commissioning Manuals shall include:
- (i) name and logo as directed by the City;
 - (ii) name of the Project;
 - (iii) project number;
 - (iv) identification of each item of the System Infrastructure tested and commissioned;
 - (v) the date each item of the System Infrastructure was tested and commissioned;
 - (vi) the signature of the Project Co Testing and Commissioning Coordinator;
 - (vii) issue and date;
 - (viii) document version control; and
 - (ix) document amendments table.
- (h) All Testing and Commissioning Manuals shall include:
- (i) test reports;
 - (ii) configuration control records;
 - (iii) equipment check sheets (start-up, verification and performance) for each item of the System Infrastructure provided as part of the Works; and

- (iv) interim and final acceptance check sheets for each item of the System Infrastructure provided as part of the Works.
- (i) Project Co shall prepare and submit O&M manuals in accordance with Schedule 10 – Review Procedure and Schedule 12 – Works Scheduling Requirements.
- (j) Project Co shall prepare and submit a re-commissioning manual in accordance with the requirements of Schedule 10 – Review Procedure.
- (k) Project Co shall prepare and submit configuration control records in accordance with the requirements of Schedule 10 – Review Procedure and Schedule 12 – Works Scheduling Requirements.

1.7 Coordination with the City, Systems Integration Verifier and the Independent Certifier

- (a) The Project Co Testing and Commissioning Coordinator shall co-ordinate with the City, Systems Integration Verifier, CNR, Via Rail, the NRC and the Airport Authority, as applicable, and the Independent Certifier, throughout the Project Co Testing and Commissioning process.
- (b) This co-ordination shall include:
 - (i) review of test, verification and performance test forms;
 - (ii) review of testing and commissioning progress management forms and performance testing;
 - (iii) review of the Testing and Commissioning Plan;
 - (iv) review of the Testing and Commissioning Schedule;
 - (v) sample witnessing of tests and performance testing;
 - (vi) review of the training curriculum and materials as outlined in Part 1 Article 12 of Schedule 15-2 and scheduling;
 - (vii) review of the O&M manuals;
 - (viii) sample witnessing of seasonal performance testing;
 - (ix) review of the testing and commissioning reports;
 - (x) attend Testing and Commissioning Team meetings; and
 - (xi) report to the City and third parties as applicable regarding the progress of testing and commissioning.

1.8 Systems and Vehicles to be Commissioned

- (a) The Project Co Testing and Commissioning shall include the testing and commissioning of all Systems and Vehicle items of the System Infrastructure provided as part of the Works including, but not limited to, the following:
- (i) Revenue Vehicles;
 - (ii) Maintenance Vehicles;
 - (iii) Signalling and Train Control System;
 - (iv) Communications System up to the demarcation point at Bayview Station; and
 - (v) Tracks.

1.9 Guideway and Building Systems to be Commissioned

- (a) The Project Co Testing and Commissioning shall include the testing and commissioning of all Guideway and building system items of the System Infrastructure provided as part of the Works including, but not limited to, the following:
- (i) SCADA system (field devices and equipment);
 - (ii) Maintenance equipment systems;
 - (iii) Building envelope;
 - (iv) Elevators;
 - (v) Fire protection systems;
 - (vi) TVS
 - (vii) Plumbing systems;
 - (viii) HVAC systems;
 - (ix) Building automation systems;
 - (x) Electrical systems;
 - (xi) Security and safety systems;
 - (xii) Communications System up to the demarcation point at Bayview Station;
 - (xiii) CCTV;

- (xiv) Interfaces with OLRT and BRT stations and systems;
 - (xv) Passenger information systems; and
 - (xvi) Intrusion detection systems.
- (b) For further certainty, the City will be responsible for communication system, subsystems and equipment testing and commissioning activities relating to the headend equipment at the TOCC and BCC. Project Co shall be responsible for coordinating this work, and reflecting it in the SIMP and the overall Testing and Commissioning Plan.

1.10 Civil Engineering Elements Inspection and Testing

- (a) Project Co Testing and Commissioning shall include inspection and testing of the civil engineering elements of System Infrastructure, New Municipal Infrastructure, and New Utility Infrastructure for purposes of establishing readiness for intended use, including the following:
- (i) Structures;
 - (ii) Underground Structures;
 - (iii) Guideway structures and foundations;
 - (iv) Facility structures, foundations, architectural elements and finishes;
 - (v) roadways and roadway related infrastructure;
 - (vi) landscaping and urban design elements; and
 - (vii) wayfinding, signage and visual displays.

APPENDIX A

NEW MUNICIPAL INFRASTRUCTURE

For clarity, the obligations of Project Co in this Appendix A are in addition to and not in substitution of any other requirements for Project Co Testing and Commissioning of the Works and/or any other requirements in respect of New Municipal Infrastructure contained in the Project Agreement or this Schedule 14, including, for clarity, the process and requirements set out in Section 25.13 of the Project Agreement. The obligations in this Appendix A are in respect of New Municipal Infrastructure only.

1. DEFINITIONS

- 1.1** The following terms shall have the following meanings for purposes of this Appendix A:
- (a) **“Operations Data and Maintenance Manuals”** means the operations data and maintenance manuals Project Co is required to deliver pursuant to Section 2.3 of Attachment 1 of this Appendix A.
 - (b) **“Special Infrastructure”** means, for purposes of this Appendix A, the assets described in the Ontario Water Wellness Report under the headings of “Underground Storage Tanks/Superpipes”, “Oil Grit Separators” and “Wet or Dry Pond or Other Stormwater Management Facilities”.
 - (c) **“Witness and Hold Points”** has the meaning given in Schedule 11 – Integrated Management System Requirements.

2. INSPECTION, TESTING, COMMISSIONING, AND HANDOVER

2.1 Interim Inspection of New Municipal Infrastructure

- (a) Project Co shall comply with all requirements set out in this Schedule 14- Testing and Commissioning (including, for clarity, this Appendix A) as well as all requirements set out in Section 25.13 of the Project Agreement in connection with interim inspections of New Municipal Infrastructure.
- (b) Project Co shall notify the City of achievement of all milestones set out in the Inspection and Test Plan in respect of New Municipal Infrastructure as well as all Witness and Hold Points in respect of New Municipal Infrastructure.

2.2 Final Inspection of New Municipal Infrastructure

- (a) Project Co shall comply with all requirements set out in this Schedule 14 – Testing and Commissioning (including, for clarity, this Appendix A) as well as all requirements set out in Section 25.13 of the Project Agreement in connection with final inspections of New Municipal Infrastructure.
- (b) Prior to final inspection of New Municipal Infrastructure, Project Co shall, in addition to all other requirements set out in Section 25.13 of the Project Agreement:
 - (i) remove all Temporary Works no longer required from the site subject to final inspection, including but not limited to fencing, sign board, samples, and any other items

not considered to be part of System Infrastructure or New Municipal Infrastructure, except for those items required for ongoing Works; and

- (ii) clean all New Municipal Infrastructure prior to Handover following final inspection of such New Municipal Infrastructure including:
 - (A) sweeping/spraying of roads, boulevards and sidewalks;
 - (B) flushing of sewers; and
 - (C) cleaning out of catch basins, maintenance holes, and valve chambers,all taking into account ongoing Works.
- (c) Prior to final inspection of New Municipal Infrastructure, Project Co shall, in addition to all other requirements set out in Section 25.13 of the Project Agreement, prepare a record of the following, and submit it to the City for review in accordance with Schedule 10 – Review Procedure at least 20 Business Days before the final inspection:
 - (i) a list of any required Operations Data and Maintenance Manuals, as required for New Municipal Infrastructure that is Special Infrastructure and highways, as set forth in Attachment 1 of this Appendix A.

2.3 Pre-Conditions to Handover of New Municipal Infrastructure

In addition to any other requirements in the Project Agreement, Project Co shall satisfy the requirements of this Appendix A, including, for clarity, those set out in Attachment 1 of this Appendix A, prior to, and as a condition of, Handover of New Municipal Infrastructure.

ATTACHMENT 1

NEW MUNICIPAL INFRASTRUCTURE

3. REQUIREMENTS FOR TESTING, COMMISSIONING, HANOVER, AND ACCEPTANCE

3.1 Applicable to all New Municipal Infrastructure

(a) Project Co shall, prior to and as a pre-condition of achievement of Handover of New Municipal Infrastructure, submit the following to the City in accordance with Section 2.1 of this Attachment 1 for review in accordance with Schedule 10 – Review Procedure:

- (i) certification of the New Municipal Infrastructure in accordance with Section 3 of this Attachment 1; and
- (ii) Final Record Drawings in accordance with Sections 2.1 and 2.2 of this Attachment 1, unless final Record Drawings are not reasonably available at the time of Project Co Testing and Commissioning of the New Municipal Infrastructure, in which case Project Co shall:
 - (A) provide red-lined as-built drawings within ten Business Days after final inspection of the New Municipal Infrastructure; and
 - (B) provide final Record Drawings in accordance with Sections 2.1 and 2.2 of this Attachment 1 within three (3) months of Handover of such New Municipal Infrastructure.

3.2 Applicable to Sanitary, Storm and Combined Sewers

(a) For New Municipal Infrastructure comprised of sanitary sewers, storm sewers, and combined sewers, and for maintenance holes and catchbasins in addition to the documents and other items required to be delivered and/or performed by Project Co pursuant to Section 1.1 of this Attachment 1 and other documents, actions or deliverables otherwise required to be delivered or performed pursuant to the Project Agreement, Project Co shall, prior to and as a pre-condition of Handover of such New Municipal Infrastructure, complete and perform the following:

- (i) complete all tasks listed under the headings ‘Sanitary, Storm and Combined Sewers’, ‘Maintenance Hole’, and ‘Catchbasins’ in the Ontario Water Wellness Report in accordance with the Project Agreement (if a Notice of Delegation has been issued under the Project Agreement in respect of such New Municipal Infrastructure); and
- (ii) Project Co shall submit the following to the City in accordance with Section 2.1 of this Attachment 1, for review in accordance with Schedule 10 – Review Procedure:
 - (A) a copy of the Ontario Water Wellness Report prepared, stamped, signed and dated by a professional engineer licensed in the Province of Ontario for all applicable items under the headings ‘Sanitary, Storm and Combined Sewers’, ‘Maintenance Hole’, and ‘Catchbasins’ in the Ontario Water Wellness Report;

- (B) material testing results;
- (C) performance test results;
- (D) manufacturer's manuals and instructions;
- (E) compaction testing results for backfilling and paving;
- (F) video report and detailed written report and electronic files containing chainage-specific defect codes from a CCTV inspection. Where deficiencies have been identified by the CCTV inspection, The City shall arrange for additional examinations as required to demonstrate that all deficiencies have been rectified in accordance with the Project Agreement (if a Notice of Delegation has been issued under the Project Agreement in respect of such New Municipal Infrastructure);
- (G) design documents, including design sheets, reports, and technical studies; and
- (H) service connection cards prepared on the standard form supplied by the City.

3.3 Applicable to Watermains

- (a) For New Municipal Infrastructure comprised of watermains, in addition to the documents and other items required to be delivered and/or performed by Project Co pursuant to Section 3.1 of this Attachment 1 and other documents, actions or deliverables otherwise required to be delivered or performed pursuant to the Project Agreement, Project Co shall, prior to and as a pre-condition of Handover of such New Municipal Infrastructure, complete and perform the following:
 - (i) complete all tasks listed under the headings 'Watermain', 'Fire Hydrants', 'Tracer Wires', and 'Water Service Connections' in the Ontario Water Wellness Report in accordance with the Project Agreement (if a Notice of Delegation has been issued under the Project Agreement in respect of such New Municipal Infrastructure); and
 - (ii) submit the following to the City in accordance with Section 2.1 of this Attachment 1, for review in accordance with Schedule 10 – Review Procedure:
 - (A) a copy of the Ontario Water Wellness Report prepared, stamped, signed and dated by a professional engineer licensed in the Province of Ontario for all applicable items under the headings 'Watermain', 'Fire Hydrants', 'Tracer Wires', and 'Water Service Connections';
 - (B) material testing results;
 - (C) performance test results;
 - (D) manufacturer's manuals and instructions;
 - (E) compaction testing results for backfilling and paving;

- (F) documentation related to the applicable hydrostatic pressure testing, disinfection/chlorination and bacteriological test results, and tracer-wire reports;
- (G) design documents, including design reports, and technical studies; and
- (H) service connection cards prepared on the standard form supplied by the City

3.4 Applicable to Special Infrastructure

- (a) For New Municipal Infrastructure comprised of Special Infrastructure, in addition to the documents and other items required to be delivered and/or performed by Project Co pursuant to Section 3.1 of this Attachment 1 and other documents, actions or deliverables otherwise required to be delivered or performed pursuant to the Project Agreement, Project Co shall, prior to and as a pre-condition of Handover of such New Municipal Infrastructure, complete and perform the following:
 - (i) complete all tasks listed under the headings ‘Underground Storage Tanks/Superpipes’, ‘Oil Grit Separators’, and ‘Wet or Dry Pond or Other Stormwater Management Facilities’ in the Ontario Water Wellness Report in accordance with the Project Agreement (if a Notice of Delegation has been issued under the Project Agreement in respect of such New Municipal Infrastructure);
 - (ii) submit the following to the City in accordance with Section 2.1 of this Attachment 1, for review in accordance with Schedule 10 – Review Procedure:
 - (A) a copy of the Ontario Water Wellness Report prepared, stamped, signed and dated by a professional engineer licensed in the Province of Ontario for all applicable items under the headings ‘Underground Storage Tanks/Superpipes’, ‘Oil Grit Separators’, and ‘Wet or Dry Pond or Other Stormwater Management Facilities’;
 - (B) material testing results;
 - (C) performance test results;
 - (D) manufacturer’s manuals and instructions;
 - (E) compaction testing results for backfilling and paving;
 - (F) video report and detailed written report and electronic files containing chainage-specific defect codes from a CCTV inspection. Where deficiencies have been identified by the CCTV inspection, Project Co shall arrange for additional examinations as reasonably required to demonstrate that all deficiencies have been rectified in accordance with the terms of the Project Agreement;
 - (G) design documents, including design sheets, reports, and technical studies; and
 - (H) Operations Data and Maintenance Manuals in accordance with the requirements set out in Section 2.3 of this Attachment 1.

- (iii) Project Co shall have provided system demonstration and training to the City for all Special Infrastructure, which training shall include hands-on instruction of City personnel in the operation, adjustment and maintenance of the Special Infrastructure. At the time of the instruction, Project Co shall provide an operations and maintenance manual (in form and content to satisfy the requirements of Section 2.3 of this Attachment 1), which shall be used by Project Co to assist in the instructions; and
- (iv) Project Co shall complete all other requirements for testing, commissioning and acceptance that are conditions to approvals and permits obtained for Special Infrastructure.

3.5 Applicable to Highways

- (a) For New Municipal Infrastructure comprised of highways as defined in the City of Ontario Act, 2006, in addition to the documents and other items required to be delivered and/or performed by Project Co pursuant to Section 3.1 of this Attachment 1 and other documents, actions or deliverables otherwise required to be delivered or performed pursuant to the Project Agreement, Project Co shall, prior to and as a pre-condition of Handover of such New Municipal Infrastructure, complete and perform, as applicable, the following:
 - (i) rectify and repair of all damages, settlements and depressions to the above ground road subgrade;
 - (ii) submit the following to the City in accordance with Section 2.1 of this Attachment 1, for review in accordance with Schedule 10 – Review Procedure:
 - (A) Electrical Safety Authority (ESA) certificate for any traffic signal plant including red light cameras; and
 - (B) inspection and testing reports for all traffic plant including traffic control signals, Red Light Cameras, and arterial cameras; and
 - (iii) For any special equipment associated with traffic management, Project Co shall provide:
 - (A) system demonstration and training to the City for all highways, which training shall include hands-on instruction of City personnel in the operation, adjustment and maintenance of the highways. At the time of the instruction, Project Co shall also provide an operations and maintenance manual (in form and content to satisfy the requirements of Section 2.3 of this Attachment 1), which shall be used by Project Co to assist in the instructions; and
 - (B) an Operations Data and Maintenance Manual, in form and content shall satisfy the requirements in Section 4.3 of this Attachment 1.

3.6 Applicable to Street Trees

- (a) For New Municipal Infrastructure comprised of street trees, in addition to the documents and other items required to be delivered and/or performed by Project Co pursuant to Section 3.1 of this Attachment 1 and other documents, actions or deliverables otherwise required to be delivered or performed pursuant to the Project Agreement, Project Co shall, prior to and as a pre-condition

of Handover of such New Municipal Infrastructure, submit the following in accordance with Section 2.1 of this Attachment 1:

- (i) A full list of trees planted by Project Co on public lands, including on City Road Allowance.

4. DOCUMENTATION

4.1 Submittals

(a) Project Co shall submit to the City all documentation (including drawings) required to be delivered under this Attachment 1 as follows:

- (i) to the City for review in accordance with Schedule 10 – Review Procedure; and
- (ii) in the following formats and quantities in respect of all Record Drawings required to be delivered to the City pursuant to this Attachment 1.
 - (A) for Record Drawings, four CDs/DVDs, one (1) full size hard copy set, and one (1) reduced size hard copy set unless specified otherwise by the City;
 - (B) for Special Infrastructure, five (5) CDs/DVDs and two (2) hard copy sets, unless specified otherwise by the City; and
 - (C) for all other documents (other than documents referenced in (A) and (B), four CDs/DVDs and one (1) hard copy set, unless otherwise specified by The City; and
 - (D) each of the foregoing shall be in PDF format generated from the source electronic document and not scanned from hard copies.

4.2 Record Drawings

- (i) Project Co shall provide Record Drawings for the New Municipal Infrastructure in compliance with the City Standards, or such other standards as are agreed to by Project Co and The City.
- (ii) Project Co shall provide Record Drawings for New Municipal Infrastructure for review in accordance with Schedule 10 – Review Procedure, as follows:
 - (A) Record Drawings shall be in Microstation and PDF format showing the final plan and profile locations of the New Municipal Infrastructure, including service connections;
 - (B) Only the plan and profile drawings shall be updated and submitted as the Record Drawings;
 - (C) Profile drawings shall not be required if profile drawings are not required by the City during the approval and permitting stage; and

- (D) Record Drawings shall accurately record deviations from the original drawings accepted by the City, including changes caused by site conditions.

4.3 Operations Data and Maintenance Manuals

- (a) In respect of New Municipal Infrastructure that is Special Infrastructure or Highways, as contemplated in Sections 3.4 and 3.5 of this Attachment 1, Project Co shall prepare operations data and maintenance manuals for the City in accordance with the following requirements:
- (i) Vinyl, hard covered, three ring, loose leaf binder for 215 mm X 280 mm sized paper;
 - (ii) Title sheet, labelled 'Operations Data and Maintenance Manual', project name, date, and list of contents;
 - (iii) Contents organized in the respective sections of work with each section marked by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets. The electronic copy shall be bookmarked with the list of contents hyperlinked;
 - (iv) Details of operation and maintenance instructions for equipment and systems, including a complete list of equipment and part lists consisting of make, size, capacity, and serial number;
 - (v) Names, addresses, and phone numbers of subcontractors and suppliers;
 - (vi) Warranties showing the 'Title' of the Project, guarantee periods reflecting the start date, a clear indication on parts and parcels that are covered under guarantee, and due authorization of competent signatories; and
 - (vii) Any additional materials used in the applicable New Municipal Infrastructure showing names of manufacturers and source supplies including manufacturers' literature.

- (b) All PDF documents included within all Operations Data and Maintenance Manuals shall be generated from the source electronic document and not scanned from hard copies

5. CERTIFICATION

- (a) Prior to achievement of Handover of New Municipal Infrastructure, and as a pre-condition of Handover, Project Co shall submit to the City (if a Notice of Delegation has been issued in respect of the New Municipal Infrastructure) written certification of the New Municipal Infrastructure in the form attached as Attachment 2 of this Appendix A. Each certificate shall be stamped, signed and dated by professionals licensed in the Province of Ontario qualified to certify the specific type of work and equipment being certified.

ATTACHMENT 2

FORM OF NEW MUNICIPAL INFRASTRUCTURE CERTIFICATION

Certificate Reference Number [....]
(insert reference number)

CERTIFICATE OF MUNICIPAL INFRASTRUCTURE

A. General

1. This certificate is in respect of:
 - (a) [...] *(insert details of the New Municipal Infrastructure to be certified)* (the “**Certificate - (b) the Project Agreement between The City and Project Co dated [...] *(insert date of Project Agreement)* (the “**Project Agreement**”) relating to the Project.**
2. Defined terms and expressions used in the Project Agreement have the same meanings in this Certificate.
3. This Certificate is used by Project Co for certifying, as applicable:
 - (a) the substantial completion of construction activities in respect of those components of the Works set out in paragraph A1 of this Construction Certificate; or
 - (b) the total completion of construction activities in respect of any Reinstatement Work carried out by the Construction Contractor pursuant to Section 30 of the Project Agreement in accordance with a Reinstatement Plan,

in accordance with the Project Agreement, City Standards, the designs and plans submitted by Project Co and accepted by the City, other standards that have been agreed to in writing by the City and Project Co, and good engineering practices.

B. Construction Contractor’s Statement

1. We certify that the components of the Works set out in paragraph A1 of this Construction Certificate have been designed, constructed, **[substantially completed as set out in paragraph A2(a)], [totally completed as set out in paragraph A2(b)]**, commissioned and tested in all respects in accordance with: *(Inapplicable language to be deleted)*
 - (a) the relevant Design Data, Design Certificates, and Construction Certificates pursuant to Schedule 10 of the Project Agreement in each case to which there has been no objection under the Review Procedure;
 - (b) the provisions of the Project Agreement, including all applicable Output Specifications, as amended by the following Variation(s):
 - (i) [...] *(List, if any, the change(s) made by the issue of any Variation(s))*; and
 - (c) the requirements of City Standards, the designs and plans submitted by Project Co and accepted by the City, other standards that have been agreed to in writing by the City and Project Co, and good engineering practices.

Signed..... (Construction Contractor's representative)

Name.....

Date.....

C. Design Team's Statement

1. We certify that the components of the Works set out in paragraph A1 of this Construction Certificate have been designed, constructed, [substantially completed as set out in paragraph A2(a)], [totally completed as set out in paragraph A2(b)], commissioned and tested in all respects in accordance with: the requirements for examination of the Works contained in the Design Management Plan and the Construction Design Management Plan and utilizing the standards of care, skill and diligence that, in accordance with the standards of our profession, are required of experienced professionals undertaking such examinations. (*Inapplicable language to be deleted*)
2. We further certify that in our professional opinion the components of the Works set out in paragraph A1 of this Construction Certificate have been designed, constructed, [substantially completed as set out in paragraph A2(a)], [totally completed as set out in paragraph A2(b)], commissioned and tested in all respects in accordance with: (*Inapplicable language to be deleted*)
 - (a) the relevant Design Data, Design Certificates, and Construction Certificates pursuant to Schedule 10 of the Project Agreement in each case to which there has been no objection under the Review Procedure;
 - (b) the provisions of the Project Agreement, including all applicable Output Specifications, as amended by the following Variation(s):
 - (i) [...] (*List, if any, the change(s) made by the issue of any Variation(s)*); and
 - (c) the requirements of City Standards, the designs and plans submitted by Project Co and accepted by the City, other standards that have been agreed to in writing by the City and Project Co, and good engineering practices.

Signed..... (Design Team's Principal)

Name.....

Date.....

Professional Registration Number: (Affix Professional Seal)

D. The City Representative

1. This Certificate is:
 - i. reviewed*
 - ii. reviewed as noted as follows*
 - iii. returned marked "rejected" as follows:

* delete as appropriate

Signed: (The City Representative)

Name:

Date:

SCHEDULE 15-1

TECHNICAL TERMS AND REFERENCE DOCUMENTS

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**PART 1
TECHNICAL TERMS AND REFERENCE DOCUMENTS**

ARTICLE 1 DEFINITIONS

100-Year Storm means a storm event with a return period of one hundred (100) years (1-percent annual exceedance probability), as described in the City of Ottawa Sewer Design Guidelines.

100-Year Plus 20% Storm means a 100-Year Storm calculated on the basis of a 20% increase of the City's Intensity Duration Frequency (IDF) curves.

Accident means an unforeseen event or occurrence which causes death, injury or property damage. Any event involving the revenue service operation of a rail fixed guideway system if as a result:

- An individual dies;
- An individual suffers bodily injury and immediately receives medical treatment away from the scene of the accident; or
- A collision, derailment, or fire causes substantial property damage.

Action Plan has the meaning given in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Airport Link means the approximately 4km long spur line connecting South Keys Station to the OMCIA. The Airport Link includes Stations at Uplands and the OMCIA.

Airport Restricted Area means any area on the OMCIAA property to which access is signed as restricted.

Airport Restricted Area Pass means a pass that allows non-passengers access to the Airport Restricted Areas.

Airport Security Requirements has the meaning given in Schedule 15-2, Part 1, Article 4.6.

Airport Station Concourse means the portion of the construction to be completed by the OMCIAA as per Schedule 15-2, Part 4 – Stations.

Airport Zoning Regulations means the Transport Canada regulations that restrict the heights of buildings, structures and objects (including natural growth, such as trees) on regulated land.

Airside means the part of an airport used by aircraft for loading and unloading and takeoffs and landings.

Airside Vehicle Operator's Permit means a permit issued by the OMCIAA to certify those able to drive in the gate, runway and aircraft taxi areas.

Airside Vehicle Operator's Permit D means a permit issued to those with a need and right to regularly access runways and taxiways in the ongoing and regular performance of their duties.

Airside Vehicle Operator's Permit DA means a permit issued to those with a need and right to access airside aprons and vehicle corridors in the ongoing and regular performance of their duties.

Alert Level has the meaning given in Schedule 15-2, Part 2, Article 9.

Ancillary Facilities means those facilities, buildings, or structures adjacent to or directly linked to Stations. They can also be standalone facilities or structures located within or adjacent to the alignment. They include the following elements:

- Pedestrian overpass or underpass structures;
- Passenger shelter structures;
- Structures containing mechanical, electrical, communications or other service equipment;
- Signal equipment enclosures and bungalows;
- Parking areas;
- Entrances;
- PPUDO;
- Public washrooms;
- Bus Platforms;
- Bus layby areas; and,
- Bus Operations support building (including bus supervisor office).

Annual Preventive Maintenance Plan means at any time during the Maintenance Period, that component of the Maintenance and Rehabilitation Plan describing the Preventive Maintenance for the then current or immediately following Contract Year, as the context requires.

Appointed Railway Bridge Engineer means a Project Co team member with the responsibilities outlined in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Art Program includes both temporary and permanent artwork projects that may be linked, permanently affixed to and / or integrated into the architectural and / or landscape design along the streets, guideway, park land or on the exterior or within the interior of the Stations.

Asset Management Plan means a plan which identifies the replacement schedule for the Expanded Trillium Line components based on their expected Design Life, and based on the relevant lifespan projections of the individual and combined assets through applicable analysis founded on the design, specifications and asset performance and maintenance, which will be included within the Asset Management Plan, which plan forms part of the Maintenance and Rehabilitation Plan.

Asset Preservation Performance Measures has the meaning given in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Authorities Having Jurisdiction has the meaning given in NFPA 130.

Availability means the probability that a system or system element will be operational when required. Mathematically, that equals the ratio of the mean time between failure and the sum of the mean time between failure and the mean down time.

Backup Control Centre means an emergency control center facility providing a remote location complete with the basic functioning systems to dispatch, monitor, and control operations of the System in case the TOCC at 875 Belfast is unavailable.

Baseline Vehicle Kilometers means the scheduled annual Revenue Service Vehicle Kilometers set out for each Service Level in the Operations Service Plan as of Financial Close.

Basic Day Demand is as defined in Schedule 15-2, Part 2, Article 8 – Utility Design Criteria.

Booking means the schedule of work assignments for Operators established by the City, several times a year (beginning of January, end of April, end of June, and beginning of September) in accordance with the Operations Service Plan.

Bridge means a structure that provides a Roadway, railway or walkway for the passage of vehicles, pedestrians or cyclists (or other similar forms of transportation) across an obstruction, gap or facility that is greater than 3m in span.

Bridge Condition Index means a condition rating index for bridges, in accordance with MTO's bridge condition rating procedure.

Bridge Safety Management Plan has the meaning given to it in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

The **Canadian Rail Operation Rules** is the official set of rules governing the operation of railways in Canada. The CROR is used by every Canadian Railway.

Capital Railway means the entity under which the City of Ottawa operates the Expanded Trillium Line.

Central Instrument House means a wayside control room housing all the controls for an interlocking or group of interlockings.

Certifiable Elements (Lists) has the meaning given in Schedule 15-2, Part 1, Article 8 – Security and Emergency Management.

Certificate of Fitness means the certificate issued by the CTA to a company proposing to construct or operate a railway under federal jurisdiction, when the company holds adequate liability insurance. Certified companies are monitored by the CTA for continued compliance.

Certification Program Representative has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

Checked Redundancy Principle has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

City Direction has the meaning given to it in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Civil Works means the installation or relocation of duct banks, manholes, hand wells, vaults, transformer bases, and pads, or underground support structures in speciality structures.

Closed Circuit Television means a video transmission system monitoring a location, recording images and presenting the images to a central location.

[REDACTED] Walkley Line is a [REDACTED] operated freight rail line that encompasses the Existing Walkley Yard and connects with the Existing Trillium Line via the north connecting Track and the south connecting Track.

Compensating Construction has the meaning given to that term in the OBC.

Computerized Maintenance Management System means part of an overall integrated information management system which includes a work order based system, maintenance schedule tool, asset registry and inventory, help desk functionality, control room log and performance reporting.

Concourse Level means the intermediate level of a Station that connects Platform Level and Entry Level.

Confederation Line means all of the existing Confederation Line, located between and including Blair Station in the east and Tunney's Pasture Station in the west; the Confederation Line west extension, an expansion west between and including Tunney's Pasture Station and Baseline and Moodie Stations; and the Confederation Line east extension, an expansion east between and including Blair Station and Trim Station.

Connecting Track has the meaning given in Schedule 15-2, Part 2, Article 3 – Trackwork.

Construction Impact Assessment Report – Level 1 has the meaning given in Schedule 15-2, Part 2, Article 9 – Protection of Existing Adjacent Structures.

Construction Impact Assessment Report – Level 2 has the meaning given in Schedule 15-2, Part 2, Article 9 – Protection of Existing Adjacent Structures.

Construction Security Plan means a plan that is developed to establish the procedures required to provide the Security measures necessary to achieve Security on the Site as outlined in Schedule 15-2, Part 1, Article 8 – Security and Emergency Management.

Controller means a City employee that will be assigned to the TOCC and will be responsible for all dispatching functions for the System.

Controller Training means a program of Controller Training a City employee must attend prior to becoming a certified Controller. The program is provided by a Project Co Trainer.

Corrective Maintenance means the repair of failed E&M and/or Vehicles or the repair of any portion of the fixed facilities to restore normal operating condition to a state in accordance with the Standard and includes the repair or replacement of a failed system or subsystem through actions such as:

- investigation, localization and isolation of faults (troubleshooting);
- disassembly, reassembly, repair or replacement of the affected part or parts;
- retesting of the repaired system or subsystem; and
- correcting Defects.

Corrective Maintenance Plan means the plan establishing the general policies, procedures and methodology which Project Co shall apply to perform Corrective Maintenance, including without limitation to identify and analyze existing and anticipated Deficiencies, including inspection and testing, and which shall be employed by Project Co to affect the Repairs and Correction of Deficiencies when they occur during the Maintenance Period.

Cost Recovery means total actual net cost to Project Co based on an open book system.

Crime Prevention through Environmental Design means the design, maintenance, and use of the built environment in order to reduce both the incidence and fear of crime. It involves the application of these three core principles: natural surveillance, natural access control, and territorial reinforcement.

Crossing Agreements means [REDACTED] and [REDACTED].

Critical means failure conditions which could result in significant system damage or adverse effects on one or more occupants (including fatal injury).

Culvert means a structure that forms an opening through soil to allow the passage of surface water, livestock or pedestrians under a Roadway, railway or roadside entrance.

Custodial Maintenance means all forms of cleaning and clearance of unwanted items from New System Infrastructure including clearance of snow, ice, debris, garbage, trash, litter, stickers, gum and graffiti to restore the normal operating condition to meet the Standard.

Custodial Maintenance Areas means those areas and elements of the System included in Schedule 15-3 – Maintenance and Rehabilitation Requirements and identified therein as the responsibility of Project Co with respect to Custodial Maintenance, and for further certainty, includes Vehicles, the New Walkley Yard, the alignment, the Tracks and, to the extent identified in Schedule 15-3 – Maintenance and Rehabilitation Requirements, the Stations.

Daily Lane Closure Report has the meaning given in Schedule 15-2, Part 7, Appendix D.

Daily Traffic Management Site Record has the meaning given in Schedule 15-2, Part 7, Appendix C.

Daily Traffic Monitoring Report has the meaning given in Schedule 15-2, Part 7, Appendix D.

Defect means the condition of any part of the work which does not meet the contract document requirements; cause a train or a portion of the Work to cease operating or operate in a degraded mode; or inflicts damage or harm on any other portion of a train or the Work.

Deficiency means any condition which exists with respect to any aspect of the System and which requires Maintenance, including without limitation any failure of the System to meet the Standard, other than a Non Maintenance Repair.

Design Criteria means established parameters used during design.

Design Life means the period of time specified by the Owner during which an asset is intended to remain in service.

Design Safety means safety achieved by the integration of safety features into the system design characteristics to prevent or minimize the probability of operation in an unsafe manner.

Developer's Guide has the meaning given in Schedule 15-2, Part 1, Article 9 – Future Adjacent Construction Requirements.

Disposed, Disposed of or Disposal means disposal as identified in the “Waste and Excess Materials Management for Maintenance (MTO)” operational specification.

Documentation Plan has the meaning given in Schedule 15-2, Part 3, Article 1 – Introduction.

Drainage means the interception and removal of surface water or groundwater by constructed or natural means.

Dwell Time means the amount of time a Train resides at a Station.

Elements of Continuity has the meaning given in Schedule 15-2 Part 4, Section 2.3(c).

Elements of Variability has the meaning given in Schedule 15-2 Part 4, Section 2.3(c).

Elevated Guideway means a Guideway elevated above grade by means of a Structure.

Emergency Costs has the meaning given to it in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Emergency Guard Rail (Steel Inner) is intended to contain and guard a derailed truck, keeping the Vehicle upright and on the Track structure.

Emergency Traffic Plan is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Employee Security Standard means the security clearance and identification procedures and requirements mandated by the hiring policies, practices and standards of the City’s Human Resources Department, as may be amended from time to time.

Epidemic Defect shall be deemed to have occurred at any time during the Maintenance Period when the Failure Rate within a Population of a component, subsystem or system exceeds the Constant Failure Rate by [REDACTED] measured over the time period in which the constant Failure rate is expressed but, for the avoidance of doubt, an Epidemic Defect shall exclude any Defect which arises:

- as a result of the failure by the Operator to operate the System in accordance with the Operation Requirements;
- out of the replacement or repair of any component, subsystem or system where such replacement or repair is the responsibility of the Operator or the City;
- out of the replacement or repair of any component, subsystem or system by the Maintenance and Rehabilitation Contractor where such replacement or repair is a product of the Design Life and Constant Failure Rate of the applicable component, subsystem or system; and/or
- any Defect which occurs after the expiration of the Design Life of such component, subsystem or system.

For the purposes hereof, the “**Population**” of a component, subsystem or system means the total number of identical line replaceable units (as identified in the Response) of a distinct type and function, whether the line replaceable unit consists of individual components, subassemblies or unit assemblies, incorporated in the fleet of Vehicles provided as part of the Project.

Erosion and Sediment Control Plan means the approach, techniques and measures used to prevent erosion during the construction process, to deal with suspended sediment at the source and minimize sediment transport from leaving the Construction site.

Existing Adjacent Structures means Adjacent Structures and other structures that are susceptible to ground movements caused by construction activities.

Existing Vehicle Fleet means the six Alstom 41m long DMUs in service on the Expanded Trillium Line.

Existing Trillium Line ROW means those Lands where the Existing Trillium Line operates subject to federal rail regulations apply.

Existing Walkley Yard is the existing Capital Railway facility east of Albion Road used for the maintenance and service of the Existing Vehicle Fleet.

Facilities means the above-grade structures, at-grade structures, below-grade structures, mechanical elements, electrical elements, interior areas, and exterior areas described in Schedule 15-2, Part 4 – Stations and Schedule 15-2, Part 5 – New Walkley Yard, including but not limited to: Stations, New Walkley Yard, and Ancillary Facilities.

Failure means the event, or inoperable state, in which any item or part of an item does not, or would not perform as previously specified, regardless of the operational state of the subsystem.

Failure Mode, Effects and Criticality Analysis outlines the Failure cases and assesses the impact on the System. It has the meaning defined in Schedule 15-2, Part 1, Article 7 – System Safety Certification. Reference MIL-STD 1629A or EN 60812.

Failure Review Board has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

Fail Safe (Safety) A characteristic of a system which insures that any and all failure modes result in the system defaulting to a safe mode in regard to Passengers, personnel, Track, wayside and Vehicle.

Fail Safe Principle has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

Fare Paid Zone means the area within transit stations in which Passengers shall have paid a fare and allows customers to transfer between modes of transit without passing through fare control barriers, revalidating fare payment on either the bus or when entering a train station, or passing in and out of a proof of payment zone.

Fault Tree Analysis means a systematic analysis of single and multiple events used for identifying the probability of occurrence of an undesired event using AND gates, OR gates, and Boolean algebra. FTA's produce graphic representations of failures and events which may result in a pre-selected top-level event to occur.

Federal Lands mean all lands owned and managed by all federal government departments.

Federally Mandated Stations means those stations within the project that are subject to Federal Land Use Agreement letters.

Final Safety Certificate is a certificate provided by Project Co signifying that the System Safety elements have been fulfilled and the System is safe for Revenue Service.

Fire Life Safety means those aspects of safety specifically related to the prevention, detection and response to fire, smoke and toxicity hazards.

Fire Life Safety and Security Committee means the committee that acts as a review board of the activities, analyses, and reports generated on fire/life safety and security issues.

Fire/Life Safety System means: (a) emergency exit buildings, emergency pathways, emergency walkways, tunnel cross passages, emergency stairs, emergency doors and emergency wayfinding signage any other elements provided for the purposes of emergency egress; and (b) fire alarms, fire sprinkler systems, fire extinguishers, fire standpipe, emergency ventilation systems, fire fighter telephones, emergency lighting, emergency and standby power sources, and emergency response vehicles; and (c) any other assets provided for the purposes of fire/life safety and evacuation.

Fitups means infrastructure required to operate a bus stop or a bus station, such as, but not limited to, shelters, benches, signage, garbage cans, lighting, PIDS, and power and communications necessary to support the elements.

Fixed Component Availability Standard has the meaning given in Schedule 15-3 - Maintenance and Rehabilitation Requirements, as applicable to Attachments 3, 4, 8 and 9.

Foundation means a Structure that transfers loads to the earth.

General Traffic when used in Table 7-1.3 of Part 7 – Traffic and Transit Management and Construction Access, means Roadways that are not part of the City’s Truck Route Network and accommodate no scheduled transit routes.

Geotechnical Instrumentation and Monitoring Plan has the meaning given in Schedule 15-2 Part 2 - Article 7, Geotechnical Design Criteria and Requirements.

Greenfield has the meaning given in the City of Ottawa Sewer Design Guidelines.

Guideway means the part of a passenger rail transit System on which the Trackwork is located, with a boundary marked by ROW fences, curbs and parapets or in a Tunnel.

Handover Maintenance means the testing, disassembly, refurbishment, rebuilding and/or repair of any components of the System to be completed by Project Co within the last 60 months of the Maintenance Period and prior to the expiry of the Maintenance Period in accordance with the requirements contained in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Handover Maintenance Period means the last 60 calendar months of the Maintenance Period.

Handover Maintenance Plan means the documented plan for the performance of the Handover Maintenance in compliance with the requirements of Schedule 15-3 – Maintenance and Rehabilitation Requirements.

HASTUS means a software package by GIRO used by Public Transit. The HASTUS software solution includes a suite of integrated modules for improved planning, scheduling, operations, passenger information, and analysis.

Hazard means any real or potential condition that can cause injury, death, or damage to or loss of equipment or property.

Hazard Analysis means any analysis performed to identify hazardous conditions for the purpose of their elimination or control.

Hazard Log has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

Hazard Resolution means the analysis and subsequent actions taken to reduce, to the lowest level practical, the risk associated with an identified Hazard.

Headway means the time separation between two Trains, both traveling in the same direction on the same Track. It is measured from the time the head end of the leading Train passes a given reference point to the time the head end of the Train immediately following passes the same reference point.

Immediate or Immediately means the initiation of an activity as soon as possible after Detection or being Made Aware and no later than two hours from the time of Detection or being Made Aware. If more than one activity requires immediate action at the same time, Project Co shall give priority to the highest degree of Hazard.

Infill has the meaning given in the City of Ottawa Sewer Design Guidelines.

Initial Works means the Works undertaken by Project Co in the first 120 days following Commercial Close.

ISO 9001:2008 means the quality management system so designated and established by the International Organization for Standardization.

Landscape Plan means a plan that specifies the hard and soft landscape material.

Lane Closure Measurement and Verification Plan has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Lane Shift means a transfer of traffic along lane(s) of the same route and which, using existing Roadway lanes or surfaces, guides traffic around the work zone.

Legal Survey means a survey that is prepared by an Ontario Land Surveyor for the Registration or Deposit in the Provincial Land Registry Office to facilitate a conveyance by providing a Registerable description, effect an expropriation or to confirm the location of a property boundary.

Leitrim Service Road has the meaning given to it in Schedule 15-2, Part 2 – Civil and Guideway.

Level of Service, when used with respect to Roadway operation, has the meaning as described in the City of Ottawa's Transportation Impact Assessment Guidelines.

Line Replaceable Unit means components that are replaceable on the Vehicle.

Low Impact Development means a SWM strategy that seeks to mitigate the impacts of increased runoff and stormwater pollution by managing runoff as close to its source as possible.

Lowest Line Replaceable Unit means the lowest level assembly of components or piece parts to which a failure can be isolated and that can be readily replaced in its field application.

Mainline Track has the meaning given in Schedule 15-2, Part 2, Article 3 – Trackwork.

Mainline Storage Track or Storage Track has the meaning given in Schedule 15-2, Part 2, Article 3 – Trackwork.

Maintain means to perform the Maintenance, as required in accordance with the Project Agreement including the Maintenance and Rehabilitation Requirements, and “**Maintained**” shall have a corresponding meaning.

Maintainability means the quality of the combined features of equipment design and installation that facilitates the accomplishment of inspection, test, checkout, servicing, repair, and overhaul with a minimum of time, skill, and resources in the planned maintenance environments.

Maintenance means Preventive Maintenance, Corrective Maintenance, Custodial Maintenance and Handover Maintenance.

Maintenance and Rehabilitation Plan means the documented plan for the performance of the Maintenance and Rehabilitation Services, provided to the City and with respect to which the City has no material objection at the time of the Final Design Submittal as contemplated in the RFP, which shall thereupon be attached as Appendix A Attachment 1, as revised from time to time in accordance with the Project Agreement.

Maintenance and Rehabilitation Services means Maintenance to be provided by Project Co to the City in accordance with Schedule 15-3 – Maintenance and Rehabilitation Requirements and the other terms of the Project Agreement and shall also include the supply, operation and maintenance of any vehicle and or equipment used to provide Maintenance.

Maintenance Dispute has the meaning given to it in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Maintenance Dispute Resolution Procedure has the meaning given to it in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Maintenance Emergency means any Emergency which is caused by, or which arises as a result of:

- Project Co’s performance of, or failure to perform, the Maintenance and Rehabilitation Services;
- a Defect or Deficiency of the fixed equipment, Vehicles or fixed facilities;
- any act or omission of Project Co or any employee or officer, agent or contractor of Project Co; or

except to the extent that such Emergency is not caused by or does not arise as a result of any of subparagraphs (a), (b) and (c) above, and except to the extent that such Emergency is caused by or arises as a result of a Force Majeure.

Maintenance Management System has the meaning given to it in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Maintenance Responsibility Table means the table set out in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Maintenance Vehicles means vehicles that are capable of being rail-mounted and used by staff in the performance of maintenance duties on the System Infrastructure.

Major Maintenance Shutdown Period means any period of time during the Maintenance Period during which Project Co is permitted to partially or fully shut down the System during Revenue Service Hours without deductions under the Payment Mechanism, compliance with Section 1.5 of Schedule 15-3 – Maintenance and Rehabilitation Requirements, in order to carry out major maintenance works.

Major Municipal Roads means a City freeway, Arterial Roadway or Major Collector Road as defined in the City of Ottawa Transportation Master Plan.

Master Test Plan is as defined in Schedule 15-2, Part 8 – Vehicles.

Maximum Day Demand is as defined in Schedule 15-2, Part 2, Article 8 – Utility Design Criteria.

Mean Distance Between Failure means the average number of kilometres traveled between independent component malfunctions or failures, regardless of time or status of Train.

Mean Time Between Failure means the average equipment operating time per independent equipment failure. MTBF is the reciprocal of failure rate and is expressed mathematically as: $MTBF = (\text{Equipment Operating Time}) / (\text{Independent Failures})$

Mean Time to Repair means the mean elapsed time required to perform the task of isolating an independent failure to the LLRU to remove and replace the malfunctioned LLRU and to verify proper equipment function. It is expressed in hours.

Minor Municipal Roads means a Collector Road or Local Road as defined in the latest City of Ottawa Transportation Master Plan.

Monthly Activity Report has the meaning given in Schedule 15-3, Appendix A, Article 1.8 – Records and Reporting.

Multi-Use Path means a formalized travel surface intended for a wide variety of non-motorized travelers that is physically separated from motorized vehicular traffic, with the exception of bridges, sidewalks and walkways.

Network Management System means a management software package that collects and manages information about the CTS network equipment including switches, routers, servers, etc. The NMS provides a browser interface to allow operators, administrators and network engineers an easy to understand manner to help them quickly identify and correct network problems with the CTS.

New Vehicle Fleet means the new Vehicles being procured for service on the Expanded Trillium Line.

New Walkley Yard means the proposed Capital Railway facility located west of Albion Road to be used for the maintenance and service of the Revenue Vehicles.

Night Period means the period of time between 22:00 and 5:00 hrs, when used in Schedule 15-2, Part 7 – Traffic and Transit Management Requirements.

Noise and Vibration Control Plan has the meaning given in Schedule 17 – Environmental Obligations.

Non Maintenance Emergency means an Emergency that is not a Maintenance Emergency.

Non-Revenue Vehicles means vehicles that are used by staff in the performance of maintenance and operational duties on the Existing Trillium Line and its related facilities.

North Prescott Spur is an existing freight rail line that extends southward from Greenboro Station (Existing Trillium Line) to the NRC Facility, and is to be part of the Trillium Line Extension.

Not Shared when used in Table 7-1.3 of Part 7 – Traffic and Transit Management and Construction Access, means a lane intended for use by vehicles only (usually the median lane on a multi-lane highway).

NRC 6 Month Shutdown Period is as defined in the Rail Car Transfer Agreement.

NRC 7 Day Freight Access Periods is as defined in the Rail Car Transfer Agreement.

NRC Facility means the NRC Automotive and Surface Transportation site located at 2320 Lester Road.

Obstacle Limitation Surfaces means a surface that establishes the limit to which objects may project into the airspace associated with an aerodrome consisting of the following; a takeoff surface, an approach surface, a transitional surface and an outer surface.

OC Transpo Trainer(s) means City employee(s) or contractor who has been trained and certified to instruct OC Transpo employees in certain classifications who are assigned to or have any duties and responsibilities on the System. These classifications include but are not limited to Operator, Station Attendant, Customer Service Staff, Controllers, Supervisors and Superintendents, and security personnel.

Off Peak Period means any period of time which is not a Peak Period or Night Period, when used in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Off Peak Period means any period of time during Revenue Service Hours which is not a Peak Period, when used in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Open Process Control means a software interface standard that allows Windows programs to communicate with industrial hardware devices.

Operation(s) means operation of the System commencing upon the Revenue Service Commencement in accordance with Schedule 15-3 – Maintenance and Rehabilitation Requirements, and shall specifically exclude Maintenance.

Operations Crew Facility means the space within the New Walkley Yard occupied and used by the City for purposes of the operation of the System, including dispatching of Operators and Trains, lunch rooms and locker rooms, training centre, and reception area for Operators and supervisors.

Operations Service Plan means the operations schedule as outlined in Schedule 15-3 – Maintenance and Rehabilitation Requirements, and includes Train movements in support of Revenue Service.

Operator means the driver of a Revenue Vehicle, which is a City employee who has been trained and certified by an OC Transpo Trainer to operate on the Trillium Line.

Operator Training means a program of training a City employee must attend prior to becoming a certified Operator.

O-Train means the rail system operated by OC Transpo, including both the Confederation Line and the Expanded Trillium Line.

Over-Dimensional Vehicle is as defined under the City of Ottawa By-law No. 2003-497.

Overhead means a Structure where a roadway goes over the railway when used in Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements.

Overhead Contact System sometimes referred to as **Overhead Catenary System** means a system that distributes DC power from the traction power System to the Vehicle via a pantograph on the Vehicle. The OCS consists of a conductive messenger wire suspending a contact wire between poles and/or attachments to provide the DC propulsion power requirements of the Vehicle to the Train consist maintaining continuous contact between the pantograph and the contact wire.

Overpass means a structure where the major road goes over a lower category road when used in Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements.

Park and Ride means parking lots located adjacent to Transitway Stations or important transit nodes that are readily accessible by the public from the nearest major Roadway.

Passenger Pick-Up and Drop-Off means a designated pick-up and drop-off area for Passengers from private vehicles adjacent to a Station.

Passing Siding means an auxiliary Track to the mainline for meeting or passing Trains which is also operated by one or more methods of control (i.e. Train Control System).

Pavement means all structural elements or layers including granular, above the subgrade of a road and shoulders, such as a road, shoulder, sidewalk, plaza or other artificially-covered thoroughfare.

Peak Period means the AM and PM periods each weekday as determined by the City, which encompasses 6:30 to 9:30 hrs and 15:00 to 18:30 hrs, when used in Schedule 15-2, Part 7 – Traffic and Transit Management Requirements.

Peak Period means the AM and PM periods each weekday as defined in the Operations Service Plan or otherwise determined by the City in its discretion by written notice to Project Co, when used in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Pedestrian Access Plan means a plan that outlines and shows the pedestrian flow, directions, route, volumes to, from and around all facilities, Guideway and Stations.

Permit to Take Water is required for any taking of more than a total of 50,000 litres of water in a day under the *Ontario Water Resources Act*.

Permitted Periods for Closures means the periods during which Project Co may implement closures, full closures, detour routes, Lane Shifts and diversions in respect of the various Roadways, as set forth in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Physical Constraints means existing Structures (Bridges, Tunnels, buildings, retaining walls), existing Stations, environmentally protected elements (water bodies, SAR, archeological sites, etc.) and the Lands. Physical Constraints shall be at the sole discretion of the City.

Platform means that portion of the Station where Trains and or buses stop to load and unload Passengers. There are two basic types of O-Train Platform configurations: centre loading which has the Platform located between each set of Tracks, and side loading, which has the Platforms located on the outside of each set of Tracks. Both Platform types are in use on the System.

Platform Level means the level of a Station with Platform(s) used by Passengers to board and alight from Trains.

Pre-Handover Inspection has the meaning given in Schedule 15-3, Appendix C, Article 3.0 – General Requirements.

Preventive Maintenance means any action that is performed at scheduled intervals in accordance with the Maintenance and Rehabilitation Plan or as otherwise required to maintain the System at a constant level of performance to comply with the Maintenance and Rehabilitation Requirements and ensuring that the Maintenance of the System is sufficient to permit the Operation of the System in accordance with the Operation Requirements and Specifications (and, for further certainty, to meet or exceed the Maintenance Service

Requirements), including the detection and correction of deviations from normal operation before a major system or subsystem failure occurs, periodic inspections and testing, condition monitoring, critical item replacement, lubrication, adjustment, cleaning and calibration.

Preventive Maintenance Plan means the plan establishing the Preventive Maintenance which Project Co is required to perform, which plan forms part of the Maintenance and Rehabilitation Plan.

Private Approach Permit has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Project means the Trillium Line Extension Project, which consists of the design and construction Works and the Maintenance for the System, including the extension to the Existing Trillium Line.

Project Co Operator means a Project Co employee or contractor who is trained and certified to operate a Revenue Vehicle without passengers on the Trillium Line.

Project Co Operator Training means a program of training a Project Co employee or contractor must attend prior to being allowed to operate an out of service Revenue Vehicle anywhere on the alignment or in the New Walkley Yard. The program is provided by a Project Co Trainer.

Project Co Trainer means a Project Co employee or contractor who is assigned the task of instructing and certifying a Project Co employee, Contractor or a City employee in a specific classification.

Property Access and Business Continuity Plan is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Quality Performance Criteria means the qualitative standards of service and the performance criteria set out in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Quarterly Performance Report has the meaning given in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Quarterly Performance Review has the meaning given in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Radio System Supplier means the City corporate radio nominated manufacturer determined by an external radio contract issued by the City.

Rail Transfer Agreement means the agreement between the City of Ottawa and the National Research Council of Canada as represented by its Centre for Surface Transportation Technology. The Rail Transfer Agreement sets out, among other things, terms and conditions on which the Transfer Segment can be used to provide the NRC the service of moving rail cars over the

Transfer Segment between the Siding and the Connecting Track before, during and after the O-Train Expansion and maintenance requirements in respect of the Transfer Segment.

Railway Bridge Engineer means a City team member with the responsibilities outlined in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Railway Operating Certificate means an official document issued by Transport Canada that authorizes a federal railway company or a local railway company to operate in Canada.

Railway Works means a line work or any part thereof, a crossing work or any part thereof, or any combination of the foregoing.

Reference Concept means the plans, drawings, reports and other information prepared during the preliminary design for the Project and which reside in the Data Room.

Reference Documents means the references, codes, standards, specifications, guidelines, policies, reports, publications, manuals, bulletins and other such documents listed throughout the Output Specification.

Reference Plan is defined in Ontario Regulation 43/96 Part I as a plan deposited under section 150 of the Land Titles Act or section 80 or 81 of the Registry Act and includes any other plan deposited as a reference plan. Part IV describes the requirements, contents, and procedures to be followed for a reference plan.

Reliability means the probability that the system or subsystem will perform satisfactorily for a given period of time when used under stated conditions.

Reliability/Availability Program Plan has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

Reliability Block Diagram means a diagrammatical representation of Systems elements in a series and/or parallel configuration to represent the reliability impact of complete System. Refer to IEC 61078.

Remedial Action Notice has the meaning given to it in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Replacement-In-Kind means replacement of identical or similar nature that satisfies the original design specification.

Replacement Parts has the meaning given to it in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Requirements Management Plan has the meaning given in Schedule 15-2, Part 3, Article 1 - Introduction.

Response Action Plan has the meaning given in Schedule 15-2, Part 2, Article 9 – Protection of Existing Adjacent Structures.

Restraining Rail is an additional rail installed alongside of the gauge side of the low (inner) rail of a sharp radius curve which share with the running rails the lateral forces generated while the Train is traversing the curve. Restraining rail is to enhance safety by providing additional Vehicle truck guidance, divide lateral wheel forces between two rails, reducing forces on the rail fastening system and divide rail wear over two rail surfaces increasing the time between running rail replacements.

Revenue Service means the carriage of paying Passengers on the System.

Revenue Service Hours means the hours during which Revenue Service is provided on the System as set out in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Revenue Service Vehicle Kilometres means the distance travelled by Vehicles while in Revenue Service, measured in kilometres.

Revenue Vehicles or Vehicles means the diesel multiple unit passenger cars. Revenue Vehicles includes the Existing Vehicle Fleet in service as well the New Vehicle Fleet currently being procured.

Review Level has the meaning given in Schedule 15-2, Part 2, Article 9 – Protection of Existing Adjacent Structures.

Risk Assessment has the meaning given in Schedule 15-2, Part 1, Article 8 – Security and Emergency Management.

Risk Log has the meaning given in Schedule 15-2, Part 1, Article 8 – Security and Emergency Management.

Road Close Permit has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Road Safety Design Reviews means Design safety reviews that are to be carried out in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-bys.

Road Safety Audit means an audit carried out in accordance Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-bys.

Road Safety Audit Team means a group of individuals appointed by Project Co from time to time to carry out Road Safety Audits in respect of the Works.

Road Safety Auditor has the meaning given in Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-bys.

Road Safety Audit Certificates has the meaning given in Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-bys.

Roadway means the driving surfaces including travelled lanes, shoulders and shoulder rounding.

Roadway Works is defined as the design and construction of all temporary or permanent Roadway modifications, improvements or new construction of municipal and federal Roadway infrastructure, including but not limited to travelled lanes, auxiliary lanes, bike lanes, shoulders, boulevards, accesses, intersections, interchanges and the associated ramps, related to the scope of the Stage 2 Project.

Room Data Sheets means the room data sheets in Schedule 15-2, Part 5 – New Walkley Yard, Appendix A.

Safety means freedom from harm resulting from unintentional acts or circumstances.

Safety Certification means the process of verifying compliance with a set of formal safety requirements. The requirements are defined by a safety certification plan, design criteria and technical specifications and applicable codes and industry standards. Specifically, certifiable elements need to be identified, verification activities need to be performed and documented, and certificates of conformance need to be signed and issued by the responsible and accountable parties as described in Schedule 15-2, Part 1, Article 7 - System Safety Certification.

Safety Certification Program has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

Safety and Security Certification Review Team has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

Safety and Security Operations Review Committee has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

Safety Audit means an inspection by the City of the System, the books and records and/or procedures of Project Co relating to the Safety Standards, and includes an inspection of the Safety Management System and the Safety Case.

Safety Case means the submission of Safety evidence at prescribed intervals in the Project lifecycle. It has the meaning outlined in EN 50129.

Safety Certification Report has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

Safety Critical means a designation placed on a system, subsystem, element, component, device or function denoting that satisfactory operation of such is mandatory to safety assurance of patrons, personnel, equipment, or facilities. Such a designation dictates incorporation of special safety design features.

Safety Integrity Level means a relative level of risk-reduction provided by a safety function, or to specify a target level of risk reduction. The requirements for a given SIL are not consistent among all of the functional safety standards. In the functional safety standards based on the IEC 61508 standard, four SILs are defined, with SIL 4 the most dependable and SIL 1 the least. A SIL is determined based on a number of quantitative factors in combination with qualitative factors such as development process and safety life cycle management.

Safety Management System means the Safety protocol (including without limitation the activities, resources, procedures, methodologies, responsibilities and organizational structure) which Project Co shall assist Capital Railway in updating, taking into account the Design and Construction Specifications and is implemented to ensure the Safety of the System and compliance with the Safety Standards, and which is authorized by the City Manager and filed with the City Manager, adherence to which Safety protocol shall be mandatory in all Operations and Maintenance activities, and which shall without limitation include the Capital Railway rules and the Standard Operating Procedures.

Safety Requirements Traceability Matrix is a means of tracking all Project Safety requirements identified by the PA or Project Co to ensure Safety elements are captured and fulfilled for the System with a direct link to the source of the Safety requirement.

Safety Standards means all mandatory Safety standards for the System, being the requirements of Law relating to health and Safety matters respecting the Design, Construction, Maintenance and Operation of the System, including all such Safety standards established by Project Co, in conjunction with the City, taking into account Comparable LRT Safety Standards, the Safety Case, and all Safety standards established by the Design and Construction Performance Requirements.

Safety Verification Matrix has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

Scheduled Revenue Service Vehicles has the meaning given in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

Seasonal Load Restriction regulations are applicable to commercial vehicles or trailers with a gross vehicle weight in excess of 5 tonnes or 11,000 lbs per axle that are prohibited on roads where restriction signage is posted or on all truck routes identified on the most current City of Ottawa Urban and Rural Truck Route Maps.

Security means freedom from harm resulting from intentional acts or circumstances.

Security and Emergency Preparedness Plans means plans that outline Security and Emergency procedures and activities that will occur in response to a Security or Emergency incident.

Security Certification means the process of verifying compliance with a set of formal security requirements. The requirements are defined by a security certification plan, design criteria and

technical specifications and applicable codes and industry standards. Specifically, certifiable elements need to be identified, verification activities need to be performed and documented, and certificates of conformance need to be signed and issued by the responsible and accountable parties as described in Schedule 15-2, Part 1, Article 8 - Security and Emergency Management.

Security Certification Checklists means checklists that are used to validate the design and implementation of Security equipment and processes to verify compliance with a set of formal Security requirements.

Security Certification Program has the meaning given in Schedule 15-2, Part 1, Article 8 – Security and Emergency Management.

Security Management System means the Security protocol (including, without limitation, the activities, resources, procedures, methodologies, responsibilities and organizational structure), which Project Co shall assist Capital Rail in updating, taking into account the Design and Construction Specifications and the initial Threat and Vulnerability Assessment, and implement to ensure the Security of the System and compliance with the Safety Standards, and which is authorized by the City Manager and filed with the City Manager, adherence to which Security protocol shall be mandatory in all Operations and Maintenance activities, and which shall without limitation include the Capital Railway rules and the Standard Operating Procedures.

Security Requirements Traceability Matrix has the meaning given in Schedule 15-2, Part 1, Article 8 – Security and Emergency Management. For clarity, the Security Requirement Traceability Matrix is a matrix format document used to verify and certify that the Security requirements have been incorporated in the design and certify that all Security requirements of the design are constructed and/or installed in accordance with the Project Agreement.

Security Standard means all mandatory Security standards for the System, being the requirements of Law relating to Public and Security matters respecting the Design, Construction, Maintenance and Operation of the System, including all such Security standards established by Project Co, in consultation with the City, taking into account all Security standards established by the Design and Construction Specifications and the initial TVA, as approved and amended from time to time by the City, identifying the mandatory Security Standards to be followed by the City and Project Co (including personnel employed in the performance of Operations and Maintenance), including in response to conditions, events, or Deficiencies which cause interruption to or interference with the Operation of the System.

Security Verification Matrix has the meaning given in Schedule 15-2, Part 1, Article 8 – Security and Emergency Management.

Service Change means a modification to the Operations Service Plan whereby the then-prevailing Operations Service Plan is replaced by one of the other Service Levels identified in Schedule 15-3 Appendix A – Attachment 2.

Service Level means the sets of operational parameters set out by the City in the Operations Service Plan in Schedule 15-3 Appendix A – Attachment 2 and labeled as Service Levels 1 to 4,

describing the , headways, consist sizes, hours of operation, and other key parameters to be attained by the System in each case, which Project Co's provision of the Maintenance and Rehabilitation Services must accommodate, and the term also includes any additional or modified operational parameters which may be developed and agreed by the City and Project Co from time to time.

Service Level Decrease means a requirement by the City for Project Co to provide a Service Level with a lower revenue train kilometres as compared to the then-prevailing Service Level.

Service Level Increase means a requirement by the City for Project Co to provide a Service Level with a greater revenue train kilometres as compared to the then-prevailing Service Level.

Service Proven Vehicle means a Vehicle that is substantially compliant with the following characteristics:

- The major Vehicle sub systems (including bogies, braking systems, diesel engines, etc.) have been integrated in a comparable Vehicle currently in Revenue Service.
- A minimum of 10 of these Vehicles have been in Revenue Service on a comparable-Design based system for a minimum of two years.

Service Reliability Standard has the meaning given in Schedule 15-2, Part 1, Article 3 – Operational Performance Requirements.

Shared Lane when used in Table 7-1.3 of Part 7 – Traffic and Transit Management and Construction Access, means a lane intended for shared use between vehicles and cyclists. Such lanes may be marked by a “sharrow” pavement marking.

Shutdown Period means the period during which the City will cease operations of the Existing Trillium Line in order to facilitate the implementation of the Project. The Shutdown Period will commence on May 3, 2020 and will cease at Revenue Service Availability.

Signalling and Train Control System has the meaning given in Schedule 15-2, Part 3 – Systems.

Site Office has the meaning given in Schedule 15-2, Part 1, Article 9 – Project Office.

Special Constables Unit means sworn-in Peace Officers who have the powers of a Police Officer to enforce the Criminal Code of Canada, the Controlled Drugs and Substances Act, the Liquor License Act, Trespass to Property Act, and the Safe Streets Act on all transit vehicles and properties.

Special Trackwork refers to all rail installations where Tracks converge, diverge or cross. Standard Trackwork is made simply from rolled rails of a constant cross-section, while rails in several special Trackwork components are cast or machined and have cross-sections that vary along their length.

Spur Track has the meaning given in Schedule 15-2, Part 2, Article 3 – Trackwork.

the Standard(s) means a standard of Maintenance which complies with all of the standards and terms set out in Schedule 15-3, Appendix A, Article 2 – Maintenance and Performance Standards and described in the Attachments to Schedule 15-3, Appendix A.

Standard Operating Procedures means the standard operating procedures which Project Co shall assist Capital Railway in updating, taking into account the Design and Construction Specifications, Maintenance and Rehabilitation Services, Operation of the System, and Good Industry Practice, as approved and amended from time to time by the City, identifying any new mandatory procedures to be followed by the City and Project Co (including personnel employed in the performance of Operations and Maintenance), including in response to conditions, events, or Deficiencies which cause interruption to or interference with the Operation of the System. The Standard Operating Procedures shall incorporate as required the provisions of the Safety Management System, Security Management System, Capital Railway rules, and regulations governing the Operation and Maintenance of the System.

Station means a Facility where Trains and or buses stop to pick up or drop off customers. The Station primarily consists of Platform areas for Passenger loading/unloading, fare control equipment, and passenger information. Other related components include: service rooms, stairs, ramps, escalators, elevators, advertising, public art, and Train and bus Operator support Facilities, customer amenities, etc. On the Ottawa System, O-Train stations are classified as follows:

- **At Grade Station:** A Station at which the platform is at grade, above grade, below grade, and meets the criteria for an open station as defined in NFPA 130
- **Transfer Station:** A Station with the incorporation of Facilities to support the transfer of passengers between modes of transportation or between the O-Train Lines, within a fare paid area.
- **Terminal Station:** A Station that is located at the terminus of a line.
- **Line Station:** A Station that is located along the alignment providing service in both directions of the line.

Station Plaza means a plaza at a Station.

Storage Yard means the outdoor areas located within the New Walkley Yard, not including the Maintenance Building or the Operations Crew Facility, but including the open space, parking areas, Track area, storage of Maintenance of Way equipment and supplies (unless incorporated within Maintenance Building), outdoor storage (ties, Track, poles, etc.) and Vehicle storage.

Stormwater Management means the integrated process of capturing, treating and/or controlling of stormwater runoff to maintain the natural hydrologic cycle, prevent undesirable stream erosion, prevent an increased risk of flooding, and protect water quality of receiving waters.

Stormwater Management Practice means the combination of strategies, techniques and measures used on or off-site for Stormwater Management or a document containing the combination of strategies, techniques and measures used on or off-site for Stormwater Management.

Structure means any building, Bridge, Tunnel, structural Culvert, or retaining wall.

Supervisory Control and Data Acquisition means the system that allows the supervision and control of wayside and Station equipment and devices from TOCC. SCADA collects alarm and indication functions for transmission and implements control commands initiated from TOCC and other control locations. The SCADA functions are an addition to local control, alarm, and indications associated with each equipment or system.

Supply Point is defined in [REDACTED].

Surplus Vehicle Fleet means, following a Service Level Decrease, any vehicles which are in excess of:

- the maximum fleet required to provide the service plan;
- the number of Vehicle required to maintain Project Co's spare Vehicle ratio; and,
- the quantity of Non-Revenue Vehicles called for by Project Co's maintenance plans.

System Element has the meaning given in Schedule 15-3 – Maintenance and Rehabilitation Requirements.

System Engineering Management Plan has the meaning given in Schedule 15-2, Part 3, Article 1 - Introduction.

System Safety means the application of operating, technical, and management techniques and principles to the safety aspects of a system throughout its life to reduce hazards to the lowest practical level through the most effective use of available resources.

System Safety and Assurance Plan has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

System Security Certification means the process of verifying compliance with a set of formal Security requirements. The requirements are defined by a System Security Certification Plan, design criteria and technical specifications and applicable codes and industry standards. Specifically, certifiable elements need to be identified, verification activities need to be performed and documented, and certificates of conformance need to be signed and issued by the responsible and accountable parties as described in Schedule 15-2, Part 1, Article 8 - Security and Emergency Management.

System Security Certification Plan means a detailed plan used to verify compliance with a set of formal security requirements as outlined in Schedule 15-2, Part 1, Article 8 – Security and Emergency Management.

Systems Integration Verifier is a key member of the overall Expanded Trillium Line's project team. The Systems Integration Verifier will review and provide confirmation of the successful completion of the systems integration work related to the communication integration at the TOCC, BCC and at Bayview Station. The Systems Integration Verifier will also act as adjudicator in a fast track dispute resolution procedure to resolve any disputes as to the source of the inability to successfully complete integration of the communication system at the TOCC, BCC and Bayview Station. The Systems Integration Verifier will review and comment on the Expanded Trillium Line's Systems integration design for the communications system and associated integration documents. During the installation, testing, and commissioning phases, the Systems Integration Verifier will review and comment on the communications, integration, test and commissioning plans, traceability documents, and test procedures.

Tail Track has the meaning given in Schedule 15-2, Part 2, Article 3 – Trackwork.

Threat and Vulnerability Assessment has the meaning given in Schedule 15-2, Part 1, Article 7 – System Safety Certification.

Threat Log has the meaning given in Schedule 15-2, Part 1, Article 8 – Security and Emergency Management.

Ticket Machine means a piece of City supplied and installed equipment where customers purchase a fare for OCT services.

Tolerable Hazard Rate has the meaning given in EN 50129.

Track means the system of ballast, rails, ties and fastenings composing the Track structure.

Trackwork means all work related to the construction of a complete rail passenger system Track structure from subgrade to top of rail including the design, supply, installation and Quality Control of ballast and sub-ballast, ballast curbs, ties, rails, guardrails, fastenings, subdrains, Special Trackwork, end of Track devices, Track drains, rail welds, rail insulated joints, direct-fixation baseplates as well as concrete slab inserts, and other Track materials.

Trackwork Design and Construction Test Plan has the meaning given in Schedule 15-2, Part 2 – Civil and Guideway.

Traffic Advisory Temporary Signage Plan is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Traffic and Transit Management Communications Plan is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Traffic and Transit Management Monitoring Plan is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Traffic and Transit Management Plan means a written plan, and a series of sub-plans, describing all direct and indirect impacts on all road users, including pedestrians, cyclists, transit vehicles and private vehicles of all types, at each stage of Project Co's construction sequencing plan, and outlining Project Co's measures and strategies to manage the impacts on road user traffic, parking, access for Emergency Services , as well as access to businesses and properties during construction. A Traffic and Transit Management Plan shall comply with the relevant standards, guidelines, policies and procedures of the City, OC Transpo, NCC and MTO as applicable. Further requirements are found in Schedule 15-2, Part 7, Article 6 – Traffic and Transit Management Plan.

Traffic Control Device(s) is a term used to describe any person, sign, signal, marking or device placed upon, over or adjacent to a roadway by or at the direction of a Relevant Authority or their designate, for the purpose of regulating, warning, guiding or informing a vehicle operator or pedestrian of an existing condition or hazard.

Traffic Control Persons/Personnel means a person duly trained and authorized to direct traffic at a Work zone through the use of the Traffic Control Sign (STOP/SLOW Paddle).

Traffic Control Plan is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Traffic Control Supervisor(s) has the meaning given in has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Traffic Engineer has the meaning given in has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Traffic Incident Management Plan is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Traffic Management Committee has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Traffic Management Implementation Plan is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Traffic Management Plan is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Traffic Manager has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Traffic Risk Assessment Plan is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Train means a consist of one or two Vehicles.

Train Control or Train Control System means a safety critical computer based control system for Vehicle identification, Vehicle location control and monitoring, maintaining safe headway between Vehicles, Vehicle speed control, maintaining safe brake rates, Vehicle route selection and fleet management, interlocking control and power consumption optimization.

Train Structures means any structures (excluding Tunnels) that support any form of Train loading including but not limited to grade-supported slabs, elevated Train supports, foundations supporting Train loads, retaining walls supporting Train surcharges and other similar Structures.

Train the Trainer means the training program conducted by a Project Co employee(s) or contractor(s) that trains and certifies a City employee to serve as an OC Transpo Trainer.

Transfer Segment has the meaning given in the Rail Transfer Agreement.

Transit Information Panel has the meaning given in Schedule 15-2, Part 4 – Stations.

Transit Management Plan is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

Transit Operations Control Centre means the facility that is located at 875 Belfast Road, in the City of Ottawa and provides the primary operation and control center for Revenue Service of the Confederation Line. It also operates and controls the mainline Guideway during maintenance hours, which typically occur overnight. The TOCC integrates all the LRT systems to allow operation of the scheduling, command and control, supervision & data acquisition, communications, surveillance, power and Emergency responses for the Confederation Line.

Transit Priority Lanes is as defined by the City of Ottawa.

Transition and Maintenance Plan has the meaning given in Schedule 10 – Review Procedure.

Transit Operating in Lane when used in Table 7-1.3 of Part 7 – Traffic and Transit Management and Construction Access, means lanes that will not have transit operating in them.

Transitway is a dedicated road network system that is open only to OC Transpo and Emergency vehicles, which includes physically separated ROW from mixed traffic and on-street bus lanes.

Tree Mitigation Plan means a plan to audit, monitor, protect, and preserve trees to comply with City regulations.

Trial Running means a 21 consecutive day period that may commence upon the successful completion of testing and commissioning. Upon successful completion of trial running, the integrated system will be ready for revenue service.

Tunnel means Structures located below finished grade containing the Guideway.

Tunnel Equipment and Systems has the meaning provided in Table 4.2 of Schedule 15-3, Appendix B.

Underground Structures means Tunnels excluding buried pipes and utilities, Bridge foundations and above ground Station foundations and including existing Tunnels.

Underpass means a structure where the major road goes under the lower category road when used in Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements.

Universal Design means the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

Utility Infrastructure Relocation Plan has the meaning given in Schedule 15-2 Part 2 Article 8 (Utility Infrastructure Design Criteria)

Vital Microprocessor Interlocking System means a vital microprocessor based system for controlling switches and signals at an interlocking. This system may also be known as a CBI controller.

Voice and Data Radio System has the meaning given in Schedule 15-2, Part 3, Article 5.

Walkley Diamond means the at grade rail Track intersection of the Ellwood Subdivision at Mileage 0.18 (KM 0.29) and the [REDACTED] Walkley Line at Mileage 4.1.

Weekend Period(s) means the period of time from a Saturday at 0:00 hrs to Sunday at 23:59 hrs.

Yard Limits means a point designated by a yard limit sign which separates the mainline from the yard and the demarcation point for management of train operations. Yard Limits are typically located at the governing signal protecting movement of trains onto the mainline.

Yard Track has the meaning given in Schedule 15-2, Part 2, Article 3 – Trackwork.

Zone of Influence means the area within the subsurface and surface boundaries where Ground Movement arising from Project Co construction activities is expected to occur.

ARTICLE 2 ACRONYMS

AABC means Associated Air Balance Council.

AAMA means American Architectural Manufacturers Association.

AAR means Association of American Railroads.

AASHTO means American Association of State Highway and Transportation Officials.

ABS means absolute block signal.

AC means alternating current.

ACGIH means American Conference of Governmental Industrial Hygienists.

ACI means American Concrete Institute.

ACP means access control panels.

ADA means *Americans with Disabilities Act*.

AED means automated external defibrillator.

AESS means Architecturally Exposed Structural Steel.

AHJ means Authorities Having Jurisdiction.

AHRI means Air-conditioning, Heating, and Refrigeration Institute

AIC means Amp Interrupting Capacity.

AISC means American Institute of Steel Construction.

AISI means American Iron and Steel Institute.

ALCTV means Automotive Lifts – Safety Requirements for Construction, Testing and Validation.

ALI means Automotive Lift Institute.

AMCA means Air Movement and Control Association.

AMS means Aerospace Material Specifications.

ANSI means American National Standards Institute.

AODA means *Accessibility for Ontarians with Disabilities Act*.

APC means automatic passenger counting.

APPM means Asset Preservation Performance Measures.

APTA means American Public Transportation Association.

AREMA means American Railway Engineering Maintenance-of-Way Association.

ARBE means Appointed Railway Bridge Engineer.

ASCE means American Society of Civil Engineers.

ASHRAE means American Society of Heating, Refrigerating and Air-Conditioning Engineers.

ASME means American Society of Mechanical Engineers.

ASPE means American Society of Plumbing Engineers.

ASSE means American Society of Safety Engineers.

ASTM means American Society for Testing and Materials.

ATC means automatic Train Control.

ATIS means automated traveler information system.

ATP means automatic Train protection.

ATS means Automatic Train supervision or automatic transfer switch.

AWMAC means Architectural Woodwork Manufacturers Association of Canada.

AWS means American Welding Society.

AWS BRH means American Welding Society Brazing Handbook.

AWS WHB means American Welding Society Welding Handbook.

AWWA means American Water Works Association.

AZR means Airport Zone Regulations.

BAS means Building Automation System.

BCC means Back-up Control Centre.

BCI means bridge condition index, in accordance with MTO's bridge condition rating procedure.

BIA means business improvement association.

BMS means Building Management System.

BSMP means Bridge Safety Management Plan.

BSS means British Standards Society.

CADD means computer aided design and drafting.

CaGBC means Canada Green Building Council.

CALA means Canadian Association for Laboratory Accreditation.

CATSA means the Canadian Air Transport Security Authority.

CB means Certification Body Scheme (for “Scheme of the IECEx for Mutual Recognition of Test Certificates for Electrical Equipment”).

CBI means Computer Based Interlocking.

CCIL means Canadian Council of Independent Laboratories.

CCIP means Cement and Concrete Industry Publications.

CCOHS means Canadian Centre for Occupational Health and Safety.

CCTV means Closed Circuit Television.

CE means Conformité Européene / European Conformity or consumer electronics.

CEAA means Canadian Environmental Assessment Agency.

CEC means Canadian Electrical Code.

CEL means Certifiable Elements List

CEM means crash energy management

CFAA means Canadian Fire Alarm Association.

CFC means chlorofluorocarbon.

CFD means computational fluid dynamics.

CFEM means Canadian Foundation Engineering Manual.

CFR means Code of Federal Regulations.

CGC means Canadian Gypsum Company.

CGSB means Canadian General Standards Board.

CHBDC means Canadian Highway Bridge Design Code.

CIAR means Construction Impact Assessment Report.

CIAR-1 means Level 1 Construction Impact Assessment Report.

CIAR-2 means Level 2 Construction Impact Assessment Report.

CIH means Central Instrument Houses.

CISC means Canadian Institute of Steel Construction.

CMAA means Crane Manufacturers Association of America.

CMMS means Computerized Maintenance Management System.

[REDACTED]

CNLA means Canadian Nursery Landscape Association.

COADS means City of Ottawa Accessibility Design Standards.

CPCI means Canadian Precast/Prestressed Concrete Institute.

CPR means Cardiopulmonary Resuscitation.

CPTED means Crime Prevention through Environmental Design.

[REDACTED]

CPE means City provided equipment

CPU means central processing unit.

CRCA means Canadian Roofing Contractors Association.

CRI means colour rendering index.

CROR means Canadian Rail Operation Rules.

CSA means Canadian Standards Association.

CSMP means Construction Safety Management Plan.

CSP means corrugated steel pipe.

CSRS means Canadian Spatial Reference System.

CSSBI means Canadian Sheet Steel Building Institute.

CSV means Comma Separated Value (type of software file format).

CTA means Canada Transportation Act/Agency

CTS means communications transmission system.

CWB means Canadian Welding Bureau.

CWDS means crossing warning device system.

CWR means continuous welded rail.

DAQ means delivered audio quality.

DC means direct current.

DDU means driver's display unit

DF(F) means direct fixation (fastener).

DFO means Department of Fisheries and Oceans (Canada).

DLA means dynamic load allowance.

DMP means Data Management Protocol.

DMU means diesel multiple unit.

DOB means Daily Operating Bulletin (from Transport Canada).

DOT means U.S. Department of Transportation.

DOUDS means Downtown Ottawa Urban Design Strategy.

DSD means Decision Sight Distance.

DSP means digital signal processor.

DSS means designated substance survey.

DVD means digital versatile disk.

E&M means Electrical and Mechanical.

EA means Environmental Assessment.

EAS means Emergency Alarm Station or Existing Adjacent Structure(s).

ECA means Environmental Compliance Approval

EEMAC means Electrical Equipment Manufacturers Association of Canada.

EGFP means equipment ground fault protection.

EMC means electromagnetic compatibility.

EMI means electromagnetic interference.

EN means European Norms.

EPROM means erasable, programmable read-only memory.

ERP means Emergency Response Plan.

ESA means Electrical Standards Association or Electrical Safety Authority.

ESC means Erosion and Sediment Control (part of Erosion and Sediment Control Plan).

ESP means emergency service providers.

ETEL means Emergency Telephone.

FACP means fire alarm control panel.

FAI means First Article Inspection.

FBCU means friction brake control unit.

FCC means Federal Communications Commission.

FEA means Finite Element Analysis.

FHWA means Federal Highway Administration.

FLS means Fire Life Safety and fatigue limit states.

FLSSC means Fire Life Safety and Security Committee.

FLUDTA means Federal Land Use, Design and Transaction Approval

FMEA means Failure Mode and Effects Analysis.

FMECA means Failure Mode, Effect, and Criticality Analysis.

FRA means Federal Railroad Administration.

FRACAS means Failure Reporting and Corrective Action System

FRP means fibre reinforced plastic.

FTA means Federal Transit Administration or Fault Tree Analysis.

FTEL means Tunnel phones

GANA means Glass Association of North America.

GBC means Green Building Council.

GBO means General Bulletin Order (from Transport Canada).

GDSOH means Geometric Design Standards for Ontario Highways (Ministry of Transportation).

GDGCR means Geometric Design Guide for Canadian Roads (Transportation Association of Canada).

GFCI means ground fault circuit interrupter.

GFI means Ground Fault Interrupter.

GFRP means glass fibre reinforced polymer.

GIDS means guideway intrusion detection system.

GIMP means Geotechnical Instrumentation and Monitoring Plan.

GIS means geographic information system.

GPS means global positioning system.

GSC means geological survey of Canada.

GUI means graphic user interface.

HCFC means hydrochlorofluorocarbon.

HINT means Elevator Help Intercoms

HFI means Yard Intercoms

HGCWD means Highway-Rail Grade Crossing Warning and Detection System.

HMI means Hoist Manufacturers Institute or Human Machine Interface

[REDACTED]

[REDACTED]

HPPL means High Performance Photo Luminescent.

HSDR means High Speed Data Radio.

HTM means Hazard Tracking Matrix.

HVAC means heating, ventilation and air conditioning system.

IAC means Intrusion Access Control.

ICD means interface control documents.

ICES means Interference-Causing Equipment Standards (Industry Canada).

ICNIRP means International Commission on Non-Ionizing Radiation Protection.

ICP means Incident Command Post.

IDC means initiation device circuits.

IEC means International Electrotechnical Commission.

IEEE means Institute of Electrical and Electronics Engineers or International Electrotechnical Commission for Electrical Equipment.

IES and **IESNA** mean Illuminating Engineering Society of North America.

IP means internet protocol.

ISD means Intersection Sight Distance.

ISFP means City of Ottawa Integrated Street Furniture Policy and Design Guidelines.

ISO means International Standards Organization.

ITA means International Tunnelling Association.

ITEL means Passenger Assistance Information Telephones

JHSC means joint health and safety committee.

LAN means local area network.

LCD means liquid-crystal display.

LCU means local control unit.

LED means light emitting diode.

LEED means Leadership in Energy and Environmental Design.

LID means Low Impact Development.

LKI means landmark kilometre inventory.

LLEPM means Low Location (or level – in vehicles) Exit Path Marking.

LLRU means Lowest Line Replaceable Unit

LOS means Level of Service.

LRT means Light Rail Transit.

LRU means Line Replaceable Unit.

LRV means light rail vehicle.

LSD means limits state design.

LV means low voltage.

LVC means length of vertical curve.

LVPS means low voltage power supply.

M&R means Maintenance and Rehabilitation.

MDBF means Mean Distance Between Failure

MDE means Maximum Design Earthquake.

MERV means Minimum Efficiency Reporting Value.

MEMS means micro-electro-mechanical systems.

MFIPPA means the Municipal Freedom of Information and Protection of Privacy Act.

MHIA means Materials Handling Industry of America.

MIL means U.S Military Standard.

MNECB means Model National Energy Code for Buildings.

MOECC means Ontario Ministry of the Environment and Climate Change.

MOL means Ministry of Labour.

MOW means maintenance-of-way.

MSE means mechanically stabilized earth.

MTBF means Mean Time Between Failures.

MTBSAF means mean time between service affecting failures.

MTEL means Maintenance Telephones.

MTM means Modified Transverse Mercator.

MTO means Ontario Ministry of Transportation.

MTTR means Mean Time To Repair.

MUP means Multi-Use Pathway.

MUTCD means Manual for Uniform Traffic Control Device.

MV means medium voltage.

NAC means notification appliance circuits.

NACE means National Association of Corrosion Engineers.

NAD means North American Datum.

NB means northbound.

NBCC means National Building Code of Canada.

NCC means National Capital Commission.

NCMA means National Concrete Masonry Association.

NEB means National Energy Board

NEBB means National Environmental Balancing Bureau.

NECB means National Energy Code (of Canada) for Buildings.

NEMA means National Electrical Manufacturer's Association.

NESC means National Electrical and Safety Code.

NFCC means National Fire Code of Canada.

NFPA means National Fire Protection Association.

NFRC means National Fenestration Rating Council.

NHI means National Highway Institute.

NMI means New Municipal Infrastructure.

NMS means Network Management System

NPCC means National Plumbing Code of Canada.

NRC means the National Research Council.

NRCA means National Roofing Contractors Association.

NSF means National Sanitation Foundation.

NTD means note to draft.

NVR means network video recorder.

OBC means Ontario Building Code.

OCS means Overhead Catenary System.

ODE means Operating Design Earthquake.

ODV means over-dimensional vehicle.

OESC means Ontario Electrical Safety Code.

OFC means Ontario Fire Code.

OGS means oil/grit separators

OHA means operating hazard analysis.

OHSA means the *Occupational Health and Safety Act* (Ontario).

O&M means Operations and Maintenance.

OMCIA means the Ottawa Macdonald Cartier International Airport.

OMCIAA means the Ottawa Macdonald Cartier International Airport Authority.

OMNR means Ontario Ministry of Natural Resources.

OPP means Ontario Provincial Police.

OPS means Ontario Provincial Standard or Ottawa Police Services.

OPSD means Ontario Provincial Standard Drawings.

OPSS means Ontario Provincial Standard Specifications.

OSCE means Ontario Electrical Safety Code.

OSIM means Ontario Structure Inspection Manual.

OSIMS means Ontario Structure Inspection Management Systems.

OSTC means Ottawa Seniors Transportation Committee.

OTM means Ontario Traffic Manual.

OWS means Operation Work Station.

PA means public address.

PBD means performance based design.

PABX means private automated branch exchange.

PCB means polychlorinated biphenyl.

PDI means Plumbing and Drainage Institute.

PEI means Passenger Emergency intercom.

PEO means Professional Engineers of Ontario.

PERP means Ontario Provincial Emergency Response Plan.

PGFP means personal ground fault protection.

PHA means Preliminary Hazard Analysis.

PHL means Preliminary Hazard List.

PID(S) means Passenger information display (systems).

PIS means public information system.

PLC means Programmable Logic Controller.

PPE means personal protective equipment.

PPHPD means passenger per hour per direction.

PPUDO means Passenger Pick-Up and Drop-Off.

PROM means programmable read-only memory.

PRP means Property Request Plan.

PSPC means Public Services and Procurement Canada.

PTI means Post-Tensioning Institute.

PTTW means Permit to Take Water.

PTU means portable test unit.

PTZ means pan tilt zoom.

PVB means polyvinyl butyral.

PVC means polyvinyl chloride.

PVDF means polyvinylidene fluoride.

PVMS means portable variable-message signs.

PXO means pedestrian crossover(s).

RAMS means reliability, availability, maintainability and safety.

RBE means Railway Bridge Engineer.

RBM means rail bound manganese.

RCMP means Royal Canadian Mounted Police.

RCP means reinforced concrete pipe.

RETC means Rapid Excavation and Tunneling Conference.

RH means relative humidity.

RMA means Roadway Modification Approval.

RMP means Requirements Management Plan.

ROM means read-only memory.

ROW means right-of-way.

RRFB means rectangular rapid flashing beacon.

RRTS means Rules Respecting Track Safety (TC).

RSA means Railway Safety Act.

RSS means radio standards specification in Schedule 15-2, Part 3 - Systems.

RSS means Retained Soil System in Schedule 15-2, Part 2 – Civil and Guideway.

RTU means remote terminal units.

RVCA means Rideau Valley Conservation Authority.

S&TC(S) means Signalling and Train Control (System).

SAE means Society of Automotive Engineers.

SAP means System Assurance Program.

SAR means Species-at-Risk.

SAT means System Acceptance Test(ing)

SB means southbound.

SCADA means Supervisory Control and Data Acquisition.

SCIL means safety critical items list.

SCM means Safety Certification Manager.

SeCM means Security Certification Manager.

SEMP means System Engineering Management Plan.

SeRTM means Security Requirement Traceability Matrix.

SES means “Subway Environment Simulation” software, originally referenced in the “Subway Environmental Design Handbook” (US Department of Transportation, Washington, DC, USA).

SeVM means Security Verification Matrix.

SI means System Infrastructure.

SIL means Safety Integrity Level.

SIMP means systems integration management plan.

SINAD means signal-to-noise and distortion ratio.

SIT means Systems Integration Test as defined in Schedule 14 – Testing and Commissioning.

SLC means subscriber line carrier.

SLR means Seasonal Load Restrictions.

SLS means Serviceability Limit State.

SMACNA means Sheet Metal and Air-conditioning Contractors' National Association.

SNCA means South Nation Conservation Authority.

SOP means Standard Operating Practice/Procedure.

SPL means sound pressure level.

SRTM means Safety Requirement Traceability Matrix.

SSAP means System Safety Assurance Plan.

SSCP means System Safety Certification Plan.

SSCRT means Safety and Security Certification Review Team.

SSD means Stopping Sight Distance.

SSeAP means System Security Assurance Plan.

SSeCP means System Security Certification Plan.

SSePP means System Security Program Plan.

SSH means Subsystem Hazard List.

SSORC means Safety and Security Operations Review Committee.

SSPC means Society for Protective Coatings.

SSPP means System Safety Program Plan.

SSRTM means System Safety Requirement Traceability Matrix.

SSVM means System Safety Verification Matrix.

SVM means Safety Verification Matrix.

STEL means Staff Telephones

STO means Société de transport de l'Outaouais.

SWM means stormwater management.

SWMP means Stormwater Management Practice.

T&DI means Transportation and Development Institute.

TAB means testing, adjusting and balancing.

TAC means Transportation Association of Canada.

TC means Transport Canada.

TCD means Traffic Control Device.

TCP means Traffic Control Plan or Transmission Control Protocol.

TCRP means Transit Cooperative Research Program.

TCS means Train Control System.

TCU means Traction Control Unit.

THR means Tolerable Hazard Rate.

TIA means Telecommunications Industry Association or Transportation Impact Assessment (City of Ottawa).

TIAC means Thermal Insulation Association of Canada.

TIMP means Traffic Incident Management Plan.

TIP means Transit Information Panel.

T&I means Telephones and Intercoms.

TLV means Threshold Limit Value.

TMIP means Traffic Management Implementation Plan.

TNPI means [REDACTED].

TOCC means Transit Operations Control Centre.

TOD means Transit-Oriented Development.

TOR means top of rail.

TSA means transsecure area.

TSB means Transportation Safety Board (of Canada).

TSS means total suspended solids.

TSSA means Technical Standards & Safety Authority.

TTEL means Tunnel Telephones.

TTMP means Traffic and Transit Management Plan.

TVA means Threat and Vulnerability Analysis.

TVS means Tunnel ventilation system.

TVSS means transient voltage surge suppressor.

TWSI means tactile walking strip indicators.

UIC means Union International Des Chemin de Fer

UL means Underwriter's Laboratories.

ULC means Underwriter's Laboratories of Canada.

ULS means Ultimate Limit State.

UPS means uninterruptible power supply.

UV means ultraviolet (solar radiation).

VAC means volts alternating current.

VISSIM means the microscopic multi-modal traffic flow simulation software package used to develop traffic models.

VL means vulnerability log.

VLAN means virtual local area network.

VLS means Vehicle Location System.

VMIS means Vital Microprocessor Interlocking System.

VMS means Vehicle Monitoring System.

VOC means volatile organic compound.

VoIP means voice over internet protocol.

WAN means wide area network.

WHMIS means Health Canada's Workplace Hazardous Materials Information System.

WNC means the West Nepean Collector.

WSD means Working Stress Design.

WSIB means Workplace Safety and Insurance Board.

YCC means yard control centre.

YCS means yard control system.

ZOI means Zone of Influence.

ARTICLE 3 REFERENCE DOCUMENTS

1.1 General

- (a) Codes, standards, manuals, installation, application and maintenance instructions, and other reference documents referred to in the Output Specifications, unless otherwise specified and unless otherwise stated in governing legislation, shall be the latest published editions at the date of Commercial Close.
- (b) Project Co shall conform to codes, standards, manuals, installation, application and maintenance instructions, and other Reference Documents referred to in the Output Specification.
- (c) If there is a question regarding whether any product, material, component, assembly or system is in conformance with applicable requirements, the City reserves the right to have such products, materials, components, assemblies or systems tested at Project Co's cost to prove or disprove conformance. The cost for testing will be borne by the City in the event of conformance with the Output Specification, or by Project Co in the event of non-conformance.
- (d) Refer to the Project Agreement and the Ontario Building Code for definitions applicable to the Project.

1.2 Reference Documents

Reference Documents in Schedule 15	Description of Reference Documents
14 CFR 25.853	Code of Federal Regulations, Title 14: Aeronautics and Space; Part 25.853 – Compartment Interiors
29 CFR 1910.19	Code of Federal Regulations, Title 29: Labor; Part 1910.19 – Special Provisions for Air Contaminants
40 CFR 82	Code of Federal Regulations, Title 40: Protection of Environment; Part 82 – Protection of Stratosphere Ozone
49 CFR 223	Code of Federal Regulations, Title 49: Transportation; Part 223 – Safety Glazing Standards - Locomotives, Passenger Cars and Cabooses
49 CFR Part 238	Code of Federal Regulations, Title 49: Transportation; Part 238 – Passenger Equipment Safety Standards

Reference Documents in Schedule 15

AAMA 611

AAMA 620

AAMA Aluminum Curtain Wall Design Guide Manual (CW-DG-1-96)

AAR M-101

AAR Manual of Standards and Recommended Practices

AAR RP-585

AAR S-501

AASHTO Guide for the Design of Pavement Structures

AASHTO Guide Specifications for Design and Construction of Segmental Concrete Bridges

AASHTO Guide Specifications for Horizontally Curved Highway Bridges

AASHTO Guide Specifications for Strength Evaluation of Existing Steel and Concrete Bridges

AASHTO Guide Specifications for Structural Design of Sound Barriers

AASHTO Guide Specifications – Thermal Effects in Concrete Bridge Structures

AASHTO Manual for Condition Evaluation of Bridges

ACI 201.2R

ACI 347.3R

ACI 358.1

ACI 360R

Description of Reference Documents

AAMA 611 Voluntary Specification for Anodized Architectural Aluminum

AAMA 620 Voluntary Specification for High Performance Organic Coatings on Coil Coated Architectural Aluminum

American Architectural Manufacturers Association (AAMA)

AAR M-101 Carbon Steel Axles

Association of American Railroads (AAR)

AAR RP-585 Wiring and Cable Specification

AAR S-501 Specification for Wire and Cables

American Association of State Highway and Transportation Officials (AASHTO), 1993

ACI 201.2R Guide to Durable Concrete

ACI 347.3R Guide to Formed Concrete Surfaces

ACI 358.1 Analysis and Design of Reinforced and Prestressed – Concrete Guideway Structures

ACI 360R Design of Slabs on Grade

Reference Documents in Schedule 15

ACI 365
ACI Publication 201.2R
ACI Publication 222R
ACI Publication 506.2
ACI Publication SP-77

Accessibility for Ontarians with Disabilities Act (AODA)
AESS Supplement
AISC Code of Standard Practice for Steel Buildings and Bridges
AISC Design Guide Series 9

AISI/ASTM A167

Alberta Transportation Highway Geometric Design Guide
Americans with Disabilities Act (ADA)
AMCA Standard 210

AMCA Standard 300

AMCA Standard 301

AMCA Standard 500-L

AMS 5050 E

ANSI/ALI ALCTV-2006

Description of Reference Documents

ACI 365 Service Life Prediction
ACI Publication 201.2R Guide to Durable Concrete
ACI Publication 222R Protection of Metals in Concrete Against Corrosion
ACI Publication 506.2 Below Grade Shotcrete Used as Permanent Support
ACI Publication SP-77 Sulphate Resistance of Concrete

Modern Steel Construction, May 2003
American Institute of Steel Construction (AISC), March 2005
AISC Design Guide Series 9 – Torsional Analysis of Structural Steel Members
AISI/ASTM A167 Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
Alberta Transportation Highway Geometric Design Guide, January 2004

Air Movement and Control Association International (AMCA) Standard 210, “Laboratory Methods of Testing Fans for Rating Purposes”
AMCA Standard 300, “Test Code for Sound Rating Air Moving Devices”
AMCA Standard 301, “Methods for Calculating Fan Sound Ratings from Laboratory Test Data”
AMCA Standard 500-L Laboratory Methods of Testing Louvers for Rating
AMS 5050 E Steel Tubing, Seamless, 0.15 Carbon, Maximum, Annealed
ANSI/ALI ALCTV-2006 Safety Requirements for the Installation and Service of Automotive

Reference Documents in Schedule 15	Description of Reference Documents
ANSI/ASCE/T&DI 21	Lifts ANSI/ASCE/T&DI 21 Automated People Mover Standards – Parts 1-4
ANSI/ASHRAE 135	ANSI/ASHRAE 135 BACnet A Data Communication Protocol for Building Automation and Control Networks
ANSI/AWWA C105	ANSI/AWWA C105 Polyethylene Encasement for Ductile-Iron Pipe Systems
ANSI/IEEE 515.1	ANSI/IEEE 515.1 Testing, Design, Installation, and Maintenance of Electrical Resistance Heat Tracing for Commercial Applications
ANSI/IESNA RP-22	ANSI/IESNA RP-22 Tunnel Lighting
ANSI/SIA A92	ANSI/SIA A92 Elevating and Vehicle Lift Devices
ANSI B1.20.1	ANSI B1.20.1 Pipe Threads, General Purpose (Inch)
ANSI C34.2	ANSI C34.2 Semiconductor Power Rectifiers
ANSI C37	ANSI C37 Low Voltage Power Circuit Breaker
ANSI C57	ANSI C57 Power Transformers
ANSI Z26.1	ANSI Z26.1 Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways
ANSI Z97.1	ANSI Z97.1 Safety Glazing Materials Used in Buildings
ANSI Z358.1	ANSI Z358.1 Emergency Eyewash and Shower Equipment
An Urban Design Strategy for Sussex Dr., Rideau St. and Colonel By	
APTA Guidelines for the Design of Rapid Transit Facilities	American Public Transportation Association, 1981
APTA Heavy Duty Escalator Design Guideline	American Public Transportation Association (APTA)
APTA Manual for the Development of System Safety Program Plans for Commuter Railroads	American Public Transportation Association; Commuter Rail Safety Management Program, May 2006

Reference Documents in Schedule 15

APTA RP-E-002

APTA RP-E-004

APTA RP-E-007

APTA RP-E-009

APTA RP-M-001

APTA RP-M-009

APTA SS-C&S-004

APTA SS-C&S-015

APTA SS-E-005

APTA SS-E-013

APTA SS-M-015-06

APTA SS-PS-004

AREMA Communications and Signal Manual

AREMA Manual For Railway Engineering, Volume 2, Chapter 28, Temporary Structure for Construction

ASCE Guidelines for Tunnel Lining Design,

ASHRAE 52.2

ASHRAE 55

Description of Reference Documents

APTA RP-E-002 Wiring of Passenger Equipment

APTA RP-E-004 Gap and Creepage Distance

APTA RP-E-007 Storage Batteries and Battery Compartments

APTA RP-E-009

APTA RP-M-001 Air Connections, Location and Configuration of, for Passenger Cars Equipped with AAR Long Shank Tight Lock or Similar Long Shank Type Couplers

APTA RP-M-009 New Truck Design

APTA SS-C&S-004 Austenitic Stainless Steel for Railroad Passenger Equipment

APTA SS-C&S-015 Aluminum and Aluminum Alloys for Passenger Equipment Car Body Construction

APTA SS-E-005 Grounding and Bonding

APTA SS-E-013 Emergency Lighting System Design for Passenger Cars

APTA SS-M-015-06 Wheel Flange Angle for Passenger Equipment

APTA SS-PS-004 Low-Location Exit Path Marking

AREMA

AREMA

ASCE Technical Committee on Tunnel Lining Design, edited by T. O'Rourke, 1984

ASHRAE 52.2 Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size

ASHRAE 55 – Thermal Environmental Conditions for Human Occupancy, 2010 Edition.

Reference Documents in Schedule 15

ASHRAE 62.1

ASHRAE 90.1

ASHRAE 189.1

ASHRAE Handbook

ASME/ANSI B16.3

ASME/ANSI B16.5

ASME/ANSI B16.22

ASME A17.1

ASME A112.19.2 / CSA B45.1

ASME B30.2

ASME B30.10

ASME 30.11

ASME B30.16

ASME B31.1

ASME B31.5

ASME RT-1

ASSE 1052

ASTM A1

Description of Reference Documents

ASHRAE 62.1 – Ventilation for Acceptable Indoor Air Quality

ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings – permitted for construction after December 31, 2011

ASHRAE 189.1 – Design of High-Performance, Green Buildings

HVAC Applications, Division 13, “Enclosed Vehicular Facilities”, 2007

ASME/ANSI B16.3 Malleable Iron Threaded Fittings

ASME/ANSI B16.5 Pipe Flanges and Flanged Fittings

ASME/ANSI B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings

ASME A17.1 Safety Code for Elevators and Escalators

ASME A112.19.2 / CSA B45.1 Ceramic Plumbing Fixtures

ASME B30.2 Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)

ASME B30.10 Hooks

ASME 30.11 Monorails and Underhung Cranes

ASME B30.16 Overhead Joists (Underhung)

ASME B31.1 Power Piping

ASME B31.5 Refrigeration Piping and Heat Transfer Components

ASME RT-1 Safety Standard for Structural Requirements for Light Rail Vehicles

ASSE 1052 Performance Requirements for Hose Connection Backflow Preventers

ASTM A1 Carbon Steel Tee Rails

Reference Documents in Schedule 15

ASTM A6

ASTM A53

ASTM A82 / A82M

ASTM A105

ASTM A106

ASTM A123

ASTM A153M-03e

ASTM A167

ASTM A185

ASTM A193

ASTM A197

ASTM A234

ASTM A240

ASTM A269

ASTM A276-04

ASTM A307

ASTM A325M

Description of Reference Documents

ASTM A6 General Requirements for Rolled Structural Steel Bars, Plates, Shapes and Sheet Pilings

ASTM A53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

ASTM A82 / A82M Steel Wire, Plain for Concrete Reinforcement

ASTM A105 Carbon Steel forgings for Piping Applications

ASTM A106 Seamless Carbon Steel Pipe for High-Temperature Service

ASTM A123 Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A153M-00 Zinc Coating (Hot Dip) on Iron and Steel Hardware

ASTM A167 Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

ASTM A185 Steel Welded Wire Reinforcement, Plain, for Concrete

ASTM A193 Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications

ASTM A197 Cupola Malleable Iron

ASTM A234 Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service

ASTM A240 Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications

ASTM A269 Seamless and Welded Austenitic Stainless steel Tubing for General Service

ASTM A276-04 Stainless Steel Bars and Shapes

ASTM A307 Carbon Steel Bolts and Studs

ASTM A325M Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

Reference Documents in Schedule 15

ASTM A416/416M-06

ASTM A421/421M-05

ASTM A496/A496M

ASTM A497/A497M

ASTM A515

ASTM A516

ASTM A563

ASTM A568

ASTM A588

ASTM A606

ASTM A653/A653M

ASTM A666

ASTM A775/A775M

ASTM B33

ASTM B209

Description of Reference Documents

ASTM A416/416M-06 Steel Strand, Uncoated Seven-Wire for Prestressed Concrete

ASTM A421/421M-05 Uncoated Stress-Relieved Steel Wire for Prestressed Concrete

ASTM A496/A496M Steel Wire, Deformed for Concrete Reinforcement

ASTM A497/A497M Steel Welded Wire Reinforcement, Deformed, for Concrete

ASTM A515 Pressure Vessel Plates, Carbon Steel, for Intermediate- and Higher-Temperature Service

ASTM A516 Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower Temperature Service

ASTM A563 Carbon and Alloy Steel Nuts

ASTM A568 General Requirements for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled

ASTM A588 High-Strength Low-Alloy Structural Steel

ASTM A606 Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance

ASTM A653/A653M Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM A666 Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar

ASTM A775/A775M Epoxy Coated Reinforcing Steel Bars

ASTM B33 Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes

ASTM B209 Aluminum and Aluminum Alloy Sheet and Plate

Reference Documents in Schedule 15

ASTM B221

ASTM B280

ASTM B584

ASTM C67

ASTM C260

ASTM C452-75

ASTM C494/C494M

ASTM C507-95a

ASTM C534

ASTM C542

ASTM C547

ASTM C553

ASTM C568

ASTM C612

ASTM C615

ASTM C716

ASTM C864

ASTM C881/C881M

Description of Reference Documents

ASTM B221 Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wires, Profiles and Tubes

ASTM B280 Seamless Copper Tube for Air Conditioning and Refrigeration Field Service

ASTM B584 Copper Alloy Sand Castings for General Applications

ASTM C67 Sampling and Testing Brick and Structural Clay Tile

ASTM C260 Air-Entraining Admixtures for Concrete

ASTM C452-75 Potential Expansion of Portland-Cement Mortars Exposed to Sulfate

ASTM C494/C494M Standard Specification for Chemical Admixtures for Concrete

ASTM C507-95a Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe

ASTM C534 Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form

ASTM C542 Lock-Strip Gaskets

ASTM C547 Mineral Fiber Pipe Insulation

ASTM C553 Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications

ASTM C568 Limestone Dimension Stone

ASTM C612 Mineral Fiber Block and Board Thermal Insulation

ASTM C615 Granite Dimension Stone

ASTM C716 Installing Lock-Strip Gaskets and Infill Glazing Materials

ASTM C864 Dense Elastomeric Compression Seal Gaskets, Setting Blocks and Spacers

ASTM C881/C881M Epoxy-Resin-Base Bonding Systems for Concrete

Reference Documents in Schedule 15

ASTM C936

ASTM C1017/C1017M

ASTM C1026

ASTM C1036

ASTM C1048

ASTM C1059/C1059M

ASTM C1166

ASTM C1172

ASTM C1184

ASTM C1242

ASTM D395

ASTM D422-63

ASTM D516

ASTM D695

ASTM D790

ASTM D2240

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ASTM D2922

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ASTM C1166 Lock-Strip Gaskets

ASTM C1172 Laminated Architectural Flat Glass

ASTM C1184 Structural Silicone Sealants

ASTM C1242 Selection, Design and Installation of Dimension Stone Attachment Systems

ASTM D395 Rubber Property – Compression Set

ASTM D422-63 Particle-Size Analysis of Soils

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ASTM E119	ASTM E119 Fire Tests of Building Construction and Materials
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ASTM G57 Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method

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Ottawa Transit-Oriented Development Guidelines	Ottawa Transit-Oriented Development (TOD) Guidelines
Ottawa Transportation Master Plan	Ottawa Transportation Master Plan
Ottawa Urban Design, A Reference Guide to Creating Great Places and Great Spaces	Publication #2103
PDI-WH 201	PDI-WH 201 Water Hammer Arresters
Pinecrest/Centrepoinete Stormwater	J F Sabourin & Associates Inc., June 2009

Reference Documents in Schedule 15	Description of Reference Documents
Management Criteria Study	
Policy and Guidelines on Disability and the Duty to Accommodate	Ontario Human Rights Commission
Post-Tensioned Box Girder Bridge Manual	Post-Tensioning Institute (PTI) Post-Tensioned Box Girder Bridge Manual
<i>Professional Engineers Act</i>	<i>Professional Engineers Act R.S.O. 1990, CHAPTER P.28</i>
Quality Standards for Architectural Woodwork	Quality Standards for Architectural Woodwork (AWMAC)
Railway Employee Radio Communication Rule	
Railway Freight and Passenger Train Brake Rules	
Railway Medical Rules for Positions Critical to Safe Railway Operations	
Railway Passenger Handling Safety Rules	
Railway Rules Governing Safety Critical Positions	
<i>Railway Safety Act (RSA) (R.S., 1985, c. 32 (4th Supp.))</i>	
Recommendations for Prestressed Rock and Soil Anchors	Post-Tensioning Institute (PTI) Recommendations for Prestressed Rock and Soil Anchors
Region of Ottawa-Carleton Regional Road Corridor Design Guidelines	Region of Ottawa-Carleton Regional Road Corridor Design Guidelines, July 2000, Region of Ottawa-Carleton
Regulations Amending the Contraventions Regulations	<i>“Fail to give way to railway equipment at a road crossing”</i>
Roadside Safety Manual	MTO
Rock Tunneling with Steel Supports	Proctor, R.V. and White, T.L., Youngstown, Ohio: Commercial Shearing, Inc., 1988
Rules for the Control and Prevention of Fires on Railway Rights-of-Way	
Rules for the Installation, Inspection and	

Reference Documents in Schedule 15	Description of Reference Documents
Testing of Air Reservoirs (Other than on Locomotives)	
Rules for the Protection of Track Units and Track Work	
Rules Respecting Minimum Qualification Standards for Railway Employees	
Rules Respecting Track Safety	
SAE J524	SAE J524 Hydraulic Standards for Industrial Equipment
Secondary Plan for the Central Area	City of Ottawa
Seismic Design and Analysis of Underground Structures	Hashash, Y.M.A. et al., 2001, Tunneling and Underground Space Technology 16, pp. 247-293
Shotcrete Lining Design: Factors of Influence	John M. and Mattle B. (2003), RETC 2003 Proceedings, 726-734
SMACNA Architectural Sheet Metal Manual	Sheet Metal and Air-conditioning Contractors' National Association (SMACNA), 2003
SMACNA HVAC Duct Construction Standards	SMACNA
Specification for Tunnelling	British Tunnelling Society and Institution of Civil Engineers (latest edition)
Specifications Covering Use of Aluminum in Passenger Carrying Railway Vehicles	
SSPC SP10	SSPC SP10 Near-White Blast Cleaning
Standard for LED Signal Modules at Highway/Railway Grade Crossings	Transport Canada, TC E-14
Standard Respecting Pipeline Crossings Under Railways (2000)	Transport Canada, TC E-10
Standard Respecting Railway Clearances	Transport Canada, TC E-5
Subway Environmental Design Handbook	Subway Environmental Design Handbook (SEDH) (DOT 1976);
Superpave Asphalt Mix Selection	
TC – RTD 10 Road/Railway Grade Crossing Technical Standards and Inspection, Testing and Maintenance Requirements	Transport Canada (TC), October 2002

Reference Documents in Schedule 15

Technical Report No. 63, Guidance for the Design of Steel-Fibre-Reinforced Concrete

Toxics Reduction Act

Transit Cooperative Research Program (TCRP) Report 155 Track Design Handbook for Light Rail Transit (Second Edition)

Transportation of Dangerous Goods Act (R.S. 1992, c. 34)

Transportation Safety Board Regulations 2014 (made pursuant to the Canadian Transportation Accident Investigation and Safety Board Act)

Tunnel Lining Design Guide

Tunney's Pasture Master Plan

UIC605OR

Uniform Code of Operating Rules

University of Ottawa – Main Campus Strategy

User's Guide – NBCC: Structural Commentaries (Part 4)

Wire Crossings and Proximities Regulations General Order E-11

Work/Rest Rules for Capital Railway

Description of Reference Documents

The Concrete Society, CCIP-017, March 2007

S.O. 2009

UIC605OR Protection from Corrosion

Regulations No. O-8, Part I; and amendment given by CTC 1986-3 RAIL, Handling Main Track Switches

APPENDIX A

OMCIAA Work Permit

PTB / Airside / Parking Structure



Work Permit

Safety First - For Emergency Response Dial 248-2111

Contractor		Application date (dd/mmm/yy)			
Start Date (dd/mmm/yy)		to be completed on			
Hours of work from				To:	
FAP Related work		<input type="checkbox"/> No	<input type="checkbox"/> Yes #	O2 parking	<input type="checkbox"/> No <input type="checkbox"/> Yes
OMCIAA or Tenant Project Contact:					Tel/Cell #:
Location of work (room # and / or description)					
<p>Ensure planned work does not disrupt daily operations. Any damage sustained during the performance of the work described must be repaired and the area left clean.</p>					

Checklist (all items must be checked)

Yes	No	Work Information	Yes	No	Required Compliance
1	<input type="checkbox"/>	Work affects life/safety system(s)?	A	<input type="checkbox"/>	Service person(s) briefed on site safety. (1 to 13)
2	<input type="checkbox"/>	Hot work(welding,soldering,grinding.)	B	<input type="checkbox"/>	Clearance with user-group prior to job. (1 to 13)
3	<input type="checkbox"/>	Smoke Eater for all hot works	C	<input type="checkbox"/>	Shutdown notice required. (2,4,5,6,12)
4	<input type="checkbox"/>	Beam detector bypass - list zones	D	<input type="checkbox"/>	Lock Out Tag Out SOP is understood (2,4,5,7,12)
5	<input type="checkbox"/>	Smoke detector bypass - list zones	E	<input type="checkbox"/>	Security personnel required (PSL) (9)
6	<input type="checkbox"/>	Electrical/mechanical interruption?	F	<input type="checkbox"/>	Fire extinguisher required. (2,3)
7	<input type="checkbox"/>	Disruption to building systems?	G	<input type="checkbox"/>	Safety barriers required. (2-6,8-10)
8	<input type="checkbox"/>	Loud noises / strong odours?	H	<input type="checkbox"/>	Supplementary cleaning required. (1 to 11)
9	<input type="checkbox"/>	Building access / egress blocked?	I	<input type="checkbox"/>	Notification of affected user-group(s). (1 to 13)
10	<input type="checkbox"/>	Work in ceiling space?	J	<input type="checkbox"/>	Lock-out / tag-out required. (2,4-7,12)
11	<input type="checkbox"/>	Drilling/coring in occupied space?	K	<input type="checkbox"/>	Escort required
12	<input type="checkbox"/>	System shutdown required?	L	<input type="checkbox"/>	Escort arranged (prior to submitting work permit)
13	<input type="checkbox"/>	Other building Systems(s) impacted?	M	<input type="checkbox"/>	Canine required

Disclaimer:

The contractor is responsible to ensure that all safety codes are adhered to during performance of work associated with this permit. Construction materials and tools must NOT be left unattended at any time. ALL tools and construction materials MUST be removed from the worksite at the end of each work day.

Work Plan - Provide complete details and / or schedule as well as specifics for each checkbox marked "yes"

On-Site Service Personnel Information

*Restricted Area Identity Card - if "yes", complete the tab marked "RAIC"

Company Name	Print Rep Name	Email	Phone#	*RAIC (Y/N)
1				
2				
3				

Submitted by:	Telephone and/or Cellular #
---------------	-----------------------------

Approvals
OMCIAA Approval: <i>[Signature]</i> Approval status: <i>[Signature]</i>

APPENDIX B

City Systems Integration Obligations

Task Name	Duration*
Expand NMS	
Draft head end specs and procure	80 days
Upgrade /install hardware	15 days
Software/licenses	15 days
NMS GUI station design	40 days
Integrate new station CTS equipment to NMS	20 days
Station SAT & regression test	10 days
Complete CTS SIT(NMS to station) after fibre loops closed	5 days
Telephone & Intercom System (Article 3)	
Expand PABX	
Draft head end specs and procure	80 days
Upgrade /install hardware	10 days
Software/licenses	10 days
PABX upgrade SAT regression test	10 days
PA/PIDS (Article 4)	
ICD Centralized message generator	20 days
ICD supervision/failure management	0 days
PIDS Database	20 days
Expand PA/PIDS Head End	
Draft head end specs and procure	80 days
Upgrade /install hardware	10 days
Software/licenses	10 days
PA/PIDS upgrade SAT regression test	10 days
VDRS (Article 5)	
Perform spec and design criteria	40 days
CCTV System (Article 7)	
Expand CCTV Head End	
Draft head end specs and procure	80 days
Upgrade /install server hardware	15 days
Procure Software/licenses	10 days
Conduct CCTV head-end upgrade SAT regression test	10 days
SCADA System (Article 8)	
Expand SCADA Head End	
Draft head end specs and procure	80 days
Upgrade and/or install hardware	15 days
Procure software/licenses	10 days
GUI station design	40 days
Conduct SAT /regression test of head-end	10 days

Task Name	Duration*
Intrusion Access Control System (Article 9)	
Expand IAC Head End	
Draft head end specs and procure	80 days
Upgrade /install hardware	10 days
Software/licenses	10 days
GUI station design	40 days
Cellular System (Article 12)	
Produce Cellular System specifications and design criteria	80 days
Procure and install active repeater equipment for coverage	80 days
SIT	5 days

* Durations are provided in Business Days

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APPENDIX A OMCIAA Work Permit

**SCHEDULE 15-2
DESIGN AND CONSTRUCTION**

**PART 1 DESIGN AND CONSTRUCTION REQUIREMENTS - GENERAL
 REQUIREMENTS**

ARTICLE 1 REFERENCE DOCUMENTS AND SUBMITTALS

1.1 Application of the Reference Documents, Standards and Procedures, City Standards, Ontario Provincial Standards for Roads and Public Works and Other Manuals, Codes and Standards

- (a) The Works, shall be carried out in accordance with the applicable Reference Documents, and with the following amendments:
- (i) Requirements related to design and submission requirements and quality assurance in the Reference Documents do not apply; rather, the Output Specifications and express requirements of this Project Agreement, including Schedule 11 – Integrated Management System Requirements, respectively shall apply;
 - (ii) Requirements and specifications in the Reference Documents related to equipment for performing the Works do not apply;
 - (iii) Sections within the Reference Documents that are not applicable to this Project, such as payment terms, do not apply;
 - (iv) Any and all references to “approval by the Contract Administrator” or other such reference in the Reference Documents, in terms of acceptance of materials, permission to proceed, work methodology or end product, shall be construed as being the responsibility of Project Co, but each such instance shall be in consultation applicable Governmental Authorities;
 - (v) Project Co shall consult with the City to determine which Reference Documents submissions are to be submitted under Schedule 10 – Review Procedure;
 - (vi) Project Co shall, when required in the Reference Documents to submit for approval by the City samples of any products proposed by Project Co, submit such samples with supporting documentation to the City in accordance with the Schedule 10 - Review Procedure; and,
 - (vii) The OPS specifications that apply to the Works shall only include the municipal and provincial common standards in OPS Volumes 1 through 4 and the municipal-oriented specifications in OPS Volumes 7 and 8, unless specified otherwise in Schedule 15 – Output Specifications.

1.2 Reference Documents

- (a) Without limiting any other provision in this Project Agreement, the Reference Documents shall apply to the Works as described in Schedule 15-2 – Design and Construction Requirements.

1.3 Order of Precedence

- (a) Unless otherwise expressly provided in Schedule 15-2 – Design and Construction Requirements, if there is any conflict between any of the provisions of this Project Agreement and any of the Reference Documents, the following shall apply in descending order of precedence:
- (i) Applicable laws and regulations;
 - (ii) the provisions of this Project Agreement;
 - (iii) City Standards and procedures;
 - (iv) OPS; and,
 - (v) any other applicable Reference Documents.

1.4 Reference Concept

- (a) Any use by Project Co of any or all aspects of the Reference Concept in performing the design and construction Works shall be entirely at Project Co's own risk. Use of the Reference Concept as a basis for Project Co's design for any part of the Project does not guarantee the City approval of Project Co's design.

1.5 Submittals

- (a) Project Co shall be responsible for determining any and all necessary Works Submittals, as specified in the relevant sections of this Schedule 15-2 – Design and Construction Requirements, whether or not a specific reference to Schedule 10 – Review Procedure is specifically mentioned.

ARTICLE 2 PHYSICAL LAYOUT

2.1 Existing Infrastructure

- (a) Existing infrastructure is comprised of, but not limited to, the following existing major components:
- (i) Approximately 8km of single Track from Greenboro Station north to Bayview Station used to provide Passenger service.
 - (ii) Approximately 4km of single Track south of Greenboro Station used to facilitate freight movements to the NRC Facility.
 - (iii) Passing sidings at Brookfield, Carleton and Gladstone.
 - (iv) Absolute block signal system, with Indusi intermittent, inductive automatic Train stop devices.
 - (v) Five Stations:
 - A. Bayview Station;
 - B. Carling Station;
 - C. Carleton Station;
 - D. Mooney's Bay Station; and,
 - E. Greenboro Station.
 - (vi) Dow's Lake Tunnel and associated systems
 - (vii) Rail Carrying Bridge Structures:
 - A. Rideau River Bridge (SN015290);
 - B. Southeast Transitway Bridges – Ellwood diamond (SN055930);
 - C. Sawmill Creek Bridge (SN055200);
 - D. Sawmill Creek Culvert (SN055470);
 - E. Walkley Yard Lead over Transitway (SN055900);
 - F. Rail Bridge over Transitway at Walkley Yard Connecting Track (SN055910);
 - G. Hunt Club Road Bridge (SN055350);
 - H. Rail Bridge over MUP at South Keys Station (SN058490);
 - I. South Rail Bridge over MUP at Carleton University (SN018510); and,

- J. North Rail Bridge over MUP at Carleton University (SN018490)
- (viii) Drainage infrastructure, including ditches, storm sewers, and Culverts, associated with the Track and passing sidings.
- (ix) Perimeter fencing of the alignment and landscape features within the Existing Trillium Line corridor and from Greenboro Station to the NRC Facility.
- (b) Upon commencement of the Shutdown Period, Project Co shall take full responsibility for all existing infrastructure and the Existing Vehicle Fleet including the Maintenance and Security of such infrastructure. For further clarity, upon commencement of the Shutdown Period, the Existing Trillium Line ROW including all existing infrastructure will be deemed Project Co's construction Site under the Occupational Health and Safety Act (Ontario).
- (i) The Ellwood and [REDACTED]/Walkley diamonds are active railway crossings that are subject to crossing agreements with Railway Companies described in Schedule 16 – Encumbrances. Upon the start of the Shutdown Period, Project Co shall be required to take full responsibility for the Maintenance and operation of these crossing agreements in accordance with the requirements set out in the crossing agreements, as outlined in Schedule 16 Article B, and as further outlined in Article 5 – Implementation Constraints, of this Part 1.
- (ii) Project Co shall be responsible for rail traffic control, dispatch and maintenance over the Ellwood Diamond from the start of the Shutdown Period until such time as Project Co has completed the decommissioning of the interlocking infrastructure at the diamond and [REDACTED] has assumed full control and responsibility for dispatch on their line.
- (iii) Project Co shall be responsible for rail traffic control, dispatch (east-west movements across the Walkley Diamond or movements to the NRC Facility) and maintenance over the Walkley Diamond from the start of the Shutdown Period until such time as Project Co has commissioned and turned over the new dispatch system as outlined in Schedule 15-2 Part 3 Article 10.2 to the City and the City has assumed full control and responsibility for dispatch. Project Co shall provide flagging or other suitable rail traffic controls to enable [REDACTED] and NRC rail traffic through the interlocking during the construction period.
- (iv) Project Co acknowledges that the Existing Trillium Line is not entirely fenced. Project Co shall determine where gaps in the fence exist and where repair work is required to the fence and shall complete fence installation and repairs prior to the Shutdown Period to ensure Security of the Site and compliance with this Article 2.
- (v) Project Co shall prepare and submit, in accordance with Schedule 10 – Review Procedure, a Transition and Maintenance Plan no later than three months in advance of the Shutdown Period that outlines how Project Co intends to comply with the requirements of this Article 2 and the Project Agreement as of the Shutdown Period commencement. Project Co shall co-ordinate with the City, the City's current Maintenance providers on the Existing Trillium Line, [REDACTED] and [REDACTED] in the preparation of the Transition and Maintenance Plan.

2.2 System Infrastructure

(a) System Infrastructure shall include the following:

- (i) Project Co may incorporate any of the existing infrastructure in whole or in part, modified or unmodified into the System Infrastructure with the exception of the following:
 - A. The Existing Walkley Yard currently located east of Albion Road; and,
 - B. The Dow's Lake Tunnel structure.
- (ii) System Infrastructure shall consist of the following:
 - A. Approximately 19.5km of Guideway and Track from Bayview Station to Limebank Station;
 - B. A 4.5km Airport Link from South Keys Station to the OMCIA;
 - C. Passing sidings at Gladstone, Carleton, Brookfield, South Keys and Leitrim;
 - D. Passing siding at Uplands;
 - E. Eleven Stations on the Expanded Trillium Line:
 - i. Bayview Station;
 - ii. Gladstone Station;
 - iii. Carling Station;
 - iv. Carleton Station;
 - v. Mooney's Bay Station;
 - vi. Walkley Station;
 - vii. Greenboro Station;
 - viii. South Keys Station;
 - ix. Leitrim Station;
 - x. Bowesville Station; and,
 - xi. Limebank Station.
 - F. Two Stations on the Airport Link:
 - i. Uplands Station; and,
 - ii. Airport Station.

- G. New Walkley Yard to be constructed west of Albion Road with northbound and southbound connection Tracks;
 - H. New rail, road and pedestrian facilities and Structures;
 - I. New Signalling and Train Control System;
 - J. New communications systems and infrastructure;
 - K. Perimeter fencing and landscaping;
 - L. Drainage infrastructure, including ditches, storm sewers, and Culverts, associated with the Track and passing sidings;
 - M. Dow's Lake Tunnel ventilation and drainage systems and facilities;
 - N. The Existing Vehicle Fleet; and,
 - O. The New Vehicle Fleet.
- (iii) Project Co shall decommission and remove any Existing Trillium Line assets that are not being incorporated into SI and have been made redundant following the implementation of the Expanded Trillium Line, including but not limited to, existing signal bungalows, existing signal infrastructure and existing Bridges.
- (b) All SI shall be designed and constructed in accordance with Transport Canada rules and regulations including, but not limited to, the Canadian Transportation Agency Code of Practice in addition to the OC Transpo Transitway and Station Design Guidelines, June 2013.
- (c) All SI shall be upgraded and / or designed and constructed to meet the requirements of NFPA130 and OBC313.
- (i) A consolidated NFPA requirements matrix shall be provided for review and approval by the AHJ in accordance with Schedule 10 – Review Procedure.
- 2.3 New Municipal Infrastructure**
- (a) The New Municipal Infrastructure physical layout is detailed in Article 14.4.
- 2.4 General Alignment Requirements**
- (a) The alignment falls within existing City ROW and the permanent takings as described in Schedule 33 – Lands. Project Co shall Design the Guideway alignment within the Lands as prescribed in Schedule 33 – Lands.
- (b) Guideway Requirements.
- (i) The Guideway shall be completely fenced and segregated from any pedestrian and vehicular traffic, with the exception of the following:

- A. The Walkley diamond where the Guideway fence shall be connected to the existing fence associated with the crossing railway.
 - B. If required, the NRC spur line crossing of Lester Road at-grade as outlined in Schedule 15-2, Part 3, Article 10 – Signalling and Train Control System.
- (ii) Fencing location, type and height shall be as outlined in Schedule 15-2, Part 6, Article 2 – Design Criteria.
- (iii) Emergency egress points that will allow ESP access as per the requirements of NFPA 130 shall be provided with secure Maintenance/Emergency access gates, where fences are installed for separation as per clause (i) above. A unique identification system shall be developed for the gates in consultation with the City and signage shall be fixed to both sides of each gate for identification purposes. Maintenance access gates shall be coordinated with Emergency egress and access gates.
- A. The Airport Emergency route ER-2 vehicular crossing shall be as outlined in Schedule 15-2, Part 3, Article 10 – Signalling and Train Control System.
- (iv) Project Co shall provide all fencing, gates and Security required to secure the NRC spur line and the Trillium Line from the NRC Facility.
- (c) Crossings
- (i) The following rail and vehicular at-grade crossings shall be incorporated into the Project:
- A. Walkley diamond rail crossing;
 - B. Airport Emergency Route ER-2 vehicular crossing; and,
 - C. NRC Spur Line crossing of Lester Road vehicular crossing, if required.
- (d) The Airport Link is primarily located on Federal Lands leased to the OMClAA, and is therefore subject to review by the NCC as are other components of the Project proposed on Federal Lands as outlined in the NCC Trillium Line South Extension Approval Letter dated September 14, 2017. Project Co shall be responsible for design and construction of all components of the Project on Federal Lands in accordance with the following:
- (i) The National Capital Act makes the NCC responsible for coordinating and approving projects related to Federal Lands and buildings in Canada's National Capital Region. The NCC is a Crown Corporation and therefore functions at a distance from the federal government, reporting to Parliament through the Minister of Canadian Heritage.
 - (ii) All individuals and federal organizations need NCC approval before undertaking projects on Federal Lands and buildings in Canada's National Capital Region.
 - (iii) The NCC's mandate to approve federal land uses, transactions and designs is set out in sections 12 and 12.1 of the National Capital Act.

- (iv) Project Co's approach to Works on Federal Lands including the Airport Link shall be subject to review by the NCC and shall be assessed in terms of compliance with the guiding principles contained within this Project Agreement:
- A. Project Co shall be responsible to develop designs and design documentation to support the City and the OMCIAA in obtaining NCC approval, including but not limited to:
- i. Attending meetings with the City, the OMCIAA and NCC;
 - ii. Providing design documentation, reports, renderings and specifications to be used in the approval process; and,
 - iii. Presenting the Airport Link to the Advisory Committee on Planning Design and Realty at the NCC.

2.5 Systems Requirements

- (a) Project Co shall be responsible for the design, construction testing, Commissioning Plans, Commissioning Tests and Maintenance of a new S&TCS capable of providing continuous cab signaling and Train protection required for the safe and efficient operation of the Expanded Trillium Line, including a head-end management platform and dispatch function at the TOCC & BCC. The head-end management platform for the S&TC system shall be comprised of both hardware and software that provides the command and control capability for the Expanded Trillium Line's new S&TCS and shall include new operator workstations along with the graphical user interfaces connected to servers running industry standard operating systems, and the communications transmission infrastructure required to support operations, monitoring and alarm handling of the field equipment along the alignment.
- (b) Project Co shall be responsible for the design, construction, testing, Commissioning Plans, Commissioning Tests and Maintenance of the following communications systems and co-ordination with the City the integration of these communications systems with the existing head-end management platform at the TOCC & BCC;
- (i) CTS;
 - (ii) PA/PIDS;
 - (iii) CCTV;
 - (iv) IAC;
 - (v) T&I System;
 - (vi) SCADA system; and,
 - (vii) Voice and Data Radio System.
- (c) The head-end management platform for the communications systems is the existing communications system architecture made up of both hardware and software that provides the command and control capability for the communications systems. It includes existing operator

workstations along with the graphical user interfaces connected to servers running industry standard operating systems, and the communications transmission infrastructure required to support operations, monitoring and alarm handling of the field equipment along the alignment.

- (d) Project Co shall be responsible for overall Systems Integration Tests, coordination and integration between all System elements and interfacing disciplines including integration with the Revenue Vehicles, fare collection system, communications systems, and other interfacing systems. Interfacing disciplines includes but is not limited to infrastructure, facilities, subsystems, software, Operations personnel and Maintenance personnel, etc.
- (e) The City shall integrate the Expanded Trillium Line's communications systems into the Confederation Line's existing head-end management platform. Project Co's physical cable and equipment demarcation for all communications systems shall be the CTS equipment cabinet at Bayview Station. Project Co shall connect the Expanded Trillium Line's new CTS to the Confederation Line's CTS. As the systems integrator, Project Co shall be responsible for the overall systems integration including the planning, scheduling, coordination, and acceptance of this work.

2.6 Vehicle Requirements

- (a) Project Co shall provide all Non-Revenue Vehicles, including Maintenance Vehicles required to Maintain the SI.
- (b) The City shall turnover to Project Co the existing fleet of 6 Alstom LINT 41 Vehicles. Project Co shall be responsible for all upgrades, Maintenance and retrofits required to the Existing Vehicle Fleet.
- (c) Project Co shall provide appropriate standstill Maintenance on the six Alstom LINT 41 Vehicles until such time that they are required for testing and commissioning and/or to be placed into service.
- (d) Project Co shall be responsible for undertaking the scheduled Alstom "F6" 8-year overhaul including a powerpack and transmission overhaul during the Shutdown Period and any other scheduled Maintenance activities that are required by the Alstom inspection and Maintenance schedule, LINT DMU rules, or other Maintenance requirements arising for the Vehicle.
- (e) Project Co shall provide new vehicles as outlined in Schedule 15-2, Part 8 – Vehicles.

2.7 Facilities Requirements

- (a) Station Requirements:
 - (i) The Stations shall be designed and constructed in accordance with any and all applicable standards regarding accessibility and Fire Life Safety, including but not limited to, Emergency egress, lighting and ventilation.
 - (ii) Stations shall be provided with space and Utility services provisions for installation of a fare control system including but not limited to fare control gates and Ticket Machines to be installed by the City.

- A. Project Co shall provide the required supporting infrastructure to allow power and communications connections, including walker ducts and conduits.
 - B. Project Co shall design and construct the location of equipment as to ensure the year round operation of the fare equipment by ensuring that all fare gate equipment is protected from the weather, including rain, snow and sleet in accordance with Schedule 15-2, Part 4, Clause 2.7 (d)(iv) A.
 - C. All fare collection, vending, and control equipment shall be located within the Station structure. If it is not feasible to locate all fare equipment within the Station structure, the equipment shall be protected from the elements in accordance with Schedule 15-2, Part 4 - Stations.
- (iii) All Stations shall be designed and constructed to accommodate the requirements of all Vehicles in the fleet.
- (iv) Stations shall be designed and constructed with Ancillary Facilities as outlined in Schedule 15-2, Part 4 – Stations.
- (v) The Stations shall be located along the corridor as described below (note a two-track Station requires Project Co to provide either two side Platforms or a single centre Platform):
- A. Bayview Station is an existing Terminal Station and Transfer Station to the Confederation Line. Project Co shall extend the existing Platform to accommodate the Revenue Vehicles, expand the Station to provide a second Platform able to accommodate the Revenue Vehicles and provide a new fare paid entrance on the west side of the alignment with a pedestrian Bridge including vertical circulation outside of the Fare Paid Zone as detailed in Schedule 15-2, Part 4 - Stations.
 - B. Gladstone Station shall be a new two-Track Station located on the Existing Trillium Line.
 - C. Carling Station is an existing Station on the Existing Trillium Line. Project Co shall extend the single Track Platform to be able to accommodate the Revenue Vehicles and perform Station upgrades as outlined in Schedule 15-2, Part 4 – Stations.
 - D. Carleton Station is an existing two-Track Station on the Existing Trillium Line. Project Co shall extend both Platforms to be able to accommodate the Revenue Vehicles and perform Station upgrades as outlined in Schedule 15-2, Part 4 – Stations.
 - E. Mooney's Bay Station is an existing single-Track Station on the Existing Trillium Line. Project Co shall extend the single Track Platform to be able to accommodate the Revenue Vehicles and perform Station upgrades as outlined in Schedule 15-, Part 4 – Stations.
 - F. Walkley Station shall be a new single-Track Station located on the Existing Trillium Line.

- G. Greenboro Station is an existing single-Track Station on the Existing Trillium Line. Project Co shall extend the single Track Platform to be able to accommodate the Revenue Vehicles and perform Station upgrades as outlined in Schedule 15-2, Part 4 – Stations.
- H. South Keys Station shall be a new two-Track Station on the Trillium Line Extension and shall operate as a Transfer Station between the Airport Link and the Expanded Trillium Line. A new fare controlled entrance shall be provided to access the Trillium Line.
- I. Leitrim Station shall be a new two-Track Station on the Trillium Line Extension. Leitrim Station shall include an expanded Park and Ride Facility and bus Platforms.
- J. Bowesville Station shall be a new two-Track Station on the Trillium Line Extension. Bowesville Station shall include a Park and Ride Facility and bus Platforms.
- K. Limebank Station shall be a new two-Track Station on the Trillium Line Extension and represents the terminus of the Expanded Trillium Line. Limebank Station shall include an on-street bus Facility.
- L. Uplands Station shall be a new two-Track Station on the Airport Link with an on-street bus Facility.
- M. Airport Station shall be a new single-Track Station on the Airport Link and represents the terminus of the Airport Link. Airport Station shall abut a new Airport Station Concourse and entry to be designed and constructed by the OMCIAA. Project Co shall ensure the design and construction of Airport Station is co-ordinated with the OMCIAA.

(b) Facilities Requirements – TOCC

- (i) The City shall integrate all the Expanded Trillium Line communications systems into the head-end management platform at the TOCC including hardware, software and licenses. Refer to Schedule 15-2, Part 3 – Systems.
- (ii) Project Co shall plan, design, install, test and commission all equipment required for the Expanded Trillium Line S&TC head-end management system required at the TOCC.
- (iii) The City shall reserve space in one of the IT equipment rooms in the TOCC for Project Co to install the new S&TCS servers, switches, patch panels and other equipment as required to connect the field S&TCS equipment to the new workstation in the TOCC operational theater.
- (iv) The City shall reserve space in the TOCC operational theater for the two new S&TCS operator workstations.
- (v) The City shall reserve space in the equipment room at 875 Belfast Road TOCC for Project Co to install the new S&TCS equipment as required to connect the field S&TCS equipment to the new workstations and the BCC operational theater.

- (vi) Project Co shall plan, design, install, test and commission all equipment required for the Expanded Trillium Line S&TC head-end management platform.
- (c) Facilities Requirements – BCC
- (i) The City shall integrate all Expanded Trillium Line communications systems into the BCC including hardware, software and licenses. Refer to Schedule 15-2, Part 3 – Systems.
- (ii) The City shall reserve space in the BCC operational theater for one new S&TCS operator workstation.
- (d) Facilities Requirements – New Walkley Yard
- (i) Project Co shall be responsible for the complete planning, design, construction, testing and commissioning, O&M of a New Walkley Yard facility, including the supply of all equipment and Facilities to Maintain the Revenue Vehicles and SI.
- (ii) The New Walkley Yard shall be designed to meet the functional, accessibility, aesthetic, environmental, Safety, Operation and technical requirements of the City as contained and described in Schedule 15-2, Part 5 – New Walkley Yard.
- (iii) The New Walkley Yard shall achieve “LEED Certified Rating”.
- (iv) The New Walkley Yard shall be secured by fencing that is continuous with the fencing that protects the Guideway.
- (v) Project Co shall provide Security for the New Walkley Yard Site.

2.8 Structure Requirements

(a) New Structures

- (i) New Structures located along the Guideway shall include:
- A. Rail Bridge over Hunt Club Road (SN 055440);
 - B. Hunt Club Road MUP Bridge (SN 058620);
 - C. Rail Bridge over Lester Road (SN 225620);
 - D. Trinity Pedestrian Bridge (SN 018430);
 - E. Leitrim Road Bridge (SN 225610);
 - F. Earl Armstrong Bridge (SN 225680);
 - G. High Road Bridge (SN 225670);
 - H. Bowesville Road Bridge (SN225690);
 - I. Mosquito Creek Rail Bridge (SN225050);

- J. Limebank Road Bridge (SN225710);
 - K. Rail Bridge over MUP North of Hunt Club Road (SN 055740);
 - L. Pedestrian Overpass North of South Keys Station (SN 055750);
 - M. [REDACTED] Grade Separation at Ellwood diamond;
 - N. North Rail Bridge over MUP at Carleton University;
 - O. University Road Pedestrian Bridge over Rideau River (SN018750);
 - P. Rail Bridge over the Airport Parkway (SN 225630);
 - Q. Rail Bridge over Uplands Drive (SN 225640); and,
 - R. Elevated Guideway to OMCIA Terminal (SN 225110).
- (b) The following requirements apply to existing Structures:
- (i) Project Co shall perform such investigations and design checks as may be required to ensure that any existing Structure can be used to support the Guideway including a design check of existing piers for derailment loads. The design check shall be completed in accordance with all applicable codes and standards.
 - (ii) Project Co shall Maintain all existing Structures in accordance with the terms and conditions of Schedule 15-3 – Maintenance and Rehabilitation Requirements and shall perform design checks and investigations on all existing Structures. See Schedule 15-2, Part 2, Article 4 – Structural Design Criteria for additional requirements.
 - (iii) Should such design checks demonstrate that modification is required to any portion of the Structure, Project Co shall design and construct such modifications and ensure that all applicable codes are met.
- 2.9 Design and Construction Requirements to Accommodate Concurrent and Future Works**
- (a) Project Co shall coordinate with Third Party Contractors who may be performing work which may connect, complement, interfere, or in any manner impact this Project. It is the responsibility of Project Co to work with these Third Party Contractors to fully coordinate interfaces and resolve any disputes or coordination problems that may arise.
- (b) Project Co shall be responsible to be aware of and obtain information related to all Third Party Contractors and their projects. A list of planned projects and projects currently underway can be found on the City of Ottawa Website www.ottawa.ca/devapps.
- (c) In addition to the above, Project Co shall be aware of the following projects:
- (i) The Confederation Line, which includes a new Station Platform on the Existing Trillium Line at Bayview Station, will be completed and put into Operation.

- (ii) The existing Highway 417 overpass of the Existing Trillium Line will be replaced with a single span structure.
 - (iii) The land east of Bayview Station is planned for mixed-use development that will connect to the Trinity Pedestrian Bridge.
 - (iv) Current Carleton passing siding spring switches are being replaced with powered switches, adjusted Track alignment, and new signal equipment.
 - (v) Fare Control implementation is underway at Carleton, Carling and Mooney's Bay Stations.
 - (vi) Walkley Yard Interlocking project is a capital renewal project to replace ties, rail, switch machines, turnouts, and signal equipment.
 - (vii) [REDACTED] intends to add three stories to the parking garage facility located overtop the Trillium Line.
 - (viii) The City is planning structural and architectural upgrades to the Greenboro pedestrian Bridge during the Shutdown Period.
 - (ix) The City Traffic Department is planning to install fibre optic cabling from Gladstone, Mooney's Bay, Walkley, South Keys, Leitrim and Uplands Station through the Project Co installed conduits to the Project Co installed break out points as outlined in Schedule 15-2, Part 2, Clause 8.12.
- (d) Project Co shall protect for future works in the design of the Project, including:
- (i) The future twin-Track electrification of the Expanded Trillium Line and Airport Link and conversion to a higher frequency LRT technology;
 - (ii) A future freight by-pass around the Ellwood diamond Grade Separation;
 - (iii) The widening of Lester Road;
 - (iv) The widening of the Airport Parkway;
 - (v) Elements of the Riverside South Community Design Plan and the Riverside South Core Area Urban Design Guidelines including the following:
 - A. Future Collector Road "G" and "H" overpasses perpendicular to Earl Armstrong Road between Bowesville Station and Limebank Station to allow for future local roads parallel to Earl Armstrong Road intersecting Collectors "G" and "H" at grade at a distance not less than 80m south of Earl Armstrong Road;
 - B. Future Station at Collector Road 'G' to accommodate an 80m Train;
 - C. Future Station at Collector Road 'H' to accommodate an 80m Train; and,
 - D. Future Station at Collector Road 'D' or Collector Road 'E' to accommodate an 80m Train.

- (vi) Future Platform extensions at Uplands Station and Airport Station to accommodate 80m Trains;
- (vii) The future relocation of Mooney's Bay Station and MUP pathway from SN 018750 to the future Station;
- (viii) The expansion of both the Leitrim and Bowesville Park and Ride Lots;
- (ix) The expansion of the New Walkley Yard to accommodate an expanded Vehicle fleet;
- (x) Future overhead connections from development on both the east and west side of Gladstone Station to a future second floor level of the Station;
- (xi) Future elevator and stair construction from the Carleton Tunnel Structure to the Carleton Station entrance;
- (xii) Future modification of South Keys Station to provide a Fare Paid Zone between Transitway and Train service;
- (xiii) Future extension of the Pedestrian Overpass North of South Keys Station to create a fare-free pedestrian and cycling connection;
- (xiv) Future provision of 10-minute headway service by extending the Brookfield siding to south of Walkley Station; and,
- (xv) Future installation of solar panels overtop the Guideway from Somerset Street to Gladstone Ave.

ARTICLE 3 OPERATIONAL PERFORMANCE REQUIREMENTS

3.1 Introduction

- (a) Project Co shall provide an integrated System capable of delivering public transit service in a safe, reliable and efficient manner, and in accordance with the following Operational performance parameters.
- (b) The Signalling and Train Control System for the Expanded Trillium Line shall be provided as a standalone system (independent from the Confederation Line S&TCS) located within the City's TOCC at 875 Belfast Road and the BCC located at 805 Belfast Road as further outlined in Schedule 15-2, Part 3 - Systems.
- (c) The communication system and all other operational control functions for the Expanded Trillium Line shall be fully integrated with the Confederation Line's head-end management platform(s) at the City's TOCC and the BCC as further outlined in Schedule 15-2, Part 3 - Systems.
- (d) Safety and Security monitoring of the Expanded Trillium Line shall be functionally integrated with the City's Security control centre located at 875 Belfast Road as further outlined in Schedule 15-2, Part 3 - Systems. The Security control center will be staffed by Special Constables Unit staff that will be responsible for monitoring Passenger assistance intercoms and on-demand real-time CCTV, responding to Security incidents/Emergencies, and coordinating daily fare enforcement patrols as necessary.

3.2 General

- (a) Although Operation of service will be the responsibility of the City, Project Co shall thoroughly consider the Operational needs and the functionality of a fully integrated system during design and construction Works and shall validate the Operational capabilities through performance simulation, test, and demonstration.
- (b) Project Co shall be responsible to provide and Maintain the SI to meet the Operational needs and required functionality of the System.
- (c) Project Co shall also be responsible for the testing, commissioning, and Safety and Security Certification of the SI, including new Revenue Vehicles in accordance with the requirements of Schedules 15-2, Part 1 – General Requirements, Schedule 15-2, Part 3 – Systems, and Schedule 14 – Testing and Commissioning to validate that the complete Expanded Trillium Line, including existing fleet and new fleet of vehicles, are ready to deliver a seamless service.
- (d) Project Co shall assist the City in preparing an Operations Service Plan that includes normal, degraded, and failure modes of operation. Project Co shall prepare operating procedures, records, training, and related manuals, in consultation with the City, required to operate the System based on the final System design and results of performance simulations. Project Co shall submit the referenced documents in accordance with Schedule 10 – Review Procedure. Project Co and City shall work cooperatively, each acting reasonably, to achieve an integrated Operations Service Plan. Project Co shall submit all Operating procedures, records, and related manuals at least 9 months prior to Revenue Service.

- (e) Project Co shall be responsible for the initial training of the OC Transpo Trainers in the Operation of the Revenue Vehicles as well as any new or approved revisions to the Capital Railway rules, regulations and SOP.
- (f) Project Co shall also be responsible for training of the Controllers in the use and application of the S&TC System in the TOCC.
- (g) Project Co shall develop, and submit for the City's review and adoption, any new or suggested revisions to existing Capital Railway rules, regulations and SOP governing Operations and Maintenance of the SI in accordance with Schedule 10 – Review Procedure, consulting with the City during their preparation and any subsequent reviews until Revenue Service commences. During Revenue Service, both Project Co and the City shall be responsible for compliance with the Capital Railway rules, regulations and SOP. If either the City or Project Co determines that adjustments to the Capital Railway rules, regulations and SOP are required or prudent, the City or Project Co will consult with the other party and draft the new or revised rule or procedure. The City shall have final approval authority over any new or revised rule or procedure.
- (h) Any new or suggested revisions to the Capital Railway rules, regulations and SOP shall be derived from, and be traceable to, the City's existing rule book and operating procedures, with revisions to reflect the introduction of any new infrastructure or technology, and the different roles of Project Co and the City.
- (i) During the Construction Period, the O&M manuals shall be developed and prepared by Project Co, and reviewed by the City. These manuals shall provide O&M staff with written instructions and documentation regarding the Operation of, and the Maintenance procedures associated with, each system and related piece of equipment supplied and installed by Project Co. O&M manuals shall follow the City's standard for training materials and suitable adult education training material standards.
- (j) For the avoidance of doubt:
 - (i) Project Co shall be responsible for the development of new or revised O&M manuals, new or suggested revisions to existing Capital Railway rules, DMU rules, SOP, and training materials for SI; and,
 - (ii) The City or Project Co will propose and coordinate changes to the Capital Railway rules, regulations, SOP, and associated training materials.
- (k) At the New Walkley Yard, Project Co shall be responsible for monitoring and controlling Revenue Vehicle movements within the yard and up to the Yard Limits.

3.3 Environmental Conditions

- (a) The Train shall be capable of normal Operations under the ambient environmental conditions specified in Schedule 15-2, Part 1, Article 4 – Design and Construction.

3.4 Hours of Operation

- (a) The SI design and ongoing Maintenance and Rehabilitation Services shall support the hours of Revenue Service of the Service Levels presented in Schedule 15-3 – Maintenance and Rehabilitation Requirements, Appendix A, Attachment 2.

- (b) The City will have the flexibility to modify the hours of Revenue Service pursuant to Article 3 of Schedule 15-3 – Maintenance and Rehabilitation Requirements.
- (c) The City will have the flexibility to operate extended hours during special events, including operating hours of 24 hours per day in limited circumstances to be agreed upon by the City and Project Co in advance, each acting reasonably.
- (d) Passenger facilities in a Station shall be available for use by Passengers from 15 minutes prior to the departure of the first scheduled Train from that Station until 15 minutes after the departure of the last scheduled Train from that Station.

3.5 Service Reliability

- (a) Service Reliability Standard:
 - (i) The City has established a Service Reliability Standard of 98.5% on-time performance, where a trip is considered on time if it is available to depart the following Terminal Stations within 30 seconds of scheduled departure time, respecting a minimum terminal time of 3 minutes for:
 - A. Mainline – Bayview and Limebank;
 - B. Airport Shuttle – Airport and South keys
 - (ii) During times when through-service is operated between Airport Station and Bayview Stations, on-time performance shall be assessed for the Limebank Station/South Keys Station trips.
 - (iii) The City may choose, but shall not be obligated, to reduce terminal time for the purposes of achieving an on-time departure.

3.6 Operational Design Requirements

- (a) Operating Headway:
 - (i) Project Co shall design the System to support the reliable operation of a headway of 12 minutes on both the mainline service and Airport Link service utilizing the passing sidings as specified in Schedule 15-2, Part 2, Article 1 - Introduction.
- (b) The SI shall support the following service plan:
 - (i) Trains of approximately 80m in length (single or 2-car consists) operating on 12-minute headways between Bayview Station and Limebank Station.
 - (ii) Trains of approximately 40m in length operating on 12-minute headways on the Airport Link between Airport Terminal Station and South Keys Station.
 - (iii) Occasional Airport to Bayview through-service which would also include a shuttle operation between Limebank Station and South Keys Station.
- (c) South Keys Operations:

- (i) Project Co shall design a System that supports efficient interface and operation of shuttle and mainline services at South Keys Station. For further clarity, the following reflects anticipated Train movements and interaction between mainline and shuttle services at the South Keys Station for both potential shuttle service patterns.
- (ii) Airport Link:
- A. Northbound Airport Link Train from the Airport arrives at South Keys Station ahead of northbound service from Limebank Station to Bayview Station.
 - B. Airport Link Train discharges passengers and proceeds into the South Keys pocket Track.
 - C. Northbound Bayview Train arrives at South Keys Station, services the Station and departs, and Southbound Limebank Train arrives at South Keys, services the Station and departs.
 - D. Airport Link Train pulls out of the pocket Track southbound, services South Keys Station and proceeds toward the Airport.
- (iii) Limebank Shuttle:
- A. Northbound shuttle Train from Limebank arrives at South Keys Station ahead of northbound service from Airport to Bayview.
 - B. Shuttle Train discharges Passengers and proceeds into the South Keys pocket Track.
 - C. Northbound Airport-Bayview Train arrives South Keys Station, services the Station and departs, and Southbound Bayview-Airport Train arrives South Keys, services the Station and proceeds south toward Airport.
 - D. Shuttle Train pulls out of the pocket Track southbound, services South Keys Station and proceeds toward Limebank.
- (d) Maximum cycle time
- (i) The maximum cycle time shall not exceed the following values, as demonstrated by Project Co through simulation in accordance with Clause 3.6 (e) of this Part 1:
- A. Limebank to Bayview – 84 minutes.
 - B. Airport Link – Airport to South Keys – 24 minutes.
- (ii) The maximum cycle time shall be determined by summing:
- A. All Station-to-Station travel times, and the appropriate Station dwell times in both the northbound and southbound directions, following the requirements in (iii) and (iv) below; and,

- B. Terminal layover times at terminal Stations, following the requirements in (v) below:
- i. For the mainline service, terminal times at Bayview Station and Limebank Station; and,
 - ii. For the Airport Link, terminal times at Airport Station and South Keys Station.
- (iii) Station-to-Station travel time shall be defined as the duration of time between the moment the Train wheels start moving at the first Station and the time the wheels come to a standstill at the next Station.
- A. Station dwell times shall not be included in Station-to-Station travel times.
- B. Project Co shall base the nominal Station-to-Station travel times on a maximum permissible speed of 80 km/hr and civil speed restrictions imposed by Track/alignment curvature and Platforms, as well as applicable speed restrictions on the Existing Trillium Line provided as Background Information.
- (iv) Station Dwell Times
- A. For purposes of calculating cycle time, and for simulation, Project Co shall use the following dwell times at each intermediate Station for the listed hours:

Table 1-3.3- Northbound Station Dwell Times

Station	Northbound Dwell Times (sec)			
	AM Peak 6am – 9am	Midday 9am – 3pm	PM Peak 3pm – 6pm	Evening 6pm – 12am
Airport	-	-	-	-
EY Centre /Uplands	20	20	20	20
Limebank	-	-	-	-
Bowesville	50	40	49	33
Leitrim	45	36	44	30
South Keys	30	26	29	23
Greenboro	44	35	42	29
Walkley	20	20	20	20
Mooney's Bay	23	21	23	20
Carleton	115	85	110	65
Carling	34	28	33	24
Gladstone	21	20	21	20
Bayview	-	-	-	-

Table 1-3.4- Southbound Station Dwell Times

Station	Southbound Dwell Times (sec)			
	AM Peak 6am – 9am	Midday 9am – 3pm	PM Peak 3pm – 6pm	Evening 6pm – 12am
Airport	-	-	-	-
EY Centre /Uplands	20	20	20	20
Limebank	-	-	-	-
Bowesville	20	20	20	20
Leitrim	20	20	20	20
South Keys	20	20	20	20
Greenboro	20	20	20	20
Walkley	20	20	20	20
Mooney's Bay	22	20	21	20
Carleton	90	67	86	52
Carling	25	22	25	20
Gladstone	22	20	22	20
Bayview	-	-	-	-

(v) Minimum Terminal Times:

- A. Terminal time shall be defined as the duration of time spent at the Terminal Stations at the end of a run and before the beginning of the next.
- B. For the purposes of developing the service plan for simulation, the following minimum terminal times shall be met or exceeded:
 - i. Bayview – 10.0 minutes;
 - ii. Limebank – 9.0 minutes;
 - iii. Airport – 3.0 minutes; and,
 - iv. South Keys (pocket Track) – 3.0 minutes.

(e) Simulation Requirements

- (i) Project Co shall verify travel and cycle times and prove service reliability through Operations simulation of the proposed System reflecting Project Co's design according to the following requirements.
 - A. Operating Schedule:
 - i. Five full operating days (weekday) with the prescribed headways reflecting Service Level 1 hours of Operation shall be simulated.
 - ii. For purposes of simulation, operating performance factors (such as, but not limited to: acceleration, braking, maximum allowable speed

adherence) shall be adjusted such that Station-to-Station travel times are 8% longer than the ideal Station-to-Station travel times (i.e. Station-to-Station travel times that could be achieved with full acceleration and braking rates, with perfect adherence to maximum allowable speeds; and perfect timing of brake application) to account for Operator variability and sub-optimal Vehicle performance reflecting real-world conditions. The Proponent shall adjust and calibrate the operating performance factors to achieve the 8% increase in run time and shall document the adjustments in the simulation report. The adjusted operating performance factors shall be applied to all respective trains in all simulations.

- B. Infrastructure:
- i. The simulation shall reflect Project Co's final design including Track alignment, special Trackwork, curvature, grades, and Station Platform limits.
- C. Rolling Stock:
- i. The simulation shall reflect the parameters of the existing Alstom Coradia LINT 41 DMU Vehicle and the New Vehicle Fleet, as the case may be.
- D. Train Control:
- i. The simulation shall capture the influence of the proposed signal system Design and Train protection system in accordance with Schedule 15-2, Part 3 – Systems.
- E. Station Dwell Times:
- i. Variable dwell times shall be simulated through stochastic variation in the form of a uniform probability distribution applied around the nominal dwell times at each Station as shown in Tables 1-3.3 and 1-3.4, with minimum and maximum values as outlined below.
 - ii. For Carleton Station during the AM and PM peak the uniform distribution parameter shall be:
 - 1 Minimum – Nominal dwell time minus 46 seconds; and,
 - 2 Maximum – Nominal dwell time plus 75 seconds.
 - iii. For every other Station and for all operating time periods Tables 1-3.3 and 1-3.4 the uniform distribution parameters shall be:
 - 1 Minimum – Nominal dwell time minus 12 seconds
 - 2 Maximum – Nominal dwell time plus 17 seconds

- iv. If any randomized dwell times from the uniform probability distribution result in values less than 20 seconds, they shall be adjusted upward to a minimum of 20 seconds in the simulation.

F. Service Reliability:

- i. The reliability of the operation of the System shall be measured according to the Service Reliability Standards established in Clause 3.5 of this Part 1.
- ii. For purposes of measuring service reliability, terminal times shall not violate the minimum terminal recovery time requirement of three minutes.
- iii. The simulation report shall include statistics on the number or percentage of trains in the five simulated operating days that were not available to depart within 30 seconds of the scheduled departure time after having achieved a minimum terminal time of three minutes.

3.7 Normal Operations

- (a) Personnel sign-in
 - (i) The City shall be responsible for scheduling Trains and rostering its staff.
 - (ii) City Operators will report to the New Walkley Yard or other designated location at the time designated in their roster.
- (b) Opening/closing Stations
 - (i) Project Co shall be responsible for opening Stations each morning prior to the beginning of Revenue Service in accordance with Clause 3.4 of this Article.
 - (ii) Similarly, Project Co shall be responsible for securing Stations after departure of the last Revenue Service Train each day in accordance with Clause 3.4 of this Article.
 - (iii) Project Co shall also provide the necessary equipment for remote monitoring of the status of all Station doors.
- (c) Start-Up and Shutdown and Revenue Fleet Transitions
 - (i) Project Co shall provide the capability for insertion of Trains in the northbound and southbound directions on the mainline from the New Walkley Yard.
 - (ii) Project Co shall provide the capability for removal of Trains from the mainline and into the New Walkley Yard from the northbound and southbound directions.
 - (iii) The insertion/removal of Trains into/from the mainline shall be coordinated by the TOCC.

- (iv) For further certainty, Project Co shall be responsible for monitoring and controlling revenue trains into, and within the New Walkley Yard.
- (v) Prior to the start of Revenue Service, Project Co staff shall confirm with the TOCC that the SI and Trains are ready for start-up in line with the Capital Railway rules, regulations and SOP and the current Operations Service Plan.
- (vi) Pre-conditions for normal start-up shall include:
 - A. All Maintenance work zones cleared by Project Co and confirmation that there are no Hazards associated with the mainline infrastructure that would preclude or restrict mainline Operations: and,
 - B. A sufficient number of Trains, in the required configurations, are available from Project Co to support the Operations Service Plan in effect.
- (vii) The TOCC will be responsible for monitoring and controlling the entry of all Trains onto the mainline in accordance with the Operations Service Plan. The protocols for movement of Trains within the New Walkley Yard and to/from the mainline shall be developed by the City in coordination with Project Co. The following approach is anticipated, subject to City and Project Co coordination, each acting reasonably:
 - A. Project Co shall be responsible for routing and dispatching the Train between its storage berth or Maintenance Track and Yard Limits. Departing Trains shall be routed to the Yard Limits in sufficient time to support the Operational Service Plan;
 - B. Project Co shall assign each Operator a Train consist to board at its designated storage berth or Maintenance Track;
 - C. The Operators will confirm with Project Co yard control staff that essential onboard operating and communication systems are fully functional and readiness to proceed to Yard Limits; and,
 - D. The Operator will proceed onto the mainline only when authorized by the TOCC. The S&TCS shall prevent a manually driven Train with in-active ATP functionality from leaving the yard and entering the mainline.
- (viii) The TOCC staff will be responsible for monitoring and controlling the routing of Trains from the mainline Terminal Station to the Yard Limits, in accordance with the Operational Service Plan. The process of exiting a Train from the mainline into the New Walkley Yard shall be as follows:
 - A. Project Co shall be responsible for ensuring the Train can be routed to a designated storage berth or Maintenance Track in accordance with protocols to be established between Project Co and the City;
 - B. On approach to Yard Limits, the Operator will contact Project Co yard control staff and request authorization to enter the yard; and,

- C. Upon receiving authorization from Project Co, the Operator shall secure the Train at the designated storage berth or Maintenance Track location assigned by Project Co.

3.8 Failure Management

- (a) The procedures and protocols for managing Failures shall be agreed by Project Co with the City, and documented as part of the Capital Railway rules, regulations and SOP.
- (b) The first priority in responding to and recovering from equipment failures shall be to maintain the Safety of Passengers, staff, the general public and others. The secondary priority shall be to institute an appropriate degraded mode of Operation until normal service Operations can resume, and then recovering to normal Operations as expeditiously as possible.
- (c) The City TOCC staff will have the primary responsibility to coordinate responses to equipment Failures that affect Revenue Service and/or Failures that may impact the Safety of line Operations.
- (d) As appropriate, the City TOCC staff will provide direction to a) other City and Project Co staff, b) City and Project Co roving field staff, and c) City Operators. This direction will be provided in accordance with Failure recovery protocols agreed between the City and Project Co consistent with contractual obligations in terms of Failure recovery response times and acceptable service level reductions, etc.
- (e) The City TOCC staff will have the primary responsibility for providing PA announcements to Passengers in Stations and on Vehicles, as appropriate.
- (f) In accordance with direction from the City TOCC staff, the Operator and Project Co field staff shall support Failure recovery and assist in meeting service requirements and safe Station Operations.
- (g) In accordance with direction from the City TOCC staff, and where it is safe to do so, Operators will be responsible for responding to any situation where Train performance is degraded in the course of normal Operations.
- (h) The Operator will also be responsible for reporting Revenue Vehicle malfunctions/anomalies to the City TOCC staff (which may include alarms displayed on the Operator Fault Announcement Screen) as well as anomalies observed along the ROW (e.g. Track irregularities). The City TOCC staff in turn will report to Project Co staff. The Operators will also be responsible for providing PA announcements to Vehicle passengers, as appropriate.
- (i) Project Co staff shall be responsible for responding to equipment Failures and performing required Corrective Maintenance, in accordance with Schedule 15-3 – Maintenance and Rehabilitation Requirements.

3.9 Emergency Situations

- (a) Project Co shall ensure all procedures and protocols for managing Emergency situations are in compliance with the approved ERP, agreed upon by Project Co and the City, and documented as part of the Capital Railway rules, regulations and SOP.

- (b) All City and Project Co staff shall be vigilant and respond to any real or perceived threat to the Safety of Passengers, staff, and the general public by promptly reporting such conditions to the City TOCC staff. Any perceived threat may be investigated and assessed by the City/Project Co field staff (if such investigation/assessment can be accomplished safely, and in accordance with training provided to such staff) prior to declaring an Emergency scenario and notifying ESP.
- (c) Once an Emergency scenario has been declared and ESP have been notified, specific actions by ESP, the City staff and Project Co staff shall be dependent upon the severity and extent of the incident, with priority given to:
 - (i) Responding to the Emergency scenario, moving persons to a place of Safety and treating injured persons as expeditiously as possible;
 - (ii) Correcting the conditions that generated the Emergency scenario such that normal Revenue Service Operations can resume; and,
 - (iii) Documenting and analyzing the root cause of the incident to prevent a re-occurrence.
- (d) Once on-site, ESP will manage and coordinate the response to the Emergency scenario, and shall be supported by the City and Project Co staff.
- (e) The City will designate one individual, at the incident site, as a single-point-of-contact with ESP. This individual shall be responsible for all the City and Project Co staff on scene and for keeping the City TOCC staff apprised of Emergency condition status in a timely manner. Project Co shall designate one individual as a single-point-of contact with the City. The City TOCC staff will also be responsible for communicating with Passengers and public.
- (f) Depending on the nature of the Emergency scenario, the City TOCC staff will attempt to maintain a degraded mode of Operation on the SI not affected by the Emergency scenario.
- (g) The ESP will have control of the incident site until the site is handed back to the City.
- (h) Project Co shall take whatever corrective actions may be required to provide assurance to the City that there are no remaining Hazards associated with the infrastructure and/or Trains that would preclude or restrict resuming Operations through the incident site.
 - (i) Once Project Co has advised the City that it is safe for the resumption of service and any operating restrictions, it will be the City TOCC staff responsibility to return to normal Operations as expeditiously as possible.
 - (j) To the extent appropriate and practical, the City and Project Co staff shall be responsible for ensuring that the necessary arrangements are made to ensure the preservation of evidence that may be required later to establish the cause of the Emergency scenario. This includes preserving all communications and related records and documenting the Emergency scenario in accordance with Applicable Law, regulations and the City / Project Co procedures.

3.10 Non-Emergency situations

- (a) Incidents that can be addressed without the services of external ESP are not considered Emergency scenarios. The procedures and protocols for managing these non-Emergency

situations shall be agreed by Project Co and the City, and documented as part of the Capital Railway rules, regulations and SOP.

3.11 Capital Railway Rules, Regulations and Standard Operating Procedures

- (a) The current Capital Railway rules and regulations shall serve as the basis for any new or revised operating rules that may be required as part of SI or Vehicles. Similarly, the City's existing SOP shall serve as the basis for any new or revised SOP that may be required as part of SI or Vehicles.
- (b) Project Co shall review and update existing operating rules and procedures to ensure applicability to SI and Vehicles. Project Co shall submit to the City for review and approval suggested revisions to existing or new operating rules and SOP in accordance with Schedule 10 – Review Procedure as agreed upon by the City.
 - (i) Project Co shall update or develop new procedures with respect to responses to abnormal operating conditions such as:
 - A. weather extremes;
 - B. winter snow and/or freezing rain;
 - C. severe wind;
 - D. extreme rainfalls and/or hail;
 - E. lightning;
 - F. earthquakes;
 - G. extreme hot or cold temperatures;
 - H. flooding;
 - I. asset availability issues;
 - J. insufficient Trains for Revenue Service (including Failures at the yard-to-mainline interface);
 - K. late Station opening; and,
 - L. staffing availability issues.
 - (ii) Roles and responsibilities of the City TOCC and field Operations staff and Project Co staff shall be clearly defined.
 - (iii) Administrative procedures shall also be incorporated.
- (c) Project Co shall comply with all Capital Railway rules, regulations and SOP in accordance with the requirements of Schedule 15-2, Part 1, Article 6 – Rail Regulatory Structure and Obligations.

ARTICLE 4 DESIGN AND CONSTRUCTION

4.1 General Construction Requirements

- (a) Project Co shall be responsible for the design and construction of the Project and all other construction activities, including completion, testing and commissioning of the Project, which shall be carried out in strict accordance with the Design and Construction Requirements and in such a manner as to comply with all applicable Project Agreement requirements.
- (b) Limits of construction, occupation and all works, except for Site access, construction of detours and associated works and Works under the Utility Company Works Cash Allowance shall be within the Lands, Temporary Easements and Permanent Easements as shown hatched on the PRPs. See Schedule 33 – Lands for additional information.
- (c) Project Co shall only construct or implement Site access, detours and associated works on existing City/public ROW/property if those Site access, detours and associated works have been approved by the City as part of Project Co's TTMP.
- (d) Construction Mobilization and Staging Areas
 - (i) The only Properties that can be utilized as construction mobilization or staging areas, as defined in Schedule 33 – Lands, Articles 1.4.1.4 and 1.4.1.5, are indicated on the property table Schedule 33 – Lands, Article 3.
- (e) Project Co shall restore or rehabilitate any disturbed areas within or extending beyond the limits of the Works, including but not limited to, road alignment, paving, Trackwork, monitoring wells, landscaped areas including plantings and /or sodding. These areas shall be cleaned of debris and have any temporary paving or structures removed and replaced with planting soil or restored to the same or better condition or as directed by the City in accordance with the requirements of Schedule 15-2, Part 6, Article 2 – Design Criteria. A review of the adjacent land uses and site development shall be completed for these locations and the most appropriate groundcover shall be selected.
 - (i) Project Co shall protect all City and Third Party Facilities adjacent to the Works.
 - A. Protect and/or transplant existing fencing, trees, landscaping, natural features, bench marks, buildings, Pavement, monitoring wells, surface or Utilities which are to remain. If damaged, restore to original or better condition unless directed otherwise. Project Co shall make reference to Schedule 15-2, Part 6, Article 2 – Design Criteria.
 - B. Project Co shall replace any damaged trees designated to remain in accordance with City Urban Forestry guidelines.
 - C. Project Co shall be responsible for installing, Maintaining and removing any temporary facilities necessary to access the Site, including but not limited to fences, gates, constructions, granular, silt fences and TCD.
 - D. Project Co shall be responsible for the removal of furnishing of the assets of BIA, safekeeping and restoration.

- (ii) Project Co shall complete a pre-construction condition survey of the Lands covered by Third Party Access Agreements and adjacent portions of Lands and shall provide the report to the City, not less than eight calendar days prior to the commencement of the Works. Under no circumstances shall Project Co commence the Works until the pre-construction condition survey is provided to the City. Project Co shall complete a post-construction condition survey of the Lands covered by Third Party Access Agreements and adjacent lands and shall provide the report to the City not less than eight calendar days following the completion of the Works. The survey shall record, by way of photographs, videos and written reports, the status, grading, fencing, monitoring wells, and visible condition of the Lands covered by Third Party Access Agreements and immediately adjacent property.
- (f) Project Co shall perform the following for all Lands:
- (i) Develop hoarding/fencing plans shall be submitted in accordance with Schedule 10 – Review Procedure. The boundaries of the construction Sites shall be fenced. The boundaries of mobilization Sites shall be hoarded. The hoarding/fencing plans shall include details on location, height, materials and expected timing of installation and removal.
 - (ii) In addition, for Lands subject to FLUDTA, hoarding plans shall be in accordance with the NCC hoarding specifications. No use or access to adjacent NCC lands shall be permitted without the express approval by the NCC.
 - (iii) Maintain the construction hoarding and fencing in a good condition of repair at all times.
 - (iv) Project Co shall install and Maintain promotional and advertising materials to be provided by the City in accordance with Schedule 18 – Communications and Stakeholder Engagement Obligations.
- (g) Construction Site camera systems:
- (i) The City intends to provide a camera system to be installed by Project Co at each construction Site, at a location selected by the City. Project Co shall provide power and internet connectivity to each location selected by the City. The power shall be a hard-wired connection, unless a specific arrangement is made between Project Co and the City for solar power to be used. The internet connectivity shall be high speed, through telephone or cable lines, unless a specific arrangement is made between Project Co and the City for an LTE cellular connection to be used.
 - A. The construction Sites shall be each of the Stations (total of 12 locations).
 - B. The system being developed is closed, password protected, and not publicly accessible. The City shall own the system and the content, and reserves the right to utilize the system in order to create time-lapse videos showing construction progress over time that may be shown to the public as a promotional tool. The system shall adhere to the City of Ottawa's Surveillance System for Transit Network Access and Privacy Policy.

- (ii) In the event that, upon completion of the System, Project Co wishes to have an additional camera system at any Site beyond the one that the City shall provide, Project Co can purchase the unit from the City at cost, and install it on their Site at their own cost.
- (iii) In the event that the City wishes to have an additional camera system at any Site, Project Co shall install it and provide power and internet connectivity as described in (i) above.
- (h) Project Co shall submit a pre-construction condition survey consisting of photographs, videos and written reports of the South Keys Station plaza area as per Schedule 33 – Lands, not less than seven calendar days prior to the commencement of Works.
- (i) Project Co shall submit a post-construction condition survey consisting of photographs, videos and written reports of the South Keys Station plaza area and adjacent Lands as per Schedule 33 – Lands, not more than seven calendar days following the completion of Works.
- (j) Project Co shall submit a pre-construction condition survey consisting of photographs, videos and written reports of [REDACTED] as per Schedule 33 – Lands, not less than seven calendar days prior to the commencement of Works.
- (k) Project Co shall submit a post-construction condition survey consisting of photographs, videos and written reports of [REDACTED] as per Schedule 33 – Lands, not more than seven calendar days following the completion of Works.

4.2 Surveys

- (a) Control Survey
 - (i) A control survey of the alignment has been completed by the City for this Project. Existing and new monuments were used in establishing the Project control survey.
 - (ii) Project Co shall evaluate its requirements for a control survey in order to perform the design and construction Works and determine if additional monuments are required. Any such additional monuments shall be of the same order as the control survey provided and installed by Project Co and shall be surveyed to tie into the Project survey control coordinate system. Project Co shall prepare a survey report including field notes, measurements, adjustments, station descriptions and reference tie drawings of each additional survey monument installed and provide a record to the City in accordance with Schedule 10 – Review Procedure.
 - (iii) Project Co shall be solely responsible for protecting and maintaining all existing survey control monuments. In the event that project survey control monuments have been disturbed or destroyed during the Project, then Project Co shall re-establish the survey control at construction completion and provide a survey report to the City for approval at no cost to the City, in accordance with Schedule 10 – Review Procedure.
 - (iv) The Project control survey shall be used as the basis for all Works.
 - (v) Horizontal Control
 - A. Modified Transverse Mercator, MTM 3 degree, zone 9 central meridian 76 degrees 30 minutes West;

- B. NAD83 original as well as in NAD 83 CSRS format;
 - C. The horizontal coordinates for control points are 2nd order as defined by the Specification and Recommendations for Control Surveys and Survey Markers 1978, Natural Resources Canada, Part 2 – Horizontal Control; and,
 - D. All surveys made for the Project shall be referenced and adjusted to the control survey monuments in the Project control network and shall be adjusted by holding these monuments fixed. The adjustments to the data shall be coordinated with the City. The accuracy of these surveys shall be second order.
- (vi) Vertical Control
- A. The vertical control shall be based on the Canadian Geodetic Vertical Datum of CGCD1928 using HT2 Geoid Model.
 - B. The vertical control survey shall be conducted in accordance with Specification and Recommendations for Control Surveys and Survey Markers 1978, Natural Resources Canada, Part 1 - Vertical Control, Levelling. Vertical Deep Benchmarks shall meet or exceed 1st Order Vertical levelling criteria. Non Deep Benchmarks typically set on sidewalks shall be verified for marker stability with a minimum of one adjacent marker prior to accepting the published elevations.
- (b) Aerial Photo and Digital Mapping
- (i) Detailed topographic mapping for the Project has been compiled from field survey and digital aerial imagery acquired over the period from 2012 to 2015.
 - (ii) Project Co shall evaluate their requirements for topographic mapping and augment with additional ground control, if required.
 - (iii) In the event that Project Co requires additional or updated topographic mapping, then the orthophotos and digital vector mapping shall be performed in the Project control survey coordinate system.
- (c) Legal Surveys
- (i) The City shall be responsible for the preparation, by a qualified Ontario Land Surveyor, of reference plans to facilitate the acquisition of fee simple interests in property or long term easements forming part of the Lands as identified in the Lands Table Schedule 33 – Lands, provided however, that in the case of “Additional Property Interests” as defined in Schedule 33 – Lands, the costs of undertaking this surveying work shall be borne by Project Co.
 - (ii) Project Co shall be responsible for the preparation, by a qualified Ontario Land Surveyor, of reference plans describing all of the lands accommodating System Infrastructure and any other lands required for the purposes of using, operating, repairing, Maintaining, or accessing the System so that the City will have a registrable legal description of all lands forming part of the final constructed System.

- (iii) Project Co shall engage, throughout the Construction Period, a duly qualified Ontario Land Surveyor.
 - (iv) Prior to commencing construction on any part of the Lands where construction is proposed to take place within 1m of a property limit, Project Co shall ensure that a qualified Ontario Land Surveyor stakes out the property limit in the field and prepares field notes and sketches to document the fieldwork.
- (d) Post Completion Survey
- (i) Project Co shall provide, at its own cost and expense, a post-completion Survey, in the form of a topographic survey of the entire corridor accurate to a scale of 1:1000, in CADD format, georeferenced to the project control not more than 90 days after the Final Completion Date.
 - (ii) Project Co shall be solely responsible for protecting and maintaining all existing legal survey reference monuments. In the event that Project survey monuments have been disturbed or destroyed during the Project, then Project Co shall re-establish the survey monuments at the time of the post- completion survey and provide a survey report to the City for approval at no cost to the City in accordance with Schedule 10 – Review Procedure.

4.3 Design Requirements

(a) Design Components and Design Life

- (i) Project Co shall design the components of the Project to meet the requirements outlined in Table 1-4.1.

Table 1-4.1: Design Components and Design Life

Component	Design Life Required (years)
Ancillary Facilities – Structures	50
Ancillary Facilities – Finishes	40
Ancillary Facilities – Bus shelters	15
New Bridge Structures	75
New Retaining Walls	50
New Flexible Pavement (including intervene rehabilitation with initial Design Life of minimum 20 years))	40
New Rigid or Composite Pavement (including intervene rehabilitation with initial Design Life of minimum 30 years)	55
Elevated Guideway	75
Stations – Finishes	40
Stations – At-Grade Station Structures	50
Track – Ballast	20
Track – Fixed	20
Ties - Concrete	40
Ties - Hardwood	25
Switches & Cross-overs	20
Maintenance Building	40
Signalling	30
Communications	20
New Vehicles	30
New Vehicle Carbody	40

(b) Climate Data for Design

- (i) Project Co shall use the following climate data where required for design, unless otherwise specified:

Extreme Maximum Temperature	38°C
Extreme Minimum Temperature	-40°C
Extreme Daily Rainfall	135mm
Extreme Daily Snowfall	56cm
Extreme Daily Precipitation*	135mm
Extreme Snow Depth	135cm
Maximum Hourly Wind Speed	80km/hr
Maximum Wind Gust Speed	135km/hr

* Freezing rain to be considered.

4.4 Site Works

(a) General

- (i) Project Co obligations under this Article are in addition to the obligations Project Co has under Section 16 of the Project Agreement.
 - (ii) Existing Conditions
 - A. Existing conditions shall be verified and documented by Project Co.
 - B. Project Co shall identify and document all underground and surface Utility lines and buried objects prior to any construction activities and/or excavation work.
 - (iii) Backfill
 - A. Backfill work complete by Project Co shall achieve a performance characteristic not less than the adjacent undisturbed soils and to the satisfaction of the property owner, when backfilling in areas that will not carry any load from the Works and other areas than areas regulated by any applicable standards.
- (b) Conduit Drainage
- (i) Underground
 - A. All underground conduit, duct banks, and maintenance holes for electrical, communication, and systems shall be designed and constructed to prevent the accumulation of water and formation of ice in any component within the System.
 - (ii) Non-Underground
 - A. All conduit and raceways for electrical, communication, and systems shall be designed and constructed to prevent the accumulation of water to prevent moisture from entering any equipment within the System.
- (c) All Project Site work shall be designed in accordance with the criteria contained or referenced within this Article, specific obligations and criteria identified in the other locations elsewhere in this Project Agreement, the Applicable Law, guidelines or practices applicable to the Project, including but not limited to the following Reference Documents:
- (i) City Standards:
 - A. City of Ottawa Standard Tender Documents for Unit Price Contracts, current version.
 - B. City of Ottawa Sewer Design Guidelines, October 2012.
 - C. City of Ottawa Water Design Guidelines, 2010.
 - (ii) Geometric Design Guide for Canadian Roads (TAC-1999);
 - (iii) OPSS and OPSD; and,
 - (iv) MOECC.

4.5 Construction on OMCIAA Property

- (a) Project Co shall comply with all OMCIAA policies and procedures including the Airport Security Requirements detailed below and as may be amended by the OMCIAA for all construction being performed on or adjacent to OMCIAA property.
- (b) Project Co shall be responsible to ensure that all Project Co Parties comply with Airport Security Requirements on the Works Site. Personnel requiring entry to Airside areas to perform duties may be required to possess an identification pass, to be worn or produced as the OMCIAA may require.
- (c) The OMCIAA and the City, at their sole discretion, may order Project Co to provide a minimum of three references and/or other information concerning persons employed or to be employed on the Works within OMCIA property.
- (d) The OMCIAA and the City may at their discretion order the removal of any person from the Works.
- (e) Project Co shall ensure that all construction equipment and vehicles operating near an active runway remain below the height restrictions dictated by the Obstacle Limitation Surfaces for that runway. Project Co shall provide specialized equipment in order to respect the overhead clearance to the Obstacle Limitation Surfaces as required.
- (f) Project Co shall ensure that all permanent Works constructed as part of this Project adjacent to the airport respect the height restrictions set by TC through the Airport Zoning Regulations.
- (g) Project Co shall obtain, abide by and complete an OMCIAA Work Permit for any work on OMCIA lands. The OMCIAA Work Permit is provided in Appendix A of this Part 1.
- (h) Project Co shall co-ordinate and schedule its work with the OMCIAA and appoint a single point of contact for the Airport Link construction to facilitate this co-ordination.
- (i) Project Co shall attend regular weekly meetings with the City and the OMCIAA to facilitate design and construction co-ordination.
- (j) Project Co understands there may be infrequent instances (i.e. visiting head of state) whereby work in close proximity to the Airport shall need to cease.

4.6 Airport Security Requirements

(a) Airport Restricted Area

- (i) Project Co shall only be permitted Airport Restricted Area access for the sole purpose of erecting Elevated Guideway components on a limited overnight basis subject to the approval of the City, OMCIAA and TC.
- (ii) The OMCIAA will facilitate Project Co mobilization in the Airport Restricted Area by closing Gate 1 between 21:00 hrs – 0:500 hrs for a maximum of eight nights. Project Co shall not impact the operational area of any other aircraft gates.

- (iii) Project Co shall only be permitted access to the Airport Restricted Area from 21:00 hrs – 05:00 hrs and shall fully demobilize after each shift.
 - (iv) Project Co shall abide by all OMCIAA and TC rules for working in the Airport Restricted Area.
 - (v) Airport Restricted Area access shall be limited to eight mobilizations and shall be co-ordinated with OMCIAA and the City.
 - (vi) Project Co shall be responsible for providing their own airside escort services.
 - (vii) Project Co shall be responsible for protection of airside apron Pavement.
 - (viii) Project Co shall be responsible for all costs and delays associated with any TC, CATSA or OMCIAA requirements as it relates to screening and or escorting required for Airport Restricted Area works.
 - (ix) No person shall carry or deposit lighted cigarettes, cigars, pipes, or matches on Airside. This prohibition shall apply to persons both inside and outside of vehicles and equipment. Works requiring an open flame on Airside shall be approved by OMCIAA (i.e. welding permit, available from the OMCIAA security office).
- (b) Additional Project Co Responsibilities
- (i) Project Co shall be responsible for completing a "Contractor's Information Check Sheet" to be provided to the City and the OMCIAA prior to the start of any Works.
 - (ii) Project Co shall be responsible for becoming familiar with and following all Safety and Security regulations pertaining to construction personnel. Failure to comply with federal and provincial government regulations may result in fines against Project Co or delays imposed on Works pending correction by Project Co of any deficiencies.
- (c) Emergency Contacts
- (i) Project Co shall provide to the City and the OMCIAA a list of responsible personnel, including sub-contractors, who may be contacted after working hours in case of Emergency.
- (d) Evacuation
- (i) Project Co shall immediately cease all activities and evacuate the Site as directed by the OMCIAA or the Airport Operations Manager in the event of a declared Emergency by OMCIAA.
- (e) Use of Radios
- (i) All equipment for radio communication required for Project Co personnel shall be supplied by Project Co. The OMCIAA security office shall be advised in order to verify that Project Co's radio frequency will not cause interference with essential communication equipment and navigational aids at the OMCIA.

ARTICLE 5 IMPLEMENTATION CONSTRAINTS

5.1 General Implementation Constraints

(a) General Requirements

- (i)** Project Co shall reinstate to original condition, unless otherwise indicated elsewhere in the documents, and at Project Co expense, all Lands, Roadways, MUPs and assets affected by the implementation of the Works.

(b) Access to Adjacent Properties

- (i)** Project Co shall provide access to all adjacent properties, tenants, and residential drives and building entrances, including maintaining access points for fire department connections in accordance with code requirements and for waste removal except as otherwise permitted. Should an existing entrance or access have to be closed or reduced, Project Co shall coordinate with the impacted parties to provide an alternative solution to have continuous access.

(c) Works Hours Limitations

- (i)** Project Co shall abide by all federal, provincial, and municipal statutes regarding hours of work.
- (ii)** Project Co shall be aware of the local community and political public events that may impact the work on the Project.

5.2 Existing Trillium Line Operational Constraints

(a) Project Co shall not have access to the Existing Trillium Line ROW for any type of construction activity while the current O-Train service is in Operation. Limited access will be granted for non-intrusive tasks such as surveying and geotechnical investigation as well as telecom utility relocations in the vicinity of the [REDACTED] Grade Separation at the discretion of the City and Capital Railway based on the following:

- (i)** Project Co will be provided up to 20 days access to the Existing Trillium Line during Revenue Service hours from Monday to Friday in order to perform any survey work required.
- (ii)** Project Co will be provided up to 20 nights access to the Existing Trillium Line during non-Revenue Service hours in order to perform any geotechnical investigation required.
- (iii)** Project Co will be provided access to the Existing Trillium Line for telecom utility relocations in the vicinity of the [REDACTED] Grade Separation in advance of the grade separation construction.
- (iv)** For all work outlined above, Project Co shall submit an access request to the City and Capital Railway no less than 2 weeks in advance of the requested date. The City and Capital Railway will review the request and advise Project Co of the confirmed access date(s) and arrange for TOP's on behalf of Project Co.

- (b) The City will implement a complete shutdown of the Existing Trillium Line service to facilitate the rehabilitation and construction of Track and Facilities along this line. The Shutdown Period dates are as defined in Schedule 15-1 – Technical Terms and Reference Documents.
- (c) Construction activities, including during the Shutdown Period of the Existing Trillium Line service, shall not block, restrict, interfere with signals operation or cause delay to train movements on the [REDACTED] nor on the [REDACTED]. Project Co shall abide by the terms of the City's Crossing Agreements throughout the Construction Period.
- (d) Project Co shall Maintain, in service, the Transfer Segment and all supporting infrastructure required for movement of freight between [REDACTED] and the NRC Facility for the movement of freight throughout the Construction Period and Maintenance Period subject to the following:
 - (i) Construction Period:
 - A. Project Co shall be responsible for shepherding and coordinating the movement of freight to the NRC Facility as outlined in the Rail Car Transfer Agreement as of and from the time that Project Co mobilizes for Construction Activities on the Transfer Segment.
 - B. In accordance with the Rail Car Transfer Agreement, Project Co shall be permitted to interrupt the movement of freight on the Transfer Segment for a continuous single maximum duration of six months (NRC 6 Month Shutdown Period) for the Construction Activities along the Transfer Segment. Outside of the NRC 6 Month Shutdown Period, Project Co shall provide access windows of at least seven consecutive calendar days at least once every 120 calendar days for the movement of freight on the Transfer Segment (NRC 7 Day Freight Access Periods).
 - C. Project Co shall schedule the NRC 6 Month Shutdown Period and the NRC 7 Day Freight Access Periods in accordance with Schedule 12 – Works Scheduling Requirements.
 - (ii) Maintenance Period:
 - A. Project Co shall facilitate and coordinate the movement of freight to the NRC Facility as outlined in the Rail Car Transfer Agreement for the entire Maintenance Period.
 - B. Project Co shall refer to Schedule 15-3, Appendix A, Article 1.12 for their obligations to facilitate the movement of freight during the Maintenance Period.
- (e) Project Co shall fully comply with Governmental Authorities, Nav Canada and OMCIAA regulations and procedures governing construction activities on or near the airport grounds.
- (f) Blasting shall not be permitted in proximity to the Highway 417 overpass, specifically in areas under which the Ministry of Transportation has jurisdiction of authority.

5.3 Airport Link Implementation Constraints

- (a) Project Co shall complete all Airport Station Civil Works prior to November 30, 2020 to allow uninhibited access to the OMCIAA for construction of the Airport Station Concourse.
- (b) See Schedule 15-2, Part 7 - Traffic and Transit Management for restrictions on working on OMCIAA Roadways and the Airport loading dock.
- (c) Project Co shall coordinate with the NRC and Airport Authority on the following items:
 - (i) To protect or reinstate the high-velocity impact berm; and,
 - (ii) Protect the porcine cemetery.
- (d) Project Co shall abide by all OMCIAA construction and Security requirements as outlined in Clauses 4.5 and 4.6 of this Part 1.

5.4 Construction Planning and Constraints

- (a) NCC and City MUPs shall remain open to public use during construction. Project Co shall provide temporary detours and temporary signage indicating detours if pathway closures are required. See Schedule 15-2, Part 6 - Urban Design, Landscape Architecture and Connectivity Requirements, for further information.
- (b) Project Co shall limit their material and equipment storage to within the construction boundaries and per Temporary Easement and Permanent Easement as shown hatched on the PRP's Schedule 33 – Lands for additional information.
- (c) Properties that can be utilized as construction staging areas are identified in Schedule 33 – Lands. Should Project Co require additional properties beyond those shown to be provided, it is the responsibility of Project Co to acquire any additional property.
- (d) See Schedule 15-2, Part 7 - Traffic and Transit Management and Construction Access for restrictions associated with events and holidays and additional implementation constraint requirements.
- (e) Refer to Schedule 17 – Environmental Obligations for requirements for working around SARs.
- (f) Agreement Constraints:
 - (i) Project Co shall coordinate the Works required for Uplands Station with the EY Centre.
 - (ii) Project Co shall ensure that existing truck access routes to South Keys Shopping Centre are maintained throughout the duration of construction.
 - (iii) Project Co shall coordinate the Works required for South Keys Station with the South Keys Shopping Centre.
- (g) Walkley Yard constraints

- (i) The New Walkley Yard MSF shall be constructed without interfering with access to and operations of the Existing Walkley Yard or train movements on existing rail outside of the Project limits.
 - (ii) Project Co shall be permitted to access the Existing Walkley Yard for the purpose of Existing Vehicle Fleet storage, Maintenance and upgrade, and delivery of new Vehicles.
- (h) Noise and Vibration Mitigation
- (i) Project Co shall abide by all federal, provincial and municipal statutes regarding noise levels and noise mitigation. Prior to commencement of construction, Project Co shall prepare and implement a Noise and Vibration Control Plan in accordance with Schedule 17 – Environmental Obligations prepared by a Professional Engineer describing the predicted construction noise and mitigation measures required to meet the noise level limitations.
- (i) Transit System constraints:
- (i) Refer to Schedule 15-2, Part 7, Article 1 – General Traffic and Transit Management Requirements for restrictions and implementation constraints associated with Transit System Work.
- (j) Utility Infrastructure Constraints
- (i) Refer to Schedule 15-2, Part 2, Article 8 - Utility Infrastructure Design Criteria for restrictions and implementation constraints associated with Utility Works.
- (k) Project Co shall complete the work within the alignment, between Louisa Street and Young Street to complete the reinstatement of the MUP and crosswalk/crossride at Gladstone Street, by May 1, 2021.
- (l) Coordination with City Works
- (i) Project Co is notified that Third Party Contractors and City personnel will need access to the construction Site at various times and locations during the course of the Works. Therefore, Project Co shall provide the following:
 - A. Coordinating their level of completeness to the City so that the City's coordination with Third Party Contractors can be performed at the appropriate time;
 - B. Coordinate the timing of the access to minimize disturbances;
 - C. Provide Site access to the Third Party Contractors and City staff;
 - D. Provide staging and storage areas to the Third Party Contractors and City staff for their work;
 - E. Provide access for the City's delivery and set up of City equipment (furniture, appliances, computer equipment, etc.) in City spaces; and,

- F. At the City's request, provide up to date as built drawings of the Sites at the time of the coordination.
- (ii) Anticipated coordination issues are, but are not limited to, the following:
- A. Fare control equipment installation
 - i. Installation by OC Transpo requires one month notice prior to the installation and one week per Station for the actual installation. Access is to be staggered so that installation can be performed one Station at a time. The installation shall be scheduled to begin no more than four months prior to Trial Running.
 - B. Artwork
 - i. Access for installation by the City two months prior to Trial Running.
 - C. OC Transpo spaces
 - i. Access for fit out by OC Transpo is to be provided four months prior to Trial Running.
 - D. Various Communications issues, including:
 - i. Voice and Data Radio: Access for installation shall be provided two months prior to Train movements.
 - ii. Cellular telephone: Access for installation shall be provided two months prior to Trial Running.
 - iii. Nexus PIDS: Access for installation shall be provided two months prior to Trial Running.
 - iv. City Network IT: Access for installation shall be provided two months prior to Trial Running.
 - v. Traffic Conduit: Access for the installation of traffic fiber by City personnel shall be provided.

5.5 [REDACTED] Implementation Constraints

- (a) No disruption to [REDACTED]'s operations shall be permitted.
- (b) No modification to the [REDACTED] Track shall be permitted.
- (c) All work within the vicinity of the [REDACTED] Track shall be co-ordinated with [REDACTED] and the City.
- (d) For work within the [REDACTED] ROW see document "Special Provisions [REDACTED]". Project Co shall abide by [REDACTED] rules, policies, standards and procedures outlined in this document when working within the [REDACTED]ROW.

- (i) Prior to any performance of any work within 10m of the nearest Track, the City and [REDACTED] shall be notified 5 Business Days in advance. Project Co shall provide a [REDACTED] approved flag person to protect [REDACTED] trains from Project Co activities. For flagging cost, see document “[REDACTED]”.
 - (ii) Project Co shall be permitted to work within the [REDACTED] ROW between trains upon authorization from flagman.
 - (iii) The current schedule of trains is available on the [REDACTED] website at [REDACTED] and is as follows (subject to change):
 - A. Monday to Friday: from 5:30am to 11:00pm.
 - B. Saturday: from 6:45am to 11:00pm.
 - C. Sunday: from 9:15am to 11:00pm.
 - (iv) Between trains some small work blocks from 20 minutes to two hours may be available to work.
 - (v) Outside those hours, no trains are running, but the last train at approximately 11:00pm could be late on route reducing the night work block available.
- (e) Project Co shall be responsible to perform Utility locates and protect all Utilities during construction if required. Fiber optics are running on both sides of the Track in the vicinity of the Ellwood Diamond.
 - (f) Project Co shall communicate ahead of time all activities which could disturb the nearby residents and manage residents' complaints.
 - (g) For the [REDACTED] Contractor Orientation course, it is \$15 (US dollars)/individual working within the ROW.

ARTICLE 6 RAIL REGULATORY STRUCTURE AND OBLIGATIONS

6.1 Governance

- (a) Transport Canada is the federal agency holding jurisdictional authority over the federal railway system as it relates to the design, construction, operation, Maintenance, Safety and Security, as well as the rates and conditions of service of the System. Specific legislation governing said activities include, but are not limited to regulations, rules, standards, orders and matters covered by the following:
- (i) CTA;
 - (ii) RSA; and,
 - (iii) Canadian Transportation Accident Investigation and Safety Board Act (TSB).
- (b) Project Co acknowledges that the City, as the official owner of the railway, is accountable for all aspects of the System on the Existing Trillium Line including compliance with all applicable regulatory matters. Project Co further acknowledges that the City is the single point of contact with Transport Canada as it relates to all regulatory issues. Regulatory issues affecting the System design, construction, O&M, Safety and Security as well as rates and conditions of service shall be coordinated through the City.
- (c) The City operates the Existing Trillium Line System under the name Capital Railway.
- (d) Project Co shall be responsible for providing information to support regulatory filings by the City including all relevant technical, O&M, and supporting documentation in support of the following work:
- (i) Modification of the CTA Certification of Fitness;
 - (ii) Modification of Railway Operating Certificates;
 - (iii) Notification of Railway Works for all activities associated with the Works;
 - (iv) Operational risk assessments for all operational changes in compliance with Article 7 - System Safety Certification, and Article 8 – Security and Emergency Management, of this Part 1;
 - (v) Encroachment agreements and/or crane swing agreements to provide clarity on work methods and controls on or near the active Existing Trillium Line;
 - (vi) Changes to Capital Railway rules, regulations, and SOP, DMU rules, timetable and other rules affecting safe O&M of the System; and,
 - (vii) Grade crossing risk assessment and compliance requirements.
- (e) Additional regulatory filings may be required prior to commencement of construction activities or during the Construction Period and Maintenance Period. The City and Project Co shall work together to identify design and Maintenance issues requiring such filings. Project Co shall be required to submit to the City the appropriate supporting documentation for any additional

regulatory submittals that may be required. Regulatory support documentation may be required for modifications/exemptions to existing or the introduction of new legislations, certificates, rules, standards, order, MOUs and guidelines including, but not limited to those, cited in Table 1-6.1 below.

- (f) Project Co shall be responsible for designing, constructing and Maintaining the Project in accordance with all applicable legislation, certificates, rules, standards, orders, MOUs and guidelines that may include, but are not limited to, those cited in the table below.

Table 1-6.1

Applicable Legislation, Certificates, Rules, Standards, Orders, MOUs and Guidelines

Type/Title
Canada Transportation Act (CTA)
Railway Safety Act (RSA) (R.S., 1985, c. 32 (4 th Supp.))
Canadian Transportation Accident Investigation and Safety Board Act (R.S. 1985, c. C-23.4)
Transportation of Dangerous Goods Act (R.S. 1992, c. 34)
Contraventions Act (S.C. 1992, c. 47)
Canadian Environmental Protection Act (R.S. 1999, c. 33)
Non-smokers' Health Act (R.S. 1985, c. 15 (4 th Supp.))
Legislation - Regulations
Grade Crossing Regulations
Notice of Railway Works Regulations
Non-smokers' Health Regulations (made pursuant to the Non-smokers' Health Act)
Canada Labour Code:
On Board Trains Occupational Safety and Health Regulations (made pursuant to the Canada Labour Code, Part II)
Safety and Health Committees and Representatives Regulations (made pursuant to the Canada Labour Code, Part II)
Transportation Safety Board Regulations (made pursuant to the Canadian Transportation Accident Investigation and Safety Board Act)
Wire Crossings and Proximities Regulations; General Order E-11
Regulations Amending the Contraventions Regulations - “Fail to give way to railway equipment at a road crossing”
Railway Safety Management Systems Regulations (June 2015)
Prevention and Control of Fire on Line Works Regulations (June 2017)
Transportation and Information Regulations
Certificates, Rules, Standards, Orders, MOUs
Memorandum of Understanding – Railway Security (Railway Association of Canada)
Railway Operating Certificate
Certificate of Fitness No. 00002-2 (Canadian Transportation Agency)
Grade Crossing Standards
Work/Rest Rules for Capital Railway
Canadian Rail Operating Rules
Standards Respecting Pipeline Crossings

Railway Employee Radio Communication Rule
Railway Freight and Passenger Train Brake Rules
Railway Medical Rules for Positions Critical to Safe Railway Operations
Railway Passenger Handling Safety Rules
Railway Rules Governing Safety Critical Positions
Rules for the Control and Prevention of Fires on Railway Rights-of-Way
Rules for the Installation, Inspection and Testing of Air Reservoirs (Other than on Locomotives)
Rules for the Protection of Track Units and Track Work
Rules Respecting Track Safety
Standard Respecting Railway Clearances
Railway Signal & Traffic Control Systems Standards
Capital Railway LINT Diesel Multiple Units Inspection and Safety Rules
Capital Railway – Railway Equipment Reflectorization Rules
Standard for LED Signal Modules at Highway/Railway Grade Crossings
Rules Respecting Minimum Qualification Standards for Railway Employees
A Guide on the Development and Implementation of Railway Safety Management Systems
Guideline on Submitting a Proposed Rule or a Revision to a Rule
Guideline: Engineering Works Relating to Railway Works
Guideline on Applying for an Exemption or Filing an Exemption Notice
Guidelines on Requesting Approval to Undertake Certain Railway Works
Guideline on Submitting Proposed Engineering Standards or Revisions to Engineering Standards
Guideline for Bridge Safety Management
Guideline for Culvert Safety Management
Guideline: Engineering Work Related to Railway Works
Fatigue Management Plans – Requirements and Assessment Guidelines

6.2 General Requirements

- (a) The following lists the responsibilities of the City and Project Co with respect to regulatory requirements.
- (i) The City shall:
- A. Serve as single-point of contact for all regulatory matters;
 - B. Secure exemptions to clearance standards related to the Leitrim Road aerial structure;
 - C. Secure exemptions to airport zoning regulations associated with the alignment and Leitrim Road Bridge;
 - D. Manage operating agreements and establish tariffs for movement of freight traffic on the System;
 - E. Manage operating agreements with [REDACTED] and [REDACTED]; and,

- F. Manage other third party agreements including but not limited to Utilities, developers, [REDACTED], PSPC, MTO, NCC, etc.
- (ii) Project Co shall;
- A. Be responsible for compliance with all Applicable Law and regulatory requirements;
- B. Consider, in consultation with the City, all current regulatory standards, regulations and requirements for the System having regard to its technical features and operating environment. Project Co shall support the City in the development of appropriate support documentation for changes, modifications or exemptions to such legislation, certificates, rules, regulations, standards, orders, MOUs, policies and guidelines;
- C. identify the appropriate scope, detail and timetable for submission of supporting documentation related to modifications/exemptions to existing legislation, certificates, rules, regulations, standards, orders, MOUs, policies and guidelines based on the City's obligations to comply with Transport Canada, Canadian Transportation Agency and the TSB requirements, as shown in Clause 6.3 of this Part 1 or as prescribed in Clause 6.2 (a) (ii) D of this Part 1 and Clause 6.3 (a) (i) of this Part 1. Project Co shall ensure that the regulatory support documentation is thoroughly reviewed for accuracy and completeness by individuals knowledgeable of the applicable regulatory requirements, prior to submittal. The City shall have final review and approval authority of any support documentation submitted by Project Co prior to submission to Transport Canada. The submission of required documentation shall be in accordance with Schedule 10 – Review Procedure;
- D. meet the established timetable for submission of documentation requested by regulatory agencies during the design, construction and Maintenance Period as outlined in Clause 6.3 (b) of this Part. Delays to design and construction schedules or Revenue Service date resulting from Project Co's failure to comply with regulatory submission requirements shall not entitle Project Co to a Compensation Event, Delay Event, or Excusing Cause, as applicable in the event of a delay in schedule;
- E. work with the City in a cooperative and collaborative manner in the identification, development and submittal of ongoing support documentation required for meeting regulatory obligations, throughout the Maintenance Period, including the identification and adoption of such changes as the City may, in its discretion, but with the input of Project Co, deem advisable; and,
- F. shall be responsible for the following in accordance with Part III, Rail Transportation, of the CTA:
- i. supporting the City in the continued delivery of freight services to the NRC Facility; and,
 - ii. complying with the current Rail Transfer Agreement with the NRC addressing the delivery of freight service to/from the NRC Facility.

6.3 Timing and Protocol for Approval

(a) Project Co shall develop regulatory support documentation and submit the same to the City for approval according to the following process:

(i) Submission Requirements and Timing

- A. from time to time during the design and construction, Project Co shall submit for timely approval by the City any regulatory support documentation required for modifications/exemptions to existing legislation, certificates, rules, regulations, standards, orders, MOUs, policies and guidelines that may be required to support the commencement and completion of scheduled work packages, programs or delineated work or service activities;
- B. proposed regulatory support documentation for modifications/exemptions to existing legislation, certificates, rules, regulations, standards, orders, MOUs, policies and guidelines that are planned or scheduled to be adopted prior to or following the commencement of Revenue Service shall be submitted by Project Co for review/approval by the City and submission to Transport Canada in a manner consistent with the timeframe set forth in the specific legislation or regulation, as otherwise required or requested by a regulatory agency or a date mutually agreed to by the City and Project Co; and,
- C. regulatory support documentation for modifications/exemptions to existing legislation, certificates, rules, regulations, standards, orders, MOUs, policies and guidelines shall be submitted in required format and contain all required information together with a brief explanatory note setting out the reason or purpose for the proposed modification or exemption to current regulation.

(ii) City Response and Timing

- A. The City shall initially respond to each regulatory submittal within 14 Business Days of receipt of Project Co's written submission confirming either its approval or rejection (with reasons) of the proposed modifications/exemptions to current regulations, the extent to which the City requires further information from or consultation with, or training services from Project Co, if any, and the timetable in which the City requires this to occur.
- B. Should the City or Transport Canada reject or return a submittal for further information or clarification, Project Co shall be responsible for responding to and resubmitting the updated document within:
 - i. the time period established by Transport Canada, as set forth in the specific regulation, or as otherwise required or requested by a regulatory agency; or
 - ii. the date mutually agreed to by the City and Project Co.
- (iii) Should Project Co fail to respond to the City within the stipulated time period, then the City shall penalize Project Co pursuant to Schedule 20 – Construction Period Payments;

- (iv) The City shall endeavour to complete its review of all submissions made by Project Co in accordance with the foregoing submission requirements by the later of:
 - A. the date mutually agreed to by the City and Project Co for each submission; and,
 - B. the date that falls 30 calendar days following the City's receipt of the submission from Project Co.
- (b) Project Co shall not commence or perform any construction activity comprising any portion of the Works or Project Scope unless regulations or supporting documentation that may be appropriately required to support or facilitate that particular portion of the Works or Project Scope have been adopted by Transport Canada, or alternatively the City has confirmed in writing to Project Co that there are no Regulations that are required by Transport Canada to apply to such activity.
- (c) Adoption and implementation date of such modifications/exemptions will be contingent upon Transport Canada approval.

ARTICLE 7 SYSTEM SAFETY CERTIFICATION

7.1 General Requirements

- (a) The Works specified in this Article, as well as portions of Article 8 that refer to Security, consists of the development and implementation of a SSAP. The purpose of the SSAP is to ensure the Project systems and equipment are as safe and secure as reasonably possible including
 - (i) Design and operating Hazards and Security vulnerabilities are identified, evaluated, and properly controlled or mitigated, prior to the commencement of Revenue Service.
 - (ii) All critical system elements are evaluated for compliance with the identified Safety and Security requirements during the design, conform to the drawings and specifications during construction/installation, and function as required during testing, and start-up phases of the Project.
 - (iii) The Project is operationally safe and secure for customers, employees, ESP, and the general public prior to entering Revenue Service.
 - (iv) All Project equipment, Facilities, plans, procedures, and training programs are systematically reviewed for compliance with established system Safety and Security requirements, and so verified prior to implementation of Revenue Service.
- (b) Requirements for human factors are an integral part of this program and shall be considered in the development and implementation of the SSAP plans. The System Safety and Assurance requirements shall apply to all Project Co functions during all phases of the Works including design, construction, testing, commissioning, Trial Running, in-service support, warranty, retrofits and field modifications.
- (c) Objectives: The primary objective is to deliver a Project that meets or exceeds System Safety and Assurance related governmental rules, regulations, standards and industry best practices, and applicable requirements throughout the Project. Thus, leading to delivery of a safe and reliable System for the City, its employees, Project Co, Passengers and the public at large.
- (d) The Project design shall be compliant with Safety and Security design criteria, codes, and regulations including Ontario Human Rights Commission *Policy and Guidelines on Disability and the Duty to Accommodate*, requirements, with Safety and Security of Passengers and employees as the most important requirement of the Project.
- (e) Project Co shall be responsible for compliance with the Project's SSCP and SSeCP developed by the City through strict conformance to contractual obligations. Project Co shall be responsible to update the Project's SSCP and SSeCP throughout the Project lifecycle. Project Co shall manage its Works through design, construction and integrated testing in such a way as to support the overall success of the Safety and Security Certification processes and the ultimate acceptance by the City.
- (f) Project Co shall be responsible for performing Safety Certification tasks as specified herein in accordance with EN 50126, EN 50128, EN 50129. These tasks shall be managed and performed in accordance with the Project SSCP.

- (g) Project Co shall provide an SCM. The SCM shall develop and implement the Safety Certification program to verify the inclusion of Safety items in the design, construction, testing, and commissioning of the Project. The SCM shall oversee and manage all aspects of the certification process. The SCM shall be a Professional Engineer.

7.2 References

- (a) Develop and implement the System Safety and Assurance Plans in accordance with the following guidelines and documents. Where the referenced documents provided below, conflict with these specifications, these specifications shall govern:
- (i) NFPA 101 Life Safety Code and other relevant NFPA codes and standards.
 - (ii) NFPA 130, Fixed Guideway Transit and Passenger Rail Systems.
 - (iii) MIL-HDBK-470A, Designing and Developing Maintainable Products and Systems (Volume II), December 1997.
 - (iv) MIL-HDBK-781A, Handbook for Reliability Test Methods, Plans and Environments for Engineering, Development Qualification and Production, April 1996.
 - (v) MIL HDBK-217F, Reliability Prediction of Electronic Equipment.
 - (vi) MIL STD 756B, Reliability Modeling and Prediction or IEC 61078 equivalent.
 - (vii) MIL STD-781D, Reliability Testing for Engineering Development, Qualification and Production - Exponential Distribution.
 - (viii) MIL STD-470A, Maintainability Program Requirements (for Systems and Equipment).
 - (ix) Procedures for Performing a Failure Mode Effects and Criticality Analysis, MIL- STD-1629A or EN 60812, Analysis techniques for system reliability – Procedures for failure mode and effects analysis.
 - (x) EN 50126-1:2017, Railway Applications – The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS).
 - (xi) EN 50126-2:2007, Railway Applications – The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) – Guide to the application of EN50126-1 for Safety.
 - (xii) EN 50128:2011, Railway Applications – Communication, signalling and processing systems – Software for railway control and protection systems.
 - (xiii) EN 50129:2003, Railway Applications – Communication, signalling and processing systems – Safety related electronic systems for signalling.
 - (xiv) IEC 61508, Functional Safety of Electrical/Electronic/Programmable Electronic Safety-Related Systems.

(xv) Electronic Parts Reliability Data EPRD-2014, Reliability Information Analysis Center, Quanterion Solutions Incorporated.

(xvi) Non-Electronic Parts Reliability Data NRPD-2016, Quanterion Solutions Incorporated.

7.3 System Safety Requirements

(a) General

(i) The Safety program shall establish the Safety requirements and verify Safety of the design through analyses and collaboration with the various disciplines. This approach helps assure that the Works provides for Health and Safety provisions affecting Maintenance and Operations personnel that equal or exceed the requirements of the Ontario OHSA and AODA.

(b) Safety Technical Requirements for Systems Design

(i) Safety shall be the primary design and performance requirement for the Project. The entire Expanded Trillium Line shall operate in a safe manner under all operating conditions. Safety components shall be designed according to the Safety principles (see below), and shall incorporate high reliability parts, selective redundancy, and warning and protective devices, as required, to contribute to the achievement of the specified requirements. In addition, Safety shall be provided for when elements fail or malfunction.

(ii) The Safety of the Expanded Trillium Line, when operating under normal conditions, shall preclude inadvertent/incorrect actions and/or procedures used by operating personnel. In no case shall procedures be substituted to accomplish any Safety functions provided by specific aspects, components, subsystems and/or equipment. Frequent and/or infrequent use shall not be a reason to justify unsafe or marginally safe design. At all other times (when carrying out Maintenance and/or Failure recovery), there shall be minimum dependence on correctness of actions and/or procedures used by operating and Maintenance personnel.

(iii) Whenever any Hazardous condition occurs, regardless of the cause, and the condition results in a conflicting concern between human Safety and equipment Safety; the conflict shall be resolved in favour of human Safety.

(iv) Project Co shall be responsible for designing, supplying, constructing, installing, testing and verifying and certifying the System in accordance with the requirements of the Project Agreement and the Safety principles customarily recognized by the transit industry for light rail systems. Project Co shall be responsible throughout the course of the Project for bringing to the attention of the City, in writing, any change in Laws, rules, orders, Regulations and Codes, and any condition(s), whether caused by its design, any Project Agreement requirement, or any other basis, which it believes might result in, or has resulted in, an unsafe condition. Project Co shall remain fully responsible for rectifying any such condition.

(c) Safety Principles

- (i) The following Safety principles shall be followed in the design and functionality of systems, subsystems, components, and parts.
- A. Hazard control shall follow the order of precedence:
- i. design to eliminate Hazards;
 - ii. design to control Hazards;
 - iii. use Safety devices;
 - iv. use warning devices;
 - v. implement special procedures;
 - vi. accept the Hazard; and,
 - vii. eliminate the system/ subsystem/equipment.
- B. Unacceptable Hazards shall be eliminated by design.
- C. The System shall be designed such that there shall be no single-point Failures in the System that can result in an unacceptable or undesirable Hazard condition.
- D. When the System is operating normally there shall be no unacceptable or undesirable Hazard conditions.
- E. The System design shall require positive actions to be taken in a prescribed manner to either begin or continue System Operation.
- F. The Safety of the System in the normal automatic operating mode shall not depend on the correctness of actions or procedures used by operating personnel.
- G. If one Failure combined with a second Failure can cause an unacceptable or undesirable Hazard condition, the first Failure shall be detected, and the System shall achieve a known safe state before the second Failure can occur.
- H. Software faults shall not cause an unacceptable or undesirable Hazard condition.
- I. The criteria for accepting a Hazard risk level shall be in accordance with the Safety Management System.
- J. Maintenance activities required to preserve or achieve acceptable risk levels shall be performed. Personnel qualifications required to adequately implement these activities shall also be identified.
- K. Consideration shall be given at all times to the Safety of workers, Passengers and staff of Project Co and the City.
- L. A failure on Safety Critical equipment shall be detected and reported back to the TOCC.

- (ii) Two principles of Safety, a Fail Safe Principle and a Checked Redundancy Principle, shall govern the design of Safety Critical components and subsystems. One or both of these principles shall be used to provide a safe Expanded Trillium Line System. These principles are defined as follows:
- A. Fail Safe Principle - The Fail Safe Principle applies to both hardware and software configurations, and states the occurrence of any Failure of Safety Critical hardware or software, or any combination thereof, shall not result in a condition known to be unsafe. The Fail Safe Principle shall be applied where a Failure of any critical element is likely to occur more than once in 10^6 (one million) hours of active service on the Expanded Trillium Line. For hardware this shall include, as a minimum, Failure modes; and,
- B. Checked Redundancy Principle - The Checked Redundancy Principle applies to both Safety Critical hardware and software configurations, and states that the probability of any Failure or combination of Failures that would result in a condition known to be unsafe shall pose no greater risk than that associated with Fail Safe design. In the event of a Failure, the Failure shall be detected, reported/alarmed and negated (maintain fail-safe state). Each function of a component or subsystem designed in accordance with the Checked Redundancy Principle shall provide a level of Safety equivalent to that provided by the same function designed in accordance with the Fail Safe Principle.
- (iii) The checked redundant control configuration, whether hardware or software, shall incorporate at least two parallel control units processing a common system characteristic, and means of comparing the output of the control units. If there is agreement from the comparison, the System may be allowed to respond in accordance with the output of the control units. If there is disagreement, the action resulting from that output shall not occur, and the System shall immediately revert to a safe state. For example, if a Vehicle is in motion, the brakes shall be applied, and if the Vehicle is not in motion, it shall not be allowed to move.
- (iv) The following characteristics shall be incorporated into the checked redundancy design.
- A. The checking process shall, in itself, be Fail Safe or checked redundant; "agreement" shall not be indicated unless the control units output agree.
- B. The checking process shall include the comparison of control units related to Safety.
- C. Any Failure of redundancy affecting the Safety of the System shall be detected. Where software is used; errors in programming shall be considered Failures.
- D. All parallel control units shall be completely independent. No common environmental or power fluctuations, errors, faults, or other problems, shall cause related errors in the output of the control units. Common software modes of Failure shall be prevented by the following methods, or by similar methods, if approved:
- i. Independent, different programming in the parallel control units.

ii. The use of logically complemented programs for the parallel elements of functions involving the ATP subsystem.

E. The checking process shall be comprehensive and as frequent as the number of Operations of the device or function, to provide a risk comparable to that of Fail Safe design.

F. Unless a comparative agreement occurs in the checking process, timely action shall intervene to provide Safety.

(d) SCIL

(i) Project Co shall develop a preliminary SCIL. This list shall include all equipment involved in performing a Safety-Critical function as determined by a Failure Mode, Effects and Criticality Analysis or functional Fault Tree Analysis. The SCIL shall be submitted to the City for approval and updated as required throughout the Project lifecycle. Relays certified as "vital" or Safety type shall have Failure characteristics as defined by the AAR.

(e) System Safety Design Approach

(i) Project Co shall provide a PHA for the Project. Project Co shall ensure that the analysis reflects all design changes that may impact the Safety of the Expanded Trillium Line. The PHA and resolutions shall be submitted to the City in accordance with Schedule 10 – Review Procedure.

(ii) Additionally the Safety program shall be developed to identify Hazards through the preparation of formal Hazard analyses which have been identified in the systems requirements for the specific system elements. The Hazards identified in the various analyses and the mitigation measures proposed will be reviewed and analyzed by the City for acceptance.

(iii) Project Co shall track all identified Hazards throughout the Project lifecycle using a Hazard Log and have the capability to provide status reports to the City and SSCRT for review.

(iv) Project Co shall identify all Safety Critical functions and allocate the respective SIL of each with supporting analyses.

(v) PHA: Project Co shall provide a PHA for the Expanded Trillium Line. During the progress of the Works, Project Co shall be responsible for identifying additional Hazards that are specific to the Expanded Trillium Line and updating the Hazard Log. Additional Hazards identified and analysis shall be submitted to the City for its review in accordance with Schedule 10 - Review Procedure. Project Co shall address and incorporate applicable mitigations from the Expanded Trillium Line PHA into the design of the Project.

A. Mitigations shall include design considerations, Safety devices, warning devices or recommendations for adopting special procedures or training. The resolution process shall verify but not be limited to the following:

- i. That the resolution of a Hazard in one system does not create a new Hazard in another system;
 - ii. That Hazards involving interfaces between two or more systems have been analyzed and resolved;
 - iii. That all program participants are providing required analyses in a timely manner, and that determination is made where delinquent receipt is delaying Hazard Resolution; and,
 - iv. That proper resolutions are implemented for areas identified with Hazard Resolutions requiring a change in system design or development of special procedures.
- B. Any subsequent Hazard Analysis that may be required shall be performed in accordance with EN 50126 and the Project Co's hazard management procedure.
- C. Mitigations shall be compiled into an independent Hazard Log that identifies Hazards, proposed mitigations to those Hazards. All mitigation references shall state document, revision number, section and paragraph number.
- (vi) Perform additional Hazard analysis as deemed necessary and agreed to by the City for the following system elements including but not limited to:
- A. Signalling and Train Control System;
 - B. Communications;
 - C. Trackwork;
 - D. Electrical;
 - E. Elevators;
 - F. Fire/Life Safety Systems, including ventilation; and,
 - G. The Vehicle and the on-board Vehicle equipment as required.
- (vii) Safety analysis techniques shall include, but may not be limited to:
- A. System/Sub-System Hazard Analysis;
 - B. Software Hazard Analysis;
 - C. Failure Mode, Effects and Criticality Analysis; and,
 - D. Fault Tree Analysis.
- (viii) OHA: Project Co shall perform an OHA to identify and analyze Hazards associated with personnel and procedures during production, installation, testing, training, Operations, Maintenance and Emergencies. Project Co shall provide for corrective measures to be

taken to minimize the possibility that a human error or procedure will result in injury or System damage.

7.4 Development of Safety Design Criteria

- (a) Project Co shall prepare separate, and submit, in accordance with Schedule 10 – Review Procedure, Safety Design Criteria separate from Security Design Criteria at the commencement of the design effort to provide applicable Safety guidelines for proper design, construction, testing, and preparation of the Operation of the System. The purpose for separate Design Criteria documents involves the control or restriction of information that due to its sensitive and confidential nature or content that may, if disclosed or released, identify vulnerabilities to Critical infrastructures or systems. The separation of these documents allows for one criterion to be updated without impact to the other.

(i) The Safety Design Criteria shall be submitted within 120 days of Financial Close.

- (b) The Design Criteria shall ensure that the Safety elements identified for the Project will become part of requirements that shall be addressed by Project Co through the development of specifications, drawings, design reviews, and final acceptance.

7.5 Safety and Security Certification

- (a) Project Co's management responsibilities shall include, but are not limited to, the following:

(i) Project Co shall implement a Safety and Security Certification program which shall be compliant with the City's SSCP and SSeCP, which shall verify the inclusion of all Safety and Security items in the design, construction, testing, operation and Maintenance of the Expanded Trillium Line. An SSCRT, independent of the design activities, shall oversee the certification effort.

(ii) Project Co shall utilize the SSCP and SSeCP developed by the City that describes and outlines the Project's Safety Certification and Security Certification processes which will be compliant to the City's SSCP and SSeCP. The SSCP and SSeCP developed by the City will describe roles, responsibilities, staffing, schedule and a description of the process, at a minimum. Project Co shall be responsible to develop a project specific SSCP and SSeCP to describe how they will be complaint to the City's SSCP and SSeCP and provide a deliverable timeline in line with the Project schedule.

(iii) Project Co shall participate in meetings with the SSCRT, FLSSC, and SSORC.

A. SSCRT:

- i. Shall oversee Project Co's SSCP and SSeCP;
- ii. Shall conduct meetings at a minimum of quarterly to discuss safety and security concerns;
- iii. Shall review Project Co's certification activities; and,

- iv. Shall consist of Project Co's SCM and SeCM to liaise with the SSCRT to report status, open items and Hazard, threat and risk management/resolution.

B. FLSSC:

- i. Project Co shall ensure the respective Emergency response agencies are involved including Fire, Police, Emergency Responders, etc.
- ii. The FLSSC shall be a liaison with respective City representatives and local authorities as defined by Project Co.
- iii. The FLSSC shall review standards and Safety and Security related designs, tests to verify compliance with FLS codes and Emergency preparedness.

C. SSORC:

- i. Additional committees including an SSORC shall be established as needed to review designs, plans, manuals, rules and procedures, and other documentation necessary for certification prior to Revenue Service operation.

(iv) Cooperation and facilitation of Safety and Security Certification audits of the Works shall include.

- A. Coordinating, documenting and performing training as specified in the Project Agreement.
- B. Maintaining and updating files and submitting required documentation on a timely and sequential milestone schedule basis. Preparing Safety and Security Certification progress reports each month, which shall include submitting a record copy of Safety and Security Certification files to the City in accordance with Schedule 10 – Review Procedure.

(b) Project Co's responsibilities are defined in the following table. Project Co shall be responsible for the performance of the tasks/activities identified in Table 1-7.1. The SSCP and Safety Management System shall be followed when conducting tasks below. This Table also includes the RAM deliverables described in Clause 7.8 of this Part 1.

Table 1-7.1 – Project Co Deliverable Requirements by Project Phase.

PROJECT PHASE	EN 50126 LIFECYCLE PHASE	PROJECT CO RAM TASKS	PROJECT CO SAFETY TASKS
PRELIMINARY / CONCEPTUAL DESIGN	1. Concept	Review Project Agreement RAM requirements Evaluate past RAM data and experience Preliminary RAM Allocation	Review and Update the City's SSCP
	2. System definition and application conditions	RAM Program Plan Preliminary RAM Allocation Establish RAM Assurance Plan, can be part of SSAP RAM audits (internal and 3 rd party)	SSAP Safety audits (Internal and 3 rd party) SSPP Provide PHA
	3. Risk Analysis	Preliminary identification of Reliability Critical items	SSAP Update System PHA System Risk Analysis Interface Risk Analysis Review and update Hazard Log Software Safety Plan

PROJECT PHASE	EN 50126 LIFECYCLE PHASE	PROJECT CO RAM TASKS	PROJECT CO SAFETY TASKS
DETAILED / FINAL DESIGN	1. System Requirements	Capture RAM requirements in Traceability Matrix Update RAM Program Plan, as required Update RAM portion of SSAP, as required RAM Demonstration Plan	Hazard Log update Allocation of THR → SIL Function Apportionment Update SSPP Safety Verification and Validation Plan Review/Establish Non-Conformance Procedures and Reports Safety audits (Internal and 3 rd party)
	2. Apportionment of System Requirements	RAM Allocation Report FMECA (Can be same as Safety provided it includes all information) Reliability Critical Items List Provide Lifecycle Costing for Operations and Maintenance period	SSAP update * as required SSPP update * as required Software Safety Plan update * as required PHA System Risk Analysis / Subsystem Risk Analysis Interface Risk Analysis OHA FMECA FTA Develop SCIL
IMPLEMENTATION	3. Design and Implementation	RAM Prediction Report Review and update RAM portion of SSAP, as required	Integrated System Safety Case Update Hazard Analysis (Subsystem/Interface, OHA) FMECA Test Plans and Procedures SIL Safety Function Assignment
PROCUREMENT AND MANUFACTURING	4. Manufacturing	Review First Article Inspection Maintainability Demonstration FRACAS Procedure	Hazard Log Update Safety Verification and Validation Report(s) Assess Safety related training Operation and Maintenance Manuals
CONSTRUCTION AND INSTALLATION	5. Installation	Spares List (with separate section for Safety Critical and Reliability Critical items)	SSAP Update Validation Report(s)

PROJECT PHASE	EN 50126 LIFECYCLE PHASE	PROJECT CO RAM TASKS	PROJECT CO SAFETY TASKS
TESTING & COMMISSIONING	6. System Validation	Review and update RAM Demonstration Plan as required RAM Demonstration Report FRACAS Report	System Safety Case System Test Reports Update OHA Safety Related Application Conditions (SRAC), as required Safety Audits (Internal and 3rd party)
HANDING OVER	7. System Acceptance	RAM Demonstration Report Acceptance by City for Revenue Operation	Hazard Log Update Engineering Safety and Assurance Case
OPERATIONS AND MAINTENANCE OBJECTIVES	8. Operation and Maintenance	RAM Demonstration Report during Warranty Period (Monthly Report) FRACAS Report	O&M FRACAS Review and update Hazard Log Review and Update Engineering Safety and Assurance Case Transfer and implement SSAP for Operations Update Operations and Maintenance Manuals Safety Audits (Internal and 3rd party)
	9. Performance Monitoring	RAM Demonstration Report until Warranty expiry and acceptance by City Maintain FRACAS Report	No Safety deliverables required unless assumptions found to be invalid.
	10. Modification and Retrofit	Assess RAM implications as required	Hazard Log Update Engineering Safety and Assurance Case Update as appropriate

7.6 Safety Activities

- (a) Project Co shall follow the SSCP and Safety Management System, when conducting the Safety activities listed in Table 1-7.1 above along with the respective standards listed therein.
- (b) Witness point: Witness point selection is a City responsibility with the purpose of defining selected points or locations where the City wishes to formally witness testing. Project Co shall be responsible for scheduling and performing the tests that include those City-selected points; and, for notifying the City at least 14 Business Days in advance of the date and time of the test. Notification procedures shall be established prior to witness point testing, scheduling or performance of testing. Selected areas shall include items of high risk, where concerns of compliance have been raised, or those selected by random sampling. The City shall have the right to attend and witness any and all testing that takes place.
- (c) Safety-related tests: Project Co shall verify that subsystems and systems function safely as specified and do not contain or create unforeseen Hazards. All Safety-related tests shall be

included in the test program plan contained within its own section. The respective Safety-related tests and results shall be documented within test reports to provide Safety evidence for the respective Safety Case. Safety tests shall include, at a minimum:

- (i) An initial Safety related testing conformance checklist shall be prepared for the design level of the Project Agreement. Project Co shall update the Safety related testing conformance checklist and submit it to the City for review. Project Co shall verify that all Safety related tests identified in the specifications and other Project Agreement documents are successfully performed and the completed tests have been verified within defined test parameters and the systems and subsystems function safely as specified, do not contain or create unforeseen Hazards and contain specified Safety features. All requirements on the checklists shall be verified and submitted to the City for review in accordance with Schedule 10 – Review Procedure.
- (ii) At a minimum, each of the identified Safety requirements for Safety Critical Item (unit) and respective Safety function for a Certifiable Element shall be simulated and tested to verify and certify performance in normal modes and associated sequences and the Failure modes and effects, as applicable. These tests shall demonstrate the Safety requirements stated herein have been met. Should the Safety testing identify any Safety issue, they shall be listed in the Safety test reports, indicating remediation and corrective action necessary. All remediation and corrective actions required by Project Co shall be completed within 14 calendar days and documented in a Non-Conformance Report to ensure traceability. All remediation and corrective actions shall be completed prior to the completion of the Works and pre-revenue testing and training. Project Co shall audit all tasks.
- (iii) Safety Testing Documentation - Safety testing shall be separately identified to allow recognition of Safety tests. Project Co shall include a matrix in the SSVM (output from the Hazard Log), addressing Safety tests only, which shall receive the concurrence by signature of the responsible person as defined by Project Co's organization chart. The matrix shall identify Safety parameters and/or other Safety considerations and a cross-reference to the test procedure accomplishing the verification and certification. This matrix shall be kept current throughout the duration of the Project Agreement and shall include the identification of the test reports which confirm verification and certification of the Safety and Security requirements. The references to the Safety tests along with reports shall be checked before every Safety Case submission to ensure that there have been no revisions or modifications.
- (iv) Notification - Project Co shall notify the City in writing 30 calendar days prior to the start of any Safety or Security test. If any of the data indicate conditions which could potentially result in lack of proper Safety or protection of Operations; Project Co shall immediately indicate proposed remedies and/or corrective actions.
- (v) Scheduling - All Safety tests shall be successfully completed by Project Co prior to system or equipment acceptance.
- (vi) Safety Test Reports - Project Co shall ensure test reports which contain Safety verifications and certifications shall receive the concurrence, by signature, of the responsible person, defined by Project Co's organization chart. Safety Test Reports shall be attached to the respective Safety Case and referenced within the SSVM to demonstrate compliance.

- A. Project Co shall report any non-compliance/non-conformance with applicable code and regulatory requirements noted as a result of Safety related testing. All non-compliances shall be rectified in accordance with applicable codes and regulations.
- (d) Safety training and drills: Project Co shall be responsible for the proper coordination and successful completion of this task of Safety drills and exercises with the City and other third parties including but not limited to the [REDACTED], [REDACTED], NRC, [REDACTED] and the OMCIAA as applicable. The purpose of the training and drills verification process is to verify that key Safety related training on new equipment and procedures is adequate and appropriate for the tasks performed under typical and Emergency conditions. Project Co shall schedule, arrange, invite participants, provide equipment, and set up locations for drills to occur. Where indicated elsewhere herein, Project Co shall also provide instructors to assist performing the Safety training. This includes but is not limited to:
- (i) Verifying safe System Operation through drills and exercises is an integral part of a closed-loop, pro-active System Safety process. The methodology employed by the training/drill/exercise process is to obtain written verification from the City that:
- A. Training and drills are adequate and appropriate for the assigned task, and contain instructions on Safety features for typical and Emergency conditions;
- B. Lessons learned from training and drills/exercises performed are reviewed and documented and that additional Hazards, vulnerabilities, or open Safety issues have been resolved; and,
- C. Known issues concerning training and drills, which impact Safety, have been satisfactorily resolved.
- (ii) Safety information on conformed methods and procedures necessary to maintain safe conditions shall be generated by Project Co and included in a Safety Training Program, to be provided by Project Co, for Safety training consideration of construction, Operations and Maintenance personnel. At a minimum, each of the Safety training requirements disclosed by the PHA and OHA shall be included in the training program and associated documents.
- (e) Project Co shall be responsible for establishing and maintaining a Hazard Log to record and track Hazards for resolution as addressed in the Hazard analysis. The Hazard Log shall describe all identified Hazards, the measures taken to resolve each Hazard (references citing document, revision, section number) and the results of reviews, comments and approvals by the City and other outside agencies. All Hazards shall be tracked through to resolution. Project Co shall submit the most current copy of the Hazard Log to the City for review upon request. After all tracked Hazards are resolved, Project Co shall prepare a SSVM document and submit in accordance with Schedule 10 – Review Procedure.
- (f) Fire Life Safety – Project Co shall be responsible for compliance with Fire Life Safety requirements included in federal, provincial, local codes and regulations, and the Project Agreement. Project Co shall incorporate these requirements into the design and construction of the Project and include all applicable certifiable Fire Life Safety elements in the appropriate SSRTM.

- (g) Project Co shall support the approval process by participating in reviews, inspections and technical discussions between the City and local jurisdictional authorities and other Governmental Authorities, and incorporating the resulting agreements into the design and construction. Project Co shall be responsible for verifying that Project Co's completed design complies with the resolutions of Fire Life Safety issues, and is acceptable to the applicable Governmental Authorities.
- (h) Project Safety Certification Report (Engineering Safety and Assurance Case)
- (i) A signed report shall be prepared by Project Co, prior to opening, attesting to the overall Safety and Security of the Expanded Trillium Line for public use. This shall include resolution to all non-conformance Hazards and vulnerabilities previously identified through Project Co's detailed Safety Analysis. Upon completion of the Works and pre-revenue testing and training, Project Co shall issue to the City and the SSCRT a signed and sealed Final Safety Certification Report.
 - (ii) The signed Safety Certification Report shall certify to the City that the Works has been designed and constructed in accordance with the Project Agreement Safety requirements, and Project Co has used the Safety principles customarily applied in the transit industry for transit systems in North America and Canada. The report shall further certify the Expanded Trillium Line either meets or exceeds all applicable Federal, Provincial, City, and local Laws, Ordinances, rules, Regulations, Statutes, industry Codes, and other standards and requirements, whichever are the more stringent requirements.
 - (iii) As a basis for making this formal certification, Project Co shall perform a detailed accounting of all correspondence and documentation to verify and certify all Safety requirements, activities, tests, inspections, non-conformances, remediation's and actions have been completed and satisfied, documenting these results in a Safety Certification Report which shall be submitted to the City in accordance with Schedule 10 – Review Procedure.

7.7 Format for System Safety Verification Matrix

- (a) Project Co shall provide an SSVM in the following format, noting that this shall be an output from the Hazard Log.
- (i) Item number;
 - (ii) Safety requirement;
 - (iii) Document reference:
 - A. Document name; and,
 - B. Article number.
 - (iv) Evidence:
 - A. Method of verification by Project Co;
 - B. Method of validation by audit team;

- C. Validated by (Name of auditor);
 - D. Date; and,
 - E. Remarks.
- (b) System Safety Requirement Traceability Matrix
- (i) Project Co shall develop an SSRTM for the Project. It shall be used to verify and certify that the Safety requirements have been incorporated in the design and certify that all Safety requirements of the design are constructed and/or installed in accordance with the Project Agreement. Verification reports (outputs of the SSRTM) shall be submitted in accordance with Schedule 10 – Review Procedure.

7.8 Reliability, Availability, Maintainability

- (a) System Assurance
- (i) Introduction
 - A. The SSAP shall encompass system RAM. The primary objectives of system assurance are to: ensure RAM, Safety and quality plans, processes and procedures are followed, implemented and in-line with the PA and applicable regulations and standards.
 - B. The general design concepts which shall be incorporated include, but are not limited to: use of standards, proven designs; use of reliable equipment, use of interchangeable, modular components; extensive and prominent labeling of parts, wires, etc.; use of standard, prewired harnesses; use of weatherproof seals and latches.
 - C. The systems assurance requirements are specified for specific system elements and contract specifications. Project Co shall develop and implement a System RAM Program encompassing system RAM engineering and meet quantitative RAM goals and requirements, which shall be demonstrated through analysis and test. The RAM requirements shall apply to all systems, subsystems and assemblies, software, hardware and firmware provided for the Expanded Trillium Line. The requirements apply during all phases of the work.
- (b) RAM Approach
- (i) Project Co shall follow, implement and meet RAM Program requirements including qualitative and quantitative requirements contained in the specific system elements requirements.
 - (ii) Quantitative RAM goals/requirements shall be apportioned by Project Co for subsystems/equipment/components comprising the system elements. In addition to the quantitative goals to be met, Project Co shall meet requirements defined for the RAM Program Plan, and specific analyses.
- (c) RAM Program Plan

- (i) The Project Co shall prepare a detailed RAM Program Plan in general accordance with applicable provisions of EN 50126. It shall include, at a minimum, the following:
- A. Description of the System;
 - B. RAM Requirements and Critical items;
 - C. Task listing and time phasing for each task including RAM deliverables as stated in Table 1-7-1;
 - D. Organization and responsibilities of key personnel including the formation of a Failure Review Board;
 - E. Techniques for allocation of quantitative requirements to lower level functional elements;
 - F. Interfaces between RAM and other closely related programs, and support to efforts such as:
 - i. Logistic support and Maintenance planning;
 - ii. Design;
 - iii. Quality assurance and quality control;
 - iv. Standardization;
 - v. Systems engineering; and,
 - vi. Personnel subsystem program (human engineering, life support, training, and personnel resources).
 - G. Methods for assuring that sub-contractor's' RAM efforts are consistent with overall System requirements;
 - H. Provision for source selection, first article inspection, and surveillance of sub-contractor's' RAM activities;
 - I. Analytical methods to be used during design and development for demonstrating compliance with RAM requirements and goals;
 - J. Procedures and controls, including piece part selection and screening, manufacturing process controls, procurement controls, and test procedures, to be utilized during production to ensure achievement of RAM requirements;
 - K. Provisions to evaluate design changes for possible effects upon subsystem and functional level requirements and goals; and,
 - L. Description of failure management and collection.

- (d) Maintenance Approach - Develop a concept of maintenance as part of the RAM Program Plan taking the following into considerations:
- (i) System parameters as specified above.
 - (ii) Maintenance Assumptions
 - A. Troubleshooting and repair shall be done by qualified technician with a minimum of 2 years' experience and has attended the Maintenance training programs at a minimum; and,
 - B. Spare parts recommended by the Project Co shall be available.
 - (iii) The concept of maintenance shall define the repair, Corrective Maintenance program plans, policies, and support requirements for all equipment supplied under for this Project. It shall:
 - A. Minimize each level of Maintenance consistent with the specification requirements and system Reliability goals; and,
 - B. Recommend policies and practices which ensure that, at the time of a failure, qualified Maintenance personnel shall be promptly notified and shall have the necessary documentation, tools, test equipment, and spare parts to affect the repair in a minimum of time.
 - (iv) The concept of maintenance shall develop recommendations for:
 - A. Depth and frequency of Maintenance requirements at each level;
 - B. Facilities required;
 - C. Support equipment and tools required;
 - D. Skill levels and numbers of personnel required;
 - E. Subsystem, component, and piece part repair policy; and,
 - F. Detailed fault isolation and troubleshooting procedures, diagnostic equipment, and special test equipment.
- (e) Maintainability Design Features
- (i) The subsystems and components shall incorporate the following design features:
 - A. Accessibility: All routinely serviced subsystems and components shall be readily accessible for service and inspection. Accessibility of components shall be proportional to frequency of Maintenance and repair. No active electrical or mechanical components that can foreseeably require Maintenance shall be structurally embedded to preclude convenient access for repair or replacement.

- B. Modular Design: Modular design principles shall be employed to the greatest extent practicable. Components shall be packaged together in replaceable subassemblies according to the logical function that they perform. Components or subassemblies requiring occasional removal shall preferably be plug-in units.
- C. Interchangeability: Assemblies or components that are functionally interchangeable shall be physically interchangeable. Assemblies or components that are not functionally interchangeable shall not be physically interchangeable.
- D. Adjustments: The need for adjustments shall be avoided. Where adjustment points cannot be avoided, they shall be readily accessible, adequately identified, and self-locking to prevent inadvertent adjustment or drift.
- E. Special Tools: The number of special tools required for Maintenance and repair shall be minimized. However, if they are required, they shall be defined and furnished in a quantity determined as part of the Works of this Project.
- F. Panels and Openings: Panels and openings shall be of sufficient quantity, size, and placement to permit ready access from normal work areas and positions. Adjustment controls, fittings, and such, shall be directly accessible through panels and openings. Self-retaining fasteners shall be used wherever possible. Special access opening tools shall not be used unless considered necessary to prevent vandalism.
- G. Cable Connections: Cable connectors shall be spaced far enough apart so that they can be grasped firmly for connecting and disconnecting. Connectors shall be properly labeled and keyed so that they cannot be interchanged or improperly installed. Signal and power pins shall not be adjacent.
- H. Lifting Assists: Handles, lifting lugs, or reviewed functional equivalents shall be provided on components of 18 kg or more.
- I. Visual Inspection: Visual inspection of equipment shall be unobstructed.
- J. Test Points: Built-in test points shall be provided and marked. Major components having test panels or test points shall be located for easy accessibility and shall permit external monitoring of Critical functions. Test points shall be protected against environmental damage and human error.
- K. Fault Isolation: Failure indicators shall be provided and identified. Systematic fault isolation procedures shall be developed and included in the Maintenance manuals.
- L. Labeling: All test points, fault indicators, modules, wire junctions, pipes, tubes, wires, etc., shall be identified by name plates, colour coding, number coding, or other means to assist Maintenance personnel. All ROMs, PROMs, and EPROMs shall be labeled with the version and date of stored software.
- M. Hardware: Standard, commercially available industrial components and hardware shall be used wherever possible.

- N. Vandalism: The use of vandal and damage resistant materials shall be used whenever possible.
- (f) Preventive Maintenance Plan
- (i) Project Co shall develop and submit a detailed Preventive Maintenance Plan based upon the concept of maintenance and established maintainability requirements. The Preventive Maintenance Plan shall provide all preventive Maintenance tasks needed to Maintain each subsystem/equipment, supplied for this Project, as close as possible to new condition. The Preventive Maintenance task analysis shall include all servicing, inspections, scheduled overhaul, or any task required on a scheduled basis. The elapsed time to perform specific tasks shall be defined in the analysis, and in Maintenance and servicing manuals. All tasks shall be sorted and grouped by time interval (ex. daily, weekly, monthly, etc.), as well as by Subsystem.
- (ii) In addition to Preventive Maintenance tasks recommended by equipment manufacturers to enhance the Reliability/Availability of their equipment, many Safety Critical Preventive Maintenance tasks shall be required as a means of detecting Safety-significant latent failures, which would otherwise remain latent until another subsequent Failure resulted in a potentially hazardous event. The Safety Critical preventive maintenance tasks are a direct result of performing Safety analyses on all required subsystems. Project Co shall use a clear and deliberate method to identify all Safety Critical Preventive Maintenance tasks in the Preventive Maintenance Plan
- (g) Project Co shall apportion and allocate MTBF and MTTR values as applicable to the various systems elements and subsystems using a Reliability Block Diagram model, which shall support and meet the top level RAM goals/requirements. Project Co may use the beneficial effects of redundancy and repair rate (repair rate = reciprocal of MTTR) to reduce the effective Failure frequency and thus increase the effective MTBF of system elements and subsystems due to equipment redundancy, and the ability to repair one failed unit in time before the second (redundant) unit fails. Project Co shall demonstrate through analysis and testing that the apportioned Availability/MTBF values which support the top level inherent RAM are achievable and the equipment shall demonstrate such MTBF through analysis and testing.
- (h) MTBF shall be calculated as the total number of equipment operating hours for the entire population of like items, divided by the number of Failures (loss of function) requiring unscheduled Corrective Maintenance action anywhere within the said population of items during said total accrued operating hours by said population of items. A Failure shall be defined as loss of function. In redundant systems configuration, the function shall not be deemed “lost” until all the redundant items in the “Cut-set” of redundant items have failed. Thus Project Co shall benefit from the effects of redundancy and repair rate to reduce the effective Failure frequency of the system/ subsystems (i.e., increase the effective MTBF) due to redundancy in configuration. Also, scheduled preventive Maintenance to inspect/ repair/ replace items during non-revenue-service hours, shall not be considered chargeable Failure for MTBF calculation.
- (i) RAM Prediction Report
- (i) Project Co shall submit a RAM Prediction Report to demonstrate its proposed equipment will meet RAM goals/requirements. Project Co shall not furnish any equipment until calculations or data is approved by the City.

- (ii) Reliability calculations shall use reliability block diagram, reliability model, probability of success equation, and preventive Maintenance strategies to achieve required MTBF. Sustained field data, Electronic Parts Reliability Data – 2014, Non-Electronic Parts Reliability Data – 2017 and MIL-HDBK-217F shall be used for reliability data in order of precedence. Any assumptions made shall be documented in the RAM Prediction Report, as a minimum shall include de-ration factors for environment, temperature, application and stress and redundancy configurations for MTBSAF calculations, as applicable.
 - (iii) Project Co may propose alternate method of calculating reliability, such as providing service records for proven equipment, provided Project Co can demonstrate similar function and environmental conditions, for approval by the City.
 - (iv) Project Co shall conduct a Maintainability analysis to be included within the RAM Prediction Report to ensure the Maintainability requirements listed herein have been achieved. Project Co shall follow IEC 60706 in general accordance.
- (j) RAM Demonstration Plan and Report:
- (i) Project Co shall develop a RAM Demonstration Plan outlining the equipment to be tested, acceptance criteria and test conditions to be applied. Project Co shall submit to the City for review and approval.
 - (ii) During testing and commissioning, Project Co shall provide the City a RAM Demonstration Report outlining the performance of the System and to demonstrate the ability to capture and analyze failure data (FRACAS system in place) in accordance to the RAM Demonstration Plan, for review and acceptance
 - (iii) Project Co shall provide monthly reports throughout the Warranty Period to ensure the RAM requirements are being met.
- (k) FRACAS Procedure and Report
- (i) Project Co shall develop a FRACAS Program and submit to the City for review and approval. The program shall outline the organization in place to support the program and the approach taken by Project Co to detect, collect, diagnose and correct the respective Failure as a minimum.
 - (ii) Project Co shall develop and submit to the City, on a monthly basis starting at testing and commissioning, a detailed FRACAS Report, indicating all system element Failures to the LLRU by subsystem, corrective actions to be implemented and work orders traced to the respective corrective action, identification of any pattern Failures and a summary of the most frequent failing elements.

ARTICLE 8 SECURITY AND EMERGENCY MANAGEMENT

8.1 General Security and Emergency Management Requirements

- (a) The Works specified in this Article consists of the development and implementation of Security and Emergency Management requirements. Requirements for physical and cyber Security and Emergency preparedness of City ESP are integral part of this Project. These Security and Emergency preparedness requirements shall apply to all Project Co functions during all phases of the Works including design, construction, installation, testing, pre-revenue operations, in-service support, warranty, retrofits and field modifications. As well, Project Co shall ensure Security is considered in the development and implementation of the plans, training and supporting documentation including the development and implementation of an SSeAP. The purpose of the SSeAP is to ensure the Project Facilities, systems and equipment are as secure as reasonably possible including:
- (i) Design and operating Security vulnerabilities are identified, evaluated, and properly controlled or mitigated, prior to the commencement of Passenger service on the Expanded Trillium Line.
 - (ii) All Critical system elements are evaluated for compliance with the identified Security requirements during the design, conform to the drawings and specification during construction/installation, and function as required during testing, and start-up phases of the Project.
 - (iii) The Project is operationally secure for customers, employees, ESP, and the general public prior to entering Revenue Service.
 - (iv) All Project equipment, Facilities, plans, procedures, and training programs are systematically reviewed for compliance with established system Security requirements, and so verified prior to implementation of Revenue Service.
- (b) Objectives: The primary mission of the Trillium Line Extension is to provide the City with a safe, secure, reliable, and attractive public rail transportation system. As such, the Trillium Line Extension shall incorporate Security values that affect all levels of the Project activities including; the planning, design, procurement, construction, testing, commissioning, and Operations and Maintenance. Project Co shall deliver a Project that meets or exceeds Security and Emergency preparedness related governmental rules, regulations, standards and industry best practices, and applicable requirements throughout the Project. Project Co and Project Co Parties are charged with the responsibility of delivery of a secure system for the City, its employees, customers, and public at large as well as ensuring ESP are ready to respond to Emergency events through formal training and documentation development.
- (c) The Works shall be accomplished by incorporating Security design features, facilitating Emergency response training drills (which shall include on Site (Guideway and Stations) and on-Train familiarization sessions, in classroom instructions, tabletop exercises and live exercises using Train, Stations, Guideway and maintenance Facilities) and implementing contractual training for the safe and efficient handling of both normal and Emergency conditions. Project Co shall design the Project with provisions to enable safe and timely evacuation of patrons and personnel from all fixed Structures, disabled Vehicles and Facilities. The provisions shall also include necessary safeguards to protect Passengers, personnel and ESP during evacuation and

shall minimize exposure to all Hazards, including those due to moving Vehicles and potential falls, weather issues and vulnerabilities due to intentional acts.

- (d) The Project design shall be compliant with Security criteria, codes, and regulations and the duty to accommodate Security requirements of Passengers and employees as the most important requirement of the Project.
- (e) Project Co shall be responsible for compliance with the Project's SSeCP developed by the City through strict conformance to contractual obligations. Project Co shall manage its Works and that of its Subcontractors' through design, construction and integrated testing in such a way as to support the overall success of the Security certification process and the ultimate acceptance by the City.
- (f) The Expanded Trillium Line ERP shall be in accordance with the criteria contained in this Article and all Applicable Law governing Emergency planning, response and recovery. The ERP shall incorporate requirements contained in the existing "Railway Passenger Handling Safety & Emergency Response Plan".
- (g) Project Co shall coordinate with the City on the development of an ERP to reflect all elements of the SI and Vehicles. This approach ensures that Project Co has considered, trained, addressed, and planned for all potential catastrophic natural and man-made disasters, and has established protocols, procedures, responsibilities and guidelines to mitigate the potential impacts and respond to and recover from the occurrence of a disaster event, in accordance with the ERP.
- (h) The ERP shall be completed and submitted as part of the Works Submittals in accordance with Schedule 10 – Review Procedure.
- (i) It is understood that the ERP developed by Project Co shall be incorporated into the City of Ottawa Emergency Management Plan, and the PERP. As such, the general outline, organization and structure of the ERP shall generally follow the City of Ottawa Emergency Management Plan and the PERP.
- (j) This Article is provided as a general outline for the requirements of the ERP, as the ERP shall be modified, revised or changed, as appropriate, to address specific issues, needs, threats, Hazards, vulnerabilities, or concerns, including those identified in the PHA, TVA, risk assessment, Hazard analysis and FMEA related to the Expanded Trillium Line System that shall be developed during the Project Term.
- (k) Project Co shall be responsible for performing Security Certification tasks as specified herein in accordance with U.S. Department of Transportation, Federal Transit Administration's Handbook for Transit Safety and Security Certification, Final Report, November 2002; FTA-MA-90-5006-02-01. These tasks shall be managed and performed in accordance with the Project SSeCP.
- (l) Project Co shall provide a SeCM to develop and implement the Security Certification processes. The SeCM shall develop and implement the Security Certification Program to verify the inclusion of Security items in the design, construction, testing, and commissioning of the Project. The SeCM shall oversee and manage all aspects of the Security Certification effort.

8.2 References

- (a) Develop and implement the Security and Emergency preparedness deliverables such as plans, procedures and protocols to ensure response activities are defined and outlined for incidents requiring police, fire or paramedic, in accordance with the following guidelines and documents. Where the referenced documents provided below, conflict with these specifications, these specifications shall govern:
- (i) For Security: Handbook for Transit Safety and Security Certification, Final Report, November 2002; DOT, FTA-MA-90-5006-02-01.
 - (ii) Public Transportation System Security and Emergency Preparedness Planning Guide, January 2003, Final Report, U.S. DOT, FTA, DOT-VNTSC-FTA-03-01.
 - (iii) Transit Security Design Considerations, Final Report, November 2004, US DOT, FTA, DOT-VNTSC-FTA-05-02.
 - (iv) CPTED principles, City of Ottawa, Urban Design, A Reference Guide to Creating Great Places and Great Spaces, Planning, Transit and the Environment, Publication #2103, Summer 2007.
 - (v) NFPA 130, Fixed Guideway Transit and Passenger Rail Systems.
 - (vi) ASIS International Security strategies and procedures.
 - (vii) Transport Canada Rail Codes of Practice for Rail and Transit Operations.
 - (viii) Pathway Lighting Policy, City of Ottawa Policy on Lighting Pathways.

8.3 Security and Emergency Response Principles

- (a) The following Security and Emergency response principles shall be followed in the Design and development of Security plans and procedures, ESP training and overall ESP preparedness.
- (b) Security: The three fundamental principles of Security are:
- (i) Confidentiality: The principle of confidentiality means that the System's operational and management control assets can be accessed only by authorized parties.
 - (ii) Integrity: The principle of integrity means that the System's operational and management control assets can only be modified or changed by authorized parties in authorized ways.
 - (iii) Availability: The principle of availability means that the System's operational and management control assets should be available to authorized parties at all times.
- (c) Emergency response principles include:
- (i) Emergency response procedures shall be designed and developed to align with industry accepted principles and follow the current City Emergency response protocols;

- (ii) Emergency responder systems training shall include access, familiarization sessions and tours, and operation of Safety, Security and Emergency response systems;
 - (iii) Emergency response training and familiarization shall consider City protocols for escalation of Emergency events;
 - (iv) Emergency response procedures shall account for changes to the threat as outlined in the Threat Log and Risk Log; and,
 - (v) Emergency response shall be validated through both tabletop and full-scale exercises.
- (d) Emergency response shall consider the Safety of City ESP at all times.

8.4 Development of Security Design Criteria

- (a) Project Co shall prepare Security Design Criteria at the commencement of the design effort to provide applicable Security guidelines for proper design including CPTED, construction, testing, and preparation of the operation of the Security systems. The purpose for separating Safety and Security Design Criteria documents involves the control or restriction of information that due to its sensitive and confidential nature or content that may, if disclosed or released, identify vulnerabilities to Critical infrastructures or systems. The separation of these documents allows for one criterion to be updated without impact to the other.
 - (i) The Security Design Criteria shall be submitted within 150 days of Financial Close.
- (b) The Design Criteria shall ensure that the Security elements identified for the Project shall become part of requirements that shall be addressed by Project Co through the development of specifications, drawings, design reviews, and final acceptance. These Security elements include where appropriate, and to meet the requirements as identified in the Threat Log and Risk Log:
 - (i) Perimeter fencing;
 - (ii) Alarms;
 - (iii) Fare gates;
 - (iv) Security laminates;
 - (v) CCTV cameras;
 - (vi) PA systems;
 - (vii) Security signage;
 - (viii) Intrusion detection;
 - (ix) Locks;
 - (x) Key control;
 - (xi) Roll down cooling grills;

- (xii) Blast mitigation;
- (xiii) Vehicular barriers;
- (xiv) Security lighting; and,
- (xv) Cyber protection for IT and SCADA systems.

8.5 Security Design Approach

- (a) Project Co shall follow the Security Management System when designing and developing the Security Plan and Procedures. As outlined in Article 10 – Construction Safety Management, of this Part 1, there is a requirement to develop and implement a systematic, explicit, and comprehensive process for managing Security risks. Project Co shall develop a System Security Certification Plan to support Security integration.
- (b) The Security design approach shall be founded in the TVA and Risk Assessment. As such, Project Co shall develop and maintain a current TVA to identify, mitigate, and/or control threats and vulnerabilities that might arise from design and operational deficiencies associated with the Project. During the progress of the Project, Project Co shall be responsible to update threats and vulnerabilities that are specific to the Trillium Line Extension. Additional threats and vulnerabilities identified and analyzed shall be submitted to the City in accordance with Schedule 10 – Review Procedure.
- (c) Specific Security requirements for Trillium Line Extension facilities or the supporting Systems shall be based on a risk assessment that is conducted by Project Co during the earliest stages of the Project. Project Co shall address and incorporate applicable mitigations identified by the Trillium Line Extension TVA and risk assessment as outlined at Schedule 10 – Review Procedure. Mitigation of Security physical and cyber threats are to apply to the following:
 - (i) Train Control;
 - (ii) New Walkley Yard;
 - (iii) Trillium Stations;
 - (iv) Guideway;
 - (v) Tunnel;
 - (vi) TOCC and BCC;
 - (vii) Fare Collection;
 - (viii) Intrusion Access Control;
 - (ix) CCTV System; and,
 - (x) Rail Vehicle.

- (d) Mitigations shall include design considerations, Security devices, warning devices or recommendations for adopting special procedures or training. These mitigations shall consider an integrated Security approach, CPTED principles and Security defence in depth. The resolution process shall verify the following:
- (i) That the resolution of a threat or vulnerability in one system does not create a new one in another system;
 - (ii) That threats or vulnerabilities involving interfaces between two or more systems have been analyzed and resolved;
 - (iii) That all program participants provide required analyses results in a timely manner, and that determination is made where delinquent receipt is delaying vulnerability resolution; and,
 - (iv) That proper resolutions are implemented for areas identified with vulnerability mitigations requiring a change in system design or development of special procedures or additional training for ESP or City staff.
- (e) The TVA methodology and the risk assessment process of identifying the likelihood of occurrence and the severity of impact shall be applied and performed in accordance with Public Transportation System Security and Emergency Preparedness Planning Guide, January 2003, Final Report, U.S. DOT, FTA, DOT-VNTSC-FTA-03-01.
- (f) Mitigations shall be compiled into an independent Threat Log and Risk Log that identifies threats, vulnerabilities and among other things, proposed mitigations to vulnerabilities. This Threat Log shall be reviewed and updated on an on-going basis.
- (g) The criteria for accepting a threat risk level shall be in accordance with direction provided by the City and the Security Management System.
- (h) Document confidentiality and control. The TVA, Threat Log, Risk log and the information contained within the documents shall be confidential, restricted and controlled to only those people with the need to know and access the information therein. Project Co shall establish controls and criteria for accessing the documents and information. When no longer necessary, the documents shall be destroyed beyond reconstruction or recognition.

8.6 Security Certification

- (a) Project Co's management responsibilities shall include, but are not limited to, the following:
- (i) Project Co shall implement a Security Certification Program, which shall ensure compliance with the SSeCP by verifying the inclusion of all Security items into the design, construction, and testing of the Trillium Line Extension. The SSCRT shall oversee the certification effort.
 - (ii) Project Co shall utilize the SSeCP developed by the City that describes and outlines the Project's Security Certification process, which shall be compliant to the City's SSeCP. The SSeCP developed by the City will describe roles, responsibilities, staffing, schedule, deliverables and a description of the process, at a minimum. Project Co shall be

- responsible to develop a Project specific SSeCP to describe how they will be complaint to the City's SSeCP and provide a deliverable timeline in-line with the Project schedule.
- (iii) Project Co shall participate in meetings with the SSCRT, FLSSC and SSORC.
 - (iv) Cooperation and facilitation of Security Certification audits of the Works shall include.
 - A. Coordinating, documenting and performing training as specified in the Project Agreement.
 - B. Maintaining and updating files and submitting required documentation on a timely and sequential milestone schedule basis. Preparing Security Certification progress reports each month, which shall include submitting a record copy of Security Certification files to the City.
- (b) Project Co's responsibilities are defined in the following table. Project Co shall be responsible for the performance of the task activity identified in Table 1-8.1. The SSeCP and Security Management System shall be followed when conducting tasks below:

Table 1-8.1 - Project Phases and Project Co Security Tasks

PROJECT PHASE	EN 50126 LIFECYCLE PHASE	PROJECT CO SECURITY TASKS
PRELIMINARY / CONCEPTUAL DESIGN	1. Concept	Review the City's SSCP
	2. System definition and application conditions	SSeCP SSeAP Security Audits (Internal and 3 rd party) SSePP TVA and Risk Assessment
	3. Risk Analysis	SSeAP Update System Risk Analysis Interface Risk Analysis Review and update TVA Cybersecurity Assessment and Management Review and update Threat Log and Risk Log

PROJECT PHASE	EN 50126 LIFECYCLE PHASE	PROJECT CO SECURITY TASKS
DETAILED / FINAL DESIGN	4. System Requirements	Threat Log and Risk Log Review and Update Update SSecP Security Audits (Internal and 3 rd party)
	5. Apportionment of System Requirements	SSeAP Update SSeCP update as required System Risk Analysis / Subsystem Risk Analysis Threat Log and Risk Log review and update Cybersecurity assessment and management review and update
IMPLEMENTATION	6. Design and Implementation	Emergency Preparedness (Preliminary) Test Plans and Procedures
PROCUREMENT AND MANUFACTURING	7. Manufacturing	Threat Log and Risk Log review and update Verification and Validation Report(s) Assess Security related training Operation and Maintenance Manuals
CONSTRUCTION AND INSTALLATION	8. Installation	SSeAP Update Validation Report(s)
TESTING & COMMISSIONING	9. System Validation	Security Audits (Internal and 3rd party) Conduct Emergency Training and Drills
HANDING OVER	10. System Acceptance	Threat Log and Risk Log review and update

PROJECT PHASE	EN 50126 LIFECYCLE PHASE	PROJECT CO SECURITY TASKS
OPERATIONS AND MAINTENANCE OBJECTIVES	11. Operation and Maintenance	Review and update Threat Log and Risk Log Transfer and implement SSAP for Operations Update Operations and Maintenance Manuals Conduct Emergency training and drills Security Audits (Internal and 3rd party)
	12. Performance Monitoring	No Security deliverables required unless assumptions found to be invalid.
	13. Modification and Retrofit	Review and update Threat Log
	14. De-commissioning and disposal	To be assessed at time of de-commissioning (Threat Log review and update)

8.7 Security Activities and System Testing

- (a) Project Co shall follow the Security Management System when conducting the Security activities, listed in Table 1-8.1 above, along with the respective standards listed therein. The agreed upon design countermeasures identified within the TVA and the corresponding Threat Log and Risk Log shall be incorporated.
- (b) Security Review Documentation - Project Co shall include a matrix in the SeVM (output from the Threat Log and Risk Log) addressing Security tests, which shall receive the concurrence by signature of the responsible person as defined by Project Co's organization chart. The matrix shall identify Security parameters and/or other Security considerations and a cross-reference to the test following the Review Procedure outlined at Schedule 10. This matrix shall be kept current throughout the Project lifecycle and shall include the identification of the test reports, which confirm verification of the Security requirements.
- (c) Security Systems
 - (i) Project Co shall comply with the Security requirements to support systems as outlined in the references below:
 - A. 2.3 LRT Systems Design Submission – Schedule 3 Part 1 Tech Sub Requirements;
 - B. Schedule 15-2, Part 3, Article 4 – Public Address System/Passenger Information Display System;
 - C. Schedule 15-2, Part 3, Article 7 – CCTV System; and,
 - D. Schedule 15-2, Part 3, Article 10 – Signalling and Train Control System.
- (d) System Security Certification Process
 - (i) Project Co shall conduct System Security Certification process using a minimum of the five steps outlined below:

- A. Identification of Certifiable Elements and sub-elements;
 - B. Identification of Security requirements for each Certifiable Element and sub-element;
 - C. Verification and/or validation of Security requirements;
 - D. Tracking, review, update and documentation of certification tasks in Security Certification Checklists; and,
 - E. Issuance of Certification for Certifiable Element or Sub-Element's conformance to all associated Security requirements
- (e) Witness point
- (i) Witness point selection is a City responsibility with the purpose of defining selected points or locations where the City wishes to formally witness testing. Project Co shall be responsible for scheduling and performing the tests that include those City-selected points; and, for notifying the City at least 14 Business Days in advance of the date and time of the test. Notification procedures shall be established prior to witness point testing, scheduling or performance. Selected areas shall include items of high risk, where concerns of compliance have been raised, or those selected by random sampling. The City shall have the right to attend and witness any and all testing that takes place.
- (f) Security systems tests
- (i) Project Co shall verify that Security systems function in accordance with promulgated specifications. All Security systems tests shall be included in the test program plan contained within its own section. The respective Security systems tests and results shall be documented within test reports. Security systems tests shall include, at a minimum:
 - A. An initial Security system testing conformance checklist shall be prepared for the design level of the Project Agreement documents. Project Co shall update the Security systems testing conformance checklist and submit it for review. Project Co shall verify that Security systems tests identified in the specifications and other Project Agreement documents are successfully performed and the completed tests have been verified within defined test parameters and the systems and Subsystems function safely as specified, do not contain or create unforeseen vulnerabilities, and contain specified Security features. All requirements on the checklists shall be verified and submitted to the City for review;
 - B. At a minimum, each of the identified Security requirements for a Security system shall be simulated and tested to verify and certify performance in normal modes and associated sequences and the Failure modes and effects, as applicable. These tests shall demonstrate the Security systems requirements stated herein have been met. Should the Security systems testing identify any issue, they shall be listed in the Security systems test reports, indicating remediation and corrective action necessary. All remediation and corrective actions required by Project Co shall be completed within fourteen calendar days and documented in a Non-Conformance Report to ensure traceability. All remediation and corrective actions shall be

completed prior to the completion of the Works and pre-revenue testing and training. Project Co shall audit all tasks.

- C. Security Systems Testing Documentation - Security Systems testing shall be separately identified to allow recognition of Security systems tests. Project Co shall include a matrix in the SeVM (output from the Threat Log and Risk Log), addressing Security tests only, which shall receive the concurrence by signature of the responsible person as defined by Project Co's organization chart. The matrix shall identify Security parameters and/or other considerations and a cross-reference to the test. This matrix shall be kept current throughout the Project lifecycle and shall include the identification of the test reports which confirm verification of the Security requirements. The references to the Security Systems tests along with reports shall be checked before every submission to ensure that there have been no revisions or modifications.
- D. Notification - Project Co shall notify the City in writing thirty calendar days prior to the start of any Security systems test. If any of the data indicate conditions which could potentially result in lack of proper protection of operations, Project Co shall immediately indicate proposed remedies and/or corrective actions.
- E. Scheduling - All Security tests shall be successfully completed by Project Co prior to system or equipment acceptance.
- F. Security Test Reports - Project Co shall ensure test reports which contain verifications shall receive the concurrence, by signature, of the responsible person, defined by Project Co's organization chart. Security systems reports shall be referenced within the SeVM to demonstrate compliance.
 - i. Project Co shall report any non-compliance/non-conformance with Applicable Codes and regulatory requirements noted as a result of Security systems testing. All non-compliances shall be rectified in accordance with Applicable Codes and regulations.

(g) Security training and drills

- (i) Project Co shall be responsible for proper coordination and successful completion of this task. They shall participate and provide support as defined herein. The purpose of the training and drills verification process is to verify that key Security systems training on new equipment and procedures is adequate and appropriate for the tasks performed under typical and Emergency conditions. Project Co shall schedule, arrange, invite participants, provide equipment, and set up locations for drills to occur. Where indicated elsewhere herein, Project Co shall also provide instructors to assist in performing the training in Security.
- (ii) Verifying Security system operation through drills and exercises is an integral part of the Security Systems process. The methodology employed by the training/drill/exercise process is to obtain written verification from the City that:
 - A. Training and drills are adequate and appropriate for the assigned task, and contain instructions on Security features for typical and Emergency conditions;

- B. Lessons learned from training and drills are performed, reviewed and documented to identify threats, vulnerabilities, or open Security issues have been resolved; and,
 - C. Known issues concerning training and drills, which impact on Security, have been satisfactorily resolved.
- (iii) Security information on conformed methods and procedures necessary to maintain Security conditions shall be generated by Project Co and included in a Security Training Program, to be provided by Project Co, for Security training consideration of construction, operations and maintenance personnel. At a minimum, each of the Security training requirements shall be included in the training program and associated documents.
- (h) Project Co shall be responsible for establishing and maintaining a Threat Log and Risk Log to record and track Threats and Risks for resolution. The Threat Log and Risk Log shall describe all identified threats, the measures taken to resolve each threat (references citing document, revision, section number) and the results of reviews, comments and approvals by the City and other outside agencies. All Threats and Risks shall be tracked through to resolution. Project Co shall submit the most current copy of Threat Log to the City for review upon request. After all tracked Threats and Risks are resolved, Project Co shall prepare a SeVM and submit in accordance with Schedule 10 – Review Procedure.
- (i) FLS
- (i) Project Co shall be responsible for compliance with FLS requirements included in federal, provincial, local codes and regulations, and the Project Agreement. Project Co shall incorporate these requirements into the design and construction of the Project and include all applicable FLS elements in the appropriate SeRTM.
 - (ii) Project Co shall support the approval process by participating in reviews, inspections and technical discussions between the City and local jurisdictional authorities and other Governmental Authorities, and incorporating the resulting agreements into the design and construction. Project Co shall be responsible for verifying that Project Co's completed design complies with the resolutions of FLS issues, and is acceptable to the applicable Governmental Authorities.
 - (iii) Certificates of Conformance shall be signed as certified by the Project Co SeCM and signed as approved by the Project Co's Technical Director and submitted to the City as per Schedule 10 – Review Procedure.

8.8 Format for Security Verification Matrix

- (a) Project Co shall provide an SeVM in the following format, noting that this should be an output from the Threat Log and Risk Log:
- (i) Item Number;
 - (ii) Security requirement;
 - (iii) Document reference:

- A. Document name; and,
 - B. Article number;
- (iv) Evidence:
- A. Method of verification by Project Co;
 - B. Method of validation by audit team;
 - C. Validated by (name of auditor);
 - D. Date; and,
 - E. Remarks.
- (b) SeRTM
- (i) Project Co shall develop SeRTM for the Project. It shall be used to verify and certify that the Security requirements have been incorporated in the design and certify that all Security requirements of the design are constructed and/or installed in accordance with the Project Agreement.
- ## **8.9 Construction Site Security**
- (a) The information provided in this section is intended to establish the minimum requirements to be satisfied in the development of a Construction Security Plan for this Project. Project Co's Security Management Plan shall establish the procedures required to provide the Security measures necessary to achieve Site Security.
- (b) The following issues shall be addressed in the Construction Security Plan and with the processes established by the Project Co, in consultations with City authorities:
- (i) Project Co shall be responsible for providing Security control capability for the physical Sites throughout all phases of the Project. The physical Security plan shall incorporate identifiable elements of protection, detection, and response capabilities. The Security measures shall be aligned to ensure identifiable Security perimeters are established and access controls to and monitoring of the secured areas are established and achievable for the life of the Project.
 - (ii) Adequate Security safeguards shall be established to ensure the protection of the Sites is provided on a continuous basis for the life of the Project. The measures shall be sufficient to mitigate incursion to the Sites.
 - (iii) Policies and procedures shall be developed and implemented to ensure that any Site Security force is appropriately trained and prepared to provide initial response to Security incidents.
 - (iv) The Construction Security Plan shall provide flexibility in the Security approach to permit adjustments to the Sites as the Project develops. This is to allow Project Co to shift the Site perimeters as needed to meet construction schedules.

8.10 Emergency Service Personnel Preparedness

- (a) Project Co shall provide support to the City in the review and update of Emergency response procedures in a timely manner to enable ESP to be ready for Revenue Service. This support shall include:
- (i) Review and update of current Emergency response procedures;
 - (ii) Development and delivery of up to three Train the Trainer sessions for 20 Emergency response trainers for each session;
 - (iii) Provision familiarization training session and tours on Stations, Guideway, New Walkley Yard, Trains and Systems for ESP and supporting teams;
 - (iv) Development and delivery of up to five tabletop exercises of up to 50 ESP each to address specific topics and issues as designed by the City;
 - (v) Delivery of content to update the City of Ottawa in-house Emergency Responder software related to Confederation Line Extension, which for clarity includes quick references information for first responders such as floor plans, extinguisher locations, stairs, access points, etc.; and,
 - (vi) Development and delivery of a full scale exercise to include all City ESP to validate Emergency response procedures.
- (b) Project Co shall provide support to the City for familiarization training of ESP Trainers on functionality of ESP Systems to include:
- (i) CCTV;
 - (ii) ETELs;
 - (iii) FTELS;
 - (iv) AEDs;
 - (v) GIDS;
 - (vi) ICP;
 - (vii) Train lifting equipment;
 - (viii) PA;
 - (ix) Tunnel ventilation; and,
 - (x) IAC.

8.11 ESP Training

- (a) Project Co shall provide training programs, with special emphasis on ESP responsibilities, for all City ESP to enable a Train the Trainer Emergency response program.

8.12 Emergency Response Plan

- (a) Project Co shall implement procedures designed to provide for a safe environment throughout the Project Term and provide to the City. The ERP shall include the required scenario analyses with an incident command hierarchy between ESP and demonstrate in detail how Project Co shall respond to and recover from the occurrence(s) of catastrophic natural and man-made disasters detailed in the PHA and subsequent Safety analysis. The ERP shall be consistent and in accordance with all Applicable Law governing Emergency planning, response and recovery. The plan shall be prepared with the involvement of and input from all applicable ESP and City personnel.

- (b) Project Co's new ERP, as a minimum, shall include the following:

(i) Emergency Response Policy Statement;

- A. The Emergency response policy statement shall clearly articulate the purpose of the ERP; scope and applicability of the ERP; and the methodology utilized to develop and implement the ERP. The Emergency response policy statement shall be communicated to all Project Co Parties and shall be reviewed, as a minimum, and coordinated annually with all ESP and City to ensure it is current.

(ii) Situation Analyses;

- A. The ERP shall be based upon an analysis of the potential Emergency situations specific to this Project.

(iii) Planning Assumptions;

- A. A section describing and indicating the basic planning assumptions upon which the ERP is based. It shall include lead times, effects of Emergencies, when and how an Emergency is to be declared, what outside assistance is available and the conditions under which an evacuation may be required.

(iv) Response Capabilities; and,

- A. A section describing the current response and recovery capabilities of Project Co, which shall summarize the basic capabilities both in-house and from outside sources to deal with response and recovery issues. It shall contain a general description of how resources are currently managed and deployed. It shall also identify shortfalls in response capabilities and strategies to resolve these shortfalls.

(v) Critical Facilities.

- A. Identification of Critical Facilities of Project Co, providing the System name, address, contact person, property classification, primary Emergency function, the

secondary Emergency function, the primary or normal use, the priority for power restoration and the Emergency power requirements. A location map indicating the location of all Critical Facilities shall be included in this section.

(c) System Management Polices

- (i) This section shall address the current management policies and practices regarding the major factors that can have an impact on the Operation of the Expanded Trillium Line. Copies of all written policies and procedures shall be included in an appendix to the plan.
- (ii) This section shall contain, at a minimum, a discussion of the following factors:
 - A. Surveillance and Incident detection;
 - B. Interdepartmental dependency and communication;
 - C. Information dissemination;
 - D. Traffic Incident management procedures;
 - E. Interface with the TOCC, the City, Confederation Line and bus Operations;
 - F. Public information and notifications; and,
 - G. Business impact and interruption.

(d) Project Co Expanded Trillium Line Resources

- (i) Project Co shall provide a listing and description of the resources that the City and Project Co have available on a day-to-day basis and a listing of Project Co Parties or outside resources that are available on an on-call or contract basis. Project Co shall also include a listing of all vehicles and equipment owned, leased or available on-call by Project Co.

(e) Day-To-Day Functions and Responsibilities

- (i) Project Co shall provide details on how the various responsibilities and specific parties are organized and managed with respect to Emergencies.

(f) Basic Operations

- (i) Project Co shall provide an overview of the basic operational approach to Emergency situations. Specific details and descriptions of the response organization and assign specific tasks to the agencies and organizations that may be involved in responding to an Emergency. It shall be used by Project Co to guide and direct the development of functional and Emergency specific annexes that provide specific direction and responsibilities for various types and magnitudes of incidents.

(g) Functional Annexes

(i) The functional annexes section of the ERP shall provide specific information and direction and shall focus on Operations of the Expanded Trillium Line. These annexes shall emphasize responsibilities, tasks and Operational actions that pertain to the specific functions. These annexes shall clearly define and describe the policies, processes, roles and responsibilities inherent in the various functions before, during and after any Emergency situation, including how each agency and Project Co shall perform each of the functions. An annex shall include information on the following:

- A. The purpose of the function;
- B. A description of the situations that trigger implementation of the function;
- C. A description of the assumptions that apply to the function;
- D. The concept of Operations for the function; and,
- E. Assignment of responsibility for annex Maintenance, review and updating.

(h) Emergency Specific Annexes

(i) The Emergency specific annex section of the ERP shall describe and offer a means of extending functional annexes to address special and unique response procedures, notifications, protective actions and other needs generated by a specific incident. Emergency specific annexes shall follow the same structure and similar content as the Basic Operations and Functional Annexes description above.

(ii) The following specific Hazards shall be addressed:

- A. Major traffic accidents and/or incidents;
- B. Hazardous material incidents;
- C. Nuclear or radiological incidents;
- D. Terrorism incidents;
- E. Earthquake;
- F. Biological incident;
- G. Weather related events;
- H. Railroad incidents;
- I. Structural or Tunnel fires;
- J. Structural Failure;
- K. Electrical power incidents; and,
- L. Other Utility incidents.

(i) Recovery Annexes

- (i) The recovery annex section of the ERP shall address the methodology and processes that shall be implemented during the recovery process and shall include, at a minimum the following:
 - A. Identification of the agencies with responsibility for recovery efforts;
 - B. Establishment of the documentation and record keeping requirements following the disaster event;
 - C. Establishment of the initial post disaster priorities and responsibilities (0-12 hours);
 - D. Addressing of human needs; and,
 - E. Developing and addressing mitigation strategies.
- (ii) The recovery annex section of the ERP shall be updated based upon lessons learned from specific incidents

(j) Training and Exercises

- (i) This section of the ERP shall identify and address the specific training program(s) and exercise schedule(s) for Project Co. It shall address, at a minimum, the following:
 - A. Types of training required for each Project Co Party involved in a particular incident;
 - B. A specific annual training program and schedule for each Project Co Party so identified; and,
 - C. Establishment and implementation of the exercise and training program(s) that provides both table-top and full scale training exercises based upon the potential Emergencies to which the Expanded Trillium Line System is exposed.
- (ii) Project Co shall maintain detailed records of all training exercises and drills including identification and tracking of follow-up actions.

(k) ERP Update

- (i) The ERP shall be updated as required throughout the Maintenance Period.

ARTICLE 9 PROJECT OFFICE

9.1 General Requirements

- (a) Project Co shall provide climate controlled offices, at pre-determined, locations set out in Table 1-9.1 along the active construction Sites of the Project alignment for City use.

TABLE 1-9.1: SITE OFFICE LOCATIONS AND SIZING

Site Office Locations or within 100 metres	Required Size (based on two offices and one meeting room per location)
Gladstone Station	28 m ²
Carleton Station	28 m ²
Uplands Station	28 m ²
Leitrim Road	28 m ²

- (b) With reference to the above Table 1-9-1, unless otherwise specified, Project Co shall locate the Site Offices on mobilization Sites as per Schedule 33 - Lands.
- (c) Project Co shall supply a trailer Site for the City of Ottawa management staff at the following locations: Gladstone Station - 18692-PRP_041, Parcel 1; Carleton Station - 18692-PRP_046a, Parcel 8; Uplands Station - 18692-PRP_016b, Parcel 2; and Leitrim Road - 18692-PRP_003a, Parcel 3.
- (d) Project Co shall ensure that Site Offices shall be compliant with COADS, have entrance/exit signs and lighting and meet the requirements of the Ontario Codes and Guides for Buildings; Fire; Sewage; Plumbing and Electrical and the MOL and WSIB.
- (e) Project Co shall be responsible for all Maintenance and Operational costs in association with Site Offices for the duration of Project Co's occupancy of the Lands.
- (f) The Site Offices shall include the following:
- (i) a secure climate controlled, Site Office area, including all improvements and fixturing costs and all required furniture as per the City standards.
 - (ii) Site Office accommodations include; one meeting room capable of holding 4-6 persons and required connections for laptop display; one restroom, one large heavy duty shredder and kitchen amenities such as counter, sink and storage, small bar fridge, microwave, kettle, coffee machine, storage space for supplies and personal protective equipment;
 - (iii) secure door with controlled access that is only accessible by the City. Signage at each Site Office identifying the occupant and indicate a telephone number in case of Emergency;
 - (iv) cleaning service agreements and costs for daily services of Site Office including rubber entrance mats, commercial grade and bristled scraper type boot cleaners;

- (v) voice and data cabling evaluation and installation costs, with specific location for outlets and all other requirements to be agreed in consultation with the City;
- (vi) equipment such as computers, monitors, keyboards and mouse, phones, printers, copiers and fax machines, polycoms, will be provided and maintained by the City;
- (vii) selection and costs related to the provision of data and voice services will be provided by the City;
- (viii) office supplies and stationary will be provided by the City;
- (ix) temporary buildings and trailers shall be removed upon completion and areas restored to match existing surrounding areas by Project Co; and,
- (x) two reserved parking spaces for the City exclusive use at each Site Office and Maintenance of parking spaces, sidewalks and paved areas at and adjacent to the Site in a safe condition.

ARTICLE 10 CONSTRUCTION SAFETY MANAGEMENT

10.1 General Requirements

- (a) The CSMP shall be in accordance with the criteria contained in this Article and all Applicable Laws, Codes and Standards.
- (b) The CSMP shall be prepared and submitted in accordance with Schedule 10 – Review Procedure. Project Co shall coordinate with Governmental Authorities to ensure existing Maintenance and Safety plans are not violated.
- (c) Project Co shall have an active WSIB account in good standing and shall make available a valid Clearance Certificate from the WSIB, upon request.
- (d) The construction planning for this Project shall consider the existing operations of the City and OC Transpo, and the impacts to the street network within the City, as well as considering adjacent residences, landowners and businesses, with respect to pedestrian and property access and other environmental impacts.

ARTICLE 11 SYSTEMS INTEGRATION PROGRAM

11.1 General Description

- (a) As the systems integrator on the Expanded Trillium Line Project, Project Co shall establish and maintain a systematic, documented, comprehensive, and verifiable systems integration process based on the IEC 15288 standard (Systems and software engineering -- System life cycle processes) to be applied throughout the duration of the Project beginning with requirements management, concept development, design, procurement, manufacture, implementation, integration and testing, through successful commissioning. This process shall ensure that interfaces and interaction between infrastructure, facilities, subsystems, software, and Operations and Maintenance personnel have been identified and engineered to function together as a system. At a minimum, Project Co's system integration effort shall systematically identify and formally document all human interfaces with the elements of the System and all interfaces with external systems. External systems interfaces include other facilities, existing systems, existing facilities, traffic, communities, and other agencies affected by the Project. Project Co shall define methods to confirm compatibility between System elements, and perform the necessary tests or other verification to demonstrate that every element functions and performs properly, both individually and as part of the complete System. As the systems integrator, Project Co shall provide all required resources, work processes and management authority to exercise control over the planning, scheduling, co-ordination, prioritization, and delivery of the works in order to mitigate foreseen systems integration risks, secure successful Project completion and deliver an operationally resilient railway into Project service.
- (b) In the course of complying with the provisions of this Project Agreement, various physical and functional interfaces of both the City's and Project Co's equipment may depend on facilities, equipment, or services of organizations not under with the City's or Project Co's control for successful Operation. The majority of interfaces exist within the Project Agreement between the City and Project Co and its consultants, subcontractors, and suppliers, while the remaining interfaces exist between new and existing facilities and equipment furnished by the City and with other third parties such as Utility companies and Third Party Contractors. It is necessary that all interfaces be identified, coordinated and controlled by Project Co to assure the design at the interface is understood and agreed to by affected parties. Any changes to one side of the interface shall be accepted and accommodated by the opposing interface.
- (c) This Article addresses the interfaces between each of the system elements and the system elements with the infrastructure, facilities, services, system information, or other work being provided by Project Co or others (including the City). This Article is not intended to provide Project Co with a detailed description of all such interfaces; rather, it is a broad description focused on general interface areas and the systems integration needs of the project. Project Co shall inspect the related work, review the drawings and documentation provided by the City, and coordinate with the City to identify and successfully comply with all interface and integration requirements in order to perform all of the work required to complete the Project as defined in broad terms throughout the Project Agreement.
- (d) The City shall integrate the Expanded Trillium Line's Communications Systems into the existing head-end management platform at the TOCC and BCC. The City shall also integrate the new CTS equipment in to the existing Confederation Line's NMS.
- (e) The City will assign a Systems Integration Verifier to review and provide confirmation of the successful completion of the systems integration work related to the communication integration at

the TOCC and BCC. The Systems Integration Verifier will also act as adjudicator in a fast track dispute resolution procedure to resolve any disputes as to the source of the inability to successfully complete integration of the communication system at the TOCC or BCC.

- (f) During the design phase, the Systems Integration Verifier will review and comment on the Expanded Trillium Line's Systems integration design for the communications system and associated integration documents.
- (g) During the installation, testing, and commissioning phases, the Systems Integration Verifier shall review and comment on the communications; (i) integration, test and commissioning plans, (ii) traceability documents, and (iii) test procedures.
- (h) The Systems Integration Verifier shall review and comment on the Project Co's Testing and Commissioning Plan as it relates to the communications systems.
- (i) Project Co, as the Systems Integrator shall develop the necessary Systems Engineering Management Plans, produce the integration test, produce the SIMP, produce the SIT schedule, manage the interface working groups, identify and coordinate all necessary resources required to successfully execute SIT and commissioning of the upgraded head-end management platform for all of the Trillium Line's Communications Systems. These tests shall be executed via the upgraded GUI on the existing Confederation Line's operator workstations in the operational theaters at the TOCC and BCC. Project Co shall provide personnel to coordinate (between operators and field personnel) and witness the test execution from the TOCC and BCC.
- (j) Project Co shall design, procure, install, integrate, test and commission the new head-end management platforms for the new S&TCS and the new TVS. Project Co shall identify, develop, track, test and validate all interfaces between the new S&TCS and the new TVS.
- (k) System Integration Manager
 - (i) Project Co shall appoint a Systems Integration Manager to perform the Systems Integration obligations of Project Co. The Systems Integration Manager shall have the qualifications as set out in Schedule 9 – Key Individuals.

11.2 Systems Integration Submittals

- (a) Project Co shall produce a SEMP, a RMP, a Verification and Validation Plan, an EMC Control Plan, a SIMP and a preliminary Systems Interface Matrix within 60 calendar days following Commercial Close. The City as the Operator will develop a Concept of Operations, while Project Co shall develop a Concept of Maintenance. These and other plans shall be submitted in accordance with Schedule 10 – Review Procedure.
- (b) Project Co shall manage requirements throughout the Project using an object orientated requirements tool (e.g. DOORS), to confirm traceability of requirements from the source through to closure. Project Co shall make available to the City the output of the Requirements Management Plan tool at design reviews and throughout the Project on request.
- (c) The Interface Matrix shall address the interface of the System with itself, the communications systems head-end, the CTS integration at Bayview Station, the ROW, the existing railway systems at Walkley and Ellwood Diamonds and any infrastructure contained therein; any

adjoining facilities; electric, telephone, gas and other Utilities; the City's water and sewer systems; the City's Fire and Police Departments; and any facility not provided by Project Co but which is used by Project Co for the System. The SIMP shall also address integration of the fare control, communications systems, Existing Vehicle Fleet and New Vehicle Fleet, and new S&TCS.

- (d) This SIMP and Interface Matrix shall provide the procedure by which each interface shall be defined, agreed upon and controlled. The SIMP shall contain a responsibility matrix identifying what entity is responsible for controlling the specific elements of the project. The SIMP shall be submitted to the City for review and approval. Updates to the SIMP and Interface Matrix shall be provided by Project Co when significant schedule or Project changes are made.
- (e) Project Co shall coordinate and integrate all System interfaces so that the System is properly integrated with itself and into the Project area, including the ROW, the surrounding communities, and all facilities, equipment, and systems provided by others. This integration effort is critical to allow public and commerce activities to continue with minimal interruption throughout the construction, installation, testing, and commissioning phase of the Project.
- (f) The SIMP shall list all major System elements and define which elements have a direct or indirect interface or interaction. The SIMP shall, as a minimum, define:
 - (i) The entity within Project Co's organization responsible for managing and engineering the integration or interface.
 - (ii) The agreed integration or interface arrangement (physical installation, power supply, signal levels, transfer characteristics, and other factors).
 - (iii) The functional, performance, Reliability, Maintainability, and Safety requirements of the individual elements forming the integration or interface.
 - (iv) The proposed method and schedule for verifying the interface integrity, the individual element performance, and the combined integration or System performance, with appropriate pass/fail criteria for each.
 - (v) The main elements that will be demonstrated through integrated testing.

11.3 Interface Control Document & Systems Interface Matrix

- (a) ICD shall be developed for specific interfaces as defined within the SIMP and managed by Project Co. Contents of these ICDs shall expand as the interface details are developed through the design reviews. Each design submittal and ICD shall be subject to Configuration Management. The ICD shall be developed by Project Co and submitted to the City for review and approval in accordance with Schedule 10 – Review Procedure. Contents in these ICDs shall be maintained current throughout the Project Agreement period Project Co shall be responsible for coordinating all aspects of the system design and the integration of the SI with all other Expanded Trillium Line systems and subsystems as required including Vehicles. The civil infrastructure shall be inclusive of the design of the Stations, Guideway (elevated, at grade exclusive & semi exclusive ROW), Tunnels, Bridges, viaducts, overpasses, underpasses, New Walkley Yard and the TOCC.

- (b) A systems interface register shall be used to track each interface identified within the interface matrix and their relationships, bringing forth the issues that are critical to proper systems integration. The interface register shall be updated throughout the Project Agreement. Periodic reports are processed from the systems interface matrix and distributed for information.
- (c) Project Co shall be responsible for identifying and resolving all system interfaces which contribute to successful achievement of the overall System performance requirements or other Project Agreement requirements. A preliminary list of interfaces to be addressed includes:
 - (i) Track/Vehicle; Wheel/Rail;
 - (ii) Vehicle/Facilities;
 - (iii) Vehicle/Station Platform;
 - (iv) Vehicle/Train Control/Signaling;
 - (v) Vehicle/Wayside Communications;
 - (vi) Vehicle/Operator;
 - (vii) Vehicle/Vehicle;
 - (viii) Stations/Signaling;
 - (ix) Stations/Power;
 - (x) Stations/ SCADA;
 - (xi) Stations/Track;
 - (xii) Stations/Fire detection;
 - (xiii) Stations/Communications;
 - (xiv) TOCC/Signaling;
 - (xv) TOCC/SCADA;
 - (xvi) TOCC/Fire detection;
 - (xvii) TOCC/Communications;
 - (xviii) Existing systems/new systems;
 - (xix) Corrosion Control/Wheel/Rail; and,
 - (xx) Train Control/Tunnel Systems.
- (d) The SIMP shall list all major System elements and define which elements have a direct or indirect interface or interaction. The SIMP shall, as a minimum, define:

- (i) The entity within Project Co's organization responsible for managing and engineering the integration or interface.
 - (ii) The agreed integration or interface arrangement (physical installation, power supply, signal levels, transfer characteristics, and other factors).
 - (iii) The functional, performance, Reliability, Maintainability, and Safety requirements of the individual elements forming the integration or interface.
 - (iv) The proposed method and schedule for verifying the interface integrity, the individual element performance, and the combined integration or System performance, with appropriate pass/fail criteria for each.
 - (v) The main elements that will be demonstrated through integrated testing.
- (e) Project Co shall add other integration or interfaces as the design and system integration process proceeds.
- (f) The following provide additional requirements on the contents of the Systems Integration Program:
- (i) If Project Co fails to provide necessary interface information, or if such information provided by Project Co is incorrect or subsequently changed, Project Co shall be responsible for all facility and equipment redesign and rework, whether the impacted facility and equipment are the responsibility of Project Co or others, or for modifying its Works or any Project Co provided subsystem to match the facility, or for modifying any facility, systems, or subsystems to match systems or subsystems provided by Project Co. Project Co shall also be responsible for any delay to others caused by delaying the furnishing of information, by furnishing incorrect information, or by subsequently changing information for which Project Co is responsible. Project Co shall notify the City immediately when any interface information changes or is found to be incorrect.
- (g) Project Co shall plan, schedule, and lead coordination meetings and finalize all interfaces as required. Updates of the SIMP shall be provided by Project Co whenever significant changes are made to the Works or the Project Works Schedule.
- (h) Design of all elements of the various system designs shall be developed to operate reliably in the environment in which they are installed. Project Co shall design all systems elements to integrate with the environmental conditions present including ambient temperature range, humidity, precipitation and other environmental factors that will impact Operation.
- (i) Failure to list interfaces between systems does not absolve Project Co of their responsibility for integration of the System.

11.4 Design and Coordination Elements

- (a) Preliminary listing of design elements and required coordination are provided below
- (b) Revenue Vehicles;

- (i) Project Co shall develop all designs to accommodate the New Vehicle Fleet and the Existing Vehicle Fleet. Typical coordination elements between the SI and the Vehicle are:
- A. Vehicle dimensions shall be coordinated with the Guideway design;
 - B. Vehicle weight shall be coordinated with the Guideway design and selected Vehicle;
 - C. Guideway and alignment design shall be developed to meet the requirements of the braking and propulsion system;
 - i. Project Co shall coordinate with the Vehicle manufacturer to ensure that any limitations (thermal or other) are consistent with Vehicle needs;
 - D. the System Track infrastructure design shall be coordinated with the Vehicle wheel/rail interface criteria;
 - E. Vehicle dynamic and static envelopes for Guideway clearances shall be coordinated with the Guideway design, SI design, and selected Vehicle;
 - F. Vehicle to Platform interface including:
 - i. Vehicle door threshold height above top of rail to Platform edge; and,
 - ii. Platform lateral gap to Vehicle door threshold shall be provided for accessibility as well as to maximize Station pass through speed;
 - G. coordination and integration of Vehicle borne elements of the communications and signals systems with the Vehicle suppliers;
 - H. Project Co designed onboard elements including S&TCS and communication systems shall be EMC/EMI compliant with the Vehicles; and,
 - I. Track Design shall coordinate with the Vehicles to ensure that noise and vibration requirements are in conformance with Schedule 15-2, Part 8 - Vehicles.

(c) S&TCS

- (i) Project Co shall coordinate the systems elements and Vehicle between Project Co and the Vehicles supplier for interface design, spacing, mounting and functioning of system elements within the Vehicles.
- (ii) Project Co shall coordinate the systems elements and the Vehicle between Project Co and the Vehicle suppliers for installation and commissioning of on- board equipment.
- (iii) Project Co shall coordinate the integrated testing of equipped Vehicles in all types of ROW throughout the System.

(iv) Project Co shall coordinate the location and mounting of the trackside access points, the location and mounting of termination points, and the cable routing to the signal equipment including:

- A. locations of S&TCS duct banks along the ROW to support system installation;
- B. locations of S&TCS equipment and conduit interfaces throughout Expanded Trillium Line; and,
- C. location of duct banks and conduit interfaces.

(d) Communications systems

(i) Project Co shall coordinate the location and mounting of elements noted below, routing of cabling to each element, termination of cabling to each element, and routing to the main communications equipment either in an equipment room or cabinet including:

- A. quantity and sizing of ducts within communications duct banks and conduits;
- B. CTS;
- C. SCADA system elements;
- D. PA/PIDS elements;
- E. Radio elements;
- F. CCTV system;
- G. T&I system;
- H. all communication systems control equipment;
- I. IAC system elements;
- J. FLS System elements; and,
- K. Power provisions for a fare collection machines and ticket gates.

(e) Trackwork

(i) Project Co shall coordinate the integration of the Track to meet the needs of the Expanded Trillium Line with the existing and new civil interface as well as with other elements including:

- A. Track form shall be developed to adhere to the requirements of the Vehicles as specified in Schedule 15-2, Part 8 - Vehicles;
- B. Track form shall be developed to comply with the noise and vibration requirements set out in Schedule 15-2, Part 2, Article 3 – Trackwork;

- C. Track form shall be developed to integrate along the ROW and to maintain required clearances along the ROW considering:
 - i. use of ballasted, direct fixation, embedded and other Track forms shall ensure that no unsafe condition exists due to physical interferences with required Vehicle clearances and surrounding infrastructure;
 - D. bonding, insulated joint requirements, and associated cables, conduit, and duct banks shall be identified in conjunction with the S&TCS as well as the communication systems;
 - E. electrical design related to the location of powered wayside Track equipment and electrical outlets along the ROW to support Track Maintenance activities;
 - F. wayside Track equipment includes switch machines, switch element heaters, switch blowers, rail lubricators, and associated cables, wires, conduit, and duct banks;
 - G. Operational requirements to identify special Trackwork locations and configuration, high rail wear locations and superelevation;
 - H. civil, structural and geotechnical disciplines to determine Track Drainage interface with municipal sewers, Roadway requirements, rail expansion accommodation and Emergency Guard Rail requirements on elevated structures, reinforcing steel requirements, Track foundation type and characteristics; and,
 - I. provisions for protection where required in areas of special Trackwork to allow for Vehicle Operators of short-turn or stored trains, to disembark and walk to opposite end of train, without facing Hazards of adjacent traffic and Vehicle flow in opposite direction.
- (f) Corrosion control system
- (i) Project Co shall be responsible for development of an overall approach to corrosion control. Project Co shall coordinate corrosion control designs with the following:
 - A. Track systems to identify the location and typical arrangement for any corrosion control mitigation equipment;
 - B. Utility Companies to identify sensitive Utilities that may require relocation and/or protection; and,
 - C. locations of monitoring and measuring points.
- (g) Non-Revenue Vehicles
- (i) Project Co shall coordinate all Non-Revenue Vehicles with the following:
 - A. Non-Revenue Vehicle dimensions shall be coordinated with the Guideway design and selected Non-Revenue Vehicle type;

- B. Non-Revenue Vehicle weight shall be coordinated with the Guideway design and selected Non-Revenue Vehicle type;
 - C. the wheel/rail interface criteria shall be coordinated with the Guideway design and selected Non-Revenue Vehicle type; and,
 - D. Non-Revenue Vehicle dynamic and static envelopes for Guideway clearances shall be coordinated with the Guideway design.
- (h) Emergency Services
- (i) Project Co shall coordinate with Emergency services to develop trackside elements in the areas of the Guideway required for ESP access including:
 - A. Track construction type;
 - B. special Trackwork layout and equipment protection;
 - C. CTS and S&TCS trackside equipment location; and,
 - D. any additional information to accommodate access with Emergency Services.
 - (ii) Project Co shall ensure that any trackside element placed within the Guideway is designed to withstand the worst case loading of an Emergency vehicle.
- (i) Third Party Facilities and systems work
- (i) Project Co shall coordinate all work that requires modification, extension, replacement, or temporary re-configuration of any existing third party infrastructure with the impacted third party.
 - (ii) Any modification, update, or new construction to be operated and maintained by others, including the City, shall be performed in compliance with that agencies existing design criteria, requirements, and manuals or as specifically identified in this Schedule 15-2 – Design and Construction Requirements.

ARTICLE 12 OPERATIONS TRAINING

12.1 Operations Training Curriculum and Materials

- (a) Project Co shall be responsible for the development of all Operations Training Programs referenced in this Article, including training curriculum and materials. Training programs developed by Project Co shall follow the City's standard for training materials and suitable adult education training material standards.
- (b) The City shall be given an opportunity to review the curriculum and all training materials associated with any of the operations training programs referenced in this Article. Project Co shall be responsible to submit all documentation associated with any of the training programs referenced in this Article to the City at a minimum six months prior to the specific training program's commencement in accordance with Schedule 10 – Review Procedure and Schedule 12 – Works Scheduling Requirements.
- (c) Training programs shall be subject to review by the City, in accordance with Schedule 10 – Review Procedure. During the six month interval between the submission of the training program and the commencement of training, the City shall review and suggest changes to any of the material that is submitted. Suggested changes to the training programs shall be incorporated prior to the commencement of training. In addition, Project Co shall abide by the provisions of Schedule 14 – Testing and Commissioning, Clause 1.5 (d). The review of the training curriculum and materials apply to programs provided by Project Co Trainers, in addition to those programs provided by the City or other designated individuals.

12.2 OC Transpo Operator Training Simulator

- (a) OC Transpo maintains an operator training simulator for the Existing Trillium Line.
- (b) Project Co shall support the City in the update of the simulator for the Trillium Line Extension by collaboratively providing information requested by the City.
- (c) Requested Information may include, but is not limited to the following:
 - (i) Infrastructure-Related
 - A. Videos/photos for existing portions of the alignment (used as aspect reference for the whole alignment);
 - B. Tracks and ROW: drawings, Track charts, designs, maps; and,
 - C. Stations:
 - i. Design documents (2d/3d CAD maps / mass and sections);
 - ii. Accurate location of Platforms along the Tracks;
 - iii. Ground marks accurate location (if applicable); and,
 - iv. Furniture: design documentation, photos of existing.

- (ii) Vehicle and Systems – Related
- A. Vehicle
- i. Aspect / 3D model: Measurements, design documents, CAD files; and,
- ii. Sounds: Equipment, Rolling/Aerodynamic, Horn/bell, doors, Operator cab alarms/alerts.
- B. Signals
- i. Signals library: For each kind of signal: Measurements, Aspects (pictures or drawings), Available states, Logic (block, interlocking, switches protection, etc.); and,
- ii. Accurate locations (along Tracks): Signals, Signs, Other signaling elements (loops, Track circuits limits, magnets, etc.).
- (d) For clarity, the City is responsible for updating the simulator. Project Co is only responsible for providing the required information, working collaboratively and in good faith.
- (e) The requested information shall be provided 9 months prior to the start of OC Transpo Operator training.
- (f) Project Co shall be responsible for all costs associated with any translation from other project documents, assembly, transfer of information, or any other efforts associated with supporting the City with the simulator update.

12.3 Training Provided to Project Co Operators

- (a) Trained and certified Project Co Operators shall be permitted to operate Revenue Vehicles within the confines of the New Walkley Yard. All movement of Revenue Vehicles on the mainline will be the responsibility of qualified City personnel.
- (b) Project Co Operators shall be trained and certified by Project Co Trainers prior to operating Revenue Vehicles within the confines of the New Walkley Yard.
- (c) The Project Co Operator Training program shall utilize a fully developed curriculum, with all training materials, classroom and field training, testing, pass/fail criteria and certification. The Project Co Operator Training program shall be consistent with the City Operator training program and shall conform to all applicable standards, rules and regulations. The fully developed curriculum and records of certification shall be provided to the City for review to ensure that the City maintains its ongoing regulatory obligations.
- (d) The Project Co Operator Training program shall include a provision for verifying that all potential Project Co Operator candidates possess a valid Driver's license that allows for operating an automobile in the Province of Ontario.
- (e) Project Co shall be responsible for all costs associated with the training of Project Co staff holding responsibility for operating Vehicles within the confines of the New Walkley Yard.

12.4 Training Provided to the City or Other Designated Individuals - Train the Trainer Program

- (a) Project Co shall be responsible for training and certifying a maximum of eight designated OC Transpo Trainers (Train the Trainer Program) on new operating rules and procedures, Vehicle Operations, and SI. For clarity, the following minimum criteria shall apply:
- (i) Field training is preferred and no more than 50% of training time shall be in the classroom provided that classroom materials are highly visual in nature and include hands-on exercises such as paper based mock cab control layouts;
 - (ii) For any onboard Vehicle operations training, the training shall have a limit of one instructor to two students (Train the Trainers) in order to minimize downtime for students; and,
 - (iii) Vehicle training hours should be guided as follows: Vehicle Familiarization (equipment, controls, configuration) 16 hours; Vehicle Operations (normal operations, Station operations, and degraded operations) 24 hours; Vehicle Troubleshooting (doors, engine, brakes, Train Control, other) 24 hours; Vehicle Emergency Operations (Safety equipment, towing, special operations) 16 hours; and, additional hours as required for training on system, signal, and rail network familiarization.
- (b) Project Co's Train the Trainer Program (provided by a Project Co Trainer with at least five years of adult education experience) shall ensure that OC Transpo Trainers have been trained and certified to instruct and certify employees who are assigned to or have any duties and responsibilities on the Expanded Trillium Line. The program shall utilize a fully developed curriculum, with all training materials, classroom and field training, testing, pass/fail criteria and certification. The curriculum shall follow an adult education based approach to teaching and learning. For additional clarity:
- (i) Comprehensive training materials shall include systematic procedures required by Operators for all aspects of Train operation. Procedures shall include but are not limited to: start-up/shutdown, changing ends, diagnosing faults, fault recovery, isolating doors, etc.;
 - (ii) Clear graphics that visually represent each step of a procedure shall be included;
 - (iii) Training content shall be reflective of OC Transpo's operational rules and procedures for the Trillium Line;
 - (iv) Reference material shall be easy to use and structured in a logical sequence; and,
 - (v) Technical details in the training program shall be relevant to the role of the Operator.
- (c) Project Co shall be responsible for all costs associated with the Train the Trainer Program. The sole exception will be that the City will bear the cost of providing the employees being trained as designated OC Transpo Trainers.
- (d) Training of the designated OC Transpo Trainers and Operators shall be coordinated with the City and scheduled to ensure adequate Operators will be trained and certified on new operating rules and procedures, Vehicle Operations, Vehicle Troubleshooting, Vehicle Emergency Operations, and the SI and available to support new Vehicle and system testing and commissioning.

Designated OC Transpo Trainers shall be trained at least six months prior to commencement of Trial Running on the System.

- (e) Trial Running on the System shall commence when Project Co has fulfilled the criteria identified in Schedule 14, Article 1.5, including but not limited to demonstrating to the City that all testing and commissioning has been successfully completed, all outstanding rail system (signal, Track, communications) defects have been corrected, and all Vehicles are commissioned and ready for Revenue Service.

12.5 Operator Training

- (a) Designated OC Transpo Trainers will be responsible for training and certifying Operators on new operating rules and procedures, Vehicle Operations, and SI.
- (b) The Operator training program shall utilize a fully developed curriculum, with all training materials, classroom and field training, testing, pass/fail criteria and certification. The training curriculum and materials shall be developed by Project Co, and shall be submitted in accordance with Schedule 10 – Review Procedure.
- (c) The training of Operators shall be coordinated between the City and Project Co and scheduled to ensure an adequate number of Operators are trained and certified to support Revenue Service Operations, as identified by the City. At a minimum:
- (i) Beginning 75 days prior to Trial Running, Project Co shall provide the City with a minimum of 14 hours per day of full System Track access to ensure the requisite number of Operators are trained and certified on the System and new Vehicles.
 - (ii) Project Co shall develop a Track access permit process that allows the City access to the mainline during the 75 day period for Operator training and certification. Project Co shall work cooperatively with the City in the issuance of Track access permits.
 - (iii) Project Co shall ensure the eight Vehicles are available to support the City's Operator training program, as required by the City.
 - (iv) Operator training shall be completed prior to Trial Running.

- (d) Project Co shall be responsible for the maintenance of the SI and all associated costs related to the maintenance of the SI in support of Operator Training. The sole exception will be that the City will bear the cost of providing the employees being trained as Operators.

12.6 Training Provided to Controllers

- (a) Project Co shall be responsible to train Controllers in accordance with all applicable standards, rules and regulations
- (b) Project Co's Controller Training Program (provided by a Project Co Trainer) shall ensure that all Controllers have been trained and certified to safely perform all dispatching functions associated with the System including the use and application of the S&TC System in the TOCC and in accordance with all applicable standards, rules and regulations. The program shall utilize a fully developed curriculum, with all training materials, classroom and hands on, including field and on-

the-job training, testing, pass/fail criteria and certification. Project Co Trainers for the Controller training program shall have a minimum of five years railroad dispatcher experience.

- (c) Project Co shall be responsible for all costs associated with the Controller training program. The sole exception will be that the City will bear the cost of providing the employees being trained as Controllers.
- (d) Project Co shall be responsible for ensuring that 12 Controllers are trained and certified on operating rules and procedures, Vehicle Operations, and SI prior to the commencement of Vehicle movements on the Mainline SI. The development of the Project Co delivered training program will be coordinated with the City and be completed a minimum of 9 months prior to the commencement of Vehicle Operation on the SI. The commencement of Controller training shall be based upon the duration of the proposed Controller training program and as coordinated between the City and Project Co.

12.7 Training Provided to Emergency Service Providers

- (a) Project Co shall develop a training program for ESP.
- (b) Project Co's Train the Trainer Program for ESP trainers (provided by a Project Co Trainer) shall ensure that up to 8 ESP trainers have been trained and certified on all aspects of the SI and Vehicles that they may be required to be knowledgeable of in the event of an Emergency. The program shall utilize a fully developed curriculum, with all training materials, classroom and field training, testing, pass/fail criteria and credentialing. The training curriculum and materials shall be developed by Project Co, and be subject to Schedule 10 – Review Procedure.
- (c) Training of ESP trainers shall be scheduled such that training is complete six months prior to the start of Trial Running.
- (d) Project Co shall be responsible for all costs associated with the ESP Train the Trainer Program. The sole exception will be that the City will bear the cost of providing the employees being trained as Trainers.
- (e) In addition to Project Co's Train the Trainer program and in order to facilitate an appropriate level of understanding of the new system and Vehicle fleet with the ESP, Project Co shall organize and provide appropriate technical support resources for the following events:
 - (i) Site orientation to New Walkley Yard for up to 12 ESP (upon completion);
 - (ii) Two Vehicle Familiarization sessions for the New Vehicle fleet for up to 12 ESP each;
 - (iii) Preliminary review of lifting scenarios; Emergency access, cab access, and Vehicle Safety features for new Vehicles (prior to start of new Vehicle dynamic testing);
 - (iv) Final review of lifting scenarios; Emergency access, cab access, and Vehicle Safety features (three months prior to Trial Running); and,
 - (v) New alignment and Station familiarization session for up to 12 ESP (three months prior to Trial Running).

ARTICLE 13 DEMOLITION, REMOVALS AND DISPOSAL

13.1 General

- (a) Project Co shall demolish any buildings or other Structures on the Lands as required for construction and obtain all Permits, Licenses, Approvals and Authorizations required for Demolition. All Demolition refuse and materials shall be the property of Project Co, with the exception of any materials identified as salvageable materials as outlined in Clause 13.1 of this Part 1. Project Co shall dispose of all such refuse and materials in accordance with Applicable Law and leave the Lands in a clean and tidy condition upon completion of the Works.
- (b) Performance Criteria
- (i) Project Co shall remove obstructions encountered in the construction of the Project elements that hinder the installation of said elements. Obstructions may include but are not limited to – pipes, conduits, duct banks, foundations, debris, poles and any other object.
- (ii) Project Co shall remove existing Roadway and sidewalk pavements obstructing the construction of the Project. Use equipment and methods of removal and hauling which protect underlying Pavement or existing Pavement not designated for removal.
- (iii) Project Co shall remove or relocate existing Utilities where required as per City standards and in accordance with Schedule 15-2, Part 2, Article 8 – Utility Infrastructure Design Criteria.
- (c) Specific Requirements
- (i) Existing Facilities
- A. The following Stations shall be selectively demolished and rehabilitated or renovated:
- i. Bayview Station, Trillium Line Platform area only;
- ii. Carling Station;
- iii. Carleton Station;
- iv. Mooney's Bay Station; and,
- v. Greenboro Station.
- B. To the fullest extent possible, all materials shall be recycled.
- C. The reuse and re-cycle of material shall be reflected in the priorities and objectives of the Sustainability Plan and reported in the Sustainability Annual Report Card as detailed in Schedule 17 – Environmental Obligations, Part 3.
- (ii) Leitrim Park and Ride

- A. Project Co shall remove:
- i. All Passenger amenities including shelters, signage, Platforms, lighting and foundations for the same;
 - ii. All paved surfaces not reused in Project Co's design including, Roadways, curbs, parking areas; and,
 - iii. All civil infrastructure not reused in Project Co's design.
- (iii) Other specific Project Lands:
- A. Private properties being used for development that contain existing structures include:
- i. [REDACTED]
- B. Project Co shall perform removals and Demolition as follows:
- i. Completely remove all existing sidewalks and pavement;
 - ii. Completely remove all Structures on the Site;
 - iii. Removal of structures shall include complete removal of all building foundations;
 - iv. Remove all Utility services on Site. Utilities shall be removed to the point of connection to the Utility service in the ROW and capped in accordance with Utility requirements; and,
 - v. All materials shall be recycled in according to Good Industry Practice and standards.
- (iv) Rail Bridge over Southeast Transitway (SN055930)
- A. The existing rail bridge over the Transitway shall be removed as per the following:
- i. The entire Structure, including retaining walls, shall be removed to 1m below top of existing ground.
 - ii. Grade surrounding area to match existing. A minimum of 600mm earth material, that shall sustain plant materials as described in Schedule 15-2, Part 6, Article 2 – Design Criteria, shall be installed.
- (v) Sawmill Creek Bridge (SN055200)
- A. The existing rail bridge over Sawmill Creek shall be removed as per the following:

- i. The entire Structure shall be removed to 1m below top of existing ground. The existing gabions shall be removed and the approach embankments regraded accordingly.
 - ii. Grade surrounding area to match existing. A minimum of 600mm earth material, that shall sustain plant materials as described in Schedule 15-2, Part 6, Article 2 – Design Criteria, shall be installed.
- (d) All Demolition shall be completed in accordance with City of Ottawa Design Standards.
- (e) The Demolition, selective Demolition and or removals shall be coordinated with the City for any salvageable materials the City may want to reuse elsewhere.
- (f) Materials
- (i) Project Co shall dispose of all materials removed in accordance with City of Ottawa Standards and OPSS and applicable regulations.
 - (ii) Project Co shall manage hazardous materials in accordance with City of Ottawa Standards, OPSS and applicable regulations. Project Co shall not store materials on Site without precautions to prevent adverse effects of adjacent watercourses, groundwater, the migration of materials offsite, nor allowing the development of a nuisance condition.
 - (iii) Project Co shall properly stockpile the materials resulting from removals and/or Demolition by using separate stockpiles for waste materials and reusable or recyclable materials.
 - (iv) Project Co shall manage Contamination and excess excavated materials in accordance with Schedule 17 – Environmental Obligations.
 - (v) DSS reports have been prepared for structures/facilities/properties that have been identified for removal. Refer to Schedule 17 – Environmental Obligations.

ARTICLE 14 NEW MUNICIPAL INFRASTRUCTURE

14.1 Responsibility for New Municipal Infrastructure

- (a) Project Co shall be responsible for the design and construction, including completion, testing and commissioning, of any New Municipal Infrastructure.
- (b) The New Municipal Infrastructure includes new City infrastructure.
- (c) All design and construction in connection with the New Municipal Infrastructure shall be completed by Project Co and shall incorporate the applicable design and construction standards of the City.
- (d) All design and construction in connection with the New Municipal Infrastructure to be constructed by Project Co shall be subject to the Review Procedure as outlined in Schedule 10 – Review Procedure of the Project Agreement.
- (e) New Municipal Infrastructure shall be turned over to the City after the completion of the construction and testing and commissioning of New Municipal Infrastructure. Project Co shall not be responsible for the ongoing maintenance of the New Municipal Infrastructure, with the exception of the warranty provided for within the City of Ottawa Standard Tender Documents for Unit Price Contracts, Volume 1 and 2.

14.2 Design Standard

- (a) In addition to the City Standards identified in Schedule 15-1 – Technical Terms and Reference Documents, New Municipal Infrastructure shall be designed in accordance with the City of Ottawa Standard Tender Documents for Unit Price Contracts, Volume 1 and 2.
- (b) Where the design and construction of New Municipal Infrastructure includes material types and product types that are covered by the material specifications included in Volume 2 of the City of Ottawa Standard Tender Documents for Unit Price Contracts, only specific materials and products that are listed therein as approved shall be utilized in the Works.
- (c) Pavement design for New Municipal Infrastructure shall be in accordance with Schedule 15-2, Part 2, Article 6 - Roadways, Bus Terminals, and Laybys.

14.3 Record Drawings

- (a) Record Drawings for New Municipal Infrastructure shall be produced in accordance with the requirements of Article 15 - Record Drawings, of this Part 1.

14.4 Scope of Works

- (a) In general, the following types of assets shall be considered New Municipal Infrastructure:
 - (i) New retaining walls required for road construction and grading, and not associated with the Guideway.
 - (ii) New watermains.

- (iii) New street lights and illumination.
 - (iv) New storm and sanitary sewers.
 - (v) New traffic signals.
 - (vi) New Utilities.
 - (vii) New Culverts.
 - (viii) New Roadways (Local, Provincial, Federal).
 - (ix) New bus terminals and connections, operator facilities, Park and Ride Facilities, and PPUDO areas.
 - (x) MUPs on third party lands.
- (b) Any proposed Culverts, storm, or sanitary sewers that exclusively serve the System and falls entirely within the Lands shall be considered SI.
- (c) The items that are to be included in the Works as New Municipal Infrastructure are included in Table 1-14.1 below.

Table 1-14.1 – New Municipal Infrastructure

Asset Name / Structure Number (if applicable)
Bowesville Park and Ride
Leitrim Park and Ride
Leitrim Road Bridge (SN225610) – Roadway portion only
Earl Armstrong Bridge (SN225680) – Roadway portion only
University Road Pedestrian Bridge over Rideau River (SN018750)
Bowesville Road Bridge (SN225690) – Roadway portion only
Limebank Road Bridge (SN225710) – Roadway portion only

ARTICLE 15 RECORD DRAWINGS

15.1 General

- (a) The Design Team shall track and document all changes from the IFC drawings up to, and including, the preparation of the Record Drawings which shall be in accordance with Schedule 10 – Review Procedure.
- (b) Project Co shall keep a record of the As-Built condition and the reasons for any changes from the IFC documents, including any necessary authorizations. Where the As-Built condition deviates from the IFC documents, but continues to meet the requirements of the Output Specifications, such that any changes fall within the design and specification tolerances and do not require engineering sign-off by the responsible engineer, Project Co shall ensure that the drawings are marked up with the relevant information required to represent the As-Built condition, highlighting the difference from the IFC documents. At Substantial Completion, Project Co shall sign and seal the Record Drawings as required in Schedule 14 – Testing and Commissioning.
- (c) Where changes in the As-Built condition mean that the constructed Works would no longer meet the specifications outlined in the Output Specifications or would require Design Data to demonstrate compliance with the Output Specifications, then the responsible engineer shall revise the IFC documents and submit the Design Data as a Construction Document Submittal in accordance with Schedule 10 – Review Procedure, and shall be subject to the requirements outlined in this Article 16.
- (d) Project Co shall provide Record Drawings for any New Municipal Infrastructure in accordance with the requirements of any third party owner of such New Municipal Infrastructure as outlined in Schedule 14 – Attachment 1.
- (e) Project Co shall provide separate Record Drawings in both CAD and pdf format for each of the following works within 30 calendar days of completion of those works.
 - (i) Carleton Tunnel as outlined in Schedule 15-2, Part 4, Clause 3.5 (e).
 - (ii) Elevated Guideway to OMCIA Terminal as outlined in Schedule 15-2, Part 2, Clause 4.8 (d) (i).
 - (iii) Airport Station as outlined in Schedule 15-2, Part 4, Clause 3.13.
- (f) Record Drawings for New Municipal Infrastructure shall be produced in accordance with the requirements of the CADD Standards Manual, prepared by the City.
- (g) Temporary Detour Routes/Work
 - (i) As constructed engineering design drawings prepared in accordance with City design standards for each closure, detour route, lane shift, and diversion, or modification thereof, carrying public traffic or transit vehicles and intended to be in service for longer than six months shall be submitted in accordance with Schedule 10 – Review Procedure prior to requesting authorization from the Roadway authority for the closure and/or to utilize the detour route, lane shift or diversion or modified version thereof.

- (ii) As constructed engineering design drawings prepared in accordance with City design standards for each intersection with a new temporary or permanent traffic control signal, or modification to an existing temporary or permanent traffic control signal, shall be submitted in accordance with Schedule 10 – Review Procedure within 30 calendar days of the activation of the traffic control signal, or within 30 days of the modification being made.

Appendix A
Road Design Criteria Tables

Table 1 - Trillium Line Design Criteria

Criteria Description	Leitrim Road (Existing)		Gilligan Road	Leitrim Service Road (Existing)	Earl Armstrong Road (West of Bowesville Rd. to West of High Rd.) ¹	Bowesville Road (Leitrim Rd. to Rideau Rd.)
	Overhead	Guideway				
Road Classification ²	RAU		ULU / RLU ³	RLU	RAU / UAU ⁴	RCU
Posted Speed (km/hr) ⁵	50		50	50	80	80
Design Speed (km/hr)	60		60	60	90	90
Basic Lanes	2		2	2	2	2
Minimum Radius (m) ⁶	2000	Existing	130	16.5	4000 ⁷	4000
Min. K Factor Sag ⁸	18		18	18	68	39
Min. K Factor Crest	36		11	11	50	51
Max. Grade (%) ⁹	5% ¹⁰		5%	6%	3.2%	2.3%
Max. Superelevation (%) ¹¹	NC		NC	NC	NC ¹²	NC
Minimum S.S.D. (m) ¹³	As Per TAC		As Per TAC	As Per TAC	As Per TAC	As Per TAC
Minimum D.S.D. (m) ¹⁴	As Per TAC		As Per TAC	As Per TAC	As Per TAC	As Per TAC
Lane Width (m) ¹⁵	3.5		3.5	3.25	3.5 – 3.75 ¹⁶	3.5
Aux. Lane Width (m) ¹⁷	3.5		3.5	N/A	3.5	3.5
Sidewalk Width (m)	N/A		2.0 ¹⁸	N/A	4.0 ¹⁹	N/A
Boulevard Width (m)	N/A		N/A	N/A	1.75	N/A
Shoulder (m) ²⁰	2.5 ²¹		1.5 ²²	1.8 – 2.5 ²³	2.5 ²⁴	2.5
Bike Lane(m) ²⁵	N/A		N/A	N/A	N/A	N/A
Median Width (m)	N/A		N/A	N/A	N/A	N/A
Side Slope/ Back Slope	As Per TAC		As Per TAC	As Per TAC	As Per TAC	As Per TAC
Design Vehicle(s) ²⁶	WB-20, A-Bus, Maintenance & Emergency Vehicles		WB-20, A-Bus, Maintenance & Emergency Vehicles	WB-20, Maintenance & Emergency Vehicles	A-Bus, Maintenance & Emergency Vehicles	A-Bus, Maintenance & Emergency Vehicles
Two-Way AADT (vehicles/day) ²⁷	15,200 (Jan-2016)		690 (Jan-2016)	300	4330 (28-Aug-2015)	3840 (26-Apr-2016)
8 Hour Heavy Vehicle %	~4.7%		~36.7%	20%	1.9%	1.6%
Traffic Growth Rate ^{28, 29, 30} Assumption	1% ³¹		1%	0%	8.8%	4.2%

Table 1 - Trillium Line Design Criteria Cont'd

Criteria Description	Limebank Road (Intersection at Earl Armstrong Rd. to approx. 620m South) ³²				
Road Classification ²	UAD				
Posted Speed (km/hr) ⁵	80				
Design Speed (km/hr)	90				
Basic Lanes	4				
Minimum Radius (m)	N/A ³³				
Min. K Factor Sag	38				
Min. K Factor Crest	50				
Max. Grade (%)	4.1				
Max. Superelevation (%)	NC				
Minimum S.S.D. (m) ¹³	As Per TAC				
Minimum D.S.D. (m) ¹⁴	As Per TAC				
Lane Width (m) ¹⁵	3.5 – 3.75				
Aux. Lane Width (m) ¹⁷	3.5 – 4.25				
Sidewalk Width (m)	4.0 ³⁴				
Boulevard Width (m)	2.0				
Shoulder (m) ²⁰	N/A				
Bike Lane(m) ²⁵	N/A				
Median Width (m)	Varies ³⁵				
Side Slope/ Back Slope	As Per TAC				
Design Vehicle(s) ²⁶	WB-20, A-Bus, Maintenance & Emergency Vehicles				
Two-Way AADT (vehicles/day) ²⁷	6,690 (28-Aug-2015)				
8 Hour Heavy Vehicle %	4.1%				
Traffic Growth Rate Assumption ^{28, 29, 30}	1.5%				

-
- ¹ The Earl Armstrong Road corridor is subject to a future widening to a 4-lane urban arterial divided cross section with a 5.0m raised median. For the purpose of Project Co's design consideration, the cross section of the future Earl Armstrong Road cross section shall be assumed as follows:
- 2 general purposes lanes (3.50m wide) in both the eastbound and westbound directions;
 - 5.0m raised concrete median;
 - 2.5m shoulder constructed beside the Stage 2 westbound lanes will become half of the future 5.0m raised concrete median.
- ² Roadway classifications are identified in the City of Ottawa Official Plan – Schedule E. Project Co shall confirm all roadway classifications with the City of Ottawa.
- ³ The west side of Gilligan Road shall be urbanized between Leitrim Road and the Park and Ride, with the east side remaining rural. In addition, sidewalks shall be provided or extended along the curb radii of the southeast and southwest intersection quadrants of Leitrim Road and Gilligan Road.
- ⁴ The north side of Earl Armstrong Road (i.e. along the westbound lanes) shall have a rural cross section (i.e. shoulder, ditches, etc...) while the south side shall have an urban cross section (i.e. curbs, boulevards, etc....).
- ⁵ All posted speed limits and advisory speed signs shall be maintained for all design elements, unless specifically noted otherwise in Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals, and Lay-Bys.
- ⁶ Minimum radius corresponds to maximum superelevation values for road classification and design speed.
- ⁷ The 4000m minimum radius requirement specified in the design criteria table shall be satisfied for the entire section of the proposed Earl Armstrong Road corridor, between west of Bowesville Road to west of High Road, under the road-over-rail scenario. Under a rail-over-road scenario, the minimum radius requirement is only applicable to and shall be satisfied for the proposed Earl Armstrong Road corridor west of the eastern Bowesville Park and Ride access. Project Co's proposed design of the Earl Armstrong Road corridor east of the eastern Bowesville Park and Ride access may include a transition back to the existing roadway corridor, as appropriate. The geometry of the roadway alignment associated with the transition between the proposed and existing Earl Armstrong Road corridor shall meet the minimum requirements as per TAC GDGCR.
- ⁸ The minimum K factor for sag vertical curves shall meet the minimum comfort controls based on the presence of illumination.
- ⁹ Maximum longitudinal grade assumes a rolling terrain, unless otherwise specified.
- ¹⁰ Grades steeper than 5% are not acceptable on Leitrim Road due to necessary sight distance requirements and since the corridor is a cross-town bikeway facility according to the City of Ottawa's Cycling Plan.
- ¹¹ Maximum roadway superelevation corresponds to road classification (L – Local, C – Collector, A – Arterial). NC denotes normal crown.
- ¹² Under a scenario in which Project Co's proposed grade separation facility involves a road over rail grade separation configuration, Project Co shall provide a consistent 2% cross fall, draining the roadway surface runoff to the south side curb, on the Earl Armstrong Road Overhead Structure across both eastbound and westbound lanes.
- ¹³ The stopping sight distance parameters provided are minimum typical values. Additional sight distance may be required under certain constrained conditions. In all cases, Project Co's design shall meet the requirements of Schedule 15-2, Part 2, Clause 6.5.
- ¹⁴ Minimum decision sight distances shall be based on Avoidance Manoeuvre C, unless otherwise specified.
- ¹⁵ General lane width requirements shall meet the minimum lane widths as prescribed in the TAC GDGCR based on the corresponding road classification.
- ¹⁶ The median lane shall be 3.75m wide and the curbside lane shall be 3.5m along Earl Armstrong Road.
- ¹⁷ Auxiliary lanes with high transit volumes shall be a minimum of 3.5m.

¹⁸ A 2.0m wide sidewalk shall only be provided on the west side of Gilligan Road.

¹⁹ Project Co shall provide a 4.0m wide multi-use pathway on the south side of Earl Armstrong Road.

- Under a scenario in which Project Co's proposed grade separation facility involves a road over rail grade separation configuration, Project Co shall widen the multi-use pathway to be 4.5m and be separated from the travelled lanes by a concrete barrier per the applicable bridge codes as per Article 4 – Structural Design Criteria and Requirements of this Part 2.

²⁰ All shoulders shall be paved to meet the City's Standard Tender Package Standard Detail Drawings and Specifications.

²¹ According to the City of Ottawa Cycling Plan, Leitrim is identified as a cross-town bikeway facility. Therefore, Leitrim geometry and cross-section shall accommodate the requirement of a standard shoulder bikeway in both eastbound and westbound directions. Appropriate design domain for shoulder bikeways shall meet the requirements of TAC GDGCR Table 3.4.6.2.

²² The 1.5m proposed shoulder is only required on the east side of Gilligan Road, south of the intersection with Leitrim Road.

²³ The shoulder along the westbound lane shall be a minimum of 1.8m and the shoulder on the eastbound lanes shall be 2.5m.

²⁴ A 2.5m shoulder is only required on the north side of Earl Armstrong Road beside the westbound lane.

²⁵ Cycling facilities shall be a minimum of 1.5m. The type of bike lane facility (on-road, shared, raised cycle track, paved shoulder) are to be confirmed by Project Co with the City of Ottawa.

²⁶ All A-Bus and B12 design transit vehicles shall meet the dimensions and specifications per OC Transpo's transit vehicle fleet as per the requirements of Schedule 15-2, Part 2, Clause 6.9(c)(vi).

²⁷ Traffic information (AADT and Heavy Truck %) based on 8-hour turning movement counts provided by the City of Ottawa.

²⁸ Traffic growth rates are based on 'EMME' model outputs comparing 2011 and 2031 volumes provided by the City of Ottawa.

²⁹ Traffic projection horizon shall be year 2031 for all transportation impact assessments and traffic and transit analysis studies, unless otherwise noted.

³⁰ For the purpose of determining projected traffic volumes in traffic and transit analysis, Project Co shall reference the traffic growth rates specified in the design criteria, accordingly. Where the growth rates are used for the purpose of calculating pavement design requirements, Project Co shall use a minimum of 1.0% or the traffic growth rates specified in the design criteria, whichever is greater.

³¹ Due to changes in the road network in the immediate vicinity of the subject roadway, this has resulted in higher projected traffic demand patterns.

³² Under a scenario in which Project Co's proposed grade separation facility involves a road over rail grade separation configuration, Project Co shall design and construct an Overhead Structure to include the following cross sectional elements, in both the northbound and southbound direction as follows:

- 2 general purpose lanes (3.75m wide median lane and 3.5m wide outside lane);
- 5.0m raised concrete median;
- 2.5m shy line offset between the general traffic lanes and appropriate concrete barrier wall to separate the adjacent multi-use pathway (The shy line offset on the Overhead Structure shall transition to introduce the proposed boulevard on the approaches to the Overhead Structure.);
- 4.0m multi-use pathway between the concrete barrier and appropriate TL-4 parapet wall and railing on the outside of the Structure.

³³ Project Co shall maintain the existing lane configuration and layout within the limit of the Works on Limebank Road.

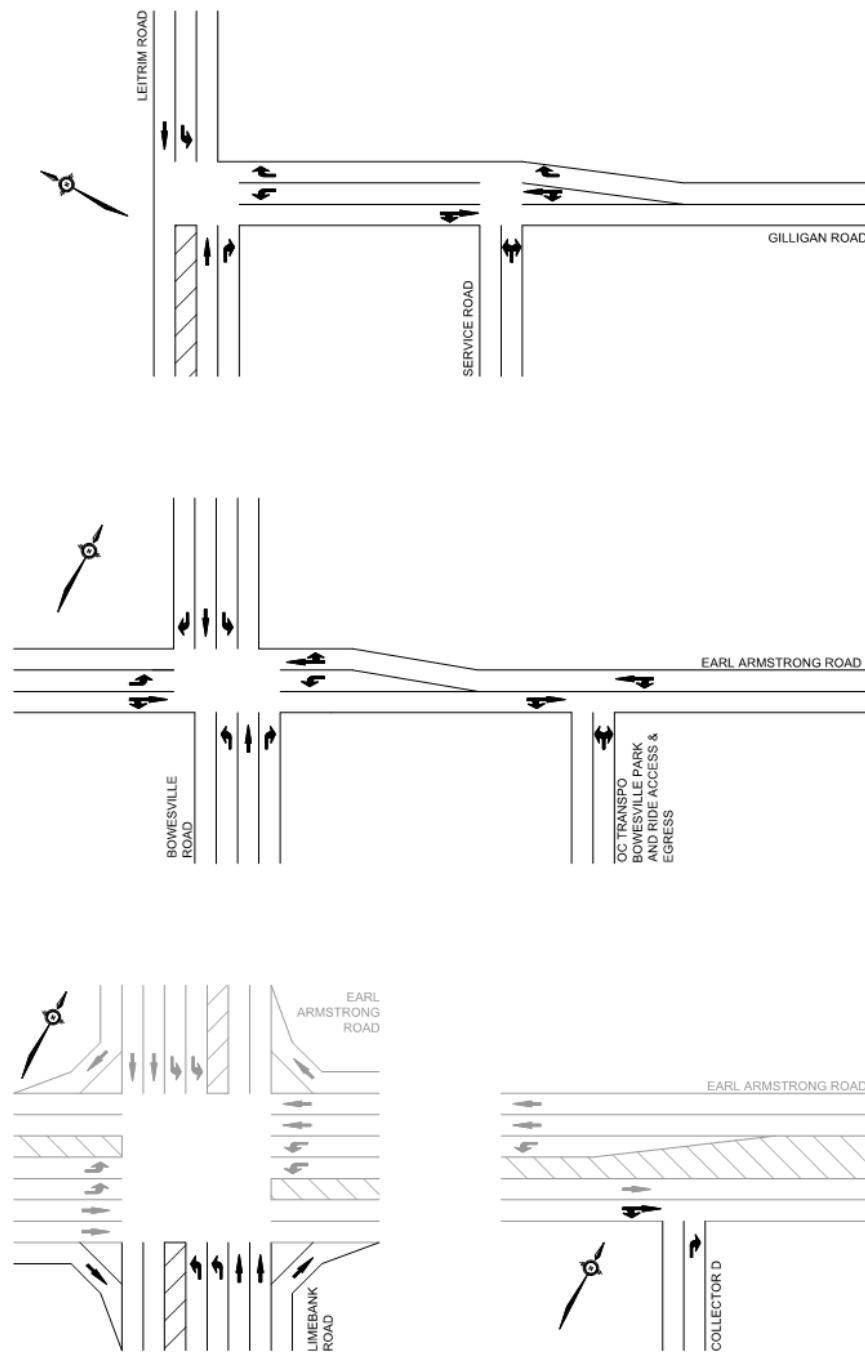
³⁴ Project Co shall provide a 4.0m wide multi-use pathway on both sides of Limebank Road.

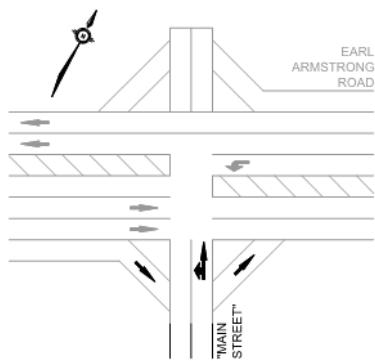
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- Under a scenario in which Project Co's proposed grade separation facility involves a road over rail grade separation configuration, the multi-use pathway shall be separated from the travelled lanes by a concrete barrier, per the applicable bridge codes as per Article 4 – Structural Design Criteria and Requirements of this Part 2.

³⁵ Typical 5.0m wide raised concrete median is required. Where the concrete median is adjacent to auxiliary storage lanes, the minimum width of the concrete median is 1.5m.

Appendix B - Road Intersection Minimum Lane Configuration Diagram

Appendix B represents the minimum lane configuration requirements at the following intersections. If the findings of Project Co's traffic analysis require additional travelled or auxiliary lanes in order to satisfy the requirements of the City of Ottawa's TIA guidelines, Project Co shall be responsible for the necessary roadway improvements in addition to the requirements shown in this Appendix.





Structure Number	Structure Name	Governmental Authority	Structure Type	Structure Conveyance	Subject to Freight Loading and Clearance on the Structure	Subject to Freight Clearance under Structure	NMI or SI	Date of Most Recent Inspection	Bridge Aesthetic Level and Classification	Geometric Structural Requirements		Scope of Design/ Construction Work							Additional Comments/Requirements	
										Structure Cross Section to Accommodate	Structure to Span Over	New - Design & Construction	Rehabilitate/ Modify	Repair, Modify or Replace	Remove Structure	Install Bridge Structure Fencing	Structural Evaluation	Seismic Evaluation	DCA & Recommendation	
Mainline																				
SN225710	Limebank Road Bridge	City of Ottawa	New Grade Separation	Roadway or Railway	-	-	NMI - Roadway Bridge SI - Railway Bridge	-	3-Low	<ul style="list-style-type: none"> Proposed Limebank Road cross section or NB & SB track Alignment Emergency walkway Future MUP on south side of Track Future collector road on north side of Track or Proposed Limebank Road cross section Future MUP on south side of track corridor Future MUP between north and south side of track corridor 	<ul style="list-style-type: none"> NB & SB track Alignment Emergency walkway Future MUP on south side of Track Future collector road on north side of Track or Proposed Limebank Road cross section Future MUP on south side of track corridor Future MUP between north and south side of track corridor 	X								* Proponent to design and construct a grade separation at Limebank Road that will either accommodate the roadway over the alignment or the alignment over the roadway
SN225050	Mosquito Creek Rail Bridge	City of Ottawa	New Elevated Guideway	Railway	-	-	SI	-	3-Low	<ul style="list-style-type: none"> NB & SB track Alignment Emergency walkway 	<ul style="list-style-type: none"> Mosquito Creek Wildlife crossing 	X								
SN225690	Bowesville Road Bridge	City of Ottawa	New Grade Separation	Roadway or Railway	-	-	NMI - Roadway Bridge SI - Railway Bridge	-	3-Low	<ul style="list-style-type: none"> Proposed Bowesville Road cross section or NB & SB track Alignment Emergency walkway 	<ul style="list-style-type: none"> NB & SB track Alignment Emergency walkway MUP or Proposed Bowesville Road cross section 	X							* Proponent to design and construct a grade separation at Bowesville Road that will either accommodate the roadway over the alignment or the alignment over the roadway	
SN225680	Earl Armstrong Bridge	City of Ottawa	New Grade Separation	Roadway or Railway	Yes	Yes	NMI - Roadway Bridge SI - Railway Bridge	-	3-Low	<ul style="list-style-type: none"> Existing Earl Armstrong Road cross section or NB & SB track Alignment Emergency walkway 	<ul style="list-style-type: none"> NB & SB track Alignment Emergency walkway East MUP or Existing Earl Armstrong Road cross section 	X			X				* Proponent to design and construct a grade separation at Earl Armstrong Road that will either accommodate the roadway over the alignment or the alignment over the roadway	
SN225670	High Road Bridge	City of Ottawa	New Overhead Bridge	Pedestrian/Maintenance Vehicle	-	Yes	NMI	-	3 - Low	MUP	<ul style="list-style-type: none"> NB & SB track Alignment Emergency walkway 	X			X					
SN225610	Leitrim Road Bridge	City of Ottawa	New Grade Separation	Roadway or Railway	Yes (applicable to rail over road only)	No	NMI - Roadway Bridge SI - Railway Bridge	-	3 - Low	<ul style="list-style-type: none"> Proposed Leitrim Road cross section or NB & SB track Alignment Emergency walkway 	<ul style="list-style-type: none"> Proposed Leitrim Road cross section or NB & SB track Alignment Emergency walkway 2 Existing water mains or Proposed Leitrim Road cross section 	X			X				* Proponent to design and construct a grade separation at Leitrim Road that will either accommodate the roadway over the alignment or the alignment over the roadway	
SN225620	Rail Bridge over Lester Road	City of Ottawa/NCC	New Elevated Guideway	Railway	No - if freight bypass is provided	-	SI	-	3 - Low	<ul style="list-style-type: none"> Single track Alignment Emergency walkway 	<ul style="list-style-type: none"> Proposed Lester Road cross section 	X							* Centre pier shall be prohibited.	
SN055350	Hunt Club Road Bridge	City of Ottawa	4-Span Concrete Bridge	Railway	Yes	-	SI	June 20, 2017	-	<ul style="list-style-type: none"> SB track Alignment Emergency walkway 	<ul style="list-style-type: none"> Existing Hunt Club Road cross section 		*			X	X			
SN055440	Rail Bridge over Hunt Club Road	City of Ottawa	New Elevated Guideway	Railway	No	-	SI	-	3 - Low	<ul style="list-style-type: none"> NB track Alignment Emergency walkway 	<ul style="list-style-type: none"> Existing Hunt Club Road cross section 	X								
SN058620	Hunt Club MUP Bridge	City of Ottawa	New Pedestrian Bridge	Pedestrian/Maintenance Vehicle	-	-	SI	-	1 - High	MUP	<ul style="list-style-type: none"> Existing Hunt Club Road cross section 	X								
SN055740	Rail Bridge over MUP North of Hunt Club Road	City of Ottawa	New Pedestrian Underpass	Railway	Yes	-	SI	June 20, 2017	1 - High	<ul style="list-style-type: none"> NB & SB track Alignment Emergency walkway 	MUP	X							* Structure shall have a minimum opening of 6m wide by 3m high	
SN058490	Rail Bridge over MUP at South Keys Station	City of Ottawa	Single-Span Concrete Rigid Frame	Railway	Yes	-	SI	June 20, 2017	-	<ul style="list-style-type: none"> NB & SB track Alignment Train Platform 	MUP		X		X		X			
SN055750	Pedestrian Overpass North of South Keys Station	City of Ottawa	New Pedestrian Underpass	Railway	Yes	-	SI	-	3 - Low	<ul style="list-style-type: none"> NB & SB track Alignment Emergency walkway NB & SB Transitway lanes 	MUP	X							* Structure shall have a minimum opening of 6m wide by 3m high	
SN055900	Walkley Yard Lead over Transitway	City of Ottawa	Single-Span Concrete Arch	Railway	Yes	-	SI	July 5, 2017	-	<ul style="list-style-type: none"> NB & SB track Alignment Emergency walkway 	<ul style="list-style-type: none"> Existing Transitway cross section 		*			X	X			
SN055910	Rail Bridge over Transitway at Walkley Yard Connecting Track	City of Ottawa	Single-Span Concrete Arch	Railway	Yes	-	SI	July 5, 2017	-	<ul style="list-style-type: none"> NB & SB track Alignment Emergency walkway 	<ul style="list-style-type: none"> Existing Transitway cross section 		*			X	X			
SN055470	Sawmill Creek Culvert	City of Ottawa	Single-Span Concrete Rigid Frame	Railway	Yes	-	SI	July 5, 2017	-	<ul style="list-style-type: none"> NB & SB track Alignment Emergency walkway 	Sawmill Creek		*		X		X			
SN055200	Sawmill Creek Bridge	City of Ottawa	3-Span Steel Plate/Prestressed Concrete Girder Bridge	Railway	Yes	-	SI	June 20, 2017	-	<ul style="list-style-type: none"> NB & SB track Alignment Emergency walkway 	<ul style="list-style-type: none"> Sawmill Creek Brookfield Pedestrian Bridge 			X						
SN055930	Rail Bridge over Southeast Transitway	City of Ottawa	3-Span Steel Plate Girder Bridge	Railway	Yes	-	SI	June 30, 2017	-	<ul style="list-style-type: none"> NB & SB track Alignment Emergency walkway 	<ul style="list-style-type: none"> Existing Transitway cross section 				X					

Structure Number	Structure Name	Governmental Authority	Structure Type	Structure Conveyance	Subject to Freight Loading and Clearance on the Structure	Subject to Freight Clearance under Structure	NMI or SI	Date of Most Recent Inspection	Bridge Aesthetic Level and Classification	Geometric Structural Requirements		Scope of Design/ Construction Work							Additional Comments/Requirements
										Structure Cross Section to Accommodate	Structure to Span Over	New - Design & Construction	Rehabilitate/ Modify	Repair, Modify or Replace	Remove Structure	Install Bridge Structure Fencing	Structural Evaluation	Seismic Evaluation	DCA & Recommendation
SN055940	VIA Grade Separation at Ellwood Diamond	City of Ottawa	New Elevated Guideway	Railway	No	Yes-	SI	-	3 - Low	• Alignment • Emergency walkway	• Existing VIA Track • Existing Transitway Configuration • Sawmill Creek • Existing Brookfield MUP	X							• The substructure shall be overbuilt in order to accommodate a future second track
SN015290	Rideau River Bridge	City of Ottawa	5-Span Riveted Steel Bridge	Railway	Yes	-	SI	June 22, 2017	see notes	• NB & SB track Alignment • Emergency walkway	• Rideau River • Existing University Drive cross section • South MUP		*		X	X	X	If replaced instead of repaired, the new structure's aesthetic level would be 1 - High	
SN018750	University Road Pedestrian Bridge over Rideau River	City of Ottawa	New Pedestrian Bridge	Pedestrian/ Maintenance Vehicle	-	-	NMI	-	1-High	• MUP	• Rideau River	X							• The Structure shall have a minimum clear width of 5m • The Structure shall have a minimum clear span of 63.5m
SN018510	South Rail Bridge over MUP at Carleton University	City of Ottawa	Single-Span Reinforced Concrete Bridge	Railway	Yes	-	SI	June 20, 2017	-	• NB & SB track Alignment • Emergency walkway	• MUP		X			X	X		
SN018490	North Rail Bridge over MUP at Carleton University	City of Ottawa	Precast Box Culvert	Railway	Yes	-	SI	June 20, 2017	-	• NB & SB track Alignment • Emergency walkway	• MUP	X						• Structure shall have a minimum opening size of 9m wide x 3m high	
SN015440	Carleton University Tunnel at Carleton Station	Carleton University	New Pedestrian Tunnel	Railway	Yes	-	SI	-	3 - Low	• NB & SB track Alignment • Emergency walkway	• Future Pedestrian Walkway	X						• Structure shall have a minimum opening size of 9m wide x 3m high	
SN015430	Existing Carleton University Tunnel System	Carleton University	Concrete Box Tunnel	Railway	Yes	-	NMI	Unknown	-	• NB & SB track Alignment • Emergency walkway	• Existing Pedestrian Walkway		*		X				
SN019020	Existing Tunnel under Dow's Lake	City of Ottawa	Existing Concrete Tunnel	Railway	-	-	SI	July 5, 2017	-	• Dow's Lake	• Single track Alignment • Emergency walkway		X				X		
SN055330	Walkley Road Overpass O-Train Line	City of Ottawa	Existing Structure	Roadway	-	-		October 26, 2016	-	• Existing Walkley Road Configuration	• Track Alignment • Emergency walkway				X				
SN055260	Heron Road Overpass O-Train Line	City of Ottawa	Existing Structure	Roadway	-	-	NMI	September 9, 2016	-	• Existing Heron Road Configuration	• Track Alignment • Emergency walkway				X				
SN055280	Riverside Drive Overpass O-Train Line	City of Ottawa	Existing Structure	Roadway	-	-	NMI	September 9, 2016	-	• Existing Riverside Drive Configuration	• Track Alignment • Emergency walkway				X				
SN015850	Campus Avenue Overpass O-Train Line	City of Ottawa	Existing Structure	Roadway	-	-	NMI	May 22, 2018	-	• Existing Campus Avenue Configuration	• Track Alignment • Emergency walkway				X				
SN015340	Somerset Street Overpass O-Train Line	City of Ottawa	Existing Structure	Roadway	-	-	NMI	July 16, 2014	-	• Existing Somerset Street Configuration	• Track Alignment • Emergency walkway				X				
SN018430	Trinity Pedestrian Bridge	City of Ottawa	New Pedestrian Bridge	Pedestrian/ Maintenance Vehicle	-	No	SI	-	1 - High	• Pedestrian Connection	• Track Alignment • Emergency walkway • MUP	X							
SN015380	Albert Street Overpass O-Train Line	City of Ottawa	Existing Structure	Roadway	-	-		August 14, 2016	-	• Existing Albert Street Configuration	• Track Alignment • Emergency walkway				X				
Airport Rail Link																			
SN225640	Rail Bridge over Uplands Drive	City of Ottawa/NCC	New Elevated Guideway	Railway	No	-	SI	-	1 - High	• EB & WB track Alignment • Emergency walkway	• Future Uplands Drive cross section	X						Subject to NCC Requirements. NBC Applies on Federal Lands.	
SN225630	Rail Bridge over Airport Parkway	City of Ottawa/NCC	New Elevated Guideway	Railway	No	-	SI	-	1 - High	• EB & WB track Alignment • Emergency walkway	• Future Airport Parkway cross section	X						Subject to NCC Requirements. NBC Applies on Federal Lands.	
SN225110	Elevated Guideway to OMCI Terminal	City of Ottawa/NCC	New Elevated Guideway	Railway	No	-	SI	-	1 - High	• EB & WB track Alignment • Emergency walkway	• Existing Road Network • Emergency parking • Existing utilities	X						NBC Applies on Federal Lands	

* The need to repair, modify or replace the structure shall be determined by Project Co following the completion of the required structural reports.

Structure Number	Structure Name	Governmental Authority	Structure Type	Structure Conveyance	Subject to Freight Loading and Clearance on the Structure	Subject to Freight Clearance under Structure	NMI or SI	Date of Most Recent Inspection	Bridge Aesthetic Level and Classification	Geometric Structural Requirements		Scope of Design/ Construction Work							Additional Comments/Requirements	
										Structure Cross Section to Accommodate	Structure to Span Over	New - Design & Construction	Rehabilitate/ Modify	Repair, Modify or Replace	Remove Structure	Install Bridge Structure Fencing	Structural Evaluation	Seismic Evaluation	DCA & Recommendation	
Mainline																				
SN225710	Limebank Road Bridge	City of Ottawa	New Grade Separation	Roadway or Railway	-	-	NMI - Roadway Bridge SI - Railway Bridge	-	3-Low	<ul style="list-style-type: none"> Proposed Limebank Road cross section or • NB & SB track Alignment • Emergency walkway • Future MUP on south side of Track • Future collector road on north side of Track or • Proposed Limebank Road cross section • Future MUP on south side of track corridor • Future MUP between north and south side of track corridor 	<ul style="list-style-type: none"> • NB & SB track Alignment • Emergency walkway • Future MUP on south side of Track • Future collector road on north side of Track or • Proposed Limebank Road cross section • Future MUP on south side of track corridor • Future MUP between north and south side of track corridor 	X								* Proponent to design and construct a grade separation at Limebank Road that will either accommodate the roadway over the alignment or the alignment over the roadway
SN225050	Mosquito Creek Rail Bridge	City of Ottawa	New Elevated Guideway	Railway	-	-	SI	-	3-Low	<ul style="list-style-type: none"> • NB & SB track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • Mosquito Creek • Wildlife crossing 	X								
SN225690	Bowesville Road Bridge	City of Ottawa	New Grade Separation	Roadway or Railway	-	-	NMI - Roadway Bridge SI - Railway Bridge	-	3-Low	<ul style="list-style-type: none"> • Proposed Bowesville Road cross section or • NB & SB track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • NB & SB track Alignment • Emergency walkway • MUP or • Proposed Bowesville Road cross section 	X							* Proponent to design and construct a grade separation at Bowesville Road that will either accommodate the roadway over the alignment or the alignment over the roadway	
SN225680	Earl Armstrong Bridge	City of Ottawa	New Grade Separation	Roadway or Railway	Yes	Yes	NMI - Roadway Bridge SI - Railway Bridge	-	3-Low	<ul style="list-style-type: none"> • Existing Earl Armstrong Road cross section or • NB & SB track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • NB & SB track Alignment • Emergency walkway • East MUP or • Existing Earl Armstrong Road cross section 	X			X				* Proponent to design and construct a grade separation at Earl Armstrong Road that will either accommodate the roadway over the alignment or the alignment over the roadway	
SN225670	High Road Bridge	City of Ottawa	New Overhead Bridge	Pedestrian/ Maintenance Vehicle	-	Yes	NMI	-	3 - Low	<ul style="list-style-type: none"> • MUP 	<ul style="list-style-type: none"> • NB & SB track Alignment • Emergency walkway 	X			X					
SN225610	Leitrim Road Bridge	City of Ottawa	New Grade Separation	Roadway or Railway	Yes (applicable to rail over road only)	No	NMI - Roadway Bridge SI - Railway Bridge	-	3 - Low	<ul style="list-style-type: none"> • Proposed Leitrim Road cross section or • NB & SB track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • Proposed Leitrim Road cross section or • NB & SB track Alignment • Emergency walkway 	X			X				* Proponent to design and construct a grade separation at Leitrim Road that will either accommodate the roadway over the alignment or the alignment over the roadway	
SN225620	Rail Bridge over Lester Road	City of Ottawa/NCC	New Elevated Guideway	Railway	No - if freight bypass is provided	-	SI	-	3 - Low	<ul style="list-style-type: none"> • Single track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • Proposed Lester Road cross section 	X							* Centre pier shall be prohibited.	
SN055350	Hunt Club Road Bridge	City of Ottawa	4-Span Concrete Bridge	Railway	Yes	-	SI	June 20, 2017	-	<ul style="list-style-type: none"> • SB track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • Existing Hunt Club Road cross section 		*			X	X			
SN055440	Rail Bridge over Hunt Club Road	City of Ottawa	New Elevated Guideway	Railway	No	-	SI	-	3 - Low	<ul style="list-style-type: none"> • NB track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • Existing Hunt Club Road cross section 	X								
SN058620	Hunt Club MUP Bridge	City of Ottawa	New Pedestrian Bridge	Pedestrian/ Maintenance Vehicle	-	-	SI	-	1 - High	<ul style="list-style-type: none"> • MUP 	<ul style="list-style-type: none"> • Existing Hunt Club Road cross section 	X								
SN055740	Rail Bridge over MUP North of Hunt Club Road	City of Ottawa	New Pedestrian Underpass	Railway	Yes	-	SI	June 20, 2017	1 - High	<ul style="list-style-type: none"> • NB & SB track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • MUP 	X							* Structure shall have a minimum opening of 6m wide by 3m high	
SN058490	Rail Bridge over MUP at South Keys Station	City of Ottawa	Single-Span Concrete Rigid Frame	Railway	Yes	-	SI	June 20, 2017	-	<ul style="list-style-type: none"> • NB & SB track Alignment • Train Platform 	<ul style="list-style-type: none"> • MUP 		X		X		X			
SN055750	Pedestrian Overpass North of South Keys Station	City of Ottawa	New Pedestrian Underpass	Railway	Yes	-	SI	-	3 - Low	<ul style="list-style-type: none"> • NB & SB track Alignment • Emergency walkway • NB & SB Transitway lanes 	<ul style="list-style-type: none"> • MUP 	X							* Structure shall have a minimum opening of 6m wide by 3m high	
SN055900	Walkley Yard Lead over Transitway	City of Ottawa	Single-Span Concrete Arch	Railway	Yes	-	SI	July 5, 2017	-	<ul style="list-style-type: none"> • NB & SB track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • Existing Transitway cross section 		*			X	X			
SN055910	Rail Bridge over Transitway at Walkley Yard Connecting Track	City of Ottawa	Single-Span Concrete Arch	Railway	Yes	-	SI	July 5, 2017	-	<ul style="list-style-type: none"> • NB & SB track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • Existing Transitway cross section 		*			X	X			
SN055470	Sawmill Creek Culvert	City of Ottawa	Single-Span Concrete Rigid Frame	Railway	Yes	-	SI	July 5, 2017	-	<ul style="list-style-type: none"> • NB & SB track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • Sawmill Creek 		*		X		X			
SN055200	Sawmill Creek Bridge	City of Ottawa	3-Span Steel Plate/Prestressed Concrete Girder Bridge	Railway	Yes	-	SI	June 20, 2017	-	<ul style="list-style-type: none"> • NB & SB track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • Sawmill Creek • Brookfield Pedestrian Bridge 			X						
SN055930	Rail Bridge over Southeast Transitway	City of Ottawa	3-Span Steel Plate Girder Bridge	Railway	Yes	-	SI	June 30, 2017	-	<ul style="list-style-type: none"> • NB & SB track Alignment • Emergency walkway 	<ul style="list-style-type: none"> • Existing Transitway cross section 				X					

Structure Number	Structure Name	Governmental Authority	Structure Type	Structure Conveyance	Subject to Freight Loading and Clearance on the Structure	Subject to Freight Clearance under Structure	NMI or SI	Date of Most Recent Inspection	Bridge Aesthetic Level and Classification	Geometric Structural Requirements		Scope of Design/ Construction Work							Additional Comments/Requirements
										Structure Cross Section to Accommodate	Structure to Span Over	New - Design & Construction	Rehabilitate/ Modify	Repair, Modify or Replace	Remove Structure	Install Bridge Structure Fencing	Structural Evaluation	Seismic Evaluation	DCA & Recommendation
SN055940	VIA Grade Separation at Ellwood Diamond	City of Ottawa	New Elevated Guideway	Railway	No	Yes-	SI	-	3 - Low	• Alignment • Emergency walkway	• Existing VIA Track • Existing Transitway Configuration • Sawmill Creek • Existing Brookfield MUP	X							• The substructure shall be overbuilt in order to accommodate a future second track
SN015290	Rideau River Bridge	City of Ottawa	5-Span Riveted Steel Bridge	Railway	Yes	-	SI	June 22, 2017	see notes	• NB & SB track Alignment • Emergency walkway	• Rideau River • Existing University Drive cross section • South MUP		*		X	X	X	If replaced instead of repaired, the new structure's aesthetic level would be 1 - High	
SN018750	University Road Pedestrian Bridge over Rideau River	City of Ottawa	New Pedestrian Bridge	Pedestrian/ Maintenance Vehicle	-	-	NMI	-	1-High	• MUP	• Rideau River	X							• The Structure shall have a minimum clear width of 5m • The Structure shall have a minimum clear span of 63.5m
SN018510	South Rail Bridge over MUP at Carleton University	City of Ottawa	Single-Span Reinforced Concrete Bridge	Railway	Yes	-	SI	June 20, 2017	-	• NB & SB track Alignment • Emergency walkway	• MUP		X			X	X		
SN018490	North Rail Bridge over MUP at Carleton University	City of Ottawa	Precast Box Culvert	Railway	Yes	-	SI	June 20, 2017	-	• NB & SB track Alignment • Emergency walkway	• MUP	X						• Structure shall have a minimum opening size of 9m wide x 3m high	
SN015440	Carleton University Tunnel at Carleton Station	Carleton University	New Pedestrian Tunnel	Railway	Yes	-	SI	-	3 - Low	• NB & SB track Alignment • Emergency walkway	• Future Pedestrian Walkway	X						• Structure shall have a minimum opening size of 9m wide x 3m high	
SN015430	Existing Carleton University Tunnel System	Carleton University	Concrete Box Tunnel	Railway	Yes	-	NMI	Unknown	-	• NB & SB track Alignment • Emergency walkway	• Existing Pedestrian Walkway		*		X				
SN019020	Existing Tunnel under Dow's Lake	City of Ottawa	Existing Concrete Tunnel	Railway	-	-	SI	July 5, 2017	-	• Dow's Lake	• Single track Alignment • Emergency walkway		X				X		
SN055330	Walkley Road Overpass O-Train Line	City of Ottawa	Existing Structure	Roadway	-	-		October 26, 2016	-	• Existing Walkley Road Configuration	• Track Alignment • Emergency walkway				X				
SN055260	Heron Road Overpass O-Train Line	City of Ottawa	Existing Structure	Roadway	-	-	NMI	September 9, 2016	-	• Existing Heron Road Configuration	• Track Alignment • Emergency walkway				X				
SN055280	Riverside Drive Overpass O-Train Line	City of Ottawa	Existing Structure	Roadway	-	-	NMI	September 9, 2016	-	• Existing Riverside Drive Configuration	• Track Alignment • Emergency walkway				X				
SN015850	Campus Avenue Overpass O-Train Line	City of Ottawa	Existing Structure	Roadway	-	-	NMI	May 22, 2018	-	• Existing Campus Avenue Configuration	• Track Alignment • Emergency walkway				X				
SN015340	Somerset Street Overpass O-Train Line	City of Ottawa	Existing Structure	Roadway	-	-	NMI	July 16, 2014	-	• Existing Somerset Street Configuration	• Track Alignment • Emergency walkway				X				
SN018430	Trinity Pedestrian Bridge	City of Ottawa	New Pedestrian Bridge	Pedestrian/ Maintenance Vehicle	-	No	SI	-	1 - High	• Pedestrian Connection	• Track Alignment • Emergency walkway • MUP	X							
SN015380	Albert Street Overpass O-Train Line	City of Ottawa	Existing Structure	Roadway	-	-		August 14, 2016	-	• Existing Albert Street Configuration	• Track Alignment • Emergency walkway				X				
Airport Rail Link																			
SN225640	Rail Bridge over Uplands Drive	City of Ottawa/NCC	New Elevated Guideway	Railway	No	-	SI	-	1 - High	• EB & WB track Alignment • Emergency walkway	• Future Uplands Drive cross section	X						Subject to NCC Requirements. NBC Applies on Federal Lands.	
SN225630	Rail Bridge over Airport Parkway	City of Ottawa/NCC	New Elevated Guideway	Railway	No	-	SI	-	1 - High	• EB & WB track Alignment • Emergency walkway	• Future Airport Parkway cross section	X						Subject to NCC Requirements. NBC Applies on Federal Lands.	
SN225110	Elevated Guideway to OMCI Terminal	City of Ottawa/NCC	New Elevated Guideway	Railway	No	-	SI	-	1 - High	• EB & WB track Alignment • Emergency walkway	• Existing Road Network • Emergency parking • Existing utilities	X						NBC Applies on Federal Lands	

* The need to repair, modify or replace the structure shall be determined by Project Co following the completion of the required structural reports.

Appendix D – Form of Road Safety Audit Certificates

1. Road Safety Audit Certificate (Stage 1)
2. Road Safety Audit Certificate (Stage 2)
3. Road Safety Audit Certificate (Stage 4)

Certificate Ref No. []

ROAD SAFETY AUDIT CERTIFICATE (STAGE 1)

This Certificate is being delivered pursuant to the agreement between the City of Ottawa and [Project CoJ dated • (“the Project Agreement”) relating to the Project. Defined terms and expressions used in this Certificate have the same meanings as ascribed thereto in the Project Agreement.

Form of Certificate to be used by the designer for certifying that a Stage 1 Road Safety Audit has been carried out in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-Bys of the Design and Construction Specifications.

1. We certify that the Pre-Final Design Development of [.....] has been the subject of a Stage 1 Road Safety Audit in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-Bys of the Design and Construction Specifications, the Design Quality Management Plan and all other relevant provisions of the Project Agreement.
2. The Road Safety Audit Team’s report and statement certifying the audit has been carried out are attached.

Signed:

Road Safety Audit Team (Principal)

Name:

Title:

Date:

Professional Registration Number:

Affix Professional Seal

3. We certify that the preliminary design of [.....] has been the subject of a Stage 1 Road Safety Audit in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-Bys of the Design and Construction Specifications, the Design Quality Management Plan and all other relevant provisions of the Project Agreement and that all observations and recommendations in the Road Safety Audit Team’s report have been satisfactorily addressed and resolved.

Signed:

Designer (Principal)

Name:

Title:

Date:

Professional Registration Number:

Affix Professional Seal

Signed:

Construction Contractor (Principal)

Name:

Title:

Date:

Professional Registration Number:

Affix Professional Seal

Signed:

Project Co Representative

Name:

Date:

4. Receipt of this Certificate is acknowledged.

Signed.....

City of Ottawa Representative

Name.....

Date.....

Certificate Ref. No. []

ROAD SAFETY AUDIT CERTIFICATE (STAGE 2)

This Certificate is being delivered pursuant to the agreement between the City of Ottawa and [Project CoJ dated • (“the Project Agreement”) relating to the Project. Defined terms and expressions used in this Certificate have the same meanings as ascribed thereto in the Project Agreement.

Form of Certificate to be used by the designer for certifying that a Stage 2 Road Safety Audit has been carried out in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-Bys of the Design and Construction Specifications.

1. We certify that the Final Design Development of [.....] has been the subject of a Stage 2 Road Safety Audit in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-Bys of the Design and Construction Specifications, the Design Quality Management Plan and all other relevant provisions of the Project Agreement.
2. The Road Safety Audit Team’s report and statement certifying the audit has been carried out are attached.

Signed:

Road Safety Audit Team (Principal)

Name:

Title:

Date:

Professional Registration Number:

Affix Professional Seal

3. We certify that the final design of [.....] has been the subject of a Stage 2 Road Safety Audit in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-Bys of the Design and Construction Specifications, the Design Quality Management Plan and all other relevant provisions of the Project Agreement and that all observations and recommendations in the Road Safety Audit Team’s report have been satisfactorily addressed and resolved.

Signed:

Designer (Principal)

Name:

Title:

Date:

Professional Registration Number:

Affix Professional Seal

Signed:

Construction Contractor (Principal)

Name:

Title:

Date:

Professional Registration Number:

Affix Professional Seal

Signed:

Project Co Representative

Name:

Date:

4. Receipt of this Certificate is acknowledged.

Signed.....

City of Ottawa Representative

Name.....

Date.....

Certificate Ref. No. []

ROAD SAFETY AUDIT CERTIFICATE (STAGE 4)

This Certificate is being delivered pursuant to the agreement between the City of Ottawa and [Project CoJ] dated • (“the Project Agreement”) relating to the Project. Defined terms and expressions used in this Certificate have the same meanings as ascribed thereto in the Project Agreement.

Form of Certificate to be used by the designer for certifying that a Stage 4 Road Safety Audit has been carried out in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-Bys of the Design and Construction Specifications.

1. We certify that the **[reference relevant works]** as constructed, tested and commissioned has been the subject of a Stage 4 Road Safety Audit in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-Bys of the Design and Construction Specifications, the Design Quality Management Plan and all other relevant provisions of the Project Agreement.
2. The Road Safety Audit Team’s report and statement certifying the audit has been carried out are attached.

Signed:

Road Safety Audit Team (Principal)

Name:

Title:

Date:

Professional Registration Number:

Affix Professional Seal

3. We certify that the **[reference relevant works]** as constructed, tested and commissioned has been the subject of a Stage 4 Road Safety Audit in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-Bys of the Design and Construction Specifications, the Design Quality Management Plan and all other relevant provisions of the Agreement and that all observations and recommendations in the Road Safety Audit Team’s report have been satisfactorily addressed and resolved.

Signed:

Designer (Principal)

Name:

Title:

Date:

Professional Registration Number:

Affix Professional Seal

Signed:

Construction Contractor (Principal)

Name:

Title:

Date:

Professional Registration Number:

Affix Professional Seal

Signed:

Project Co Representative

Name:

Date:

4. Receipt of this Certificate is acknowledged.

Signed.....

City of Ottawa Representative

Name.....

Date.....

APPENDIX E

[REDACTED]

APPENDIX F

Pedestrian Crossover Infrastructure Requirements

1.0 General

1.1 Scope

- a) This general specification identifies additional construction requirements specific to pedestrian crossover (PXO) facilities, including but not limited to, traffic infrastructure, street lighting, traffic signs, and pavement markings.

2.0 Reference Standards

- a) These are the primary references for the design and construction of a pedestrian crossover per Schedule 15-2, Part 2, Clause 6.1(a). Project Co shall reference, but not be limited to, the following reference material for the design and construction of a pedestrian crossover:
- City of Ottawa Pedestrian Crossover Program and Example Documents 1 and 2
 - City of Ottawa Right-of-Way Lighting Policy
 - Ministry of Transportation of Ontario (MTO) Ontario Traffic Manual (OTM)

3.0 Approval of Source

- a) Project Co shall coordinate and request approval from the City of Ottawa for their pedestrian crossover designs according to the requirements of Schedule 15-2, Part 2, Table 6-1 before proceeding to order, supply and install the pedestrian crossovers. For the permanent installation of pedestrian crossovers, Project Co shall only supply and install materials provided by manufacturers approved by the City of Ottawa or its agent. Only materials evaluated and approved will be accepted. Once the materials are approved, Project Co and the manufacturer shall not change the material type or component parts without prior approval, by the City of Ottawa or its agent, for subsequent orders.

4.0 Characteristics (Physical, Electrical, Environmental, Operational)

4.1 Physical Characteristics

4.1.1 Traffic Poles and Foundations

- a) Project Co shall supply and install the traffic infrastructure referenced from Table 1 below, based on the PXO Type and presence of street lighting, per the City of Ottawa Standard Detail Drawings.

Table 1: Pole Type and Foundation Detail for each PXO Type

PXO Type		City of Ottawa Standard Detail Drawing		
		Pole Type	Foundation Details	
Type B	w/ street lighting	Joint Use (32')	J-6-16	As per T23
	w/o street lighting	Mast Pole	J-6-51	As per T22
Type C	w/ street lighting	Joint Use (32')	J-6-16 (w/o arm)	As per T23
	w/o street	Tubular Pole	J-6-49 (w/o)	As per T21 (or LID 002D)

	lighting		arm)
--	----------	--	------

- a) Project Co shall refer to the attached design references for the placement and spacing of signs, push buttons, RRFB, etc. on the appropriate poles.

4.1.2 RRFB

- a) Project Co shall reference the City of Ottawa RRFB specification included with this Appendix. The City has pre-approved the following RRFB models:
- JSF RRFB Model AB 9207 (Single-sided)
 - JSF RRFB Model AB 9407 (Double-sided)
 - Carmanah SC 315 (Single-sided or double-sided)

4.2 Electrical Characteristics

- a) Project Co is to coordinate and provide sufficient notice to the City of Ottawa prior to making any electrical connections per Schedule 15-2, Part 2, Table 6-1. An authorized City of Ottawa electrical maintenance provider shall complete all final electrical connections.
- b) For the installation of the RRFBs, Project Co shall comply with the requirements of the RRFB specifications.

4.3 Environmental Characteristics

- a) For the installation of the RRFBs, Project Co shall comply with the requirements of the RRFB specifications.

4.4 Operational Characteristics

4.4.1 Illumination

- a) Project Co shall coordinate with the City of Ottawa Street Lighting Group to confirm if the proposed location of the PXO meets the required City of Ottawa lighting level criteria as per City of Ottawa ROW Lighting Policy. If the location does not meet the required lighting level criteria, Project Co shall design, obtain approvals, supply materials and labour, equipment, construct, provide inspection and testing associated with the City's requirements for street lighting standards and best practices, or upgrade the existing fixtures to meet the appropriate lighting levels.
- b) For the installation of new street lights, Project Co shall supply and install all luminaires and the associated traffic fixtures, or an equivalent approved material. The type/model of street light varies for each specific site. As such, Project Co shall confirm with City of Ottawa Street Lighting Group for the appropriate type/model of each material required for new street lights.

- c) An authorized City of Ottawa Street Light maintenance provider shall complete all final electrical connections.

4.4.2 Traffic Signs

- a) Project Co shall design, supply and install all temporary and permanent traffic signs for a pedestrian crossover per the requirements of OTM Book 5 and Book 15.

4.4.3 Pavement Markings

- a) Project Co shall design, supply and install all temporary and permanent pavement markings for a pedestrian crossover per the requirements of OTM Book 11 and Book 15.
- b) The dimensions of the “shark tooth” pavement markings in the general traffic lanes shall be:

- Height = 90 cm
- Width = 60 cm
- Spacing = 30 cm

Appendix F1 - RRFB Specification

1.0 General Requirements

- a) RRFB's are pedestrian-activated, high-intensity flashing beacons that warn drivers of the presence of a pedestrian in the crosswalk. RRFB's consist of two rectangular yellow indications with two tell-tale end indicators to let pedestrians know that the beacon is flashing. RRFB's must be activated manually by pushbuttons and are to flash in a rapid pattern for a pre-set time.
- b) The Ontario Traffic Manual (OTM) Book 15, outlines the components and installation layouts of RRFB's at pedestrian crossovers. All RRFB's supplied must be compliant with Book 15 applications and requirements and also be compliant with all certifications, as may be required by law.
- c) The RRFB must be widely distributed and have been on the market for more than two (2) years.

2.0 General Design

- a) The unit shall be available in two configurations, double-sided and single-sided. A RRFB unit shall consist of the RRFBs, associated enclosure, and a power supply consisting of a solar panel with rechargeable battery(s) and a push button for activation. The unit may have a separate controller and/or battery cabinet if so required.
- b) The RRFB's must be capable of being mounted on these poles above the Pedestrian Crossing sign and at a height between 3.0m and 4.0m from the base of the pole.

3.0 RRFB Specifications

- a) The enclosure in which the RRFBs are mounted must be yellow. The yellow colour must be similar to that used on warning signs in the Province of Ontario. Refer to the OTM Book 1B. Where a separate controller/battery cabinet is provided, the cabinet shall be grey.
- b) All RRFB enclosures (and controller/battery cabinet if applicable) shall be powder coated aluminum and shall be weather tight, secure and vandal resistant. All enclosures/cabinets shall have a minimum 5 year corrosion damage warranty.
- c) Each single-sided RRFB unit shall provide two (2) LED rectangular-shaped amber indications facing outward toward on-coming traffic. A double-sided unit shall provide an additional two (2) LED indications facing the opposite direction.
- d) Each LED indication shall be a minimum of 125mm wide by 50mm high. The two (2) RRFB indications shall be aligned horizontally, with the longer dimension horizontal and with a minimum space between the two indications of 175 mm, measured from inside edge of one indication to the inside edge of the other indication.

- e) The RRFBs shall provide a minimum of 20 degrees horizontal pivot. When set, the RRFB angle shall remain securely in place.
- f) Each RRFB unit shall provide two (2) yellow LED tell-tale end indicators, one facing inward toward the crossover the other facing outward. Each tell-tale indicator shall be a minimum of 5 sq. cm.

4.0 Power Specifications

- a) Each unit shall be powered by a rechargeable battery(s). The battery(s) shall be recharged by solar panels.
- b) Each unit must be capable of being connected directly to 120 volt AC power or to be capable of being modified to provide a direct AC connection. In the case where the supplied unit does not provide a direct AC connection, an “AC modification package” must be available from the manufacturer that would enable the unit to accept a direct AC connection. The “AC modification package” must be easily field installable. The cost of the “AC modification package” must be available at a cost of not more than 10% of the RRFB unit cost.
- c) The power supply must be capable of operating the RRFB unit (from full charge) for a minimum of 20 days without re-charging at an average usage rate of 200 cycles per day at 25 seconds of activation/per cycle.
- d) The solar panel and battery(s) must be of sufficient size and capacity to provide the necessary power as recommended by the manufacturer to achieve the rated usage, where installed in Ottawa, Ontario, Canada.
- e) The battery(s) shall be UL certified and field replaceable.
- f) The solar panel must be capable of being securely installed on the top and on the side of the J-6-49, J-6-51 or J-6-16 (side only) pole that the RRFB is mounted.
- g) All brackets and hardware required to mount the solar panels must be supplied with the unit. All brackets and mounting hardware are to be corrosion resistant. Brackets and mounting hardware must be supplied to enable 12 side-of-pole installations and 20 top-of-pole installations.
- h) All wiring connections for the RRFB unit components must be capable of being easily installed within the poles specified (J-6-49, J-6-51, J-6-16). All wiring and connections shall be weather tight, secure and vandal resistant.
- i) The unit is to be supplied with an accessible push button for pedestrians to activate the RRFB's. The push button is to be yellow and must be capable of being mounted on the same pole that the RRFB is mounted. Brackets and mounting hardware to attach the push button to the poles specified must be supplied.

- j) The pushbutton shall have a two-tone audible confirmation.
- k) The power supply, including battery and solar panel and all other components must be capable of operating at temperatures between -40°C and +40°C. Any upgrades to the power supply or other components recommended by the manufacturer required to ensure the unit operates at its rated usage, within this temperature range are to be included.

5.0 Operational Requirements

- a) The operation of the RRFB shall be as outlined in OTM Book 15.
- b) When activated by push button, the two (2) yellow indications in each RRFB unit (two in each direction for double sided units) shall flash in a rapidly alternating “wig-wag” flashing sequence (left light on, then right light on) with a duty cycle of 800 milliseconds (ms). The left LED flashes two times in a slow volley each time it is energized (125 ms on and 75 ms off per flash). This is followed by the right LED, which flashes four times in a rapid volley when energized (25 ms on and 25 ms off per flash) and then has a longer flash for 200 ms. The effect is known as a “stutter flash effect” and is compliant with the Manual on Uniform Traffic Control Devices (MUTCD) RRFB flash pattern 2/4-1 (2012).
- c) The RRFBs must also be capable of flashing in compliance with MUTCD RRFB flash pattern WW+S (2014) (Wig-Wag plus Simultaneous).
- d) The unit’s flash pattern shall be capable of being easily set in the field through manual means (switch, dial, etc.).
- e) When the RRFB is flashing, the two tell-tale end indicators on the unit shall be on. Otherwise, they are to be off.
- f) The time lapse between the push button activation and start of the RRFB flashing should be less than 1 second and in no case more than 3 seconds.
- g) If a pedestrian pushes the button midway through a flashing cycle, the unit is to reset the RRFB flash duration for another full cycle.
- h) The flash rate of each individual yellow indication, as applied over the full on-off sequence of a flashing period of the indication, shall not be between 5 and 30 flashes per second.
- i) The flash duration cycle of the RRFB must be variable. The flash duration cycle must be capable of being set (in 5 seconds increments) for a minimum of 5 seconds up to 60 seconds.
- j) Generally more than one (1) RRFB unit is installed at a PXO. The operation of these units must be synchronized to enable the activation of one RRFB unit to automatically activate up to four (4) additional RRFBs.

- k) The communication “channel” for the RRFB to synchronize with other RRFB units shall be capable of being easily set in the field through manual means (switch, dial, etc.).
- l) Communication enabling the synchronization of the RRFB units shall be wireless and must operate within a minimum line-of-sight distance of 350m.
- m) Communication between RRFB units to enable synchronized activation must be secure and designed to avoid interference between multiple locations or other electrical devices.
- n) The RRFB units must provide a night time auto brightness feature. This feature must be capable of being turned off.
- o) The RRFB unit shall provide a visual indicator of substandard operating condition.

6.0 Operational Requirements

- a) A five (5) year warranty is to be provided for workmanship and materials.
- b) The RRFB enclosure and controller cabinet (if applicable) shall have a five (5) year corrosion damage warranty.
- c) One (1) written copy of the installation and operating manual must be supplied for each unit supplied. The manual is to contain the information necessary to install, operate, and maintain the RRFB unit and all associated components.
- d) Keys and/or special tools that may be required to access and maintain the unit shall be supplied.
- e) Parts covered by warranty must be available within twenty (20) calendar days. The supplier shall be responsible for all delivery costs, including those for the return of defective components as may be required.

APPENDIX G

Trillium Line Switch Heater Supply Options

TRILLIUM LINE SWITCH HEATERS SUPPLY OPTIONS

Trillium Line Switches		[REDACTED]: Switch Heater Supply Point		[REDACTED]: Switch Heater Supply Point		Other
LOCATION	Geographic Coordinates	Supply Point Geographic Coordinates	Comments	Supply Point Geographic Coordinates	Comment	General Comments
BAYVIEW CROSSOVER	45.408862N 75.721336W	From Station	Supply from Bayview Station.	45.403885N 75.713858W	Use existing supply from metering station at Gladstone	
BAYVIEW CROSSOVER	45.408447N 75.720745W					
GLADSTONE SIDING	45.40054N 75.711417W	From Station	Supply from Gladstone Station	45.400548N 75.711685W	[REDACTED] can extend gas main from Railway Street to the provided supply point/metering station.	
CARLETON SIDING	45.388136N 75.696286W	From Station	Supply from Carleton University Station. Check existing supply from Carleton University.	Not Verified	Use supply for existing natural gas switch heater. Existing switch heater is at 45.386648N, 75.697879W.	[REDACTED] has two natural gas switch heaters today. Existing supply point and metering station has not been verified.
CARLETON SIDING	45.382205N 75.695325W					
BROOKFIELD SIDING	45.374118N 75.678041W	45.374118N 75.678041W	Use existing supply.	45.373888N 75.677007W	Use existing [REDACTED] metering station supply, which services both existing natural gas switch heaters.	
BROOKFIELD SIDING	45.370475N 75.668938W	45.370475N 75.668938W	Use existing supply.			

Trillium Line Switches		[REDACTED]: Switch Heater Supply Point		[REDACTED]: Switch Heater Supply Point		Other
LOCATION	Geographic Coordinates	Supply Point Geographic Coordinates	Comments	Supply Point Geographic Coordinates	Comment	General Comments
WALKLEY YARD LEAD	45.365651N 75.662619W	45.365651N 75.662619W	Use existing supply.	45.363359N 75.658580W	[REDACTED] can extend gas main from Bank St. to the provided supply point/metering station.	North Walkley Yard Lead switch heater is currently supplied by propane tank.
WALKLEY YARD LEAD	45.360148N 75.659451W	45.360148N 75.659451W	Use existing supply.			South Walkley Yard Lead will have an electric switch heater installed in 2018. There is no room for a propane tank.
NEW WALKLEY YARD	45.36348N 75.657892W	45.36348N 75.657892W	Use existing supply.			Walkley Yard switch heaters for switches 4, 5a, 5b, 6a and 6b are currently supplied by a propane tank at 45.363912N 75.656856W.
AIRPORT LINK	45.356744N 75.657451W	45.353819N 75.655748W	Recommend supplying from South Keys Station.	45.350748N 75.653833W	[REDACTED] can extend gas main from Hunt Club to the provided supply point/metering	
SOUTH KEYS POCKET TRACK	45.354544N 75.656147W					

**Trillium Line Extension
Ottawa Stage 2 LRT Project**

**Project Agreement - Schedule 15-2 Part 2
Execution Version**

SOUTH KEYS POCKET TRACK	45.354035N 75.655763W				station.	
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Trillium Line Switches		[REDACTED]: Switch Heater Supply Point		[REDACTED]: Switch Heater Supply Point		Other
LOCATION	Geographic Coordinates	Supply Point Geographic Coordinates	Comments	Supply Point Geographic Coordinates	Comment	General Comments
SOUTH KEYS CROSSOVER	45.349006N 75.652832W	45.349778N 75.651722W	4.16kV at Mac Street	45.349721N 75.651903W	[REDACTED] can extend gas main from Mac Street to the provided supply point/metering station.	
SOUTH KEYS CROSSOVER	45.347944N 75.652209W					
UPLANDS SIDING	45.340161N 75.650014W	From Station	Supply from Uplands Station	45.332050N 75.658175W	[REDACTED] can extend gas main from Lester Road to the provided supply point.	
UPLANDS SIDING	45.332239N 75.657663W					
LEITRIM SIDING	45.319516N 75.635242W	From Station	Supply from Leitrim Station	45.316360N 75.633185W	[REDACTED] can extend gas main from Leitrim Road to the provided supply point/metering station.	
LIMEBANK CROSSOVER	45.278190N 75.665000W	From Station	Recommend supplying from Limebank Station.	45.279767N 75.666975W	[REDACTED] can extend gas main from Earl Armstrong Road to the provided supply	[REDACTED] is currently designing expansion XHP from Canyon Walk Drive

LIMEBANK CROSSOVER	45.277575N 75.666572W			point/metering station.	to Earl Armstrong and Limebank for a customer.
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**SCHEDULE 15-2
DESIGN AND CONSTRUCTION**

**PART 2 DESIGN AND CONSTRUCTION REQUIREMENTS – CIVIL AND
GUIDEWAY**

ARTICLE 1 INTRODUCTION

1.1 General

- (a) The Expanded Trillium Line intends to improve intermediate recovery time between stopping points, supporting achievable headway service. Key improvements include lengthening existing sidings and improving Track geometry.
- (b) The Existing Trillium Line shall be extended south from Greenboro Station to Limebank Station with new Stations also located at South Keys, adjacent to the existing BRT Station, at Leitrim, about 275m south of Leitrim Road, and at Bowesville Road.
- (c) The entire Expanded Trillium Line, which falls within the existing rail corridor, is subject to be designed to accommodate freight. Project Co shall provide a continuous single-Track freight route, with the following exceptions:
 - (i) The [REDACTED] Grade Separation at Ellwood Diamond is not required to carry freight. Refer to clause 2.9(d)(ii) of Schedule 15-2, Part 1.
 - (ii) A Leitrim Road over Rail grade separation shall not be subject to freight clearance under the Structure. Refer to Schedule 15-2 Part 2 Appendix C.
 - (iii) The alignment of the Trillium Line Extension deviates from the existing rail corridor south of Earl Armstrong Road. The extension which falls outside the existing rail corridor is not required to be designed to accommodate freight.
 - (iv) An Earl Armstrong rail over road grade separation shall not be subject to freight gradients as outlined in Article 2.9 (b) (iii) of this Part 2, however shall be subject to freight loading requirements outlined in Article 4.5 (c) (i) of this Part 2.
- (d) The Existing Trillium Line currently provides access for freight deliveries to and from the NRC Facility ten to twelve times per year from the Walkley Interchange to the NRC Facility about 500m south of Lester Road. The Trillium Line Extension shall include an NRC Spur Line to provide for freight deliveries to the NRC Facility.
- (e) The Trillium Line Extension shall include a branch line to the OMCIA referred to as the Airport Link. The Airport Link shall operate the Expanded Trillium Line Trains exclusively (no freight traffic) from 300m south of Hunt Club road where the alignment extends outside the existing established rail corridor.

1.2 General Description of the Guideway and Guideway Requirements

- (a) Project Co shall design and construct the Guideway in the following Track configuration:
- (i) one Mainline Track for operation from Limebank Station in the south end to Bayview Station in the north end for a length of approximately 19.5km;
 - (ii) with single Track passing sidings off the mainline at:
 - A. Leitrim: of a length of 6.64 km originating at Limebank Station and terminating at 23+511.334 (Reference Concept stationing) with a powered turnout;
 - B. South Keys: of a length of 0.933km from station 27+077 with a powered turnout at station 28+00 (Reference Concept stationing);
 - C. Brookfield: of a length of 0.86km shifting the southerly existing powered turnout to station 29+820 and shifting the northerly powered turnout to station 30+680 (Reference Concept stationing);
 - D. Carleton: of a length of 0.641km with powered turnouts at station 32+314 and station 32+955 (Reference Concept stationing). The existing powered turnouts have recently been replaced with new turnouts. These existing turnouts shall be relocated and used in the design;
 - E. Gladstone: of a length of 1.307km from powered turnout at station 34+847 (Reference Concept stationing) to Bayview Station;
 - (iii) with a single-Track branch line, Airport Link, for operation from the OMCIA in the west to north of South Keys Station, for a length of approximately 4.5km with a single Track passing siding at Uplands Station for a length of 1.15km with powered turnouts at station 11+420 and station 12+577 (Reference Concept stationing);
 - (iv) with two Tracks for non-revenue connections, one going north and one going south, to the Mainline Tracks to/from New Walkley Yard.
 - (v) Project Co shall provide the Track layout so that all Trains can move into and out of service to/from both directions of the Mainline Tracks to/from New Walkley Yard.
- (b) Project Co shall design and construct the Guideway with Guideway alignment characteristics as follows:

(i) Existing Trillium Line

- A. Maintain the existing Mainline Track and embankment from about 360m north of South Keys to 250m north of Gladstone Station with short segments of Track shift to improve geometry and to accommodate proposed siding extensions at Brookfield, Carleton, and Gladstone;
- B. Replacement of existing Track from 250m north of Gladstone Station to Bayview Station including extending Gladstone siding to Bayview Station with new CWR Track for approximately 1.12km and by revising the Track profile, meeting design criteria as required, to provide a TOR to Platform height at Bayview Station as outlined in Schedule 15-2, Part 4, Clause 2.7 (a)(vii)D;
- C. Maintain the existing Walkley line Connecting Tracks from the mainline 280m south of the Walkley Diamond to New Walkley Yard and from the mainline 400m north of the Walkley Diamond to New Walkley Yard;
- D. Replacement of existing Track within the limits of Dows Lake Tunnel, including the replacement of all Track ballast and all existing Timber ties with NFPA 130 compliant ties;
- E. Replacement of existing jointed Track of the North Prescott Spur from the existing NRC freight connection 500m south of Lester Road to Greenboro Station with new CWR Track for approximately 3.5km including a mainline elevated structure crossing over Lester Road; and,
- F. Construction of a new Spur Track for the NRC freight connection, from the existing NRC internal connection located 500m south of Lester Road to the mainline. Construction of the new spur track shall include but not be limited to, the following:
 - i All new Track shall be constructed with new CWR Track.
 - ii NRC Spur Track shall include a powered turnout at the mainline and a turnout at the NRC internal connection (No. 9 or equal to the existing turnout) and located such that minimal Track rework is required to the internal NRC Tracks.
 - iii NRC Spur Track shall include a gate in the perimeter fence at the NRC connection. Security of this gate shall be the responsibility of Project Co.

- iv An at-grade crossing at Lester Road is acceptable for the NRC freight connection subject to the requirements outlined in Schedule 15-2, Part 3, Clause 10.2 (s).
 - v 200m of runout Track south of the NRC internal connection turnout shall be constructed for storage and marshalling.
- (ii) Proposed Trillium Line Extension
- A. Construction of a section of mainline double Track from Bowesville Station to the existing established rail corridor through greenfield with new CWR Track for approximately 0.7km;
 - B. Construction of a section of mainline double Track from Limebank Station to Bowesville Station through greenfield with new CWR Track for approximately 3.5km;
 - C. Construction of a passing siding from Limebank Station to 400m north of Leitrim Road with new CWR Track for approximately 6.64km; and,
 - D. Rehabilitation of the abandoned rail corridor ROW, for the Mainline Track, formerly the North Prescott Spur, from 100m south of Earl Armstrong Road to the existing NRC Freight Connection 500m south of Lester Road with new CWR Track for approximately 3.92km, including a mainline at-grade crossing at the Private Airport Access Road;
- (iii) Airport Link
- A. Construction of a section of Spur Track (Airport Link) on elevated structure operating Expanded Trillium Line Trains exclusively (no freight traffic) from Airport Station to 525m west of Uplands Drive through greenfield with new CWR Track for approximately 0.75km such that;
 - i The elevated Guideway Structure shall not protrude into the future terminal expansion area as defined by a 1.0m offset from column line "M" as shown on the Ottawa Macdonald-Cartier International Airport Expansion Program Terminal Building drawings in the data room.
 - B. Construction of a section of Spur Track (Airport Link) on embankment operating Expanded Trillium Line Trains exclusively (no freight traffic) from approximately 525m west of Upland Drive to approximately 480m east of Airport Parkway, through greenfield with new CWR Track for a length of approximately 1.7km includes Upland Station and elevated structures over Uplands Drive and Airport Parkway;

- C. Construction of a passing siding on embankment operating Expanded Trillium Line Trains exclusively (no freight traffic) from approximately 40m east of Upland Drive to approximately 480m east of Airport Parkway through greenfield with new CWR Track for approximately 1.15km includes an elevated structure over Airport Parkway;
 - D. Construction of an at-grade section of Spur Track (Airport Link) operating Expanded Trillium Line Trains exclusively (no freight traffic) from approximately 480m east of Airport Parkway to approximately 300m south of Hunt Club Road, through greenfield and in the existing rail corridor with new CWR Track for a length of approximately 0.88km; and,
 - E. Construction of an at-grade section of Spur Track (Airport Link) from approximately 300m south of Hunt Club Road, to the turnout approximately 750m north of Hunt Club Road in the existing rail corridor with new CWR Track for a length of approximately 1.1km, includes South Keys Station and a pocket Track north of South Keys Station.
- (c) Project Co shall design and construct the Guideway with components for safe and efficient operation of the System, including but not limited to:
- (i) Trackwork;
 - (ii) Communications and low voltage power duct banks;
 - (iii) Signalling and Train Control System;
 - (iv) Drainage systems and SWM;
 - (v) Other appurtenances as required by Project Co's design for the safe and efficient Operation of the System;
 - (vi) Track turnout power or dual-control switch machines and heaters;
 - (vii) Track turnout hand throw switch stands; and,
 - (viii) Wayside rail lubrication systems.
- (d) Project Co shall design and construct lighting to the required safety walkway area as per the requirements of NFPA 130.

1.3 Access of Emergency Services Vehicles to the Guideway

- (a) Project Co shall design and construct all sections of the Guideway with a means of Emergency egress in compliance with the requirements of NFPA 130 via an unobstructed clear width.
- (b) Project Co shall provide Emergency egress points that will allow ESP access as per the requirements of NFPA 130. These locations shall be in addition to end of Platform egress points. These points shall be provided with a gated entry through the security fencing of the Guideway where they are located between Stations. A unique identification system shall be developed for the gates in consultation with the City and signage shall be fixed to both sides of each gate for identification purposes.
- (c) Project Co shall design and construct the Guideway so that Emergency vehicles are able to travel by a paved route to within 15m of the gated entry point. The route may be from an existing Transitway, nearby public Roadway allowance, nearby commercial parking lot or public MUP. If existing routes are not within 15m Project Co shall construct an access route.
- (d) Project Co shall design and construct access for Emergency egress routes to a minimum paved width of 6.0m and shall be designed to the requirements of Clause 6.10 of this Part 2. The paved route shall be maintained for winter travel by Project Co. If the route is more than 90m in length then a turnaround for the Emergency vehicle shall be provided at the gated entry point or, in the case of multiple entry points being accessed from one route, at the end of the route at a minimum. The turnaround shall be designed for a minimum center line radius of 12m. The turnaround shall be either circular cul-de-sac or a hammer head with minimum dimensions of 14m x 14m.

ARTICLE 2 GEOMETRIC DESIGN CRITERIA FOR TRACK ALIGNMENT

2.1 Reference Documents

- (a) The design and construction of the alignment work shall comply with the criteria contained within this Article and the Applicable Law, guidelines or practices applicable to the Project, including but not limited to the following Reference Documents. In the event of a conflict between the criteria, commitments or requirements contained within one document when compared with another, the more stringent shall apply. The order of precedence for this portion of the Project Agreement shall be as follows:
- (i) The criteria in this Article 2;
 - (ii) Transit Cooperative Research Program TCRP Report 155 – Track Design Handbook for Light Rail Transit, 2nd Edition;
 - (iii) The American Railway Engineering and Maintenance-of-Way Association Manual for Railway Engineering (2014);
 - (iv) European Standard (EN) For Railway Applications;
 - (v) Union International Des Chemin de Fer (UIC) Standards;
 - (vi) OHSA; and,
 - (vii) Standard Respecting Railway Clearance - Transport Canada - TC E-05 (1992).

2.2 Use of Minimum or Maximum Criterion

- (a) Where specific numbers are given for limitations on alignment elements, such limitations are not targets to be achieved by Project Co, but limits to be avoided if at all practical. Project Co shall in all cases strive to exceed the minimum requirements.
- (i) Design for maximum Passenger comfort where no physical restrictions or significant construction cost differences are encountered.
 - (ii) Design to meet the operating objectives without compromising ride quality or taxing the mechanical limits of the vehicle and maintain the operational performance requirements to the maximum extent possible at reasonable cost where physical restrictions or significant cost differences are encountered.
 - (iii) Minimum and maximum values are determined primarily by the vehicle design limitations and/or safety considerations, with maximum operating speeds and passenger comfort as secondary considerations. Minimum and maximum values have potential impacts in terms of Maintenance costs, noise, wheel life and Track

life. Minimum and maximum values should be used as a last resort where physical restrictions prevent the use of Passenger comfort values, as extensive use of minimum and maximum values can result in service problems and unacceptable Maintenance costs. The use of minimum and maximum values shall be used when it can be demonstrated that no other value will work and shall be justified and documented in a Basis of Design Report, and shall only be used by Project Co when approved by the City.

2.3 General

- (a) Project Co shall provide the Mainline Track, non-revenue Track, including Connecting Track, Storage Track and Yard Track, for maximum operating speed to satisfy the criteria identified in Schedule 15-2, Part 1, Article 3 - Operational Performance Requirements, as dictated by existing topography, permanent physical features, property, and alignment constraints.
- (b) Project Co shall ensure that the design and construction for the Trillium Line Extension systems are integrated with all systems of the Existing Trillium line.
- (c) Project Co shall design the Spur Track to Mainline Track Design Criteria.

2.4 Horizontal Alignment

- (a) Project Co shall design the horizontal Track alignment in accordance with the requirements of Clause 2.2 of this Part 2, and shall be such that all the SI is contained within the Lands as defined in Schedule 33 – Lands.
- (b) Project Co shall design the mainline and Airport Link Track for the maximum operating speed to satisfy the criteria identified in Schedule 15-2, Part 1, Article 3 – Operational Performance Requirements; 100km/h wherever possible unless Physical Constraints do not allow, in which case Project Co shall design the mainline and Airport Link Track so as to maximize the operating speed. Where the existing Mainline Track is to remain horizontally and vertically unaltered, no design modifications are required.
- (c) Project Co shall provide a tangent horizontal alignment through Station Platform limits and for a minimum of 15m beyond the end of Platforms, with a distance of 25m provided where there are no physical constraints. The spiral transition curve may begin closer to the Platform, with the City's approval, if Site conditions do not provide sufficient length, provided sufficient running clearance between the Vehicle and Platform is achieved and the relationship of the Revenue Vehicle and Platform are achieved as per Schedule 15-2, Part 4, Clause 2.7(a)(vii).
- (d) All non-Track related construction layout shall be related to or dimensioned from the centreline of the Mainline Track, unless otherwise noted.

- (e) Project Co shall design the connections to the New Walkley Yard for a speed of no less than 30 km/hr and shall also consider the safety of the geometrics. Project Co shall design the Connecting Track to maximize the operating speed.

2.5 Track Centres

- (a) Ballasted Track center spacing shall be 4.5m or greater.
- (b) Where Site constraints are physically restricted, ballasted Track centre spacing of 4.0m on tangent Track and increased on curves for superelevation and carbody overhang may be constructed with City approval of the design exception.

2.6 Horizontal Curves

- (a) Project Co shall define circular curves by the arc definition of curvature and specified by their radius in metres to three decimal places.
- (b) For Mainline Tracks, the minimum radii of curves shall be designed to maintain the maximum possible operating speed as dictated by existing topography, permanent physical features, property, and the alignment constraints per this Part 2. The minimum radius shall be 125m.
- (c) Project Co shall provide the New Walkley Yard Track with curves of the following radii:
- (i) New Walkley Yard Lead Track radii shall be designed to operate with maximum design speed of 30km/hr. The minimum radius of curve shall be 100m; and,
 - (ii) New Walkley Yard Track radii shall be designed to operate with maximum speed of 15km/hr. The minimum radius of curve shall be 100m.
- (d) Project Co shall provide a tangent distance between horizontal curve and reverse curves for the Mainline Track, Connecting Track and Yard Track, as per the following formula where V is speed in km/hr and LT is the length of the tangent:
- (i) $LT=0.57V$; and,
 - (ii) the minimum tangent length between curves shall be 51.4m unless physical constraints do not allow this then the minimum length shall be 35m.
- (e) Reverse Curves
- (i) The minimum tangent length between reverse curves in New Walkley Yard shall be per TCRP Report 155 Chapter 3.2.1 or 10m, whichever is higher.

- (ii) The minimum tangent length between reverse curves in a crossover shall be per TCRP Report 155 Chapter 3.2.1 or 10m, whichever is higher.
 - (iii) The minimum tangent length between reverse curves in a Track other than mainline shall be per TCRP Report 155 Chapter 3.2.1 or 10m, whichever is higher.
 - (iv) There shall be no tangent between curves in the same direction in New Walkley Yard for curves with a ratio of radii less than 1.5:1.
 - (v) The minimum distance shall be 17m for back-to-back turnouts with same hand throw.
 - (vi) The minimum distance shall be 5m for back-to-back turnouts with a different hand throw.
- (f) Compound Curves
- (i) Compound curves shall not be permitted on the mainline or Yard Track design, except for the existing mainline curves from Station 29+094 to 29+378.

2.7 Spirals

- (a) Spiral transition curves shall be used on all mainline and New Walkley Yard lead Tracks to connect circular curves to tangents, with the exception that spirals are not required where both actual superelevation and unbalanced superelevation is zero.
- (b) Project Co shall determine the minimum length of a spiral transition curve (L_s) by the rate of change from zero superelevation to full superelevation being achieved within the length of the spiral at a rate of 25mm E_a per 19m of spiral.

2.8 Superelevation

- (a) Superelevation shall be linearly attained throughout the full length of the spiral curve by raising the rail farthest from the curve centre, while maintaining the top of the inside rail at profile grade.
- (b) Project Co shall determine Superelevation by applying the following equations:
 - (i) $E_e = 12.0 V^2/R$
 - (ii) $E_a = 6.57(V^2/R) - 5.58$
 - (iii) $E_a = 100\text{mm maximum. If physical constraints do not allow maximum speeds of } 100\text{km/hr, then maximum of } 150\text{mm may be applied.}$

$$(iv) \quad Eu = Ee - Ea$$

where Ee = equilibrium superelevation in mm

Ea = actual or applied superelevation in mm

Eu = unbalanced superelevation in mm

V = design speed in km/hr

R = horizontal curve radius in meters

- (c) Project Co shall use zero actual superelevation for special Trackwork, with a maximum unbalanced superelevation of 50mm at turnouts.
- (d) Project Co shall design the Track superelevation for new Track to meet or exceed the following criteria:
 - (i) maximum unbalanced superelevation, Eu of 50mm.
 - (ii) maximum actual superelevation, Ea of 100mm unless physical constraints do not allow maximum speeds of 100km/hr then maximum of 150mm may be applied.
 - (iii) Round actual superelevation to the nearest 5mm.
 - (iv) Superelevation, Ea and Eu shall be applied equally or proportionally up to maximum Eu with no Ea until $Eu = 13\text{mm}$.
 - (v) Existing Trackwork that is to be maintained unaltered shall be exempt from these criteria for new Track.

2.9 Vertical Alignment

- (a) General
 - (i) All references to profile in the vertical alignment shall represent the top of the low rail for a given Track.
 - (ii) Project Co shall provide vertical curves separated by a minimum tangent length of 35m.
 - (iii) Vertical alignment shall conform to the existing freight envelope in the vicinity of the future Golf Course Runway (07C-25C), per Schedule 32 - City Permits, Licences, Approvals and Authorizations.

(iv) Where the existing Mainline Track is to remain horizontally and vertically unaltered, no design modifications are required.

(b) Grades

(i) Project Co shall not apply changes in grade or vertical curves within the limits of Station Platforms and future Platforms.

(ii) Project Co shall provide grades through Stations of a minimum grade of 0.5% and a maximum grade of 1.5%. A minimum grade of 0.0% shall be permitted when additional measures to accommodate positive drainage are provided.

(iii) Project Co shall provide the mainline between Bayview Station and Earl Armstrong Road for freight service Track with a minimum grade of 0.30% and maximum of 2%with the exception of the [REDACTED] Grade Separation and the Earl Armstrong Grade Separation as outlined in Clauses 1.1(c)(i) and (iv) of this Part 2.

(iv) Project Co shall provide the mainline where it is Passenger service only Track with a maximum grade of 4.0%, compensated.

A. The maximum grades are after compensating for any horizontal curvature.

i Grade compensation for horizontal curvature:

$$1. \quad G_c = G + 0.04\% \times (5729.6/R \times 3.28)$$

Where:

G_c = compensated gradient to account for horizontal curvature, in percent;

G = grade before adjustment in percent; and,

R = horizontal curve radius in metres.

(v) Project Co shall not overlap horizontal and vertical curvature unless physical constraints do not allow it.

(vi) Project Co shall provide the alignment such that the maximum grade for mainline turnouts is 2.0%. Where existing turnouts are unaltered no design modifications are required.

(vii) All special Trackwork shall be located on constant grades with no vertical curves within the limits of the special Trackwork.

(viii) Project Co shall provide Mainline Storage Track and Tail Tracks with a maximum grade of 0.3% with Tail Tracks sloped away from the mainline, or provide means

of mitigating potential Vehicle rollaway onto Mainline Track in case of brake failure.

(c) Vertical Curves

- (i) Project Co shall provide parabolic vertical curves for all grade changes.
- (ii) Project Co shall provide a minimum distance of 15m between Platform limits and any point of vertical curvature.
- (iii) The length of a vertical curve shall be as long as practicable, but no less than shown below.
 - A. The minimum length of vertical curve (L_{VC} , m) for mainline and connection Tracks shall be determined by the following equations where A = Algebraic difference in grades:
 - i $L_{VC} = 60A$
 - ii Minimum, where $V = 100\text{km/hr}$ unless physical constraints do not allow:
 - 1. Greater of either $L_{VC} = 0.005AV^2$ or 30m, for crest curves;
 - 2. Greater of either $L_{VC} = 0.003AV^2$ or 30m, for sag curves;

2.10 Special Trackwork

- (a) Project Co shall provide Special Trackwork that conforms to AREMA requirements and AREMA Specification for Special Trackwork for rails 115lb and heavier.
- (b) Project Co shall provide the Special Trackwork on tangent Track and on a constant vertical grade.
- (c) Project Co shall provide the alignment such that the minimum horizontal tangent length beyond Special Trackwork located on Mainline Track and Connecting Track is 51.4m unless physical constraints do not allow it in which case the minimum length shall be 35m.
- (d) Project Co shall provide the Special Trackwork at a minimum horizontal tangent distance of 15m from the end of Station Platforms.
- (e) Project Co shall determine minimum horizontal and vertical tangent lengths beyond New Walkley Yard Special Trackwork based on Vehicle requirements as defined in Schedule 15-2, Part 8 - Vehicles.

- (f) Project Co shall use No. 20 turnouts on Mainline Tracks of the Trillium Line Extension Project including diamond cross-overs with the following exceptions: at end of the line where No. 8 turnouts shall be used; at pocket Tracks where No. 8 and No. 4 equilateral turnouts shall be used; at the NRC turnout where No. 8 shall be used; and, at the Bowesville and Bayview diamond cross-overs where No. 8 shall be used. All Existing Trillium Line turnouts shall be reused or relocated. No. 7 turnouts shall be used for yard and Storage Tracks. Special Trackwork with lead curve radii greater than a Standard AREMA No. 7 turnout may also be used for Yard Tracks and Storage Tracks. No. 4 Equilateral turnouts may be used for Storage Tracks (e.g. pocket Tracks).

2.11 Other Alignment Requirements

- (a) Combined horizontal and vertical curvature shall not be used. Where this situation is unavoidable, Project Co shall include justification in its Trackwork Design Report with reference to alignment safety at the design speed.

2.12 Clearances

- (a) Vehicle Clearances
- (i) Project Co shall measure horizontal clearance dimensions perpendicular to the Track centreline accounting for any superelevation in the Track.
- (ii) Project Co shall account for structure chord lengths, tilt from superelevation, Track type, and outswing and inswing of a Vehicle that occurs along horizontal curves in their horizontal clearance calculations.
- (iii) Project Co shall design a single continuous Track for the Freight Vehicle clearances for the alignment which falls within the existing rail corridor including Platform extenders at all Stations. Project Co shall design for the Revenue Vehicle clearance only (not including Freight Vehicle) where the alignment falls outside the existing rail corridor.
- (iv) Project Co shall define the Revenue Vehicle clearance envelope as the space occupied by the dynamic envelope, or maximum movement, of the Vehicle as it travels along the Track plus an additional running clearance of 150mm, or any other dimension in excess of 150mm deemed pertinent by Project Co's own analysis for the Passenger service route. Project Co shall provide a clearance envelope such that the Revenue Vehicle clearance envelope provides sufficient running clearances and tolerances under all operating conditions.
- (v) Project Co shall define the Freight Vehicle clearance envelope from freight train clearances Diagram 1 and Diagram 2 found in TC E-05. This document is available on the Transport Canada website.

- (vi) Project Co shall design the alignment based on the information of the Vehicle dynamic envelope.
 - (vii) Project Co shall determine the horizontal clearance dimensions from the centreline of Track to the finished edge of Station Platform based on the criteria identified in Schedule 15-2, Part 8 - Vehicles, Revenue Vehicle pass-through speed criteria, and compliance with applicable accessibility standards. Platforms will require retractable extenders to meet Freight Vehicle clearance requirements where the alignment is within the existing rail corridor.
 - (viii) Vertical clearance dimensions shall always be measured in a vertical plane irrespective of any superelevation or profile grade. When superelevation is present, the top of low rail shall be used as the reference elevation when calculating vertical clearance.
- (b) Other Clearance Requirements
- (i) Temporary clearance requirements for construction shall be assessed on an individual basis.
 - (ii) Project Co shall account for additional clearance requirements for Train overhang and mid-ordinate overhang for all horizontal curves.
 - (iii) Project Co shall allow for the future electrification of the Expanded Trillium Line by providing clearance for a future OCS pole to be installed without impacting Revenue Service or cutting off access to the live Track.
 - (iv) Project Co shall allow for the future electrification of the Expanded Trillium Line by providing a 4.5m clearance for a future OCS under all overhead Structures.
 - (v) Project Co shall not preclude for the future double tracking of the Expanded Trillium Line including all future clearance requirements.
 - (vi) Signal, Trackwork, wayside, and Track-mounted equipment shall be kept clear of the under car clearance envelope of the Revenue Vehicle.
 - (vii) Refer to Schedule 15-2, Part 2, Article 8 – Utility Infrastructure Design Criteria for watermain clearance requirements.

ARTICLE 3 TRACKWORK

3.1 Reference Documents

- (a) Project Co shall provide Trackwork in accordance with the criteria contained in this Article and all standards, regulations, policies, Applicable Law, guidelines or practices applicable to the Project, including but not limited to each of the following Reference Documents:
- (i) APTA Manual of Standards and Recommended Practices for Rail Transit Systems;
 - (ii) AREMA Manual for Railway Engineering;
 - (iii) European Standard (EN) for Railway Applications;
 - (iv) UIC Standards;
 - (v) ASTM Standards;
 - (vi) ISO 2631 Mechanical Vibration and Shock;
 - (vii) NFPA 130 Standard for Fixed Guideway Transit and Passenger Rail Systems;
 - (viii) TCRP Report 155 Design Handbook for Light Rail Transit, latest edition;
 - (ix) TCRP Report 71 Track-Related Research; and,
 - (x) Transport Canada Track Safety Rules.

3.2 Scope of Work

- (a) Project Co shall provide all Works related to the construction of a complete System for Trackwork, including Track, Track materials, Special Trackwork, and Spur Track as required in this Part 2.
- (b) Project Co shall provide Special Trackwork as described in this Part 2, including all turnouts, crossovers, diamond crossings, adjoining Trackwork, Track materials, switch machines, switch clearing devices, expansion joints, end-of-Track devices, wheel/rail friction control devices, and all other Track materials.
- (c) Project Co. Co shall be responsible for control and any mitigation which may be a result of wheel-rail noise throughout the System in accordance with Schedule 17 - Environmental Obligations.

3.3 Track Classification

- (a) Project Co shall classify Track as follows:
 - (i) Mainline Track: used for the operation of Revenue Vehicles carrying Passengers and railbound Maintenance Vehicles;
 - (ii) Tail Track: located at Terminal Stations to provide overrun protection and potential Vehicle storage;
 - (iii) Mainline Storage Track: used to store Revenue Vehicles adjacent to Mainline Track and for potential crossover functionality;
 - (iv) Yard Track: includes shop Track located in Maintenance shops, Storage Track, Spur Track, and other Track required beyond Connecting Track within the New Walkley Yard;
 - (v) Connecting Track: links Yard Track to Mainline Track; and
 - (vi) Spur Track: Track that branches off the Trillium Line Extension Mainline Track as a secondary Track either for the Airport Link or for allowing for the delivery of freight service to the NRC connection.

3.4 General Requirements

- (a) Project Co shall provide Trackwork that is compatible with the Revenue Vehicle wheel profile and back-to-back gauge identified in Schedule 15-2, Part 8 - Vehicles and that can accommodate Freight traffic.
- (b) Project Co shall provide Trackwork that permits diverging route speeds consistent with Schedule 15-2, Part 1, Article 3 - Operational Performance Requirements.
- (c) Project Co shall provide Trackwork that is durable for more than or equal to the Design Life identified in Schedule 15-2, Part 1, Article 4 – Design and Construction.
- (d) Project Co shall provide Trackwork to meet the requirements identified in Schedule 15-3 - Maintenance and Rehabilitation Requirements.
- (e) Project Co shall provide Trackwork that is safe, efficient and allows continuous Operation under all operating conditions.
- (f) Project Co shall provide Trackwork that performs safely and efficiently under all local, Site-specific climatic and environmental conditions.

- (g) Project Co shall provide for the coordination of Trackwork with conduits, cabling, duct banks, raceways, wayside equipment, and Track-mounted equipment for associated S&TCS, communications, electrical, and other systems.
- (h) A Trackwork Design and Construction Test Plan shall be submitted by Project Co in accordance with Schedule 10 – Review Procedure.
- (i) Track Gauge and Cant
 - (i) Project Co shall provide 1435mm Track gauge on tangent Track.
 - (ii) Project Co shall provide rail cant for Special Trackwork that is compatible with Mainline Track and/or includes appropriate transitions.
- (j) Project Co shall set the criteria for total and differential post-construction settlements along the Track bed to satisfy the requirements of Clauses 3.10, 3.11 and 3.12 of this Part 2.
- (k) Track Loading
 - (i) Project Co shall provide Trackwork to accommodate the vertical, horizontal and longitudinal loading from the Freight Vehicles, Revenue Vehicles and Maintenance Vehicles, without exceeding permissible stress limits of the elements comprising the Track system or Track subgrade.
 - (ii) Project Co shall incorporate loading arising from thermal stress within the rail, based on the rail temperature range for local climatic and environmental conditions, into the Track system design, including allowance for heating due to direct sunlight exposure and extreme cold.
- (l) Corrosion Control
 - (i) Project Co shall protect all Track components from corrosion in accordance with the requirements outlined in Schedule 15-2, Part 3, Article 11 - Corrosion Control.
 - (ii) Project Co shall provide reinforcing steel compliant with structural grounding requirements identified in Schedule 15-2, Part 3, Article 11 - Corrosion Control, and compliant with ACI 318M and AREMA Chapter 8 requirements.
 - (iii) Project Co shall provide Trackwork that ensures the rail and fasteners are electrically insulated from ground.
 - (iv) Electrical Continuity of Rail

- A. Project Co shall ensure rail electrical continuity and rail bonding are in accordance with the requirements identified in this Article.
- B. Project Co shall ensure that the rails shall be electrically bonded at locations requiring bolted rail joints. Otherwise all rail shall be CWR meeting AREMA requirements.
- C. Project Co shall provide rail bonding compliant with the standards identified in AREMA Chapter 33 Part 7 and Chapter 4 Section 3.7.

3.5 Track Structure Types

- (a) General
 - (i) Project Co shall provide Track to support and hold the rails in place to the correct alignment, profile, cross level, and Track gauge.
 - (ii) Project Co shall provide Track compliant with NFPA 130 requirements for trainways.
 - (iii) Project Co shall coordinate the placement of Track fastener assemblies and ties with the location of deck or slab steel reinforcement, rail joints, Track-mounted equipment, and wayside equipment.
 - (iv) Project Co shall provide any of the following permitted Track types for at-grade locations or elevated Guideways, subject to additional conditions in this Clause 3.5:
 - A. direct fixation; or,
 - B. ballasted.
- (b) Direct Fixation Track
 - (i) Project Co shall provide DF Track as an open Track form consisting of a resilient, elastic DFF system anchored into a concrete foundation slab or elevated Structure deck.
- (c) Ballasted Track
 - (i) Project Co shall provide ballasted Track as an open Track form consisting of a resilient, elastic fastening system and concrete, composite, or timber ties.
 - (ii) Ballasted Track shall be permitted for use provided that:

- A. At Roadway crossings only fully planked, timber, asphalt concrete or solid rubber planking will be accepted. Gravel or filled crossing surfaces shall not be permitted;
 - B. Vehicle clearance envelope for ballasted Track is applied;
 - C. Guideway fits within prescribed property limits; and,
 - D. NFPA 130 requirements are satisfied.
- (iii) Material Requirements
- A. Crushed stone or other material shall conform to AREMA ballast specifications, with evidence of previous approval on a similar or heavier rail type system within the last 5 years provided to the City.
 - B. The particle size requirements shall conform to AREMA requirements in relation to the crushed stone ballast, class number 4A.
 - C. Project Co shall provide ballast gradation with sufficient voids to permit water to migrate freely.
 - D. Project Co shall provide sub-ballast compliant with the requirements found AREMA Chapter 1 Part 2.
 - E. Project Co shall provide for ballast resistivity of not less than 3000 ohm-metres.

3.6 Rail Configurations

- (a) Project Co shall, as necessary, coordinate the following rail configurations with Track structure types. Project Co may consider the principles identified in TCRP Report 155.
- (b) Rail/ 115 lb RE Rail
 - (i) Supply rail that meets:
 - A. AREMA Volume 1, Chapter 4, Part 2; and
 - B. ASTM A1.
- (c) Restraining Guard Rail
 - (i) All running rail and guard rail for Track shall be new and shall conform to the associated AREMA specifications.

(ii) Application:

- A. Project Co shall install restraining rails along the gauge side of the low rail based on Revenue Vehicle requirements related to negotiating short radius mainline horizontal curves.
- B. Restraining rail shall be electrically isolated from running rail in order to maintain broken rail protection as per Schedule 15-2, Part 3 - Systems.
- C. Restraining rail may use bolted joints to avoid difference in thermal stress level between the restraining rail and adjacent CWR running rail.

(d) Emergency (Steel Inner) Guard Rail

- (i) Emergency Guard Rail shall be provided at location where it is important to prevent a derailed Train from traveling more than a few inches from the running rails. Emergency Guard Rails shall be installed at retained embankments, on approached to Tunnel portals, near Overhead Structure abutments and at location where a derailed Train would likely impact critical non-transit facilities such as high tension power line poles.
- (ii) Project Co shall provide Emergency Guard Rail at the following DF and ballasted Track locations where structural lateral restraints capable of containing a derailed Train within the Guideway are not present:
 - A. Adjacent (within Train car length) to pier of column;
 - B. Track is on embankment near the top of retaining walls where the top of rail is a minimum of 600mm above the surrounding grade, or other value agreed upon by Project Co and the City;
 - C. Track is located on a Bridge or an aerial Structure;
 - D. At approaches to obstructions or other adjacent Structure.
- (iii) Project Co shall provide Emergency Guard Rail that:
 - A. On Mainline Tracks extends 30m ahead of the beginning of the Bridge Structure or area being protected on the approach end, and 15m beyond the end of the protected Structure on the departure end.
- (iv) Emergency guard rail shall not be required on Tracks where structural lateral restraints occur and are strong enough to contain a derailed Vehicle.

(v) Project Co shall provide lateral structural restraints capable of containing a derailed Train within the Guideway.

3.7 Track Materials

(a) General

(i) Project Co shall provide Rail/ 115 lb RE Rail that meets:

- A. AREMA Volume 1, Chapter 4, Part 2; and
- B. ASTM A1.

(ii) Head- Hardened Rail (High-Strength) :

- A. Shall comply with the requirements of AREMA, Chapter 4.
- B. Shall be used on 500m radius or lower.
- C. Shall be used on vertical gradients steeper than 4.0%.
- D. Shall be used in Special Trackwork sections.

(b) Rail

(i) General

- A. Project Co shall provide running rail as CWR in accordance with AREMA Chapter 4 Section 3.11, and Chapter 5 Part 4 and Part 5 standards.
- B. Project Co shall provide all new rail that has undergone mill scale removal.
- C. Project Co shall provide new rail that has a profile as per the Existing Trillium Line current implemented rail.

(ii) Restraining Guard Rail

- A. Project Co shall provide restraining rail based on vehicle integration.

(iii) Emergency (Steel Inner) Guard Rail

- A. Worn/used rail may be used for Emergency Guard Rails, provided it is free from strength-impairing defects. All Emergency Guard Rail used on the Project shall be the same section and rail drilling. Project Co shall

consider undercar clearances and rail wear limits when determining the vertical position of Emergency Guard Rail.

- B. Emergency guard rail shall be electrically isolated from the running rail.

(c) Track Fasteners

(i) General

- A. All new Track fasteners shall have Design Life as identified in Schedule 15-2, Part 1, Article 4 – Design and Construction.
- B. Project Co shall provide the new Track fasteners as a Track fastening system(s) that:
- i provides vertical and lateral stability to the rail;
 - ii distributes loadings to the Track substructure;
 - iii resists longitudinal CWR forces due to thermal, acceleration and braking forces;
 - iv prevents rail buckling under all climatic and environmental conditions;
 - v resists corrosion and electrically insulates the rail from ground;
 - vi absorbs vibration energy in order to attenuate noise and vibration and reduce Track substructure loading;
 - vii are of a standardized elastic, resilient, self-tensioning type that applies a constant toe load to the rail under all service conditions;
 - viii permits the removal and re-installation of the rail vertically without loss of Track fastener function;
 - ix are easily installed and removed by one person with standard hand tools;
 - x are capable of being removed and reinstalled without loss in toe load, stiffness, or other performance properties;
 - xi are compatible with the Revenue Vehicle dynamic envelope and clearances; and,

- xii complies with the criteria identified in Article 4 - Structural Design Criteria and Requirements, of this Part 2.
- (d) Timber ties
- (i) Project Co shall provide timber ties made from hardwood that shall conform to the requirements of Chapter 30, Part 3 of the AREMA Manual for Railway Engineering.
- (e) Composite ties
- (i) Project Co shall provide composite ties that conform to the requirements of Chapter 30, Part 5 of the AREMA Manual for Railway Engineering.
- (f) Concrete ties
- (i) Project Co shall provide concrete ties that shall conform to the requirements of Chapter 30, Part 4 of the AREMA Manual for Railway Engineering.
- (g) Direct fixation plates
- (i) Project Co shall provide DF plates that:
- A. are typically used in ballastless Track designs that include concrete base slabs and/or concrete plinths;
- B. shall incorporate elastomeric elements that permit a controlled amount of vertical deflection under dynamic loads; and,
- C. shall be secured with anchor bolts and inserts that provide adequate resistance to lateral and vertical forces from Train movements.
- (h) Track Type Transitions
- (i) Project Co shall design and construct transition sections to facilitate a gradual change in Track stiffness, where Track structure type changes occur. Transition section lengths shall be a minimum of 30m unless otherwise directed by the City.
- (i) Rail Joints
- (i) Insulated Joints
- A. Project Co shall provide insulated rail joints wherever it is necessary to electrically isolate contiguous rails from each other in order to comply with Track signalling criteria.

- B. Project Co shall determine the need for and the positioning of insulated rail joints based on coordination with the S&TCS requirements and in compliance with applicable AREMA standards and good industry practice.
- C. Project Co shall provide bonded insulated joints compliant with the requirements of AREMA Chapter 4 Section 3.8 or equivalent, where insulated rail joints are required.

(ii) Welded Joints

- A. General
 - i Project Co shall provide no holes in the rail located within a minimum of 150mm of the weld location, including for temporary bolted locations.
- B. Flash-Butt Welds
 - i All CWR shall be welded by means of electric flash-butt method compliant with the requirements of AREMA Chapter 4 Section 3.10. Electrical flash-butt welds shall be used for all running rail connections consistent with CWR practice. Rail shall be welded into the longest strings practical during Construction.
- C. Thermite Welds
 - i Project Co shall perform the thermite welding method compliant with the requirements of AREMA Chapter 4 Section 3.13 or CEN EN 14730, where impossible to weld rail joints by means of flash-butt welding.

(iii) Bolted Joints

- A. Standard bolted joints shall not be installed in Mainline Track. Bolted Joints are acceptable as a temporary condition only.
- B. Project Co shall provide bolted joints with standard diameter holes and standard hole-spacing for the rail type.
- C. Project Co shall provide bolted rail joint components compliant with the requirements identified in AREMA Chapter 4 or equivalent standard for 115lb RE rail.

(iv) Rail Expansion Joints

- A. Project Co shall determine the need for rail expansion joints at elevated Structures due to thermal and longitudinal rail stresses based on rail-to-structure interface analysis.

3.8 Special Trackwork

- (a) Special Trackwork refers to all rail installations where Tracks converge, diverge or cross. Standard Trackwork is made simply from rolled rails of a constant cross-section, while rails in several Special Trackwork components are cast or machined and have cross-sections that vary along their length.
- (b) General
- (i) Turnout materials shall be in general accordance with AREMA or approved equals;
 - (ii) Special Trackwork shall include running surfaces of castings machined to conform to the cross-section of 115lb RE rail;
 - (iii) Special Trackwork shall include running surfaces, flangeways and guarded dimensions that are compatible with the Revenue Vehicle wheels and back-to-back gauge dimensions;
 - (iv) Special Trackwork that is installed at locations with sensitive receptors as indicated in Schedule 17 - Environmental Obligations shall include appropriate “service-proven” mitigation measures;
 - (v) Project Co shall provide the following minimum required operational Track facilities:
 - A. crossovers, turnouts, Storage Tracks and Special Trackwork at locations necessary to comply with the operational requirements identified in Schedule 15-2, Part 1, Article 3 - Operational Performance Requirements while providing maximum redundancy and minimizing single points of failure;
 - B. Tail Tracks and crossovers at Terminal Stations sufficient to facilitate the reversing of trains, accommodate safe braking distance as defined in Schedule 15-2, Part 3, Article 10 – Signalling and Train Control System, and maximize approach speeds;
 - C. inline failure management crossovers comprising single crossovers, double crossovers, and three-Track storage crossovers;
 - D. scissors crossovers or universal crossovers at the following Stations:

- i South Keys; and,
 - ii Bayview.
- E. storage crossovers at the following Stations:
- i South Keys.
- (vi) Project Co shall provide turnouts located on Mainline Track that:
- A. employ standard lateral turnout geometries and straight frogs;
 - B. route mainline traffic through the tangent side of the turnout at inline locations. Routing mainline traffic through the diverging side of turnouts shall be permitted at Terminal Station locations only; and,
 - C. comply with the operational requirements identified in Schedule 15-2, Part 1, Article 3 - Operational Performance Requirements and maximize approach speeds.
- (vii) Project Co shall provide Special Trackwork layouts:
- A. comprised of a constant Track structure type located entirely within a constant Guideway structure type;
 - B. located clear of road vehicle and pedestrian intersections and crossings;
 - C. located clear of elevated Structures unless structural lateral restraints are present that are capable of containing a derailed Train; and,
 - D. adjacent to a safe walkway compliant with NFPA 130 requirements in order to accommodate an Operator Driver walking the full length of a 3-Revenue Vehicle Train at Storage Track locations and at turnback locations if not located at a Platform. The safe walkway shall be located clear of the Vehicle dynamic envelope if the Operator is exposed to an adjacent live Track.
- (c) Special Trackwork Components
- (i) Project Co shall design and construct all mainline turnouts to include flangeways that can accommodate both freight and the Revenue Vehicles.
 - (ii) Project Co shall design and construct all mainline Special Trackwork to be boltless welded manganese frogs (conformal frogs).

(iii) Project Co shall design and construct all new yard Special Trackwork to utilize RBM frogs as well as conformal frogs.

(iv) Project Co shall design and construct all mainline and yard Special Trackwork to be equipped with either plate rollers or point rollers installed on concrete ties with heaters.

(d) End-of-Track Protection Devices

(i) Project Co shall provide end-of-Track shock-absorbing devices for use at Terminal Station Tracks. These devices shall be mounted near the end of the Track at Bayview Station, Airport Station and Limebank Station. These devices shall be located to prevent the Train from running over any pedestrian path located adjacent to the end of Track or running off of the elevated Guideway;

(ii) End-of-Track shock-absorbing devices shall meet the following criteria:

- A. suitable for permanent exterior exposure;
- B. be capable of stopping an unoccupied Train travelling at 10km/hr;
- C. engage the vehicle symmetrically about the coupler at bumper height;
- D. have a cushioned face and not produce any damage to a Vehicle at Vehicle speeds less than 5km/hr. Project Co shall coordinate the design of the stopping device to ensure engagement to the car is adequate to prevent damage; and,
- E. meet requirements as outlined in Schedule 15-2, Part 3, Clause 10.2 (p).

(e) Wheel/Rail Friction Control

(i) Project Co shall provide wheel/rail friction control measures in locations consistent with the practices identified in AREMA Chapter 5 Section 5.9, Chapter 4 Section 4.11, CEN EN 15427, and TCRP Report 71 Volumes 1 and 4.

(ii) Project Co shall provide lubricant selection and application aimed at minimizing loss of traction.

(iii) Project Co shall provide lubricators capable of adjusting lubricant application based on Site-specific conditions.

(iv) Project Co shall provide space within the Guideway for lubricator cabinets, tubing, ancillary equipment, and Maintenance access. Project Co shall protect tubing from impact damage.

3.9 Track Commissioning Tests

- (a) Project Co shall complete and submit the following minimum verification tests of Track installation to the City, in accordance with Schedule 10 – Review Procedure prior to Revenue Service:
- (i) Track geometry assessment by automated self-propelled measuring equipment;
 - (ii) Track clearances measurement;
 - (iii) Revenue Vehicle Platform clearances (horizontal and vertical) measurements;
 - (iv) Track rail profile assessment measurement;
 - (v) Ultrasonic Rail Flaw Detection assessment; and,
 - (vi) Revenue Vehicle ride quality measurement for end-to-end Vehicle operation of the New Vehicle Fleet and Existing Vehicle Fleet across the entire alignment. Project Co shall provide a custom test procedure to demonstrate that interior Vehicle vertical and lateral accelerations across the alignment meet appropriate Passenger comfort criteria and Operator comfort criteria for both Vehicle types.

3.10 Track Measurement and Assessment Standards

- (a) Project Co shall implement the following Track measurement and assessment standards:
- (i) Track parameters based on vehicle integration as follows:
 - A. Track gauge limits measured against construction tolerances of $\pm 3\text{mm}$;
 - B. cross level and superelevation measured against construction tolerances of $\pm 3\text{mm}$ from design values;
 - C. horizontal curve and spiral alignments compliance with design for radii and lengths;
 - D. relative horizontal alignment measured against construction tolerances of $\pm 3\text{mm}$ in a 20m chord from design values; and,
 - E. relative vertical alignment measured against construction tolerances of $\pm 3\text{mm}$ in a 20m chord from design values.
 - (ii) Track clearances compliant with the criteria in this Part 2;
 - (iii) Revenue Vehicle clearance to Platforms compliant with the criteria defined in Schedule 15-2, Part 4, Article 2 - Architectural Design Criteria;

- (iv) Revenue Vehicle ride quality compliant with the criteria defined in Schedule 15-3, Appendix B, Article 4.0, Table 4.1 b, with resulting noise and vibration not to exceed the limits imposed by City Bylaws or Schedule 17 – Environmental Obligations. Ride quality shall be measured across the complete alignment; and,
- (v) rail defect criteria, prioritization, and remedial action compliant with EN 13146 or APTA Standard for Rail Transit Track Inspection and Maintenance.

3.11 Track Measurement and Assessment Methodology

- (a) Project Co shall complete verification of Track geometry by means of a Track geometry measuring vehicle in accordance with AREMA Chapter 2 Part 1 practices.
- (b) Project Co shall complete verification of Track clearances by means of a Track clearance measuring system in accordance with AREMA Chapter 2 practices.
- (c) Project Co shall complete verification of rail profile measurements by means of a rail measuring system in accordance with AREMA Chapter 2 Part 2 practices.
- (d) Project Co shall complete verification of rail defects by means of an ultrasonic rail flaw detection system in accordance with practices identified in AREMA Chapter 4, Part 4 and Part 5.
- (e) The scheduled frequency of Track measurement and assessment activities shall comply with the following criteria:
 - (i) Schedule 15-3 - Maintenance and Rehabilitation Requirements, applicable to visual Trackwork and CWR inspections; and,
 - (ii) automated Track geometry inspections by self-propelled equipment compliant with AREMA or EN standards four times per year as evenly distributed as possible to make allowances for inclement weather.

ARTICLE 4 STRUCTURAL DESIGN CRITERIA AND REQUIREMENTS

4.1 Scope

- (a) This Article governs the design and construction for Bridges, Elevated Guideways, at-grade Guideways, portal walls, Culverts, retaining walls, pole bases and other Structures not included elsewhere.
- (b) Stations and Ancillary Facilities shall be in accordance with Schedule 15-2, Part 4 - Stations.

4.2 Reference Documents

- (a) The codes, standards and references indicated in this clause shall be utilized for the design and construction of the Structures indicated in this Article, except as explicitly indicated in other articles. The structural design shall conform to the most current edition of the following codes and standards. If the criteria sources conflict, unless otherwise noted, the following shall apply in descending order of precedence:
 - (i) Applicable laws and regulations;
 - (ii) Specific obligations and Design Criteria identified in this Part 2;
 - (iii) Pedestrian and Roadway Structures:
 - A. CAN/CSA-S6 Canadian Highway Bridge Design Code; and Exceptions to the Canadian Highway Bridge Design Code CAN/CSA-S6 for Ontario;
 - B. City of Ottawa Standard Tender Documents for Unit Price Contracts;
 - C. MTO Structural Manual;
 - D. OPSS; and,
 - E. OPSD.
 - (iv) Vehicle Guideway Structures:
 - A. AREMA Manual for Railway Engineering, hereinafter referred to as AREMA;
 - B. CAN/CSA-S6 Canadian Highway Bridge Design Code; and Exceptions to the Canadian Highway Bridge Design Code CAN/CSA-S6 for Ontario;
 - C. City of Ottawa Standard Tender Documents for Unit Price Contracts;

- D. MTO Structural Manual;
 - E. OPSS; and,
 - F. OPSD.
- (v) Freight Guideway Structures:
- A. AREMA;
 - B. Transport Canada Standards Respecting Railway Clearances (TC E-05);
 - C. CAN/CSA-S6 Canadian Highway Bridge Design Code; and Exceptions to the Canadian Highway Bridge Design Code CAN/CSA-S6 for Ontario;
 - D. City of Ottawa Standard Tender Documents for Unit Price Contracts;
 - E. MTO Structural Manual;
 - F. OPSS; and,
 - G. OPSD.
- (vi) MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads;
- (vii) MTO Roadside Safety Manual;
- (viii) CAN/CSA A23.3 Design of Concrete Structures;
- (ix) CAN/CSA A23.1 Concrete Materials and Methods Construction;
- (x) CAN/CSA A23.2 Test Methods and Standard Practices for Concrete;
- (xi) CAN/CSA S16 Design of Steel Structures;
- (xii) CAN/CSA G40.20-04/G40.21-04 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel;
- (xiii) MTO Reports and Guidelines; and,
- (xiv) TAC Geometric Design Guide for Canadian Roads.

4.3 General Requirements

- (a) Roadway and pedestrian Structures shall be designed by the limit states design method in accordance CAN/CSA S6.

- (b) Guideway Structures shall be designed in accordance with AREMA. Live loads shall be as specified in Clause 4.5 of this Part 2. The design of all Guideway Structures shall also consider loads and space requirements due to system-wide elements such as signalization, communication equipment and electrification, for the future Expanded Trillium Line LRV.
- (c) The loading criteria to which the Structures are designed shall appear on the Structural drawings. When required by design conditions, concrete placing sequence shall be indicated on the drawings or in the supplementary conditions.
- (d) Minimum clearance requirements
 - (i) New Overhead Structures and existing Bridge Structures being modified to Overhead Structures shall span:
 - A. The Guideway;
 - B. Emergency access walkways; and,
 - C. The minimum Vehicle clearance in accordance with Clause 2.12 of this Part 2.
 - (ii) New Guideway Structures and existing Bridge Structures being modified to Guideway Structures shall have a Structure width to allow for:
 - A. The Guideway;
 - B. Emergency access walkways; and,
 - C. The minimum Vehicle clearance in accordance with Clause 2.12 of this Part 2.
 - (iii) The minimum vertical clearance for Overhead Structures shall be in accordance with Clause 2.12 of this Part 2.
 - (iv) The minimum vertical clearance for new Guideway Structures over Roadways shall be in accordance with the MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads.

4.4 Design Requirements

- (a) Pedestrian and Roadway Structures
 - (i) Seismic Design

- A. New Bridge Structure shall be designed to meet importance category “Other”.
- B. PBD approach in accordance with CAN/CSA S6 shall be used for all new Bridge Structures.
- C. New Bridge Structures shall be analyzed for design earthquake loads for all three return periods and damage states in accordance with CAN/CSA S6.
- D. Seismic design for buried Structures and retaining walls shall be as per CAN/CSA S6.
- E. Table 2-4.1 summarizes the design approach, return period and performance requirements.

Table 2-4.1: Design Approach, Return Period and Performance Requirements

Seismic Design Summary	
Design Approach	PBD
Seismic ground motion probability of exceedance in 50 years (return period)	2%, 5% and 10% (2475yrs, 975yrs, and 475yrs)
Performance Level and Criteria	As per CAN/CSA S6

- (ii) Collision Protection for Overhead Structures which provide freight clearance under the Structure shall meet the collision requirements as specified in AREMA.
- (iii) Collision Protection for Overhead Structures which do not provide freight clearance under the Structure shall meet the following requirements:
 - A. Piers supporting new and existing Bridges over the alignment and with a clear distance of less than 6m from the centerline of a Track shall be of heavy construction or shall be protected by a reinforced concrete crash wall.
 - i Crash walls shall have a minimum height of 1200mm above the TOR. The crash wall shall be at least 600mm thick and at least 3.5m long. When two or more columns compose a pier, the crash wall shall connect the columns and extend at least 900mm beyond the outermost columns parallel to the Track. The crash wall shall be anchored to the footings and columns, if applicable, with adequate reinforcing steel and shall extend to at least 1200mm below the lowest surrounding grade.

- ii Piers shall be considered of heavy construction if they have a cross sectional area equal to or greater than that required for the crash wall and the larger of its dimensions is parallel to the Track.
 - (iv) Vibration and deflection control for pedestrian Structures shall be in accordance with CAN/CSA S6 and the MTO Structural Manual.
- (b) Guideway Structures
- (i) Seismic Design
 - A. Seismic design of new Guideway Structures shall be in accordance with AREMA.
 - B. The seismic evaluation of existing Guideway Structures shall be in accordance with AREMA and shall use the return periods specified in Table 2-4.2. The seismic evaluation of existing buried structures is not required.

Table 2-4.2: Return Period (in Years) for Existing Guideway Structures

	SN055350 Hunt Club Bridge	SN055900 Walkley Yard Lead	SN055910 Rail Bridge over Transitway			SN015290 Rideau River
Serviceability Limit States Return Period	92.5	90.6	90.6			92
Ultimate Limit States Return Period	312.5	260	267.5			312
Survivability Limit States Return Period	1910	1577.5	1857.5			1910

- C. When background information required to undertake a seismic analysis of a Structure is incomplete, Project Co Shall obtain additional information via field measurement, exploratory removals, sampling and material testing.
- (ii) Structure support elements shall withstand the collision load in accordance with Clause 4.5 of this Part 2.
- (iii) Vibration and Deflection Control shall be in accordance with AREMA.

- (c) New or existing Guideway Bridges shall be designed or modified such that rehabilitation work can be performed while maintaining a minimum of one Track. New or existing Roadway Bridges shall be designed or modified such that rehabilitation work can be performed while maintaining a minimum of two traffic lanes, bicycle lanes and one sidewalk, as applicable.
- (d) The structural capacity and the condition of existing Structures being modified to carry future electrified Vehicle, Vehicle and freight loading or subject to Project Co Construction Activities shall be assessed and confirmed in coordination with the Governmental Authorities. Project Co shall perform any repairs or strengthening required to accommodate the applicable vehicle loading or Construction Activities.
- (e) Project Co shall note all Design Criteria, including geotechnical and condition survey information, to which the Structures are designed on submissions and/or the structural drawings.
- (f) Design of new Structures which are interfacing with existing Structures shall be coordinated with the owners and shall comply with the design and construction requirements of the Governmental Authorities. Environmental, hydrology and hydraulic studies shall be performed to address all immediate and long-term impacts and issues for Culverts and all Bridges, including Elevated Guideways, over water in coordination with the Governmental Authorities, and the design shall comply with the requirements of the Governmental Authorities.
- (g) Access to steel girders for inspection purposes shall be incorporated into the design, including devices/system to enable inspectors to walk along all girders and tie-off safely.
- (h) All new Bridges, Elevated Guideways and at-grade Guideways shall meet NFPA 130 requirements. Emergency walkways on Guideway Structures and under Overhead Structures shall meet the requirements of Clause 1.3 of this Part 2.
- (i) Noise and vibration measures and control shall comply with the requirements of Schedule 17 – Environmental Obligations.
- (j) Aesthetic Design
 - (i) All new Structures shall meet the requirements of the MTO Aesthetic Guidelines for Bridges, supplemented by the additional requirements of this Article. All references in the MTO Aesthetics Guideline to Ministry Bridge Aesthetics Evaluation Group or MBAEG shall be replaced with the City. The aesthetic design review process and approval procedures as detailed in Chapter 11 of the MTO Aesthetic Guidelines for Bridges are not applicable to this project. Chapter 11 of the MTO Aesthetic Guidelines for Bridges shall be considered deleted in its entirety.

- (ii) The Bridge Aesthetic Level and Classification for new Structures shall be as specified in Appendix C of this Part 2.
- (iii) The aesthetic design of Level One Bridges (High Aesthetic Classification) shall be subject to City review and approval. Project Co shall prepare and submit an Aesthetic Design Report in accordance with Schedule 10 – Review Procedure for all Level One Structures. The Aesthetic Design Report shall:
- A. Be signed by the Design Architect.
- B. Document the Architect's consideration of the following aesthetic design principals, as defined in the MTO Aesthetic Guidelines for Bridges, and how each of the aesthetic design principals were successfully addressed in the preliminary bridge design:
- i Functional clarity – The size and shape of each primary element shall be appropriate for its respective structural task and the form of the Structure should truthfully and clearly express the loads that are being carried and transferred to the ground.
- ii Economy and simplicity – The number of materials, textures, colours and architectural features should be kept at a minimum without becoming visually monotonous and should be applied consistently to provide a continuity of appearance.
- iii Scale and proportion – The Structure shall be designed to minimize the overall dimensions of elements and shall appear in scale with its surroundings.
- iv Harmony and visual balance – The Structure exhibits visual balance amongst its component part as well as with its surroundings.
- v Contrast and complexity – The design of the Structure shall introduce complexity as a means of relieving visual monotony without the use of excessive eye-catching elements, colours or superfluous decoration.
- vi Enduring visual quality, with a focus on surface finishes – The Structure shall be designed and constructed to ensure the quality and durability of base materials in order to achieve a lasting positive visual effect.
- vii Integration with context – The Structure shall be designed to make a positive aesthetic contribution to its physical setting.

- C. Include drawings of Bridge alternatives, details of specific aesthetic enhancements and 3D computer renderings of the proposed Structure viewed at perspective angles. Renderings shall be inclusive of the surrounding context.
- (iv) Level Three Bridges (Low Aesthetic Classification) shall not be subject to aesthetic design approval by the City. Submission of Aesthetic Design Report shall not be required for Level Three Bridges (Low Aesthetic Classification).
- (v) There are no Level Two Bridges (Medium Aesthetic Classification) on this Project.
- (vi) Chain link fencing shall not be used on pedestrian Structures.
 - (i) Project Co shall detail and protect the structural steel-to-concrete interface in a way that no rust staining of the concrete occurs.
- (k) Durability
 - (i) New Structures shall be designed to attain the indicated Design Life as detailed in Schedule 15-2, Part 1, Article 4 – Design and Construction. Time dependent design calculations, including corrosion, creep and fatigue shall be based on indicated Design Life.
 - (ii) Time dependent design calculations for modified existing Structures, shall take into account the age and condition of the Structure.
 - (iii) Fatigue cycles for Guideway Structures shall be a minimum 15,000,000 cycles for peak period Trains of 120m to 150m length.
 - (iv) Structures shall be designed to protect against atmospheric corrosion, soil corrosion and stray current corrosion in accordance with Schedule 15-2, Part 3, Article 11 – Corrosion Control.
 - A. New steel girder Structures over and adjacent to highways or exposed to salt spray shall be steel box girders.
 - B. Waterproofing shall be required for all Structure decks. The top of the existing and new concrete Structures shall be waterproofed as per applicable standards. Where DF is utilized, a waterproofing technology compatible with DF shall be applied. In-situ testing and warranties shall be required.

- C. Steel piles shall not be used in corrosive ground water. Precast concrete piles may be used under these conditions, if specified with sulphate resisting cement.
- (v) Where technically feasible, new Bridges shall be designed with integral or semi-integral abutments.
- (l) A depressed approach slab shall be provided at all transitions between Track slab or Bridge decks with DFF and tie and ballast Track. Approach slabs shall be waterproofed.
- (m) Approach slabs shall be designed and constructed for all new Structures supporting highway loads. Approach slabs shall be waterproofed.
- (n) Drainage
- (i) All Structures shall include provision for drainage in accordance with Article 5 – Drainage and Stormwater Management Design Criteria, of this Part 2.
 - (ii) Joints shall be detailed to allow longitudinal conveyance of runoff without leaking at the joints.
 - (iii) Drain pipes shall be external to the concrete.
 - (iv) Drainage from Structures within RVCA or SNCA Regulated Flood Plains shall be in accordance with Article 5 – Drainage and Stormwater Management Design Criteria, of this Part 2 and requirements of Governmental Authorities within whose jurisdiction the Structures are located.
 - (v) Drainage pipes shall not reduce the vertical and horizontal clearance of existing Structures.
 - (vi) Catch basins shall not be located within the approach slab area.
- (o) Ductbanks
- (i) Ductbanks shall be provided as necessary for systems and Operation conduits, including pull boxes and access to connecting devices.
 - (ii) The design of ductbanks at existing Structures shall with the requirements of the Governmental Authorities.
 - (iii) Services carried through or under Bridges shall be located as per the requirements of the MTO Structural Manual.
- (p) Design of Retaining Structures

- (i) A drainage layer shall be provided behind the wall to mitigate the build-up of hydrostatic pressure, where Structures are designed as drained. Both the water pressure and the lateral soil pressure shall be considered in the design.
 - (ii) MSE walls and MSE true abutments shall not be utilized as the primary support paths for Bridge beams and girders.
 - (iii) Earth retaining Structures whether temporary or permanent greater than 3m in height shall be designed on the basis of specific soils information relating to the backfill material. Such walls shall be analyzed using a recognized numerical design method accounting for the rigidity or flexibility of the soil-structure interaction.
- (q) Demolition and Restoration
- (i) Demolition and restoration shall be as per Schedule 15-2, Part 1, Article 13 – Demolition, Removals and Disposal in addition to the provision contained in this Clause.
 - (ii) The condition of the existing Structures within the Project ZOI of the demolition shall be surveyed and recorded with the cooperation of the owners of the Structures affected and the Governmental Authorities. The condition of Structures to be demolished shall not be required to be surveyed and recorded.
- (r) Project Co shall provide pedestrian, bicycle or combination barrier in accordance with CAN/CSA S6 on all new and existing Roadway and pedestrian Structures, where applicable.
- (s) Any structural work or upgrades undertaken by Project Co shall not obstruct existing MUP, sidewalk, Roadway or waterway connections on or under the Structure.

4.5 Loads and Forces

- (a) Pedestrian and Roadway Structures
- (i) All loads, load factors and load combination shall be determined in accordance with CAN/CSA S6, supplemented and/or modified to meet the requirements of this Clause.
 - (ii) Loads due to horizontal earth pressure and hydrostatic pressure (E) shall be determined in accordance with CAN/CSA S6. Lateral earth pressure shall have a maximum load factor of 1.5 when used for proportioning wall sections of earth retaining Structures.

(iii) Earthquake (EQ) load shall be in accordance with CAN/CSA S6 and as modified by Clause 4.4 of this Part 2.

(b) Vehicle Guideway Structures

(i) Vehicle Guideway Structures shall be designed to support the following Live Load (L) conditions:

A. The Alstom CORADIA LINT 41 is the Existing Trillium Line Revenue Vehicle, a low-floor DMU vehicle with maximum axle loads of 196kN, as shown in Figure 2-4.1.

Figure 2-4.1: Alstom CORADIA LINT 41 Vehicle Loading

[REDACTED]

B. Expanded Trillium Line Revenue Vehicle provided by Project Co based on the selected Vehicle. The Revenue Vehicle shall be selected in accordance with Schedule 15-2, Part 8 – Vehicles.

C. The Alstom CITADIS SPIRIT shall be considered as the future Expanded Trillium Line LRV. The maximum axle load for this vehicle is 14.9 tonnes (126kN), axel loading and spacing shall be as shown in Figure 2-4.2.

Figure 2-4.2: Alstom CITADIS SPIRIT Vehicle Loading

[REDACTED]

- D. Maintenance vehicle live load to be determined and provided by Project Co.
- (c) Freight Guideway Structures
- (i) Freight Guideway Structures shall be designed to support the following Live Load (L) conditions:
- A. Cooper E80 loading as specified by AREMA.
- B. The Alstom CORADIA LINT 41 is the Existing Trillium Line Vehicle, a low-floor DMU vehicle with maximum axle loads of 196kN, as shown in Figure 2-4.1.
- C. Future Expanded Trillium Line Revenue Vehicle provided by Project Co based on the selected Vehicle. The future Revenue Vehicle shall be selected in accordance with Schedule 15-2, Part 8 – Vehicles.
- D. The Alstom CITADIS SPIRIT electrical vehicle shall be considered as the future Expanded Trillium Line LRV. The maximum axle load for this vehicle is 14.9 tonnes (146kN), axel loading and spacing shall be as shown in Figure 2-4.2.
- E. Maintenance vehicle live load to be determined and provided by Project Co.
- (d) The following load conditions for the future OCS shall be taken into consideration for all Guideway Structures:
- (i) Wind loading on the OCS shall be considered in the design of both superstructure and substructure elements.
- (ii) Thermal forces resulting from the temperature variations in the OCS shall be considered. Loads shall be determined in accordance with AREMA unless otherwise determined by Project Co using other established codes of practice.

4.6 Material

- (a) Material used for the modification, repair and rehabilitation of existing Structures shall be compatible with the existing in-situ material.
- (b) Material selection and/or coating of attached elements shall be used to minimize staining to concrete elements.
- (c) All material for the Structures as identified in this article shall conform to OPSS.

(d) Earth Retaining Structures

- (i) Permanent RSS systems located beyond the salt spray zone shall meet, as a minimum, medium performance and low appearance requirements in accordance with MTO RSS Design Guidelines. RSS systems within 10m of a salt spray zone or associated with the Bridge Structure shall meet high performance and high appearance requirements in accordance with MTO RSS Design Guidelines.
- (ii) Where accessible to Passengers within the Fare Paid Zone, including bus Platform areas and adjacent to public areas at Station entrances, gabion stones at the face of gabion walls shall be sized to prevent removal.

(e) Concrete

- (i) Concrete shall conform to OPSS 1350 and City Special Provisions F-9045 and F-9043.
- (ii) All concrete mixes shall be in accordance with CAN/CSA A23.1.
- (iii) Concrete strength for Roadway and pedestrian Structures shall be as per the MTO Structural Manual, except for Bridge decks and sidewalks which shall be 35 MPa.

(f) Reinforcing Steel

- (i) Reinforcing steel shall meet the material requirements as defined in OPSS 905 and OPSS 1440.
- (ii) Minimum reinforcement designation shall be 15M.
- (iii) Welded splices or joints in reinforcing steel shall not be permitted. Welding for purposes of bonding and grounding continuity is permitted.
- (iv) Couplers shall not be permitted in plastic hinge zones.
- (v) No splices shall be permitted in plastic hinge zones for substructure components.
- (vi) Premium reinforcing for Roadway and pedestrian Structures shall be used where required in accordance with the MTO Structural Manual.
- (vii) Premium reinforcing for Guideway Structures shall be used in:
 - A. Guideway plinths that may be subject to de-icing salts, such as adjacent to Platforms; and,

- B. Substructure elements that are located within the splash zone of Roadways treated with de-icing salts. Parking lots will not be considered a splash zone.
- (viii) Where electrical continuity is required for managing stray currents, weldable reinforcement and suitable welding shall be used.
- (ix) Epoxy coated reinforcing shall be used in accordance with Schedule 15-2, Part 3, Article 11 – Corrosion Control.
- (g) GFRP Reinforcing bars:
- (i) GFRP reinforcing bar shall only be permitted in barrier and parapet wall applications.
- (ii) The GFRP reinforcing bars shall conform to the following standards:
- A. CAN/CSA S806: Design & Construction of Building Structures with Fibre Reinforced Polymer
- B. CSA S807: Specifications for Fibre Reinforced Polymer
- (iii) GFRP shall have a minimum modulus of elasticity of 40 GPa.
- (iv) GFRP shall have a specified minimum tensile strength of 1000 MPa.
- (v) GFRP shall be type 2 or type 3.
- (h) Prestressing Tendons
- (i) Internal unbonded post-tensioning tendons shall not be permitted.
- (ii) External grouted post-tensioning tendons are permitted for segmental Construction and shall be corrosion protected.
- (i) Structural Steel
- (i) Structural Steel for Roadway and pedestrian Structures shall conform to the material requirements in the MTO Structural Manual.
- (ii) Structural steel for Guideway Structures
- A. Superstructure primary members shall be grade 350AT Category 3 for primary plates, girders and rolled section members.

- B. Primary members made from pipe sections shall meet the minimum Charpy impact energy specified in Table 9 of CSA G40.21 for the similar yield strength of steel tested at a Category 3 temperature.
 - C. Secondary steel members shall be grade 350W or 350A.
 - D. ASTM A 588 may be substituted for grade 350A or grade 350AT. ASTM A 588 shall only be substituted for grade 350AT steel when the Charpy impact energy requirements are verified by the submission of test documentation.
- (iii) Steel fabrication companies shall be CWB certified.
 - (iv) The use of uncoated weathering steel shall be in accordance with CAN/CSA S6, based on applicable environmental exposure conditions.
- (j) Deck joint assemblies shall comply with City of Ottawa Special Provision F-9201, including the 5 year warranty period for all New Municipal Infrastructure Structures.
 - (k) Bearings shall comply with City of Ottawa Special Provision F-9221, including the 5 year warranty period for all New Municipal Infrastructure Structures.
 - (l) Corrugated Steel Pipe, regardless of thickness or type, shall not be used for Bridge or Culvert construction.

4.7 Construction

- (a) Concrete construction shall be in accordance with OPSS 904 and City of Ottawa Special Provision F-9040.
- (b) Precast Prestressed Concrete
 - (i) Construction shall be in accordance with OPSS 909.
 - (ii) Precast members shall not be erected until sample cylinders tested per OPSS 1350 achieve a design 28 day compressive strength.
 - (iii) Precast segmental Bridges shall be constructed in accordance with the requirements of AASHTO's Guide Specifications for the Design and Construction of Segmental Bridges except where it conflicts with CAN/CSA S6.
- (c) Structural steel shall be constructed in accordance with OPSS 906.
- (d) Soffits shall be uncovered and without coatings.
- (e) Bearings shall be uncovered.

- (f) Bolted connections shall have a minimum diameter of 22mm and A325M designation of weathering steel.
- (g) Welded connections – critical welds, such as over supports and midspan, shall be treated as tension splices subjected to more stringent tests (Non-Destructive Testing). Testing schemes shall be submitted by Project Co for review Schedule 10 – Review Procedure.
- (h) Project Co shall not store and/or leave exposed to the environment, prefabricated Bridge decks or partially constructed prefabricated Bridge decks in the Construction staging area during the calendar dates from December 1 to March 30. Prefabricated Bridge decks and partially Constructed prefabricated Bridge decks include Structural steel, reinforcing steel bars and concrete.
- (i) Prefabricated Bridge decks shall be constructed in the designated construction staging area, transported to Site and erected into place in the same construction season.

4.8 Description of Project Structures

- (a) Structures shall meet the requirements in Schedule 15-2, Part 1, Article 2 – Physical Layout, Clause 2.8 as well as the requirements contained in this Clause.
- (b) Provisions contained in this Clause shall be read in conjunction with Appendix C of this Part 2.
- (c) Project Co shall design and construct the following Works for the Expanded Trillium Line Mainline:
 - (i) Limebank Road Bridge (SN225710)
 - A. Design and construct a new grade separation at Limebank Road to either accommodate the alignment over the Roadway or the Roadway over the alignment. The new Structure shall accommodate:
 - i The Limebank Road cross section in accordance with Clause 6.18 of this Part 2 on the Structure;
 - ii The northbound and southbound Track alignment, including Emergency walkway; and,
 - iii The future Roadway cross section for a collector Roadway and a MUP in accordance with Clause 6.18 of this Part 2.
 - B. Design and construction of a new grade separation that accommodates Limebank Road over the alignment shall:

- i Include the installation of Bridge Structure fencing in accordance with the requirements in Schedule 15-2, Part 6, Clause 2.7; and,
 - ii Accommodate a collector Roadway on the north side of the Track in accordance with Clause 6.18 of this Part 2.
 - iii Accommodate a future MUP on the south side of the Track corridor in accordance with Clause 6.18 of this Part 2.
- C. Design and Construction of a new grade separation that accommodates the alignment over Limebank Road shall:
- i Include the installation of a pedestrian barrier/railing system on each side of the Structure.
 - ii Center piers shall not be permitted.
 - iii Accommodate a collector Roadway on the north side of the track corridor in accordance with Clause 6.18 of this Part 2.
 - iv Accommodate a future MUP connection between the north and south sides of the Track corridor, on the east side of Limebank Road, in accordance with clause 6.18 of this Part 2.
- (ii) Mosquito Creek Rail Bridge (SN225050)
- A. Design and construct a new Guideway Structure to carry the alignment over Mosquito Creek. The new Structure shall accommodate:
- i The northbound and southbound Track alignment, including Emergency walkway on the Structure;
 - ii Mosquito Creek and wildlife path under the Structure; and,
 - iii The wildlife path shall provide a minimum clearance envelope of 3m wide by 4m high. The wildlife clearance envelope shall be outside of and unobstructed by the channel that contains the average flow.
- (iii) Bowesville Road Bridge (SN225690)
- A. Design and construct a new grade separation at Bowesville Road to either accommodate the alignment over the Roadway or the Roadway over the alignment. The new Structure shall accommodate:

- i The Bowesville Road cross section in accordance with Clause 6.18 of this Part 2;
 - ii The northbound and southbound Track alignment, including Emergency walkway; and,
 - iii MUP.
- B. Design and construction of a new grade separation that accommodates Bowesville Road over the alignment shall:
- i Include the installation of Bridge Structure fencing in accordance with the requirements in Schedule 15-2 Part 6 Clause 2.7; and,
 - ii Accommodate the MUP under the Structure on the south side of the alignment.
- C. Design and Construction of a new grade separation that accommodates the alignment over Bowesville Road shall:
- i Include the installation of a pedestrian barrier/railing system on each side of the Structure;
 - ii Allow for an at-grade MUP crossing with Bowesville Road to the south of the Structure; and,
 - iii Center piers shall not be permitted.
- (iv) Earl Armstrong Bridge (SN225680)
- A. Design and construct a new grade separation at Earl Armstrong Road to either accommodate the alignment over the Roadway or the Roadway over the alignment. The new Structure shall accommodate:
- i The Earl Armstrong Road cross section in accordance with Clause 6.18 of this Part 2;
 - ii The northbound and southbound Track alignment, including Emergency walkway under the Structure; and,
 - iii A MUP.
- B. Design and construction of a new grade separation that accommodates Earl Armstrong Road over the alignment shall:

- i Include the installation of Bridge Structure fencing in accordance with the requirements in Schedule 15-2, Part 6, Clause 2.7; and,
 - ii Accommodate the MUP under the Structure on the east side of the alignment.
- C. Design and Construction of a new grade separation that accommodates the alignment over Earl Armstrong Road shall:
- i Include the installation of a pedestrian barrier/railing system on each side of the Structure; and,
 - ii Allow for an at-grade MUP crossing with Earl Armstrong Road to the east of the Structure.
- (v) High Road Bridge (SN225670)
- A. Design and construct a new Overhead Structure to carry a MUP and ecological corridor over the alignment. The new Structure shall accommodate:
- i A MUP and ecological corridor on the Structure; and,
 - ii The northbound and southbound Track alignment, including Emergency walkway under the Structure.
- B. Configuration of the MUP and ecological corridor on the Structure shall be in accordance with Schedule 15-2, Part 6, Clause 4.4.
- C. Install Bridge Structure fencing in accordance with the requirements in Schedule 15-2, Part 6, Clause 2.7.
- (vi) Leitrim Road Bridge (SN225610)
- A. Design and construct a new grade separation at Leitrim Road to either accommodate the alignment over the Structure or the Roadway over the alignment. The Structure shall accommodate:
- i The Leitrim Road cross section in accordance with Clause 6.18 of this Part 2;
 - ii The northbound and southbound Track alignment, including Emergency walkway; and,
 - iii A MUP.

- B. The new Structure shall abide by the Airport Zoning Regulations Exemption to be secured by the City as outlined in Schedule 32 – City Permits, Licenses, Approvals and Authorizations.
 - C. The two existing watermains adjacent to the alignment shall be protected in accordance with the requirements of Article 8 of this Part 2.
 - D. Design and construction of a new grade separation that accommodates Leitrim Road over the alignment shall:
 - i Include the installation of Bridge Structure fencing in accordance with the requirements in Schedule 15-2, Part 6, Clause 2.7; and,
 - ii The Design Life for the new Overhead Structure shall be 40 years and.
 - E. Design and construction of a new grade separation that accommodates the alignment over Leitrim Road shall:
 - i Include the installation of a pedestrian barrier/railing system on each side of the Structure; and,
 - iii Center piers shall not be permitted.
- (vii) Rail Bridge over Lester Road (SN225620)
- A. Design and construct a new elevated Guideway Structure to carry the alignment over the Lester Road. The new Structure shall accommodate:
 - i The single Track alignment, including an Emergency walkway on the Structure; and,
 - ii The Lester Road cross section in accordance with Clause 6.18 of this Part 2 under the Structure.
 - B. Install a pedestrian barrier/railing system on each side of the Structure.
 - C. Center piers shall not be permitted.
 - D. Structure shall be designed and constructed to allow for future widening of the Bridge to accommodate a second Track. Overbuilding of the substructure is not required.

- E. Use of the new rail Bridge over Lester Road for the NRC access to the current NRC yard in lieu of a separate NRC spur line shall be permitted, provided that:
- i The new Bridge is designed and constructed to allow for the passage of the Vehicle and freight Trains; and,
 - ii Modifications to the existing NRC internal Track and yard are not required.
- (viii) Hunt Club Road Bridge (SN055350)
- A. Complete a seismic evaluation to determine if seismic upgrades are required to AREMA requirements. Project Co shall perform all required repairs and/or seismic upgrades or replacement.
 - B. Replace the existing railing system on the Structure with a new pedestrian barrier/railing system.
- (ix) Rail Bridge over Hunt Club Road (SN055440)
- A. Design and construct a new Elevated Guideway to carry the alignment over Hunt Club Road. The new Structure shall accommodate:
 - i The single Track alignment on the Structure; and,
 - ii The existing Hunt Club Road cross section under the Structure.
 - B. Install a pedestrian barrier/railing system on each side of the Structure.
- (x) Hunt Club Road MUP Bridge (SN058620)
- A. Design and construct a new pedestrian Structure to carry a MUP over Hunt Club Road. The new Structure shall accommodate:
 - i A MUP with a minimum width of 4.2m on the Structure; and,
 - ii The existing Hunt Club Road cross section under the Structure.
 - iii Install a bicycle barrier/railing system on each side of the Structure. Barrier/railing system on the Structure shall be a minimum of 1.37m in height.
- (xi) Rail Bridge over MUP north of Hunt Club Road (SN055740)

- A. Design and construct a new Guideway Structure to carry the alignment over a MUP. The new Structure shall accommodate:
 - i The northbound and southbound alignment, including Emergency walkway on the Structure; and,
 - ii A MUP under the Structure.
 - B. The minimum opening under the Structure shall be 6m wide and 3m high. The haunches of a concrete box section shall be permitted to intrude into this opening provided the haunch dimensions do not exceed 600mm x 600mm.
 - C. Install a pedestrian barrier/railing system on each side of the Structure.
- (xii) Rail Bridge at South Keys Station (SN058490)
- A. Project Co shall complete a structural evaluation to ensure the structural capacity of the Structure is not exceeded with the application of all loads as defined in Clause 4.5 of this Part 2.
 - B. Project Co shall ensure that the Structure has adequate width to accommodate a second railway Track and Train platform for the South Keys Station. Project Co shall perform all required Structure modifications and/or repairs needed to accommodate a second Track and Train Platform. Structure modifications shall be completed in conjunction with the South Keys Station.
 - C. Project Co shall perform all required repairs, strengthening or replacement to ensure the structural capacity of the Structure is not exceeded.
- (xiii) Pedestrian Overpass north of South Keys Station (SN055750)
- A. Design and construct a new Guideway Structure to carry the alignment over a future MUP. The new Structure shall accommodate:
 - i The northbound and southbound alignment, including Emergency walkway, on the Structure; and,
 - ii A future MUP under the Structure.
 - B. The minimum opening under the Structure shall be 6m wide and 3m high. The haunches of a concrete box section shall be permitted to intrude into this opening provided the haunch dimensions do not exceed 600mm x 600mm.

- C. The Structure shall be designed and constructed in conjunction with the South Keys Station. Refer to Schedule 15-2, Part 4, Clause 3.9 (e).
 - D. Install a pedestrian barrier and/or handrail on each side of the Structure.
- (xiv) Walkley Yard Lead over Transitway (SN055900)
- A. Project Co shall complete a seismic evaluation to determine if seismic upgrades are required to meet AREMA requirements. Project Co shall perform all required repairs, seismic upgrades or replacement.
- (xv) Rail Bridge over Transitway at Walkley Yard Connecting Track (SN055910)
- A. Project Co shall complete a seismic evaluation to determine if seismic upgrades are required to meet AREMA requirements. Project Co shall perform all required repairs, seismic upgrades or replacement.
- (xvi) Sawmill Creek Culvert (SN055470)
- A. Project Co shall complete a structural evaluation to ensure the structural capacity of the Structure is not exceeded with the application of all loads as defined in Clause 4.5 of this Part 2. Project Co shall perform all required repairs, strengthening or replacement to ensure the structural capacity of the Structure is not exceeded.
- (xvii) Sawmill Creek Bridge (SN055200)
- A. Project Co shall decommission and remove the Structure in accordance with Schedule 15-2, Part 1, Article 13 – Demolition, Removals and Disposal.
- (xviii) Rail Bridge over Southeast Transitway (SN055930)
- A. Project Co shall decommission and remove the Structure in accordance with Schedule 15-2, Part 1, Article 13 – Demolition, Removals and Disposal.
- (xix) [REDACTED] Grade Separation at Ellwood Diamond (SN055940)
- A. Design and construct a new Guideway Structure to separate the alignment from the [REDACTED] tracks at the Elwood Diamond. The new Structure shall accommodate:
 - i The alignment, including Emergency walkway, on the Structure; and,

- ii The existing [REDACTED], the existing Transitway, Sawmill Creek and the existing Brookfield MUP under the Structure.
 - B. Project Co shall ensure that neither [REDACTED] nor [REDACTED] operations are impacted by the construction of the grade-separation.
 - C. The existing Brookfield MUP connection adjacent to Sawmill Creek shall be maintained and meet the requirements of Schedule 15-2, Part 6 – Landscape Architecture and Connectivity Requirements.
 - D. Project Co shall ensure the design of the Guideway Structure will not obstruct the construction of a future second Track, to be supported on either a widened Structure or an independent twin Structure.
- (xx) Rideau River Bridge (SN015290)
- A. Project Co shall complete a seismic evaluation to determine if seismic upgrades are required to meet AREMA requirements.
 - B. Project Co shall complete a structural evaluation to ensure the structural capacity of the Structure is not exceeded with the application of all loads as defined in Clause 4.5 of this Part 2. Project Co shall perform all required repairs, strengthening, seismic upgrades or replacement to ensure the structural capacity of the Structure is not exceeded. At a minimum, Project Co shall perform the following upgrades;
 - i Replacement of span 2 and span 4 bearings to ensure the safe transfer of loads from superstructure to substructure
 - ii Repoint all stone masonry joints in the south abutment and wingwalls
 - iii Repair deteriorated masonry stones in the south abutment and wingwalls
 - iv Remove the existing deteriorated paring, reface the north abutment and wingwalls and install wall drains through the wingwalls to prevent build-up of water behind the abutment
 - v Remove existing concrete refacing and reface pier #1
 - vi Repoint deteriorated stone masonry joints in pier #2 and pier #3 shafts

- vii Remove and replace the concrete collars at the base of pier #2 and pier #3 shafts and
 - viii Repair spalled and delaminated areas of concrete at the top of the South Abutment
- C. Install a pedestrian barrier/railing system on each side of the Structure.
- (xxi) University Road Pedestrian Bridge over Rideau River (SN018750)
- A. Design and construct a new single span pedestrian Structure to carry a MUP over the Rideau River. The new Structure shall accommodate:
 - i A MUP with a minimum clear width of 5.0m on the Structure;
 - ii A minimum clear span length of 63.5m; and,
 - iii A design service life of 75 years.
 - B. Bridge superstructure shall be a painted steel Structure with a concrete deck. Concrete deck shall include curbs and a drainage system to prevent runoff onto the supporting superstructure.
 - C. Project Co shall provide bridge with a fabrication camber that counters the effects of full dead load deflection in order to obtain a final vertical camber that matches approach grade slopes.
 - D. Bridge substructure shall be constructed of reinforced concrete. Foundations shall be spread footings bearing on rock. Bottom of footings shall be cast a minimum of 250mm into sound bedrock and sides of footings shall be cast against undisturbed rock.
 - E. Intermediate piers shall be prohibited.
 - F. Outer faces of abutment walls shall accommodate:
 - i A natural stone architectural finish consisting of a 75mm minimum depth as defined in Schedule 15-2, Part 6 – Urban Design, Landscape Architecture and Connectivity Requirements. Relief pattern shall appear natural and non-repeating; and,
 - ii An anti-graffiti coating shall be applied to the full height of the natural stone finish. Coating shall be clear and shall not alter the color of the stone finish.

- G. Install a pedestrian barrier/railing system on each side of the Structure and along retaining walls and wingwalls, as required, a minimum of 1.37m in height consisting of a painted steel guardrail and an IPE wood handrail.
 - H. Project Co shall demonstrate that the barrier/railing system is designed to prevent the attachment of pad-locks to longitudinal elements along the Bridge.
 - I. Centreline of the Structure shall be offset by a minimum of 23m from the centreline of the adjacent Rideau River Bridge.
 - J. Project Co shall design the Structure bottom chord to be above the greater of the following:
 - i A minimum opening under the Structure based on a 3.0m navigational clearance above the normal water elevation of the Rideau River, to be confirmed by Transport Canada's Navigational Protection Act requirements as per Schedule 32 - City Permits, Licences, Approvals and Authorizations; or.
 - ii A 0.3m clearance above the 1:100 year flood elevation which will result from the placement of fill as defined in Clause 5.7 of this Part 2.
 - K. The coating system for the steel truss and railing shall conform to the following requirements, at a minimum:
 - i Low VOC Paint Coating System 2 as specified in the MTO Structural Steel Coating Manual; and,
 - ii The colour of the topcoat shall be 17038 black – according to Federal Standard 595B colours.
 - L. An anti-slip coating shall be applied to all expansion joint cover plates.
 - M. Removable bollards shall be installed at both bridge approaches to prevent vehicular access.
 - N. All stone retaining walls along the Bridge approaches required to construct the pedestrian Bridge shall be designed and checked by a Professional Engineer.
- (xxii) South Rail Bridge over MUP at Carleton University (SN018510)

- A. Project Co shall complete a structural evaluation to ensure the structural capacity of the Structure is not exceeded with the application of all loads as defined in Clause 4.5 of this Part 2. Project Co shall perform all required repairs, strengthening or replacement to ensure the structural capacity of the Structure is not exceeded.
- B. Project Co shall ensure the Structure has adequate width to accommodate siding Track. Project Co. shall carry out all required Structure modifications and/or repairs needed to accommodate the siding Track.
- C. Install a pedestrian barrier/railing system on each side of the Structure.

(xxiii) Carleton University Tunnel at Carleton Station (SN015440)

- A. Design and construct a new pedestrian Tunnel segment. The new Structure shall accommodate:
 - i The southbound and northbound Track alignment over the Structure; and,
 - ii Future pedestrian traffic in the Tunnel.
- B. The Tunnel shall be designed and constructed within the Lands and in accordance with the requirements of Schedule 15-2, Part 4, Clause 3.5.

(xxiv) Existing Carleton University Tunnel System (SN015430)

- A. Project Co shall complete a structural evaluation to ensure the structural capacity of the Structure is not exceeded with the application of all loads as defined in Clause 4.5 of this Part 2. Project Co shall perform all required repairs, strengthening or replacement to ensure the structural capacity of the Structure is not exceeded.

(xxv) North Rail Bridge over MUP at Carleton University (SN018490)

- A. Project Co shall design and construct a new elevated Guideway Structure to carry the alignment over a MUP. The new Structure shall accommodate:
 - i The single Track and siding Track alignment, including an Emergency walkway on the Structure; and,
 - ii A MUP under the Structure

B. The Structure shall have a minimum opening size of 9m wide by 3m high. The haunches of a concrete box section shall be permitted to intrude into this opening provided the haunch dimensions do not exceed 600mm x 600mm.

C. Install a pedestrian barrier/railing system on each side of the Structure.

(xxvi) Existing Tunnel under Dow's Lake (SN019020)

A. Project Co shall design and construct Tunnel upgrades and rehabilitation work for the following components of the Tunnel. Design and construction documents are to be submitted per the requirements of Schedule 10 – Review Procedure.

- i Concrete structural repairs for spalled surfaces greater than 50mm deep with exposed rebar, crack repairs for crack widths between 0.15mm to 1mm and ballast curb concrete and rebar replacement sections.
- ii Existing Tunnel Track tie removal and replacement with ties meeting NFPA 130 requirements and having an elastic fastening system per the material requirements of Clause 3.7 of this Part 2.
- iii Track ballast removal and replacement with material meeting the requirement of Clause 3.5 (c)(iii), of this Part 2.
- iv Assess the condition of the concrete Tunnel Track slab and curbs after Track and ballast removal. Project Co shall make repairs to the Track slab and curbs as necessary to properly support the Track and to ensure the water infiltration criteria at the expansion joint locations of Clause 4.8 (c)(xxvi)(B) of this Part 2 are met and that the surface and slope of the Track slab allows for positive drainage to the ballast curb weep holes for collection in the Tunnel drainage gutters as originally designed. Track slab repair design and construction shall be in accordance with the applicable criteria for Guideway Structures as specified in this Article 4 and the Track requirements of Article 3 – Trackwork, of this Part 2.
- v Dry standpipe system upgrades meeting NFPA 130 standards, and the design criteria in Schedule 15-2, Part 4 – Stations, work to include but not be limited to:
 1. Removal of all existing standpipe hose connections, shut off valves, drop piping and installation of new components meeting NFPA standards;

2. Provide/relocate fire department connections at locations as required per NFPA standards and modify piping accordingly;
 3. Demolish existing standpipe isolation valves and provide new isolation valves at a height that can be operated at floor level;
 4. Provide automatic air relief-vacuum valves at all standpipe high points;
 5. Provide drains at all fire standpipe system low points;
 6. Provide pipe supports to meet requirements for new installations;
 7. Replace all existing mechanical couplings for the standpipe main where any existing coupling connection failed the initial pressure test; replace the existing standpipe main in its entirety where any two or more existing connections or pipe failed the initial pressure test; and,
 8. The standpipe system upgrades shall not involve any structural modifications and structural lining removals of the Tunnel Structure. If the existing Tunnel Structure and Vehicle clearance envelope prevent compliance with NFPA requirements Project Co shall propose an alternative design that is acceptable with the AHJ and will be documented in the NFPA 130 Compliance Report described herein.
- vi The Tunnel Drainage System, including all facilities which remove or are intended to remove water which would otherwise collect within the Tunnel, including but not limited to all ditches, gutters, catch basins and other inlets, grates, catch basin leads, maintenance holes, sewers and other drainage piping, weep holes, screens, pumping stations, force mains and outlets including the outlet pipe and outfall to Dow's Lake. Work shall include but not be limited to:
1. Evaluate the existing Tunnel Drainage system and implement remedial measures as necessary to bring the Tunnel drainage system into compliance with the

- requirements as specified in Article 5 – Drainage and Stormwater Management Design Criteria of this Part 2;
2. Remedial measures may include: improvement of connections between Tunnel Drainage gutters and the external storm sewer; improvement of cross connections between existing east and west drainage gutters; interception of flows within drainage ditches upstream of one or both Tunnel portals and diversion either by gravity or pumping to alternative outlet(s); improvement of the alternative outlet to include upsizing or installation of downstream sewers; the replacement of existing pumps and/or installation of additional pumps; and, installation of storm water quality and quantity controls for outlets; and,
 3. The evaluation of the Dow's Lake Tunnel Drainage System shall make allowance for fire-fighting flows and infiltration.
- vii Tunnel ventilation system meeting the requirements of NFPA 130 for Emergency Tunnel ventilation and the Canada Occupational Health and Safety Regulations for normal operation and ventilation of Revenue Vehicles meeting the requirements of Schedule 15-2, Part 8 - Vehicles. Design Criteria for the ventilation system is outlined in the Emergency Ventilation System and Egress Evaluation Report requirements of this Article.
- viii Expansion joint water infiltration mitigation measures meeting the design requirements of the Water Infiltration Management Plan of this Article.
- ix Upgrades to the Tunnel to comply with NFPA 130 standards. The upgrades are to include but not be limited to, the following:
1. Improvements to the existing Emergency walkway where the walkway does not meet the egress standards of NFPA 130;
 2. Replacement of existing non-fire rated wiring in the Tunnel with wiring meeting NFPA 130 standards;
 3. Provide a battery back-up system for Tunnel lighting;
 4. Provide directional signs in Tunnel and illuminated exit signs at the portals; and,

5. Install FTELs in the Tunnel and upgrade the communications systems in the Tunnel and BAS with the TOCC and ESP. Refer to Schedule 15-2, Part 3, Article 3 – Telephone and Intercom System and Article 5 – Voice and Data Radio System, for radio communications requirements. The FTELs shall provide the same function as the blue light stations of NFPA 130 but shall be modified such that a fluorescent or reflective sign describing the function of the FTEL is located at the top of the station instead of the standard blue light. Signage shall be provided adjacent to each FTEL station providing information that identifies the location of the Tunnel exits and the distance to the exits in both directions. Refer to Schedule 15-2, Part 4, Article 7 – Wayfinding and Signage for applicable signage design criteria. The FTELs shall be located in the Tunnel at both portal exits and any Emergency egress (two safety bays) locations within the Tunnel. The FTEL stations shall be spaced throughout the Tunnel 100m apart along the Emergency walkway. Based on a 600m tunnel, roughly eight FTELs shall be installed in the Dows Lake Tunnel.
- B. Project Co shall prepare and submit a Water Infiltration Management Plan for the 22 existing expansion joints in the Tunnel per the requirements of Schedule 10 – Review Procedure. The plan shall include design drawings showing the means and methods of managing water infiltration at the expansion joints. The plan shall incorporate the following criteria and minimum requirements:
 - i Water from the expansion joint shall not be allowed to leak onto the Track, ballast, ballast curbs and Emergency walkway;
 - ii Water from the expansion joints shall not drip onto Tunnel equipment, conduits, piping, lighting and any other system components in the Tunnel;
 - iii Water shall not be allowed to freeze in the joint and the joint shall be kept free of debris;
 - iv Determine a maximum infiltration rate per expansion joint as well as a total Tunnel expansion joint infiltration volume on a total L/day measurement that can be accommodated by the upgraded Tunnel drainage system. The infiltration rate and total infiltration volumes shall incorporate the Drainage and Stormwater

- Management Design Criteria of Article 5 – Drainage and Stormwater Management Design Criteria of this Part 2, and any design improvements required to the existing drainage system as defined in this Article. The maximum infiltration rate at any one expansion joint shall not exceed 500L/day;
- v Schedule for periodic inspections of the expansion joints and the concrete either side of the expansion joint a minimum of once a year for the duration of the Project Term to ensure the water infiltration management plan is performing as designed;
 - vi Schedule for expansion joint water infiltration volume measurements taken during periods when the Tunnel is experiencing the highest rate of water infiltration through the joints for the duration of the Project Term to verify the design maximum infiltration rates are not exceeded; and,
 - vii Designs shall account for the vertical clearances of Clause 2.12 of this Part 2.
- C. Project Co shall prepare and submit in accordance with Schedule 10 – Review Procedure, an Emergency Ventilation System and Egress Evaluation Report for the Tunnel ventilation system per the requirements of NFPA 130. Evaluation shall include at a minimum SES and if required CFD analyses for fire cases in the Tunnels to demonstrate that the existing exhaust fans meet the design criteria of NFPA 130. Modifications to the existing Emergency ventilation system necessary to meet the design criteria based on the SES and CFD study results shall be included in the analyses. The report shall include modelling assumptions, methodology and criteria including reference to applicable Codes and standards, tenability criteria and time of tenability calculations for the Tunnel, fire scenario development, fire detection time and ventilation system start up time, modelling input data and assumptions, acceptable limits and other constraints. The Tunnel ventilation fans shall satisfy the following design criteria:
- i Design Fire Data: Project Co shall determine the fire heat release rate using the Revenue Vehicle properties and fuel capacities based on a probable fire scenario in the Tunnel.
 - ii Maximum Emergency operation air velocity of 11.0 m/s.
 - iii Ventilation equipment noise shall not exceed a speech interference level, measured at 1.5 m above walking surface along the path of

evacuation in the Tunnel, of 78 dBZ Leq ‘slow’ over any period of 1 minute, using the arithmetic average of unweighted sound pressure level in the 500, 1000, 2000 and 4000 Hz octave bands.

- iv Refer to Schedule 17 – Environmental Obligations for external noise level restrictions.
- v Normal fan operation shall ensure carbon monoxide limits in the Tunnel from Revenue Vehicles and the Vehicle requirements of Schedule 15-2, Part 8 - Vehicles do not exceed safe concentrations for exposure to passengers, operators and persons working in the Tunnel. The report shall include limits for carbon monoxide concentrations as well as particulate matter visibility levels in the Tunnel as determined through Code requirements and environmental regulations. At a minimum, the ventilation system shall be designed to operate when carbon monoxide limits are above 100 ppm and the fans shall only turn off when the carbon monoxide level is brought below 30 ppm. For visibility, an extinction coefficient above 0.007 per meter shall activate the ventilation system until visibility falls below 0.005 per meter. Carbon monoxide and visibility monitoring equipment shall be included in the design and connected to the BAS.
- vi Modification or replacement of the existing ventilation system shall be designed and constructed based on the available space and physical constraints of the Tunnel clearance envelope and the ventilation air shaft. Structural modifications to the Tunnel and ventilation shaft shall not be permitted to accommodate a modified or replacement Tunnel ventilation system. Refer to Clause 2.12 of this Part 2 for vertical clearance requirements in the Tunnel.
- vii The existing pump house building may be modified to accommodate an upgraded Tunnel ventilation system as determined by Project Co’s Co’s Emergency Ventilation System and Egress Evaluation Report and the ventilation system maintenance responsibilities of Schedule 15-3 – Maintenance and Rehabilitation Requirements. Pump house modifications shall be subject to the requirements of Schedule 15-2, Part 4 - Stations and all applicable codes and standards referenced therein. Architectural and structural modifications shall also be required to match the existing building materials and structural systems and shall be subject to the City’s and the NCC’s approval.

- viii Any upgrades to the existing Tunnel ventilation system or replacement Tunnel ventilation system shall be classified as a new Tunnel ventilation system. Project Co shall design a new stand-alone head end located in the TOCC and BCC for the new Tunnel ventilation system, which shall not be integrated with the Existing Confederation Line SCADA. The Trillium Line's new S&TCS and fire detection and alarm systems shall be integrated with the Dow's Lake Tunnel Tunnel ventilation system head end to communicate with Vehicle Operators and prevent their entry into Dow's Lake Tunnel during an Emergency. Project Co shall design, procure and install all of the hardware and software necessary to operate and monitor the Tunnel ventilation system including two new operator workstations in the TOCC operational theatre and one new operator workstation in the BCC operational theater. Operator workstation functions shall vary based upon the responsibility and access rights of the person who is logged on at that workstation at any given time. The workstations shall include visual displays, keyboards, telephones, head-set connection and head-set, microphone and printer. Project Co shall connect the new Tunnel ventilation system to the new head end in the TOCC and BCC via the CTS. Refer to Schedule 15-2 Part 3 – Systems for S&TCS and CTS design requirements.
- D. Project Co shall develop an NFPA 130 Compliance Report for the Tunnel components demonstrating design modifications and upgrades to satisfy the requirements for trainways, Emergency ventilation, Emergency procedures, communications, controls, wire, and cable requirements. Refer to Schedule 15-2, Part 4 Stations, clause 5.8 - Building Automation System for BAS design requirements and compatibility with other BAS systems of the Existing Trillium Line to be incorporated along with the NFPA 130 requirements. The CTS requirements of Schedule 15-2 Part 3 – Systems, shall be implemented for all modifications and replacements to the systems and equipment in the Tunnel and pump house building necessary to satisfy compliance. The report shall include a compliance checklist identifying each applicable requirement of NFPA 130 with design narratives and supporting documentation demonstrating how the design addresses these requirements. The report and compliance checklist shall be submitted per the requirements of Schedule 10 – Review Procedure.
- E. Project Co shall design and install an automatic fire detection system in the Tunnel that shall be integrated with the new Dows Lake Tunnel ventilation system head end. The fire detection system shall communicate with the Dows Lake Tunnel ventilation system head end workstations and

an annunciator panel in the pump house via the CTS or otherwise acceptable methods satisfying NFPA 130 and the City and the AHJ. Project Co shall perform a reliability analysis per the requirements of NFPA 130 to satisfy operational continuity of the systems in the Tunnel for a specified time during a fire with acceptance from the City and AHJ. Refer to Schedule 15-2, Part 4 – Stations for electrical requirements for the fire detection system.

- F. Project Co shall perform a smoke dispersion/recirculation study for the existing and modified Emergency ventilation system to demonstrate smoke discharged from Emergency ventilation exhaust points is not drawn into the Tunnel or the pump house;
- G. Project Co shall be permitted to drill into and connect to the existing Tunnel structural lining for supporting the upgrades to the Tunnel drainage, ventilation and FLS, required by the design, subject to the design calculations demonstrating the loads imposed do not overstress the Structure. The connection design and construction shall not reduce the existing structural capacity or water tightness of the Tunnel lining.

(xxvii) Walkley Road Overpass O-Train Line (SN055330)

- A. Install Bridge Structure fencing in accordance with the requirements in Schedule 15-2, Part 6, Clause 2.7.

(xxviii) Heron Road Overpass O-Train Line (SN055260)

- A. Install Bridge Structure fencing in accordance with the requirements in Schedule 15-2, Part 6, Clause 2.7.

(xxix) Riverside Drive Overpass O-Train Line (SN055280)

- A. Install Bridge Structure fencing in accordance with the requirements in Schedule 15-2, Part 6, Clause 2.7.

(xxx) Campus Avenue Overpass O-Train Line (SN015850)

- A. Install Bridge Structure fencing in accordance with the requirements in Schedule 15-2, Part 6, Clause 2.7.

(xxxi) Somerset Street Overpass O-Train Line (SN015340)

- A. Install Bridge Structure fencing in accordance with the requirements in Schedule 15-2, Part 6, Clause 2.7.

(xxxii) Trinity Pedestrian Bridge (SN018430)

- A. Design and construct a new pedestrian Structure to carry pedestrian traffic from the development at 900 Albert to the west Bayview Station Platform area. The new Structure shall accommodate:
 - i A pedestrian connection on the Structure; and,
 - ii The northbound and southbound Track alignment, including Emergency walkway and MUP under the Structure.
- B. The Structure shall be designed and constructed in accordance with the requirements of Schedule 15-2, Part 4, Clause 3.2.

(xxxiii) Albert Street Overpass O-Train Line (SN015380)

- A. Install Bridge Structure fencing in accordance with the requirements in Schedule 15-2, Part 6, Clause 2.7.
- (d) Project Co shall complete the following work as part of the Airport Link:
- (i) Elevated Guideway to OMClA Terminal (SN225110)
 - A. Design and construct a new elevated Guideway Structure to carry the alignment over various Roadway and parking areas. The new Structure shall accommodate:
 - i The single Track alignment, including Emergency walkway on the Structure; and,
 - ii The existing Paul Benoit Driveway, Tracker Private, Silver-Star Private and Convair Private cross sections and existing airport parking lots under the Structure.
 - B. Structure shall be designed and constructed to be visually compatible and have similar layout as the existing adjacent airport Bridge Structure while also meeting the aesthetic requirements of a Level 1 Bridge.
 - C. The Structure shall be designed and constructed in conjunction with the new elevated Airport Terminal Station. Design shall be coordinated with OMClAA representatives.
 - D. Install a pedestrian barrier/railing system on each side of the Structure.

- E. The substructure and deep foundations shall be designed and constructed to protect for the cantilevered Airport Station concourse, as shown in the STA-AP-A RCD dated April 3, 2017 or as otherwise agreed to by the City and the OMCIAA.
 - F. The Structure and Station Platform shall be designed and constructed in conjunction with the requirements of Schedule 15-2, Part 4, Clause 3.13.
 - G. The Structure shall be designed and constructed to allow for future widening of the Bridge to accommodate a second Track. Overbuilding of the substructure is not required.
 - H. The Structure shall be detailed to discourage bird nesting.
 - I. The Station Platform shall be designed and constructed in a manner which will allow the OMCIAA contractor to safely remove the top 25mm of concrete from the surface of the Station Platform over a 3000mm length measured from the juncture between the Station Platform and the airport facility.
 - J. Graffiti-resistant coating shall be applied to all porous opaque surfaces, including but not limited to, concrete, masonry and stone up to a minimum of 2.5m above the adjacent ground or where surfaces are reachable to tag.
- (ii) Railway Bridge over Uplands Drive (SN 225640)
- A. Design and construct a new single span elevated Guideway Structure to carry the alignment over Uplands Drive. The new single span Structure shall accommodate:
 - i The single Track alignment, including Emergency walkway on the Structure; and,
 - ii The future Uplands Drive cross section in accordance with Clause 6.18 of this Part 2, and MUP in accordance with Schedule 15-2, Part 6, Clause 4.4, under the Structure.
 - B. Install a pedestrian barrier/railing system on each side of the Structure.
 - C. The Structure shall be designed and constructed to allow for future widening of the Bridge to accommodate a second Track. Overbuilding of the substructure is not required.

- D. Graffiti-resistant coating shall be applied to all porous opaque surfaces, including but not limited to, concrete, masonry and stone up to a minimum of 2.5m above the adjacent ground or where surfaces are reachable to tag.
- (iii) Railway Bridge over Airport Parkway (SN 225630)
- A. Design and construct a new elevated Guideway Structure to carry the alignment over Airport Parkway. The new Structure shall accommodate:
- i The northbound and southbound Track alignment, including Emergency walkway on the Structure; and,
 - ii The future Airport Parkway cross section in accordance with Clause 6.18 of this Part 2 under the Structure.
- B. Install a pedestrian barrier/railing system on each side of the Structure.
- C. Graffiti-resistant coating shall be applied to all porous opaque surfaces, including but not limited to, concrete, masonry and stone up to a minimum of 2.5m above the adjacent ground or where surfaces are reachable to tag.

ARTICLE 5 DRAINAGE AND STORMWATER MANAGEMENT DESIGN CRITERIA

5.1 Reference Documents

- (a) Project Co shall complete the Works in accordance with the criteria contained in this Article, the Project Agreement, and the Applicable Law, including but not limited to the latest edition of the following Reference Documents:
- (i) City Publications:
- A. City of Ottawa Sewer Design Guidelines, including Technical bulletins;
 - B. Stormwater Management Facility Design Guidelines;
 - C. City of Ottawa By-Laws; and,
 - D. Riverside South Community Master Drainage Plan, Stantec.
- (ii) Federal and Provincial Codes, Acts and Regulations:
- A. Fisheries Act (Canada);
 - B. Ontario Water Resources Act;
 - C. Drainage Act (Ontario);
 - D. Ontario Regulation 525/98 - Approval Exemption; and,
 - E. Ontario Building Code.
- (iii) Conservation Authority Publications:
- A. RVCA: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 174/06);
 - B. SNCA: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 170/06), Conservation Authorities Act, R.S.O. 1990, c. C.27;
 - C. RVCA: Solutions for Shoreline Erosion;
 - D. TRCA/CVC: Low Impact Development Stormwater Management Planning and Design Guideline; and,
 - E. CVC: Low Impact Development Construction Guide.

- (iv) MOECC Publications:
 - A. Stormwater Management Planning and Design Manual;
 - B. Design Guidelines for Sewage Works;
 - C. Guideline B-6 – Guidelines for Evaluating Construction Activities Impacting on Water Resources;
 - D. Environmental Activity and Sector Registry information <https://www.ontario.ca/page/environmental-activity-and-sector-registry>; and,
 - E. Permit To Take Water Manual.
- (v) Ontario MNR Publications:
 - A. Technical Guide – River & Stream Systems: Flooding Hazard Limit.
- (vi) MTO Publications:
 - A. Drainage Management Manual;
 - B. Highway Drainage Design Standards;
 - C. Gravity Pipe Design Manual; and,
 - D. Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects.
- (vii) CHBDC;
- (viii) AREMA Manual for Railway Engineering;
- (ix) NFPA 130; and,
- (x) Other applicable policies, acts and guidelines by the City, Regulators, and Governmental Authorities.

5.2 General Criteria

- (a) Project Co shall design and construct a drainage and SWM system such that Revenue Service operations can safely continue, and such that surface ponding remains below the TOR, during the 100-Year Storm event.

- (b) Project Co shall evaluate the performance of the drainage and SWM system under historical storms and 100-Year Storm Plus 20% (stress test condition) and modify the design as needed in accordance with the City of Ottawa Sewer Design Guidelines and Technical Bulletins.
- (c) Runoff from at-grade and below grade segments shall be collected by trackside ditches, perforated underdrain pipes, or storm sewers. All Guideway drainage shall be captured and managed within the Guideway ROW/Lands with SWMPs that provide attenuation up to the 100-Year Storm and water quality protection that meets MOECC's 'Enhanced' standard before discharging to outlet locations. Discharge shall be to outlet locations identified in Clause 5.7 – Site Specific Criteria, of this Part 2. Storm water from the Guideway shall not be allowed to sheet flow onto adjacent properties at greater peak rates than existing.
- (d) Runoff from raised Guideway, where Guideway is an embankment, may be discharged along the embankment provided runoff is evenly distributed to prevent erosion, before being collected by SWMPs that provide attenuation up to the 100-Year Storm and water quality protection that meets MOECC's 'Enhanced' standard.
- (e) Runoff from raised Guideway, where the raised Guideway is a Structure, shall be conveyed by gutter systems to inlets. Inlets shall discharge to SWMPs that provide attenuation up to the 100-Year Storm and water quality protection that meets MOECC's 'Enhanced' standard.
- (f) Project Co shall secure all permits and approvals where necessary for the implementation of the Drainage and SWM systems for the Project, and shall be responsible for preparing and submitting all necessary drawings and supporting documentation associated with obtaining those permits and approvals in accordance with Schedule 10 – Review Procedure.
- (g) Project Co shall be responsible for all costs associated with obtaining the required permits and approvals, and those associated with providing the Drainage and SWM systems for SI.
- (h) Project Co shall obtain sewer discharge permits and approvals in accordance with the City, MOECC, RVCA, and SNCA requirements.
- (i) Project Co shall obtain all PTTWs and/or Environmental Activity and Sector Registry registrations, in accordance with current MOECC requirements, for the Works.
- (j) Project Co shall obtain municipal approval for additions and modifications to existing sewers and related appurtenances and shall ensure that these additions and modifications conform to the requirements of the City or other Governmental Authorities.

- (k) Project Co shall ensure services to adjoining properties are supported in place and maintained in operation during additions to or modifications of the existing sewers.
- (l) Without limiting any other obligations of Project Co, Project Co shall be in compliance with Ontario Regulation 166/06 (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses) for Works within RVCA and SNCA regulated areas.
- (m) No sanitary sewer discharge shall be permitted to enter the Drainage and SWM systems supporting SI.
- (n) Project Co shall design and construct Drainage and SWM systems such that any impact to existing Drainage systems and overland flow is mitigated and such that new Hazards are not introduced.
- (o) Project Co shall provide complete design packages for all Drainage and SWM components, submitted in accordance with Schedule 10 – Review Procedure. Design packages shall include all Drainage and SWM works including detailed drawings, calculations, reports, and related ECA applications.

5.3 Drainage Criteria

- (a) The Drainage Design Criteria provided herein are considered a minimum standard. The design of drainage facilities belonging to the City and other Governmental Authorities which are to be relocated or modified to accommodate SI shall conform to the Design Criteria and standards of the City and other Governmental Authorities.
- (b) Required relocation of existing drainage facilities shall be Replacement-In-Kind unless specified otherwise.
- (c) Project Co shall design and construct drainage measures for the Project including the Guideways, Tunnels, Stations, the New Walkley Yard, Roadways, parking lots, and other SI, in accordance with City and provincial standards.
- (d) Project Co shall not increase flow rates to existing combined sewers or separated sewers unless the increase is approved by the City. Flow rates shall be limited in accordance with Section 3.2 of the Ottawa Sewer Design Guidelines.
- (e) Project Co shall design and construct new storm sewers to convey minor system flows such that they capture and convey a design storm event in accordance with Section 5.10 of the City of Ottawa Sewer Design Guidelines.
- (f) Project Co shall design and construct on-Site controls and overland flow routes for storage and conveyance of SI runoff in excess of the design capacity of the receiving minor system, in accordance with Section 5 of the City of Ottawa Sewer Design

Guidelines and Technical Bulletins, for all storms up to the 100-Year Storm. The combination of a minor system and an overland flow system shall not create flow depths above the TOR.

- (g) Project Co shall demonstrate to the City through hydrologic/hydraulic analysis that the flow rates and the hydraulic grade line of receiving storm sewers does not adversely affect the existing level of service, in terms of flood protection and minor system performance, as a result of the Works.
- (h) In the below-grade sections of the Guideway and Stations, Project Co shall keep Tunnel portals, Tunnels, and Stations free from flooding due to all storms up to and including the 100-Year Storm event. Refer to Clause 4.8 of this Part 2 for additional Drainage design requirements for the Dow's Lake Tunnel.
- (i) Project Co shall design and construct pedestrian underpasses such that ponding does not occur for all storms up to the 5-year storm event.
- (j) All Drainage for Tunnels and other areas without a local gravity outlet shall be collected and discharged to a storm sewer approved by the City. The Tunnel drainage system shall meet the requirements of Article 4 – Structural Design Criteria and Requirements, of this Part 2.
- (k) Project Co shall design and construct all Drainage and SWM systems required to ensure adequate drainage during Construction of the Works. Discharges shall comply with Applicable Law and City requirements, including the Sewer Use by-law.
- (l) Project Co shall comply with the following requirements for Guideway drainage:
 - (i) The Guideway drainage system shall be designed and constructed such that ponding levels do not exceed TOR elevation and such that ponding does not contribute to subgrade instability for all storms up to and including the 100-Year Storm;
 - (ii) All Drainage discharges from the Guideway shall be in accordance with Applicable Law and the requirements of the City and other Governmental Authorities; and,
 - (iii) Project Co shall provide maintenance holes (access points) outside of the Guideway on all new service connections, between the City's ROW and the Guideway, in accordance with City requirements. The maintenance holes and sewers shall be turned over to the City to enable the City to carry out its maintenance responsibility for storm drain/sewer service connections located beyond the limits of the Guideway.

- (m) Groundwater, fireflow discharge, and storm runoff at all underground structures and other areas without a gravity outlet shall be collected and pumped to a municipal storm sewer in compliance with the City of Ottawa Sewer Use By-Law unless otherwise noted.
- (n) Project Co shall design and construct a drainage system for new MUPs in accordance with the City's MUP standards and such that existing flow direction is maintained. MUP drainage shall not be combined with SI ditch drainage system. Where SI drainage goes to a closed (piped) system, and where MUPs undergo winter maintenance with de-icing salts, MUP drainage shall be managed separately from SI drainage.
- (o) All new Culverts under the Guideway, regardless of size, shall be of reinforced concrete construction.

5.4 Stormwater Management Criteria

- (a) SWM for the Project shall be designed and constructed in accordance with the City's "Sewer Design Guidelines" and MOECC's "Stormwater Management Planning and Design Manual".
- (b) Project Co shall prepare complete SWM plans and design packages in accordance with the City and Provincial requirements for all drainage and SWM aspects of the Works to address at a minimum:
 - (i) Water balance, quantity and quality control requirements imposed by local, provincial and federal government regulations along with the Project environmental impacts and mitigations;
 - (ii) Impact on existing municipal drainage and SWM systems, and natural drainage systems;
 - (iii) Existing ditches, watercourses, Culvert crossings, and storm sewers that will be affected or are relevant to the Project;
 - (iv) Potential impacts of the Project on the existing drainage system and on any environmentally sensitive areas, in consultation with Governmental Authorities;
 - (v) Existing drainage patterns and how the proposed Drainage system design will extend the existing minor and major drainage systems;
 - (vi) Directions by Governmental Authorities in respect to changes in drainage patterns, upgrades to Drainage infrastructure or modifications, and any agreements reached with the City or Governmental Authorities;

- (vii) Proposed SWMPs to mitigate potential impacts of the Works, including appropriate plans and drawings to illustrate the same; and,
 - (viii) All pertinent background information, calculations and model output to support the proposed designs and Works.
- (c) Project Co shall submit the above SWM Plans and design packages to the City as part of the Works Submittals in accordance with Schedule 10 – Review Procedure.
- (d) Drainage and SWM designs of Facilities that require review and approval from Governmental Authorities shall be submitted in accordance with the procedures established by the respective Governmental Authority and in accordance with Schedule 10 – Review Procedure. Project Co shall comply with the Governmental Authority permit requirements and conditions.
- (e) The design of stormwater detention facilities and control measures proposed as part of the Works shall be submitted to the City and other Governmental Authorities for approval.
- (f) Where LID measures are required, they shall be designed in accordance with the “Low Impact Development Stormwater Management Planning and Design Guidelines”. Refer to Schedule 15-2, Part 6, Article 2 – Design Criteria for landscaping requirements of LID measures.
- (g) Roof Drainage (above-grade structures) shall be managed in accordance with a Site-specific SWMP. Roof drainage shall not be routed to the underground Track Drainage system.
- (h) Unless otherwise noted, all SWM facilities shall be designed to meet the MOECC’s “Enhanced” standard.
- (i) Project Site components that ultimately drain to the Ottawa River or Rideau River, and are considered Infill Development, as defined in section 8.3.7.2 of the City of Ottawa Sewer Design Guidelines, shall control peak flows to the minor system as prescribed in Section 3.2.2 and 8.3.7 of the City of Ottawa Sewer Design Guidelines. Water quality SWMPs for Infill development are to provide a net improvement over existing conditions.
- (j) Extended detention or “wet-pond” SWM facilities shall be designed and constructed to prevent both losses of permanent pool due to infiltration and losses of active storage due to intrusion of groundwater, if required.
- (k) OGS structures shall be designed with a required performance of removal of fine sediment, oil, floating and sinking debris, and 80% removal efficiency for TSS.

- (l) OGS structures located outside of the Guideway shall be accessible by rubber tire vehicle.

5.5 Numerical Computational Procedures and Models

- (a) All numerical computation procedures shall comply with the requirements of the City of Ottawa Sewer Design Guidelines. Computer models used shall comply with the guidelines for model selection provided in the MTO's "Drainage Management Manual."
- (b) Project Co shall confirm the suitability and acceptance of any computer model nominated for use in the design and analysis of drainage or SWM system for the Project with the City and other Governmental Authorities.
- (c) Peak flows to be used for design purposes for drainage areas greater than 40 hectares shall be verified using a method approved by the City and other Governmental Authorities.

5.6 Erosion and Sediment Control Requirements

- (a) Project Co shall implement stormwater control, mitigation, ESC measures appropriate for the urban context of the Project to ensure deleterious substances and other pollutants do not leave the Site and enter watercourses or the municipal Drainage infrastructure.
- (b) Project Co shall prepare an Erosion and Sediment Control Plan for the Project, as a component plan of the Environmental Management Plan described in Schedule 17 – Environmental Obligations, to comply with environmental approvals and commitments and with any and all Applicable Codes. In addition, Site-specific ESC Plans shall be developed to address local potential environmentally sensitive Site conditions, including watercourse crossings. The ESC Plan for the Project and the Site specific ESC Plans shall be submitted to the City in accordance with Schedule 10 – Review Procedure.
- (c) In addition to City and Governmental Authority requirements, Erosion and Sediment Control Plans shall be prepared in accordance with the following documents:
 - (i) MNR, et al., 1987, Guidelines on Erosion and Sediment Control for Urban Construction Sites.
 - (ii) MTO's Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects.
- (d) Project Co shall obtain all permits and approvals for all in-water works in accordance with all Governmental Authorities' requirements.

- (e) Project Co shall adhere to all fisheries (timing) window restrictions imposed by the RVCA, SNCA, or other Governmental Authorities on activities on or adjacent to watercourses associated with the Works.

5.7 Site-Specific Criteria

- (a) New Walkley Yard
- (i) Project Co shall implement methods, such as OGS units, to control runoff that contains sand (due to braking) or oil and grease (Track lubricant) from operations in compliance with the City of Ottawa Sewer Use By-Law. Runoff shall not be directed to any storm sewer permanently or temporarily unless the runoff is treated to meet Sewer Use By-Law criteria and MOECC's 'Enhanced' standard.
 - (ii) Treated runoff from the New Walkley Yard shall drain to the tributary to Sawmill Creek north of the Facility.
 - (iii) Any SWM facility for the New Walkley Yard shall be constructed in accordance with City requirements and MOECC 'Enhanced' Standards.
 - (iv) Project Co shall assess the condition of the existing Culvert under Albion Road North at the entrance to the New Walkley Yard and shall design and construct modifications and/or replacement of the Culvert as required.
- (b) Gladstone
- (i) The Gladstone Station is considered infill development. As such, design and construction of this Station shall comply with Section 3.2.2 and 8.3.7 of the Ottawa Sewer design Guidelines.
 - (ii) A storm sewer shall be constructed to convey runoff from the trackside ditches to the south of the Station and outlet to the existing 900mm diameter storm sewer that is located approximately 200m north of the Gladstone Avenue overpass.
 - (iii) Project Co shall include on-site SWM measures to control runoff to the 2-year pre-development level.
- (c) Carling, Carleton, and Confederation
- (i) The Stations are considered infill development. As such, the design and construction of these Stations shall comply with Section 3.2.2 and 8.3.7 of the Ottawa Sewer design Guidelines.
- (d) Walkley

- (i) The Walkley Station is considered infill development. As such, design and construction of this Station shall comply with Section 3.2.2 and 8.3.7 of the Ottawa Sewer design Guidelines.
 - (ii) The existing 750mm diameter Culvert shall be removed. A new RCP Culvert (minimum 750mm diameter) shall be constructed to the south of the Station Platform and convey runoff from the Station and from the adjacent catchment area east of the alignment, bordered to the north by Bank street, to the west by Walkley road, to the south by the LCBO warehouse property northern boundary, and to the east by the Guideway on the Expanded Trillium Line. This Culvert shall discharge to the west trackside ditch.
- (e) Greenboro
- (i) Runoff from the Greenboro Station shall drain to the existing “Sawmill Creek Constructed Wetland” SWM Facility.
 - (ii) No specific quantity or quality SWMPs are required.
- (f) South Keys
- (i) Runoff from the South Keys Station shall drain to the existing “Sawmill Creek Constructed Wetland” SWM Facility.
 - (ii) No specific quantity or quality SWMPs are required.
- (g) Leitrim
- (i) The SWM system for the Leitrim Station and adjacent Park and Ride shall drain to the existing ditch on the east side of Gilligan Road.
 - (ii) SWM design for the Station and Park and Ride shall be based on LID standards.
 - (iii) SWM and drainage for the Leitrim Station and adjacent Park and Ride shall be designed and constructed to accommodate initial and ultimate Site configuration. Refer to Schedule 15-2, Part 4 – Stations for initial and ultimate Site configuration requirements of the Leitrim Park and Ride.
- (h) Bowesville
- (i) The Bowesville Park and Ride Station is within the tributary area to Mosquito Creek. Project Co shall confirm the SWM discharge criteria with the City and RVCA. Project Co shall include drainage from areas upstream of the Site and accommodate them in the Bowesville Park and Ride Station design. Project Co

- shall design and construct SWM measures within the Bowesville Park and Ride Station site to meet the SWM criteria for Mosquito Creek.
- (ii) SWM design for the Station and Park and Ride shall be based on 80% TSS removal and specific quantity control SWM criteria for Mosquito Creek, consistent with the draft 2015 Master Drainage Plan update for Riverside South, and any required adjustments made necessary by the development of this Site.
- (iii) SWM and drainage for the Bowesville Station Park and Ride shall be designed and constructed to accommodate the initial Site configuration, and expandable to accommodate the ultimate Site configuration with no interruption of service and no major changes to the initial SWM and drainage layout and location. Refer to Schedule 15-2, Part 4 – Stations for initial and ultimate Site configuration requirements of the Bowesville Station Park and Ride.
- (iv) Project Co shall design and construct drainage infrastructure downstream of the site necessary to accommodate drainage from the site.
- (i) Limebank
- (i) The City is updating the Master Drainage Plan and a Master Servicing Study for the Riverside South community, which also discharges to Mosquito Creek. SWM design for the Station shall meet 80% TSS removal and the specific quantity and erosion control SWM criteria for Mosquito Creek that are required as part of the Master Drainage Plan update for Riverside South.
- (j) Uplands
- (i) The Uplands Station is considered Greenfield development. Station drainage shall have SWMPs in accordance with this Article.
- (ii) Runoff from Uplands Station shall drain to an existing ditch along the northern edge of the EY Centre property line. Project Co shall design and construct improvements to the existing ditch as required to manage runoff in accordance with this Article.
- (k) Airport Station
- (i) The Airport Station is considered part of the existing airport development. Station drainage shall be conveyed by the existing Drainage infrastructure. SWM requirements shall be compatible with the existing airport drainage and SWM system to the satisfaction of the OMCIAA.
- (l) At-Grade Guideway – Existing Trillium Line

- (i) The existing Drainage system shall be modified as required to accommodate the additional sidings and/or other modifications associated with the Expanded Trillium Line.
- (m) At-Grade Guideway –Trillium Line Extension, South Keys to Bowesville
 - (i) Project Co shall replace or remove the following Culverts identified in Table 2-5.1.

Table 2-5.1 – Culvert Replacements and Removals

ID	Existing Structure	Northing *	Easting*	Replacement/ Removal
	Size/Material			
A	2050 x 1700 Cast-in-Place Concrete	5023567.1	371184.7	Replacement
B	2700 x 1900 Cast-in-Place Frame	5023370.1	371262.8	Removal
C	2000 x 1900 Cast-in-Place Frame	5022602.7	371596.7	Replacement
D	600 diam. CSP	5022367.4	371699.1	Replacement
E	Unknown**	5022167.5	371784.7	Replacement
F	2500 x 1300 Cast-in-Place Frame	5021855.1	371925.1	Replacement
G	350 diam. CSP	5021494.0	372103.2	Replacement
H	450 diam. CSP	5020668.0	372448.1	Replacement
I	600 diam. CSP	5019955.9	372753.4	Replacement
J	500 diam. CSP	5019939.6	372745.0	Replacement
K	600 diam. CSP	5019607.3	372894.8	Replacement
L	750 diam. CSP	5025765.1	370136.8	Removal
M	Unknown	5025707.1	370190.0	Replacement
N	Unknown	5018223.4	373162.4	Replacement

* Coordinates are NAD83 MTM Zone 9 Locations are approximate

** Culvert is part of the Alexander Municipal Drain

- (ii) Project Co shall regrade and enlarge the west trackside ditch, also known as the Cahill Drain, between Culverts A and B identified in Table 2-5.1, a distance of approximately 200m. Project Co shall design and construct the enlarged ditch to convey flows from the Cahill Drain to the south in a northerly direction to the

Sawmill Creek Constructed Wetland SWM Facility. Project Co shall design and construct modified and new channel sections using natural channel design principles and shall obtain input and review of the design by a fluvial geomorphologist.

- (iii) Project Co shall relocate an approximate 125m length of a tributary to Alexander Drain that is currently located on the east side of the Guideway, north of Lester Road, between the rail embankment and a gravel access road. This reach has been confirmed as a Coolwater Fishery. Culverts D and E identified in Table 2-5.1 convey flow to this tributary. The design and construction of the realignment shall be completed in accordance with environmental, geomorphological requirements, and meet the conditions of applicable regulatory approvals.
 - (iv) The replacement of Culvert F, as identified in Table 2-5.1, located on the Alexander Drain immediately south of Lester Road shall include the replacement of a beaver control device to prevent the crossing being affected by the formation of a beaver dam.
- (n) At-Grade and Below Grade Guideway – Trillium Line Extension, Bowesville to Limebank
- (i) Project Co shall design and construct Track drainage for the Guideway from Bowesville Station to Limebank Station in accordance with the requirements of this Article.
 - (ii) SWM design for the Guideway shall meet 80% TSS removal and the specific quantity and erosion control criteria for Mosquito Creek that are required as part of the Master Drainage Plan update for Riverside South.
 - (iii) Project Co shall design and construct a Culvert to convey external drainage area flows from south to north of the alignment. The exact location of the culvert will be subject to review by the City to confirm compatibility with the Master Drainage Plan for Riverside South.
 - (iv) Project Co shall relocate a tributary to Mosquito Creek over an approximate channel length of 70m. Project Co shall comply with the following:
 - A. The tributary in question crosses the Track alignment approximately 1.5km west of Bowesville Road, east of Mosquito Creek. Project Co shall relocate the tributary at this crossing with the Track alignment such that existing meanders in the channel are preserved or reinstated and that the overall channel length is equal to or greater than the existing channel length.

- B. The tributary shall be relocated within a 60m wide corridor adjacent to the Guideway. The relocated channel shall be designed and constructed in accordance with natural channel design principles.
 - C. The design and construction of the realignment shall be completed in accordance with environmental, geomorphological requirements, and meet the conditions of applicable regulatory approvals.
 - D. The channel realignment shall be designed by a fluvial geomorphologist who can demonstrate a Master's degree in fluvial processes (or equivalent), and who has at least 10 years' experience designing channels in urban environments.
- (o) At-Grade, Below Grade, and Raised Guideway – Trillium Line Extension to Ottawa MacDonald Cartier International Airport
- (i) Guideway drainage shall discharge to the existing airport drainage system. Project Co shall design and construct SWM controls as required to be compatible with the SWM requirements of the existing airport drainage and SWM system to the satisfaction of the OMCIAA.
 - (ii) Runoff from the raised Guideway between Uplands Drive and the Airport Terminal shall be discharged to underground SWM controls and existing airport storm sewer system. Project Co shall not construct above-ground SWM controls in the segment of raised Guideway between Uplands Drive and the Airport Terminal.
 - (iii) Project Co shall install new Culverts as required to maintain existing drainage patterns.
- (p) University Rd Ped Bridge over Rideau River
- (i) SWM design for the Bridge shall be based on MOECC's 'Enhanced' standard for TSS removal and specific quantity control SWM criteria designed to LID standards. Refer to Schedule 15-2, Part 6, Article 4 – Site Specific Desired Outcomes, for landscaping requirements.
 - (ii) Project Co shall demonstrate to the City through hydrologic/hydraulic modeling that the cumulative impacts of the Works will not increase peak flow rates or the peak hydraulic grade line of the Rideau River for all rain events up to the 100-Year Storm. This analysis shall be submitted in accordance with Schedule 10 – Review Procedure.
 - (iii) Project Co shall design for the loss of floodplain storage volume within the 1:100 year floodplain which will result from the placement of fill. Project Co shall fully

compensate for this loss of floodplain storage volume through a balanced cut (or excavation) to be performed in close proximity to and concurrent with the placement of the fill.

- (iv) Two sites on the north side of the Rideau River have been identified for floodplain compensation: 1) to the west of the proposed Structure, adjacent to [REDACTED], and 2) land adjacent to the existing pond, located within Brewer Park. This work shall be performed in accordance with the following requirements:
- A. The volume of available floodplain storage capacity within the affected river or stream reach shall not be reduced;
 - B. The minimum proposed ground elevation in the compensating excavation area shall not be lower than the minimum existing ground elevation in the proposed fill area. Excavation below the normal high water mark shall not be considered for calculation purposes and filling below the normal high water mark shall not be permitted;
 - C. The proposed site grading shall be designed to result in no increase in upstream water surface elevations in the affected channel cross-sections under a full range of potential flood discharge conditions (1:2 year to 1:100 year return periods). Compliance with this requirement shall be demonstrated by means of hydraulic computations completed to the satisfaction of the RVCA.
 - D. Any work located adjacent to existing sports fields shall satisfy the following requirements, at a minimum:
 - i The compensating excavation area shall be located a minimum of 25m from the perimeter of the existing 90m x 54m sports field #3 at Brewer Park;
 - ii Project Co shall plant coniferous and deciduous trees between sports field #3 and the compensating excavation area, to the satisfaction of the City. The tree planting shall be located a minimum of 10m from the field perimeter, and shall be designed to aid in intercepting soccer balls that are struck from the field towards the compensating excavation area.
 - iii The compensating excavation area shall be designed and constructed to maintain a pedestrian trail around the perimeter of Brewer Pond and to accommodate the potential development of a minimum 2m wide accessible pathway around the pond in the future;

- iv Project Co shall submit the following by December 31 of the year prior to commencing construction within Brewer Park, to the satisfaction of the City:
 - 1. Construction schedule;
 - 2. Grading plan;
 - 3. Landscape plan;
 - 4. Tree conservation report; and,
 - 5. Construction staging, hoarding and access plan.
 - v Project Co shall not commence construction within Brewer Park prior to obtaining written authorization from the City.
 - vi Construction shall not be permitted in Brewer Park between May 15 and August 30, of any given year.
 - vii Construction access and staging shall not be permitted on the existing sports field #3 or within a 10m buffer around the field perimeter unless approved in writing by the City.
- (v) All work proposed within Brewer Park shall be performed in accordance with the following requirements:
- A. A pre-consultation meeting to discuss ecological values that should be incorporated into the design shall be held with the following agencies at a minimum:
 - i RVCA;
 - ii MNRF; and,
 - iii City.
 - B. No construction work shall take place between May 1 and August 31, of any given year. No in-water works shall take place between March 15 and June 30, of any given year.
 - C. In-water work shall not be conducted at times when flows are elevated due to local rain events, storms or seasonal floods.
 - D. A **silt** curtain shall be installed along the extent of shoreline that will be disturbed to prevent a potential sediment release into the Rideau River.

This shall remain in place until sediment settles and then shall be removed. The majority of the embayment feature shall be constructed/shaped prior to work along the shoreline.

- E. An aquatic species stranding mitigation program shall be implemented by a qualified biologist, familiar with the aquatic species in the area, immediately following isolation to ensure that they are removed from the work site and released immediately downstream of the work area. A report of the results of the species relocation including species and quantities relocated shall be submitted to the MNRF and the RVCA.
- F. Any excess excavated material, as a result of the work, shall be **disposed** of in a suitable location outside any regulatory floodplain and fill regulated area.
- G. A temporary construction sign shall be installed outside the construction area between sports field #3 and the compensating excavation area adjacent to the floodplain compensation wetland feature to provide the public with information about the project and its **purpose** during construction.
- H. The floodplain compensation wetland feature and adjacent buffer area will be planted with a native shoreline seed mix and tree/shrub species. A landscape plan shall be submitted in accordance with Schedule 10 – Review Procedure.
- I. A post effectiveness monitoring plan for the wetland embayment **creation** project shall be prepared in consultation with the RVCA and shall be approved prior to commencement of the constructed wetland embayment. The plan shall include three years of monitoring for effectiveness of the new wetland feature (year 1, 3, 5) and shall identify plans to address deficiencies.

ARTICLE 6 ROADWAYS, BUS TERMINALS, AND LAY-BYS

6.1 Reference Documents

- (a) Project Co shall complete the Works in accordance with the criteria contained within this Article, the Applicable Law, all the City of Ottawa's by-laws, regulations, policies, standards, guidelines and practices applicable to the Project, including but not limited to the following Reference Documents:
- (i) The criteria in this Article 6 – Roadways, Bus Terminals and Lay-Bys, including Appendices;
 - (ii) AASHTO, Guide for Design of Pavement Structures;
 - (iii) City of Ottawa, Standard Tender Documents;
 - (iv) City of Ottawa, Transportation Master Plan;
 - (v) City of Ottawa, Official Plan;
 - (vi) City of Ottawa, OC Transpo - Transitway and Station Design Guidelines (June 2013);
 - (vii) City of Ottawa, Municipal Road Activity (By-law No. 2003-445) and Guidelines for Completing the Application for Road Cut Permit;
 - (viii) City of Ottawa, Municipal Traffic and Parking (By-law No. 2003-530) - City of Ottawa Regulating Traffic and Parking on Highways;
 - (ix) City of Ottawa, Municipal Zoning (By-law No. 2008-250) Consolidation;
 - (x) City of Ottawa, Transit-Oriented Development Guidelines;
 - (xi) City of Ottawa, CADD Standards;
 - (xii) City of Ottawa, Urban and Rural Truck Routes Map;
 - (xiii) City of Ottawa, Road Corridor Planning & Design Guidelines - Urban and Village Collectors / Rural Arterials and Collectors;
 - (xiv) City of Ottawa, Right-of-Way Lighting Policy;
 - (xv) City Of Ottawa, Accessibility Design Standards;
 - (xvi) City of Ottawa, Transportation Impact Assessment Guidelines;

- (xvii) Region of Ottawa-Carleton, Regional Road Corridor Design Guidelines;
 - (xviii) MTO, Ontario Pavement and Rehabilitation Manual;
 - (xix) MTO, Ontario Provincial Standard Drawings;
 - (xx) MTO, Ontario Provincial Standard Specifications;
 - (xxi) MTO Materials Information Report MI-183 “Adaptation and Verification of AASHTO Pavement Design Parameters for Ontario Conditions”;
 - (xxii) MTO, Ontario Traffic Manual Books 1 through 18;
 - (xxiii) MTO, Roadside Safety Manual;
 - (xxiv) TAC, Geometric Design Guide for Canadian Roads;
 - (xxv) TAC, The Canadian Road Safety Audit Guide;
 - (xxvi) TAC, Guide to Bridge Traffic and Combination Barriers;
 - (xxvii) OC Transpo, Interaction Zone Design Guidelines for Bus Stops and Bike Lanes
 - (xxviii) Other relevant City of Ottawa Operation Policy, Procedures and Guidelines.
- (b) Project Co shall design and construct all Roadways under the scope of Works in accordance with the geometric Design Criteria contained in this Article 6 and applicable appendices, and standards and manuals included in Clause 6.1(a) of this Part 2, and if there is any conflict between the criteria contained in this Part 2 and standards and manuals included in Reference Documents, the following shall apply in descending order of precedence:
- (i) The criteria contained in Appendices A and B of this Part 2;
 - (ii) The criteria contained in this Article 6;
 - (iii) The applicable City of Ottawa Standard Tender Documents and applicable standards and guidelines;
 - (iv) TAC, Geometric Design Guide for Canadian Roads;
 - (v) TAC, The Canadian Road Safety Audit Guide;
 - (vi) MTO, Roadside Safety Manual.

6.2 General Requirements

- (a) Project Co shall provide the design, including obtaining all necessary approvals, and supply the materials, labour, equipment, inspection and testing in order to fulfill the requirements for the execution and Commissioning of the Works.
- (b) The overall engineering design and construction requirements of the Works, including typical cross-sections and geometric Design Criteria, are primarily based on the contents of this Part 2, and the Reference Documents from the City of Ottawa and TAC.
 - (i) Project Co shall design the proposed improvements on all Works according to the Design Criteria included in Appendix A of this Part 2. In all cases where a specific Design Criteria is not provided for a Roadway and/or interchange in Appendix A of this Part 2, Project Co shall undertake a detailed survey and review of the existing conditions, confirm the Roadway and/or interchange ramps geometric Design Criteria by referencing the existing, appropriate standard and proposed design parameters, in order to address the necessary improvements.
 - A. Under the circumstances whereby an existing Roadway, impacted by the Works, does not meet current TAC standards, Project Co shall design and construct the necessary Roadway improvements so that either the existing conditions of the Roadway will be maintained or upgraded to meet current standards within the available Lands.
 - B. Project Co shall also undertake a detailed intersection operations and level of service analysis associated with the necessary improvements on all impacted signalized intersections. Project Co shall demonstrate that the traffic operations and levels of service are acceptable and feasible using projected traffic volumes, expected transit operations for 2031 horizon year per the requirements of the City of Ottawa Transportation Impact Assessment guideline, including pedestrian and cyclist movements.
 - C. Project Co shall submit to the City the results of above-noted investigations by submitting an existing conditions report, a preliminary design report including the proposed Design Criteria and design synopsis, and a separate traffic analyses report and seek approval from the City at least 20 calendar days prior to initiating the development of geometric design.
 - (ii) Project Co shall undertake all necessary traffic and transit assessments, modelling and analysis including vehicular and non-vehicular road user needs, using projected traffic volumes as specified in Appendix A of this Part 2 for a horizon year of 2031 to determine the necessary Roadways and traffic improvements and provide the requisite design and construction of such works, as per the

requirements of the City of Ottawa's TIA guidelines and other applicable standards.

- A. All traffic data used for analysis for traffic management purposes shall be based on the most current data and shall be no older than two years. The information to be collected shall include, but not be limited to all of the hourly traffic volumes and AADTs for all modes of travel on all Roadways, bus Facilities, bike facilities and pedestrian facilities which will be affected by the Project and as a part of the permanent Works. Project Co shall be responsible for obtaining or collecting all traffic data necessary for its traffic analysis, if traffic data less than two years old is not relevant to the traffic analysis due to temporary conditions that existed at the time the data was collected, then the data shall not be used for analysis for traffic management purposes. Project Co shall confirm with the City that the data is appropriate prior to conducting an analysis using said data.
 - B. Project Co shall undertake a traffic management study to determine the traffic impacts on other intersections and local road networks that are impacted as the result of the Project permanent Works and to determine appropriate mitigation measures, if road capacity and level of service is reduced. The traffic management study shall involve area wide traffic modeling to determine impacts to all modes of transportation including adjacent corridors impacted by the permanent Works. The study shall include Project Co's forecast for, but not limited to, changed traffic volumes, speeds, and travel times for all modes of travel on all routes subject to the study. The traffic management study shall be submitted as a part of the Project Co's traffic report document in accordance with Schedule 10 – Review Procedure.
 - C. All vehicle, transit customer, pedestrian, and cycling data used for analysis for traffic management purposes shall be based on the most current data, and no older than two years with growth factors acceptable to the City. Project Co shall be responsible for obtaining any vehicle, pedestrian, and cycling data necessary for its traffic management analysis.
- (iii) Appendix B of this Part 2 demonstrates only the minimum lane requirements and lane configurations at certain intersections that Project Co is responsible for in their design and construction. Shall Project Co's traffic and transit assessment, modelling and analysis determine that additional traffic lanes and improvements are required in addition to the information shown in Appendix B of this Part 2, Project Co shall be responsible for the design and construction of all such improvements.

- (c) Basic ROW widths and protection requirements shall reference the City of Ottawa's Transportation Master Plan and Official Plan (Annex 1).
- (d) Design Criteria, Road Classifications and Design Speed Considerations.
 - (i) Design Criteria parameters, based on the Roadway classifications, shall reference:
 - A. City of Ottawa Transportation Master Plan – Annex B Maps;
 - B. City of Ottawa Official Plan – Schedule B and Annex 1;
 - C. City of Ottawa Road Design Guidelines:
 - i Region of Ottawa-Carleton, Regional Road Corridor Design Guidelines; and
 - ii City of Ottawa Road Corridor Planning & Design Guidelines - Urban and Village Collectors / Rural Arterials and Collectors.
 - D. Appendix B of this Part 2.
- (ii) In general, the designation of design speeds shall be based on the speed limits currently posted for the respective Roadways, unless specified otherwise in this Article 6. Project Co shall design the modifications intended on the existing urban collectors or arterials that have design speed of 60 km/hr or lower as per the TAC GDGCR guidelines applicable to low-speed roads subject to retrofit conditions. The design of new or existing arterial roads and highways with design speeds greater than 60 km/hr shall meet the requirements of high-speed roads as per TAC GDGCR requirements accordingly.
- (iii) In the absence of City of Ottawa adopted standards, Design Criteria parameters shall reference the TAC GDGCR.
- (e) Project Co shall obtain approval from the City for all Works, including construction Works that involves the modification of existing City infrastructure, contained within the scope of Works.
- (f) Project Co shall determine the road cross slope based on the road classification using the City standards and TAC GDGCR requirements and to match the existing cross slope of the undisturbed section.
- (g) Superelevations shall satisfy the pertinent requirements as per the road classification, and City of Ottawa's design guidelines and standards, TAC GDGCR requirements.

- (h) Project Co shall refer to Article 4 – Structural Design Criteria and Requirements, of this Part 2, for any structural requirements associated with the Roadway improvements specified in this Article 6.
- (i) Project Co shall design and construct all necessary requirements for landscape, road furniture and streetscape elements required in all Works as per the requirements of Schedule 15-2, Part 6 – Urban Design, Landscape Architecture and Connectivity Requirements.
- (j) Project Co shall design and construct the necessary Utilities and associated underground and above ground infrastructures for the Works per the requirements of Article 8 – Utility Infrastructure Design Criteria, of this Part 2.
- (k) Project Co shall design and construct all necessary temporary improvements, traffic staging detours, and all associated improvements necessary to support the construction of permanent Works as per the requirements of Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.
- (l) Project Co shall design and construct all Roadway improvements to meet the applicable accessibility requirements, including but not limited to COADS or AODA.
- (m) Project Co shall set the criteria for total and differential post-construction settlements of the Pavement to satisfy the requirements of Clauses 6.10, 6.11, and 6.12 of this Part 2, including Embankment Settlement Criteria for Design, July 2010, MTO.

6.3 Horizontal Alignment

- (a) The geometric characteristics of the horizontal alignment shall meet the requirements of the TAC GDGCR, unless otherwise specified in Article 6. In particular, the following requirements shall apply:
 - (i) Minimum radius and maximum superelevation rate requirements shall correspond to the existing road characteristics as per the road classifications in Clause 6.2 – General Requirements of this Part 2. For urban collectors, the maximum superelevation rate (e_{max}) shall be limited to 2%. For local Roadways, no superelevation is required. For new construction road improvements, the maximum superelevation rate (e_{max}) shall be 4% for low-speed urban arterial roads with design speed of 60km/hr or lower. For new rural roads and new high speed urban arterial applications (i.e. urban roads with design speeds greater than 60km/hr) the maximum superelevation rate shall be 6%. Project Co shall follow the criteria specified in TAC GDGCR (Clause 2.1.2.2 – Circular Curves, Maximum Superelevation: Design Domain) for all other retrofit conditions.
 - (ii) For urban conditions, the minimum length of curve shall be between 30m to 60m.

- (iii) For high-speed urban roads (i.e. Urban roads with design speeds greater than 60 km/hr) and all rural roads, Project Co shall apply spiral curves to the design of the horizontal alignment.
- (iv) Project Co shall provide a shy line offset from edge of road lane to Station walls, portal walls, bridge railings, barriers, stop structures, retaining walls and any other obstruction located within the road clear zone for the safe operation of vehicular traffic in the road ROW. The shy line offset values shall be to TAC standards and treatment within the shy line distance and shall be to the guidelines specified in TAC Guide to Bridge Traffic and Combination Barriers and MTO Road Side Safety Manual.

6.4 Vertical Alignment

- (a) Vertical alignment shall meet the requirements of the TAC GDGCR, unless specified otherwise in this Article 6. The following main geometric parameters pertinent to the vertical alignment shall apply:
 - (i) Minimum gradient: Minimum grades shall satisfy the requirements of TAC GDGCR Section 2.1.3 under Minimum Grades: Design Domain Application Heuristics - Urban Areas.
 - (ii) Equivalent minimum “K” Values: The vertical curve geometry shall reference the requirements of the TAC GDGCR Section 2.1.3.3 – Item 2:
 - A. “K” value for crest curves shall satisfy the upper limits of the SSD requirements. In all cases, Project Co shall confirm appropriate SSDs by calculating the distance travelled during deceleration and perception and reaction time, considering the effect of grades on deceleration and verified against available sight lines according to TAC GDGCR; and,
 - B. “K” value for sag curves shall satisfy the upper limit of the requirements of headlight control and comfort control.

6.5 Sight Distance Requirements

- (a) Project Co shall satisfy the upper limit of the required sight distances beyond the minimum sight distance requirements at all intersections and in particular in situations where there are increased interactions between vehicular traffic and non-vehicular modes of traffic, such as areas within 150m of Stations entrances.
 - (i) Project Co shall determine visibility sight triangles and SSD for road horizontal and vertical geometry. Project Co shall ensure that the sight distances provided in the design meet or exceed the minimum sight distance requirements of the TAC

GDGCR based on calculations considering the corresponding Design Criteria parameters.

- (ii) Project Co shall design DSD in accordance with requirements of the TAC GDGCR.
- (b) Project Co shall determine all ISD requirements, including approach, departure, and crossing ISDs, and visibility triangles using the appropriate design vehicle(s) at all intersections according to the criteria specified in the TAC GDGCR.

6.6 Access and Intersection Layout

- (a) Project Co shall design and construct Pavement markings, traffic signs, traffic control signals and underground traffic plants in accordance with the requirements of the applicable Reference Documents.
- (b) Project Co shall design all intersection layouts and lane configurations to address all system users' requirements including pedestrian, cyclist, transit and vehicular traffic. Project Co shall give precedence to intersection design characteristics which preserve and enhance the public Safety, minimize the area impacts, and respond to the traffic demand.
- (c) Project Co shall design and construct street lighting in accordance with Clause 6.15 – Street Lighting of this Part 2.
- (d) Project Co shall design and construct all intersection layouts, lane widths, ramp throats, and Pavement widths using the appropriate design vehicle as defined in Clause 6.8 – Design Vehicles, Clause 6.9 – Facilities Operated by OC Transpo, and Appendix A of this Part 2.
 - (i) Project Co shall design intersection geometry such that the turning radius of the selected design vehicles is applied from traffic lane to traffic lane.
 - (ii) Project Co shall design intersection layouts so that turning movements will not encroach on cycling lanes.
- (e) All pedestrian and cycling crossing facilities shall meet the City requirements and reference OTM Book 15 and OTM Book 18.

6.7 Cross-Section Elements

- (a) Project Co's design of typical cross-sections for Roadways shall be in accordance with the requirements of City of Ottawa Design standards, TAC GDGCR and MTO GDSOH, unless specified otherwise in the Roadways corresponding Design Criteria (Refer to Clause 6.18 – Municipal Roads of this Part 2).

- (i) Auxiliary lane width, where applicable, shall satisfy the requirements of Special Purpose Lanes as specified under Clause 2.2.3 of the TAC GDGCR; and,
- (ii) Project Co shall provide a cross-slope of 2% towards the curbs or shoulders in order to provide improved surface drainage runoff on paved tangent Roadways, unless specifically noted otherwise in the specific municipal Roadway improvements in Clause 6.18 – Municipal Roads of this Part 2.

6.8 Design Vehicles

- (a) Project Co shall use the appropriate design vehicles to design the intersection layout geometry, and to accommodate the applicable sight distances and horizontal and vertical Roadway clearance requirements. For additional requirements pertinent to horizontal and vertical clearances under Overhead Structures, refer to Article 4 – Structural Design Criteria and Requirements of this Part 2. Selection of the largest design vehicle for each Roadway, bus facility, ramp, etc. shall follow the subsequent criteria:
 - (i) Commercial Trucks, including WB-20 shall govern the design for all intersections, roads, and streets that are designated as a truck route in the City of Ottawa's Urban and Rural Truck Route Maps.
 - (ii) Commercial Heavy Single Unit Trucks, and the largest Emergency vehicles, including fire and paramedic vehicles shall govern the design for all other intersections, roads, and streets that are listed as non-truck routes.
 - (iii) All roads and streets that are a designated bus routes shall accommodate the turning movement requirements of the City's B-12 standard bus, articulated bus, double decker bus, and Para-Transpo vehicles.
 - (iv) Where applicable, inter-City bus and school bus shall govern the design of roads, streets, and intersections.
 - (v) Where applicable, maintenance vehicles including snow removal vehicles and garbage trucks shall govern the design of roads, streets, and intersections.
 - (vi) Clearance requirements for opposing left-turn design: in design of intersections with multiple left-turn lanes, especially where simultaneous opposing left turns exist, Project Co shall ensure that design vehicle is appropriately selected. In the design of intersection layouts with double turn left lanes, the design shall accommodate the simultaneously turning manoeuvres of the largest design vehicle with a second Light Single Unit truck. Under extremely constrained conditions, as a minimum, a simultaneous double left-turn design shall accommodate the largest design vehicle turn with a passenger car.

- (vii) Project Co shall design and construct all improvements on intersection layouts, and Roadways geometry using turning simulation software (Transoft AutoTURN) with the appropriate design vehicle turning templates to allow for simple turning movements using the generate corner path method.
- A. Minimum turning speed of a design vehicle shall not be assumed less than 15 km/hr. Only in extremely constrained conditions, where Project Co can demonstrate that no feasible design solution can be developed considering a 15 km/hr turning speed, a minimum 10 km/hr turning speed may be acceptable.
- B. The design of OC Transpo bus turning paths shall satisfy the requirements of the OC Transpo - Transitway and Station Design Guidelines. Bus design turning speeds at intersection corners and curb returns shall not be less than 15 km/hr. Also refer to Clause 6.9 – Facilities Operated by OC Transpo of this Part 2.
- (b) Project Co shall have regard to the Official Plan and Policy designations for the affected areas and Roadways, including the City of Ottawa Multi-Modal Level of Service targets which are affected by curb radii. Pedestrian and cycling LOS targets are especially high in the central area, near schools and rapid transit stations and every effort shall be made to achieve these targets within the context of the City of Ottawa Complete Streets Implementation Framework.

6.9 Facilities Operated by OC Transpo

- (a) Project Co shall design and construct all OC Transpo Roadways and Facilities to meet the interim and ultimate operational requirements of the City during all Construction stages and following Revenue Service. Project Co shall obtain the City's approval prior to advancing the design of all Roadways and facilities operated by OC Transpo.
- (b) Project Co's design and construction of all temporary or permanent bus stop Facilities, Station amenities, infrastructure and shelters shall meet the requirements of Schedule 15-2, Part 4 - Stations, including Appendix A and B, and shall comply with City accessibility design standards and features, including but not limited to COADS requirements.
- (c) Unless specified otherwise, Project Co shall accommodate the following requirements:
- (i) The primary reference for the design, construction and operational requirements of all roads, accesses, bus Platforms, PPUDO and Park and Ride facilities operated by OC Transpo is OC Transpo's Transitway and Station Design Guidelines.

- (ii) The primary reference for the design of all Roadways and bus transit Facilities operated by OC Transpo including but not limited to the design speeds, geometric Design Criteria, horizontal and vertical alignments, auxiliary lanes, intersection geometry, cross-section components, drainage requirements, ramp design, pedestrian and cyclists connectivity, safety and security, accessibility, bus station Platform layouts and turnaround circulation geometry and other Roadways, facilities, and structural details shall meet the requirements of OC Transpo's Transitway and Station Design Guidelines. For specific Station Site design layout requirements with respect to pedestrian and cyclists' connectivity refer to Schedule 15-2, Part 4 – Stations and Schedule 15-2, Part 6 - Urban Design, Landscape Architecture and Connectivity Requirements.
- (iii) For the design and construction of Park and Ride facilities, in the event of a conflict between the criteria contained in this Article and any other City or OC Transpo's reference document(s), the following shall apply in descending order of precedence:
- A. All criteria and requirements specified in this Article 6 and in other pertinent parts and clauses of this Part 2;
 - B. City of Ottawa, OC Transpo - Transitway and Station Design Guidelines (June 2013);
 - C. COADS;
 - D. City of Ottawa, Municipal Traffic and Parking (By-law No. 2003-530) - City of Ottawa Regulating Traffic and Parking on Highways;
 - E. City of Ottawa, Municipal Zoning (By-law No. 2008-250) Consolidation; and,
 - F. City of Ottawa, Transit-Oriented Development Guidelines.
- (iv) Sidewalks associated with bus stops and Station Platform areas shall accommodate positive drainage and have a minimum grade of 0.5% towards the curb.
- (v) Bus shelters, bus stop pad, shelters with sidewalk and boulevard shall satisfy the requirements of both the City's Standard Tender Documents and the OC Transpo's Transitway and Station Design Guidelines, unless specifically noted otherwise in Schedule 15-2, Part 4 – Stations and/or in Schedule 15-2, Part 6 - Urban Design, Landscape Architecture and Connectivity Requirements. In particular, for additional landscape Site design provisions such as bus shelters, lighting, and shade tree requirements refer to Schedule 15-2, Part 4 – Stations and

Schedule 15-2, Part 6 - Urban Design, Landscape Architecture and Connectivity Requirements.

- (vi) Design of bus loops, bus driveway accesses, bus stops, bus Platforms and bus lay-bys in bus Station Facilities shall meet the following requirements:
- A. Project Co shall design and construct the bus Facilities, Station amenities and infrastructure that will be used for the operation of buses as per the standard established in this Part 2. Project Co shall submit the design of all bus Station Facilities for review in accordance with Schedule 10 - Review Procedure. The bus Station Facility submission shall include sufficient detail to allow the City to understand the full operation of the bus Facility, including interface with any other activities on the Site, all Station amenities, and infrastructure.
- B. Project Co shall run AutoTURN analysis to confirm the suitability of the design. Project Co shall obtain the dimensions and characteristics of a typical OC Transpo bus vehicle prior to performing the AutoTURN analysis for the appropriate bus design vehicles. Project Co shall submit the turning movement results for review and approval in accordance with Schedule 10 – Review Procedure and shall consider the following requirements:
- i Buses shall line up parallel to the bus Platforms with a distance of no more than 150mm (preferred)/ 300mm (absolute maximum) from Platform curbs.
 - ii All bus maneuvers in the swept path analysis shall ensure a smooth, continuous movement without instantaneous steering movements. The swept path analysis shall not include 0m radius turns, with the exception of the first turn away from a parking spot under constrained conditions.
 - iii Project Co shall perform field tests for compliance and functionality of bus movement clearance through the means of a bus test on mock-up facilities (demarcating curbs and other features using traffic cones and or paint lines) with dimensions identical to the proposed bus Facilities.
 - iv Project Co shall design bus loops and driveways for one way circulation at bus terminals. Exceptions to the above requirement may be acceptable where a two-way circulation offers better transit operations, for which Project Co shall consult with and seek

approval from the City prior to proceeding with such alternative design.

- v All bus loops and driveway accesses shall allow buses to safely pass stalled or parked buses.
 - vi Project Co shall ensure a bus can maneuver parallel to the Platform curbs and depart independently of parked busses with the assistance of vehicle turning movement simulation software or the appropriate turning movement templates. Project Co shall submit the turn analysis to the City for review and approval in accordance with Schedule 10 – Review Procedure.
 - vii Project Co shall provide a clearance of 0.5m between bus movements and all obstructions, including the worst case stopping positions of buses in bus bays and lay-by areas.
 - viii Project Co shall simulate the appropriate bus turning movements considering the minimum outside turning radius (wall to wall radius) to allow for simple turning movements using the “Generate Corner Path” function (Transoft AutoTURN) at the appropriate turning speeds referenced in Clause 6.8 of this Article 6 for operating efficiency.
- C. Project Co shall design and construct bus Platforms, Station amenities, and associated infrastructure located on the Platforms so that these elements are unobstructed and appropriately sized to accommodate the volume of Passengers boarding and exiting the buses. Project Co’s design shall provide for additional area to accommodate peak load volumes, not less than the minimum stated as per the OC Transpo’s Transitway and Station Design Guidelines.
- D. Project Co shall design and orient bus stops to allow Passengers to load and unload from the right side of a bus, providing Passengers with direct access to pedestrian pathways and / or into the bus terminals or Station entrance, without having to cross the front or rear of a bus. Project Co shall not provide pedestrian crossings within bus facilities without written consent and approval from the City. The design shall preclude such behaviour in addition to placing appropriate and accessible TCDs. Under exceptional circumstances, where the above requirements cannot be met due to constrained conditions and a crossing facility is required, Project Co shall confirm the appropriate traffic control requirements and demonstrate that the pedestrian crossing facility is safe and meets bus operational requirements. Project Co shall present a risk analysis

- developed by a certified traffic Safety auditor prior to design and implementation and seek approval from the City.
- E. Project Co shall locate bus stops, designated as drop-off Platforms, as close as possible to the driveway entrance and Station entries.
 - F. Project Co shall consult with and seek approval from the City and OC Transpo with respect to the dimensions, layout, and location of all bus stops and bus lay-by areas and the preferred bus stop grouping and arrangements at Platform locations (i.e. single, double, or triple stops).
 - G. Bus Platforms shall not be located on curved laneways.
 - H. Project Co shall design and construct all permanent and temporary bus stops during staged Construction to include safe and secure pedestrian access from / to bus stops and all bus stop shelters as per the requirements specified in COADS and Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access. Project Co shall reference Schedule 15-2, Part 4, Appendix B for any applicable permanent bus terminal requirements.

6.10 Pavement

- (a) Order of Precedence
 - (i) Project Co shall provide the Pavements in compliance with the criteria contained in this Article, the Applicable Law, standards, guidelines or practices applicable to the Project and including but not limited to each of the following Reference Documents.
 - (ii) In the event of a conflict between the criteria contained in this Article and any Reference Document(s), the following shall apply in descending order of precedence for design and construction of Pavements:
 - A. The criteria contained within this Article;
 - B. OPSS;
 - C. OPSD;
 - D. The City's Current Version of Design Guidelines, Standard Tender Documents and Specifications;
 - E. Ontario Provincial Standards for MTO Designated Source of Materials (DSM);

- F. Procedures for Estimating Traffic Loads for Pavement Design, 1995, MTO;
 - G. MTO Materials Information Report MI-183 “Adaptation and Verification of AASHTO Pavement Design Parameters for Ontario Conditions”;
 - H. MTO Ontario’s Default Parameters for AASHTOW are Pavement ME Design Interim Report, 2014;
 - I. 1993 AASHTO Guide for the Design of Pavement Structures;
 - J. Canadian Portland Cement Association – Thickness Design for Streets and Highways;
 - K. MTO Directive PHM-C-001 The Use of Surface Course Types on Provincial Highways;
 - L. MTO Pavement Design and Rehabilitation Manual (Second Edition);
 - M. The criteria contained within Article 7 – Geotechnical Design Criteria and Requirements, of this Part 2;
 - N. Embankment Settlement Criteria for Design, July 2010, MTO;
 - O. ASTM Standards; and,
 - P. MTO Laboratory Standards.
- (iii) For the design of rigid concrete Pavements, Project Co shall use both MTO’s Routine Method as described in the *Pavement Design and Rehabilitation Manual* and the *Canadian Portland Cement Association’s Simplified Design Procedure* in addition to the foregoing AASHTO guide for Design of Pavement Structures.

(b) General Requirements

- (i) In general, the design of Pavement structure(s) shall be the responsibility of Project Co and be based on the City’s current Pavement design practices.
 - A. Project Co shall follow the requirements of the OC Transpo’s Transitway and Station Design Guidelines for Pavement design of paved areas subject to bus traffic, Park and Ride lots, and Facilities operated by OC Transpo vehicles.

- B. Pavement structure shall be of a flexible (asphalt) Pavement design outside bus Station Platform areas, where paved areas are subject to bus traffic, unless otherwise approved by the City.
 - C. Project Co shall incorporate a rigid (concrete) Pavement structure within, at a minimum, the limits of the concrete Platforms. OC Transpo's Transitway and Station Design Guidelines shall be utilized for the approximate limits for concrete Pavement for a typical side loading Station. Project Co shall review the concrete Pavement limits for Stations with center loading Platforms, based on the Station layout, bus access and operational requirements, recommend an appropriate Pavement design and seek approval from the City prior to advancing the design. Project Co shall provide an extension of concrete Pavement 30m exceeding the Platform. A proper transition treatment shall be provided from one Pavement type to another.
- (ii) Project Co shall be responsible for design of all new Pavements and all existing paved areas that are subject to upgrade or reinstatement as a part or result of the Work both during temporary staged construction and in post construction. Project Co shall reinstate the Pavement to match the standards of either the existing adjacent Pavement structure or the current City and OC Transpo's standards and requirements specified in this Article, whichever is more stringent. In all cases, the Pavement reconstruction shall be in accordance with the following requirements:
- A. Where the existing Pavement structure adjacent to a localized widening is greater than current City standards and requirements specified in this Article, the new Pavement structure shall match the existing Pavement structure; and,
 - B. Where the existing Pavement structure adjacent to a localized widening is the same or less than the current City Standards, the new Pavement structure shall match the current City standards and requirements specified in this Article.
- (iii) Project Co shall design and build all Pavement structures in compliance with City standards in areas where Pavement structures will be built as New Municipal Infrastructure, in City ROW. Project Co shall be responsible to obtain the acceptance from the City of all works within the City ROW prior to construction. In areas where the Pavement structures will be built as New Municipal Infrastructure, on Federal Lands, Project Co shall complete Pavement designs following City standards for review and approval from Governmental Authorities in accordance with the procedures established by the respective Governmental

- Authority. Project Co shall comply with the Governmental Authority permits requirements and conditions.
- (iv) Project Co shall ensure that any roads or sections of roads with unfinished Pavement, including but not limited to milled Pavement or Pavement without a surface course opened to traffic, including but not limited to public or construction traffic, are designed to carry the expected traffic and to prevent water penetration. Project Co shall maintain and ensure all unfinished pavement opened to traffic are in compliance with the City standards prior to final paving. For milled pavement surfaces, Project Co shall follow the requirement of Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.
- (v) Project Co shall ensure that design and construction of flexible and rigid Pavement structures for all paved Roadways and paved bus Facilities such as lanes, ramps, lay-bys, and Park and Ride Facilities, and paved storage areas, as per the following:
- A. For the bus terminals and loops, Project Co shall design and construct the Pavement of the bus facilities for uninterrupted operation of the OC Transpo's buses in light of the expected bus volumes. Project Co shall submit a Pavement Design Report in accordance with Schedule 10 – Review Procedure for all paved facilities stating their consideration of the bus volumes and assumptions of private vehicles. Project Co's report shall also include a Site-specific recommendation for the periodical Maintenance and rehabilitation of the paved facility considering the facilities Design Life.
 - B. Project Co shall consider factors such as traffic volumes, subgrade conditions, environmental effects, construction traffic, availability and suitability of Construction materials and performance of similarly loaded Pavements in the area, and economics when determining a suitable Pavement design.
 - C. Project Co shall provide Site-specific Pavement design reports for the Project in accordance with Schedule 10 – Review Procedure.
 - D. Project Co shall consider the influence of heavy equipment and delivery vehicles during construction during the design process, particularly with respect to the thickness of sub-base material and the native subgrade conditions.
 - E. Project Co's Pavement design report shall provide localized Pavement designs that shall mitigate potential Pavement sliding or rutting in areas

along bus Platforms, within access ramps, bus stops, and bus lay-by locations, which are subject to repeated bus turning movements.

(c) Design and Performance Requirements

- (i) Project Co shall ensure that the Roadway Pavement structure conforms to the latest standards of the Governmental Authorities.
- (ii) Project Co shall ensure that designed Pavement structure has a Pavement life cycle as specified in Schedule 15-2, Part 1, Article 4 – Design and Construction. In the absence of City standards, Project Co shall comply with the following specific OPSS requirements related to the Pavement works, where applicable:
 - A. OPSS 510 for Removals;
 - B. OPSS 206, and 514 for Excavation;
 - C. OPSS 212 for Filling;
 - D. OPSS 501, 1010 for Granular Material. Thickness shall be suitable for the Roadway's intended use;
 - E. OPSS 310, 311, 312 for Hot Mix Asphalt paving. Thicknesses shall be suitable for the Roadway's intended use;
 - F. OPSS 350 for concrete Pavement and Concrete base. Thickness shall be suitable for its intended use;
 - G. OPSS 353 and 312 for Concrete/Asphalt, curb and gutter, and medians, where applicable;
 - H. OPSS 405 for Pipe Subdrains; and,
 - I. OPSS 355 for Interlocking concrete pavers suitable for its intended use.
- (iii) Project Co shall ensure that all the Pavement surfaces in areas drivable by vehicles shall have paved surfaces and comply with all expected performance characteristics for safe use by the public.
- (iv) Project Co shall design and construct appropriate drainage systems that meet the City's standard when Pavement type is transitioned from interlocking pavers to flexible Pavement.
- (v) Project Co shall ensure that the grading conforms to the requirements of OPSS 206 (Construction Specification for Grading) for work within municipal

jurisdictions. The Compaction shall conform to the requirements of OPSS 501 (Construction Specification for Compacting) for work within municipal jurisdictions. Granular Base and Sub-base shall be according to OPSS 314.

(d) Smoothness and Other Ride Quality

- (i) Following Substantial Completion, the completed Pavements shall meet the smoothness criteria provided in SP 103F31 for hot mix asphalt Pavements.

6.11 Grading

- (a) Project Co shall design and construct all earthworks and grading requirements so that all such work conforms to the relevant City Standards and Specifications or in absence of such standards to the following:
- (i) OPSS 206 - Earth and Rock Excavation;
 - (ii) OPSS 212 – Borrow;
 - (iii) OPSS 501 – Compacting;
 - (iv) OPSS 511 - Rip-Rap, Rock Protection and Gravel Sheeting;
 - (v) OPSS 570 – Topsoil;
 - (vi) OPSS 572 - Seeding and Mulching; and,
 - (vii) OPSS 803 – Sodding.
- (b) Project Co shall meet the requirements of Schedule 15-2, Part 1, Article 5 – Implementation Constraints, in the design and construction of all earthworks and rock excavations.
- (c) Grading includes excavation of native material and fill of approved materials as required for Construction in accordance with the recommendations resulting from Pavement design reports.
- (d) Project Co shall manage all excess and imported material per the requirements described in Schedule 17, Part 4 – Contaminated and Excavated Material Management.
- (e) Project Co shall maintain positive drainage during construction on all areas subject to grading at all times. Project Co shall treat any cut or fill slopes, left unattended for 30 calendar days or more, with temporary hydraulic mulch, erosion control blankets or vegetative cover.

- (f) Project Co shall minimize and control the amount of dust generated by construction operations at all times within and outside the construction zone. Project Co shall remove any mud, debris or dust deposited outside of the construction zone, on Roadways and in boulevards, resulting from the Works.
- (g) Project Co shall provide the design, approvals, and supply of materials, labour, equipment, inspection and testing associated with application of dust suppressants in accordance with the City of Ottawa Standards and Specifications and OPSS 506.
- (h) Rip Rap Protection and Gravel Sheeting
 - (i) Project Co shall provide the design, approvals, and supply of materials, labour, equipment, inspection and testing associated with rip-rap and rock protection in accordance with the City Standards and Specifications and OPSS 511.
- (i) Dewatering
 - (i) Project Co shall provide the design, approvals (permits to take water, where required), supply of materials, labour, equipment, inspection and testing associated with all the dewatering Works.
- (j) Temporary Measures
 - (i) Project Co shall adjust all Roadway infrastructure, including but not limited to catch basins, maintenance holes, valve chambers, and any other structures in the Roadway, flush with the base asphalt lift in order to provide snowplough protection in areas where the final lift of asphalt is not paved in advance of winter shutdown. Project Co shall design and construct temporary asphalt curbs to contain Roadway drainage at the proposed curbline of catch basins and maintenance holes. Project Co shall remove and make final adjustments immediately prior to placement of the surface course asphalt.
 - (ii) Project Co shall restore all trenches to match the existing original conditions or to the new construction cross section 24 hours of the completion of the trench. In situations where the trench is Constructed in consecutive stages with a delay in between, Project Co shall restore the trench in stages within 24 hours after the completion of each stage.
 - (iii) Project Co shall provide temporary conditions design drawings to specify all temporary measures and are responsible for all costs associated with the above noted work.

6.12 Drainage

- (a) Project Co shall provide the drainage in accordance with the criteria contained in this Article 6 and in Article 5 – Drainage and Stormwater Management Design Criteria of this Part 2 and the applicable Reference Documents.

6.13 Traffic and Transit Signals

- (a) General

- (i) Project Co shall liaise and coordinate with the City and the City's designated traffic control signal contact person, with regards to all modifications that may be required at municipal traffic signals during the design and construction period. Project Co shall support all proposed modifications with traffic engineering analysis to meet the City's traffic signal requirements and standards.
- (ii) Project Co shall define the coordination scheme, and coordinate all work with the City for municipal traffic signals that are included in the traffic signal coordination scheme.
- (iii) Project Co shall reference the information provided in Schedule 15-2, Part 7, Clause 1.11, and coordinate with the City to identify and confirm the location of all existing and new traffic cameras, ITS devices, and all associated infrastructure 60 calendar days in advance of the design stage. Project Co shall require the approval of the City for all relocations, design and construction requirements, and types and specifications of such facilities that are impacted or required as a result of the Works.

- (b) Design and Performance Requirements

- (i) Project Co shall coordinate the design, approvals and construction requirements for temporary and permanent traffic signals with the City.
- (ii) For permanent new traffic and transit signal facilities, or new permanent configurations at existing signalized intersections, with the exception of PXOs, the City shall supply and install all above ground traffic signal equipment as required by the governing road authority, including but not limited to controller, poles, pedestrian and traffic signal heads with push buttons, audible displays, etc. The City shall supply, install and make all required terminations for the traffic signal wiring. The City shall provide all equipment and labour associated with the installation of permanent above-ground traffic signal infrastructure. Project Co shall coordinate with the City the design of electrical power feeds for all alterations to existing traffic signals, and new traffic signals; the cost of obtaining new electrical power feeds shall be a City responsibility.

- A. Project Co shall construct all permanent underground traffic infrastructure, including the supply and construction of concrete encased ducts, direct buried ducts, pole foundations, maintenance holes, maintenance hole frames and covers, vehicle loop detection and concrete pads.
 - B. For all permanent signalized intersections, the City shall design the vehicle detection system and specify the type of detection equipment to be used. Project Co shall only be responsible for the cost and coordination of the installation of inductive loop detectors; any other detection equipment specified by the City's design shall be supplied and installed by the City.
 - C. Where the location selected for a traffic signal pole is not suitable for a standard pole foundation, as per City of Ottawa Standard Detail Drawings (e.g., where the pole is designed to go on top of pre-existing utilities), Project Co shall be responsible for the design of the non-standard foundation, in addition to the construction requirement in A. above.
- (iii) For all temporary traffic and transit signals, or temporary modifications to existing signalized intersections, the City shall supply and install all above ground traffic signal equipment as required by the governing road authority including but not limited to controller, poles (with the exception of wood poles), pedestrian and traffic signal heads with push buttons, audible signals, etc. The City shall also supply and install and make all required terminations for the traffic signal wiring. The City shall provide all equipment and labour associated with the installation of temporary above-ground traffic signal infrastructure. Project Co shall coordinate with the City the design of electrical power feeds for all temporary traffic signals or temporary modifications to existing signalized intersections; the cost of obtaining new electrical power feeds shall be a City responsibility.
- A. For all temporary signalized intersections, the City shall design the vehicle detection system and specify the type of detection equipment to be used. Project Co shall only be responsible for the cost and coordination of the installation of inductive loop detectors; any other detection equipment specified by the City's design shall be supplied and installed by the City.
 - B. Where temporary signal infrastructure requires the use of wood poles and/or span wire, the City shall be responsible for the design of signal head placement only. Project Co shall design the location of the wood poles, guy wires, and span wires based on the City's signal head placement.
 - C. Project Co shall construct all temporary underground traffic infrastructure, including the supply and construction of concrete encased ducts, direct buried ducts, pole foundations, maintenance holes, maintenance hole

frames and covers, vehicle loop detection and concrete pads. Project Co shall Construct all above ground infrastructure Works, including but not limited to installation, removals and reinstatement of wood poles, all aerial strand support and suspension cables, guys, anchors, ground rods, and plates, along with any required underground Civil Works including conduit, foundations, manholes/hand holes, frames and covers, as required to accommodate the staged construction of Work, with the exception of traffic signal equipment as described above, which shall remain the responsibility of the City.

- (iv) For all PXOs, Project Co shall supply and install all above ground equipment, including but not limited to poles, hardware, arms, RRFBs, etc. Project Co shall provide the labour associated with the installation of the PXOs.
 - A. The design and installation of PXOs shall be in accordance with OTM Book 15, City of Ottawa Pedestrian Crossover Program and Examples Documents 1 and 2, and Appendix F – Pedestrian Crossover Infrastructure Requirements of this Part 2.
- (v) For all temporary and permanent traffic signals, Project Co shall provide interconnection ensuring that all signals can communicate with the City's Traffic Operations Center. Interconnection duct shall be designed by the City and installed by Project Co. The City will consider City-owned system-connectivity infrastructure prior to private-owned infrastructure to establish this connectivity.

(c) Notification Requirements and Timelines

Table 6.1: Permanent/temporary new traffic signals or permanent/temporary modifications to existing traffic signals

Item	Description	Notification (Calendar Days)	Prior to	Information to be supplied to City	Information to be supplied to Project Co
1	Design	30	Desired receipt of signal design	1:250 CADD for the intersection, including pavement markings on all approaches	City provides traffic signal design, including traffic signal displays, traffic signal plant design, detection system

					design, etc., within 30 calendar days
2	Commencement of civil works (prerequisite – signal design completed)	30	Construction of civil works	Date when works are to begin, schedule of work	None
3	Electrical work involving the City (prerequisite – signal design completed)	30	Construction of civil works	Meeting date regarding electrical works, schedule of work	Contact names and telephone numbers of relevant staff
4	Scheduling of installation date by City forces (prerequisite – signal design completed)	30	Desired signal installation date	Desired installation date by City forces	Scheduled date for installation to be provided to Project Co within eight calendar days of the notification. Scheduled date shall be within 10 calendar days of Project Co's request
5	City Inspection of civil work completed by Project Co (pre-requisite – signal installation date)	14	Scheduled signal installation date	Confirmation of work being completed	Confirmation that the work was completed to City satisfaction, within seven calendar days of Project

	scheduled)				Co's notification that work was completed
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- (i) Project Co shall provide 30 calendar days' notice to the City where modification of an approach to a signalized intersection beyond OTM Book 7 applications is being proposed. Project Co shall submit 1:250 scale CADD drawings for all such modifications, as required.
- (ii) Project Co shall prepare and submit TCPs, which show the signal design for the installation of, or modification of a traffic control signal, in accordance with Schedule 10 – Review Procedure. Project Co shall submit these particular TCPs at least 45 calendar days before the start of any Construction Activities related to the installation or modification. Note however, that in the case of multiple simultaneous traffic control signal installations or modifications, the City may require more than 45 calendar days for submission review. Project Co shall meet with the City at least 60 calendar days in advance of these types of scheduled Works in order to discuss the submission schedule, and Project Co shall adjust the submission lead time to a timeframe acceptable to the City.
- (iii) Project Co shall address the City's comments and changes on signs and Pavement marking plans developed as a part of Project Co's TCPs and incorporate the revised plans as applicable. Project Co shall submit the revised drawings to the City at least 30 calendar days prior to the scheduled placement of said signs and Pavement markings, all in accordance with Clause 6.14 – Pavement Marking and Signing of this Part 2 and Schedule 10 – Review Procedure.
- (iv) Per Item 2 from Table 6-1, Project Co shall provide a minimum of 30 calendar days advanced notice to the City prior to commencing the following works:
 - A. Permanent Traffic Signals: Underground Construction of the permanent traffic signals including concrete encased ducts, direct buried ducts, pole foundations, maintenance holes, vehicle loop detection and concrete pads;
 - B. Temporary Traffic Signals: Installation of the temporary traffic signal controller cabinet onto the wood pole; wood poles, double span and anchors along with any required Civil Works including conduit, foundations, manholes/hand holes, etc.,
- (v) Per Item 3 from Table 6-1, a minimum of 30 calendar days prior to Construction, Project Co shall arrange a meeting with the City to coordinate the requirements of

the electrical work involving the City. Project Co shall provide a schedule of the work to the City.

- (vi) In accordance with the schedule specified in Item 4 from Table 6-1, City forces shall perform all traffic signal activations and deactivations.
- (vii) Per Item 5 from Table 6-1, at least 14 calendar days prior to the date scheduled for the City to install the traffic signal equipment, Project Co shall have completed their portion of the Work for permanent and/or temporary traffic signals modification/installation, and provided the City with notice that the Works are complete.

6.14 Pavement Marking and Signing

- (a) General
 - (i) Project Co shall provide the design drawings and obtain approvals from the City for all permanent and temporary Pavement marking and Roadway signs.
 - (ii) Project Co shall provide the design drawings and obtain approvals from the City for all permanent and temporary Pavement marking and signage at the locations of bus Transitway and Facilities operated by OC Transpo.
 - (iii) Unless specified otherwise in this Article 6, Project Co shall provide all signing and Pavement markings in accordance with the criteria contained in this Article 6, the requirements of OPSS, and the applicable Reference Documents.
- (b) Design and Performance Requirements
 - (i) Project Co shall design, obtain approvals, and comply with construction requirements for permanent Pavement markings as per the City of Ottawa's standards and specifications and applicable OPSS.
 - (ii) Project Co shall provide for the supply of materials, labour, equipment, inspection and testing associated with the requirements for all temporary Pavement markings during construction.
 - (iii) The City shall supply all labour, equipment and materials for the supply and installation of all permanent Pavement markings between April 16 and November 14. Project Co shall supply all labour, equipment and materials for the supply and installation of permanent Pavement markings between November 15 and April 15.

- (iv) Project Co shall supply all labour, equipment, materials, inspection and testing associated with the requirements for all temporary and permanent non-regulatory signing.
- (v) The City shall supply all labour, equipment and materials for the supply and installation of all temporary and permanent regulatory signing requirements.
- (vi) Project Co shall ensure the Pavement surface is prepared, clean and free of debris.
- (vii) Project Co shall complete final grading prior to installation of all permanent and temporary signs. Project Co shall also be responsible for the reinstatement of all areas disturbed during the installation of new or relocated signs.
- (viii) Project Co shall provide a minimum of 10 Business Days advanced notice to the City for the installation of the permanent Pavement markings and regulatory signing to be completed by the City as illustrated on Project Co's construction documents.
- (ix) Project Co shall make all submissions in relation to the requirements of this section in accordance with Schedule 10 – Review Procedure.
 - A. Project Co shall submit Pavement marking and signage CADD drawings formatted in Microstation V.8i at a scale of 1:500.
- (x) Project Co shall obtain the library of symbols from the City prior to commencing any work.
- (xi) Project Co shall contact the appropriate municipal and / or provincial road authorities to confirm, in writing, the official municipal road names as well as Civic Address Signs (911 Identification Numbers and signing) requirements and incorporate such signs in the permanent and temporary Pavement and signing design drawings. Project Co shall indicate the location, size, and type of each sign on the TCPs. Project Co shall ensure that the above noted signs are in place and visible at all times. If the placement of the signs conflict with Project Co's construction, Project Co may temporarily relocate the signs, provided the signs remain unobstructed and with the affected property limits for the duration of the Project. Project Co shall replace any damaged signs immediately.
- (xii) Project Co shall prepare and submit a permanent signing plan and a permanent signing table a minimum of 30 calendar days prior to the implementation of the plan. The permanent signing table shall include, but not be limited to information detailing sign location (station of final location, removal location and on which side of the road to be installed in relation to the direction of travel), height to bottom of sign, lateral offset to post, support type with dimensions, alpha-numeric sign code with dimensions and the message/description, etc.

- (xiii) Project Co shall prepare sign details for the following types of ground-mounted guide Signs: Roadway identification, direction & destination, and location identification. Project Co shall design and provide all overhead sign structures, ground-mounted sign break-away steel supports and associated sign footings.

6.15 Street Lighting

- (a) General
- (i) For all the temporary and permanent street lighting, Project Co shall design, obtain approvals, and supply of materials, labour, equipment, build, provide inspection and testing associated with the City's requirements for Street lighting standards and best practices.
- (b) Design and Performance Requirements
- (i) Project Co shall design and construct all permanent and temporary street lighting including power feeds. Street lighting shall meet the requirements of the City of Ottawa Right of Way Lighting Policy. Project Co shall prepare and submit the lighting design together with the lighting calculation summary in accordance with Schedule 10 – Review Procedure.
- (ii) Project Co shall illuminate cycle facilities based on the required Roadway lighting levels stipulated in the City of Ottawa Right of Way Lighting Policy.
- (iii) All activities related to Roadway lighting systems (i.e. design, construction, etc.) shall meet the Conditions of Service set out by the local Electrical Supply Authorities, the ESA, and any other entity having jurisdiction.
- (iv) The installation of luminaires shall utilize existing above ground Utility poles located within public ROW to minimize the number of poles. Project Co shall coordinate the use of these joint use [REDACTED]/street light poles with the local Electrical Supply Authority and shall satisfy the requirements of Ontario Regulation 22/04 Electrical Distribution Safety (Electricity Act, 1998) for third party equipment mounted on [REDACTED] Utility poles.
- (v) Project Co shall coordinate with the City the design of electrical power feeds for all alterations to existing street lighting, temporary lighting and new street lighting; the cost of obtaining new electrical power feeds shall be a City responsibility.
- (vi) The City shall perform all work impacting existing City owned street lighting within the contract limits, including pole removal (concrete foundations to be removed by the Project Co), wiring, luminaire replacement and aerial cables. Project Co shall coordinate its work with the City.

- (vii) Project Co shall provide a minimum of 15 Business Days advanced notice to the City for the installation of temporary Roadway illumination and removal of existing Roadway illumination.
- (viii) Project Co shall arrange a meeting with the City, a minimum of 10 Business Days prior to Construction, to coordinate the requirements of the electrical work involving the City. Project Co shall provide a schedule of its proposed work to the City in this meeting.
- (ix) Lighting shall not contain an upward component, minimize light trespass and disability glare for drivers.
- (x) Project Co shall design and construct all Roadway luminaries to be LED and meet the full cut-off type and specifications.
- (xi) All permanent Roadway lighting levels shall meet the appropriate standard for the Roadway classification.

6.16 Passenger Pick-Up and Drop Off Facilities

- (a) Project Co shall design and construct PPUDO facilities for the location and number of PPUDO spaces specified in Schedule 15-2, Part 4 - Stations, Appendix A – Trillium Line Station Functional Requirements. Project Co shall obtain approval from the City for the location of all PPUDO locations prior to advancing any Roadway designs.
- (b) Project Co shall satisfy the requirements of OC Transpo's Transitway and Station Design Guidelines, including City of Ottawa By-laws and reference material included in Clause 6.1 of this Part 2.
- (c) The following general requirements shall apply to all PPUDO facilities:
 - (i) Project Co shall limit the location of curbside PPUDO facilities to tangent Roadway segments offset from adjacent intersections and accesses as per the City of Ottawa By-law 2003-530.
 - (ii) Project Co shall satisfy the upper limit of all geometric dimensions for the design of PPUDO facilities including, but not limited to, parking space dimensions and aisle widths as per the City of Ottawa By-law 2008-250.
 - (iii) Project Co shall ensure the locations and design of PPUDO facilities will avoid conflicts with cycling facilities, bike racks, bus access and egress and operations, and Station operations.
 - (iv) PPUDO facilities shall include a fully accessible, direct, and barrier-free pedestrian access from / to all bus stops and Station access and egress. Each

PPUDO facility shall include provisions for boarding and alighting from an accessible parking space as per the accessibility requirements and best practices specified under sections 3.1 and 3.2 of COADS.

- (v) Project Co shall design and construct PPUDO facilities physically separated from fare paid zones.
- (vi) Project Co shall ensure all curbside recessed PPUDO stalls can accommodate the safe entry and exit manoeuvres with the use of curb transitions as per the City of Ottawa Standard Detail Drawing R8 – Typical Intersection Narrowing (Single) and/or R9 – Typical Mid-Block Narrowing.

6.17 Road Safety Audits and Road Safety Design Reviews

- (a) Order of Precedence
 - (i) Project Co shall have independent Road Safety Audits and Road Safety Design Reviews completed in accordance with the criteria set out in this Article 6 and the following reference documents. If there is any conflict between the criteria contained in this Article 6 and any of the reference documents, the following shall apply, in descending order of precedence:
 - A. The criteria contained in this Article 6;
 - B. TAC, Geometric Design Guide for Canadian Roads;
 - C. TAC, The Canadian Road Safety Audit Guide;
 - D. MTO, Roadside Safety Manual;
 - E. MTO, Ontario Traffic Manual Books 1 through 18; and,,
 - F. AASHTO, Roadside Design Guide.
 - (ii) Project Co shall perform the necessary Road Safety Audits and Road Safety Design Reviews in the context of the traditional Road Safety Audit processes but shall expand the process in order to include human factors, the review of drawings and plans (Reviews).
- (b) General Requirements
 - (i) Road Safety Audits shall include the Road Safety Audit processes as identified in The Canadian Road Safety Audit Guide, and shall for clarity include human factor considerations.

- (ii) Project Co shall provide the City of Ottawa with the Road Safety Review and Audit team's individuals' qualifications, experience, and knowledge, and letters of reference from the relevant Governmental Authorities where prior audits were performed, 60 calendar days in advance of any safety review or audit work. Project Co shall receive the City's approval for the proposed Road Safety Audit Team in accordance with the requirements of the Review Procedure specified in clause 6.17 - Road Safety Audits and Road Safety Design Reviews of this Part 2 and prior to any safety review or audit work being initiated.
 - (iii) The Road Safety Audits and Road Safety Design Reviews team's individuals shall not be an employee of any of the companies on Project Co's design and construction team, other than being paid for services rendered to Project Co in their capacity as Road Safety Auditor. The auditing team shall be fully independent and at arm's length from any company participating on Project Co's team.
 - (iv) All Project Co's Road Safety Audits and Road Safety Design Reviews shall include a human factors expert experienced in road and highway design and construction, who shall provide input and review of the safety and operation of the work from a human factors perspective.
 - (v) Project Co shall immediately correct any "as constructed" element that does not conform to the design, does not meet the required safety standards, or deemed not to meet a reasonable level of safety by the Road Safety Auditor. Project Co shall prepare the corrective measures and rectification recommendations noted above and shall ensure a Professional Engineer stamps and seals the appropriate recommendations for the review and acceptance by the Road Safety Audits and Road Safety Design Reviews team and to the City of Ottawa.
 - (vi) Project Co shall assume responsibility for any existing or proposed Site conditions found not to meet a reasonable level of safety, and shall rectify the condition immediately, or otherwise construct temporary works to address the safety concern until repairs are made.
- (c) Road Safety Audits and Road Safety Design Reviews Team
- (i) The Road Safety Audits and Road Safety Design Reviews individual and supporting team is more generally referred in this context as the Road Safety Auditor.
 - (ii) Project Co's Road Safety Audits and Road Safety Design Reviews team shall consist of a team of auditors, with a minimum of three qualified personnel, who are independent of the Project Co's design and construction team, and shall meet the following minimum criteria:

- A. Be Professional Engineers trained in the area of road and public safety, with over 20 years of engineering experience and demonstrated experience or resume working in the area of public safety and undertaking formal Road Safety Audits and Road Safety Design Reviews, with references from government agency;
 - B. Demonstrated experience in undertaking formal safety reviews and experience with The Canadian Road Safety Audit Guide, and Canadian and Ontario roadside safety standards;
 - C. Demonstrated experience in road safety analysis, traffic engineering, geometric design, and demonstrated expertise with human factors in design and safety reviews and audits;
 - D. Participated in at least two recent formal road safety audits with criteria similar to the Road Safety Audits and Road Safety Design Reviews in this Work, where such previous participation was on projects delivered using design build or public private partnership project delivery methods; and,
 - E. Demonstrated professional independence in undertaking Road Safety Audits and Road Safety Design Reviews in this Work.
- (d) Project Co's Responsibility:
- (i) Project Co shall undertake Road Safety Audit and Road Safety Design Review as per the requirements of this Clause 6.17 of this Part 2 on all temporary and permanent Roadway improvements listed below:
 - A. All facilities operated by OC Transpo including, but not limited to, all bus loops and associated accesses, lay-bys, bus stops, PPUDOs, Park and Ride Facilities, as specified in Clause 6.9 of this Part 2;
 - B. All Roadway improvements listed under Clause 6.18 of this Part 2; and,
 - C. All staging detour routes, Lane Shifts, lane closures and temporary conditions designed and constructed by Project Co as part of the Works per the requirements specified in the Schedule 15-2, Part 7 - Traffic and Transit Management and Construction Access.
 - (ii) Project Co shall assume responsibility for the following items:
 - A. Scheduling, initiating, allowing access to the applicable Site and managing the Road Safety Audits and Road Safety Design Reviews process at the appropriate times during the course of the Works;

- B. Providing all necessary design drawings and supporting documentation for the Road Safety Audit Team to conduct the Road Safety Audit and Road Safety Design Reviews;
 - C. Ensuring that the Road Safety Design Reviews and Road Safety Audit is conducted in accordance with good industry practice;
 - D. Receiving and reviewing the Road Safety Audit Team's report with the City of Ottawa representative;
 - E. Responding to the Road Safety Audit Team's report, including presenting rectification alternatives to address deficiencies;
 - F. Implementing required re-design as a result of the corrective suggestions as described in the sub clause noted above in an expeditious and timely manner;
 - G. Updating changes on the required design drawings; and,
 - H. Providing all draft and final documentation related to the Road Safety Audits and Road Safety Design Reviews to the City of Ottawa's representative.
- (iii) Project Co shall accept responsibility for and account for all costs associated with Road Safety Audits and Road Safety Design Reviews, including any re-design and increased costs to the Works that result from the Road Safety Audits and Road Safety Design Reviews.
- (iv) After each Road Safety Audit and Road Safety Design Review, except as otherwise expressly agreed in writing by the City of Ottawa's representative, Project Co shall address all recommendations made by the Road Safety Audit Team.
- (e) Road Safety Design Review
- (i) Project Co shall undertake an initial Road Safety Design Review at the outset of the Works and no later than 60 calendar days after Commercial Close of the Works in order to assess Project Co's proposed design elements including both temporary and permanent improvements that may have any bearing on public, Maintenance or operational safety from the point of view of any user within the Lands.
 - (ii) In each Road Safety Design Review, Project Co shall review, identify and resolve any safety concerns prior to advancing the design of both temporary and permanent improvements such that the design can be modified in a timely fashion

to address the safety concerns within the Works. Project Co shall plan, schedule and execute the review, together with providing a report that addresses any safety concerns and the recommendation or resolution of the initial Road Safety Design Review. The initial Road Safety Design Review shall precede the design activity and the subsequent design stages shall accommodate any required recommendation or resolution of this initial Road Safety Design Review.

- (iii) Project Co shall undertake Road Safety Design Reviews on an ongoing basis through the different stages and duration of all designs and all to be constructed elements, both temporary and permanent improvements that may have any bearing on public, Maintenance or operational safety from the point of view of any users within the Lands.

(f) Road Safety Audit Process

- (i) Project Co shall complete the Road Safety Audit process in accordance with The Canadian Road Safety Audit Guide. References to “review” or “response” from the owner agency, or other qualifying phrase with similar connotation in the process, shall be construed as the responsibility of Project Co in accordance with the requirements in this Clause 6.17 of this Part 2.
- (ii) Project Co’s Road Safety Audit Team shall prepare a report to document the audit findings and submit the Road Safety Audit reports to the Design Team for the stages identified in the clause that follows. The Road Safety Audit reports shall clearly identify safety hazards that need to be addressed by Project Co along with recommendations for remediation. Project Co shall respond to the identified hazards and recommendations with remediation counter-measures or provide appropriate reasons why the safety issue may not be addressed as recommended in the reports. Under any circumstances, Project Co’s response and remediation countermeasures shall address the safety issue to the satisfaction of the Road Safety Audit Team.
- (iii) For all temporary conditions and temporary Roadway improvements to accommodate staged construction under long duration Works as specified under Clause 2.5.4 Long Duration (LD) in the MTO’s OTM Book 7, Project Co shall perform Stage 3a and Stage 3b audits for all temporary Roadway improvements according to the requirements outlined in Clause 6.17(f)(v) of this Part 2.
- (iv) Project Co shall perform Stage 3b audits for all Station construction Sites according to the requirements outlined in Clause 6.17(f)(v) of this Part 2.
- (v) Project Co shall submit the Road Safety Audit reports to the City of Ottawa’s representative in accordance with the review procedures specified in Schedule 10 – Review Procedure for review at all the stages identified below:

A. Stage 1: Pre-Final Design Road Safety Audit

i Project Co shall conduct a Stage 1 Road Safety Audit immediately before submission of the Pre-final Design Development submittals in accordance with the requirements of Schedule 10 – Review Procedure of the Project Agreement. Project Co shall undertake a detailed review of the Pre-final Design Development submittals to identify any potential safety-related enhancements that might have an impact on the design and construction of Works. Issues considered shall include, but not be limited to, the following:

1. Design consistency;
2. Site conditions and visibility;
3. Drivers' work load and perceived road information;
4. Vehicular traffic speed management and associated safety risk factors;
5. Traffic control devices;
6. Human factors;
7. Horizontal and vertical alignment;
8. Cross section design;
9. Intersection design and configuration;
10. Access location;
11. Sight distance including, but not limited, to stopping sight distance and turning sight distance, sight distances to traffic control devices, bullnoses, etc.;
12. Operation of public transit;
13. Operational and Maintenance safety;
14. Traffic operations;
15. Environmental factors;
16. Clearances to roadside objects;

17. Safety barriers; and,
18. Provision for vulnerable road and all multi-modal road ROW users.

B. Stage 2: Final Design Road Safety Audit

i Project Co shall conduct a Stage 2 Road Safety Audit immediately before submission of the Final Design Development Submittals in accordance with Schedule 10 – Review Procedure of the Project Agreement. The audit shall undertake a detailed review of the completed Final Design Development submittals to identify any potential safety-related enhancements that might have an impact on the operational safety of the Works. Project Co shall consider in the audit and address issues such as the items included, but not be limited to the following items:

1. Signing and Pavement markings;
2. All interface with adjacent design disciplines (including rail Track corridors and LRT facilities; Tunnel, civil, facilities including Stations and landscaping, Utilities and Bridges, etc.);
3. Traffic signal configuration;
4. Intersection details;
5. Municipal services;
6. Drainage and SWM elements;
7. Lighting;
8. Fencing;
9. Clearances to roadside objects;
10. Safety barriers;
11. Surface standards including treatments and structures;
12. Traffic control devices;
13. Streetscape and road furniture;

14. Provision for vulnerable road and all multi-modal road ROW users;
15. Accommodation of design vehicles;
16. Emergency responses requirements;
17. Road maintenance;
18. Traffic staging plan; and,
19. Any other Stage 1 Road Safety Audit results affected by the final design.

C. Stage 3a: Temporary Traffic Control On-Site Road Safety Audit

i Project Co shall conduct Stage 3a Road Safety Audits on the applicable Sites within Lands before implementation of temporary traffic and transit control set-ups that meet one or more of the following criteria:

1. Two or more individual temporary work zones in close proximity to each other such that one would influence the traffic and transit operation of the other. The spacing between the termination area of one work zone and the advance warning area of the next work zone for which one temporary traffic control set-up influences the traffic operations of the next temporary traffic control set-up is 2.0 km or less.
2. Temporary staging are required within the existing Roadways and the duration of temporary traffic control set-ups is five calendar days or more. The set-up does not necessarily have to be in place for the entire time but can be one of a number of repeating set-ups that are active at different times.
3. The duration of temporary traffic control set-ups is ten calendar days or more on roads other than those identified (2) above. The set-up does not necessarily have to be in place for the entire time but can be one of a number of repeating set-ups that are active at different times.

D. Stage 3b: Construction Road Safety Audit

- i Project Co shall conduct Stage 3b Road Safety Audits on the applicable Sites within Lands during construction of Works. These audits shall examine the field conditions of the Work under construction and assess any circumstances that may have a bearing on public safety from the point of view of any user and public areas that are within the Lands, or are modified and constructed as a part of the Works. The audits shall meet the following criteria:
1. Project Co shall undertake two of the Stage 3b Road Safety Audits annually within the high construction season, between June and September (i.e. two audits to be performed annually between June and September) and one in the winter season, annually between December and February. Project Co shall preplan for only one of the audits, while Project Co shall perform the other audits unannounced.

E. Stage 4: Post-Construction Road Safety Audit

- i Project Co shall carry out a Stage 4 Road Safety Audit prior to opening any portions of the Roadway Works for traffic operation. Project Co's audit shall investigate and identify potential safety enhancements that may reduce the frequency and/or the severity of collisions. The Road Safety Auditor shall also check for safety deficiencies that result from using particular combinations of design elements not previously detected or any synergistic effects of using minimum Design Criteria for multiple design elements that may compromise users' safety.
- ii Project Co shall plan for and conduct Stage 4 Road Safety Audits prior to and as a condition of the issuance of the substantial completion certificate.
- iii Pursuant to the requirements of the two clause (i) and (ii) of the intended Stage 4 Road Safety Audit noted-above, the Road Safety Audit Team shall fully examine the Works by:
1. Meeting with Project Co to review any issues relating to the Works, in particular design changes that may affect the safety of Roadway Works included in this Article 6;

2. Checking to ensure that safety issues identified in the Stage 2 Road Safety Audit are addressed and the resulting design changes do not create further safety issues;
3. Reviewing any design changes that occurred during the relevant Works to ensure they do not create safety issues; and,
4. Conducting field reviews of such Works, under both daytime and night time conditions.

(g) City-requested Safety Audit

- (i) The City of Ottawa reserves the right to request Site-specific Road Safety Audits at any time in addition to the audits required in all other Road Safety Design Reviews and Road Safety Audits specified in Clause 6.17 of this Part 2. Such request may be for any Site conditions, design element, design concern or Constructed element of Works that is of concern to the City of Ottawa. The City's written request will outline the safety concern and the issues required to be investigated and addressed by Project Co.
- (ii) Project Co shall demonstrate that the design and proposed Constructed Works meet a reasonable level of safety for all affected users. Project Co shall provide supporting research or engineering rationale and analyses for the design decisions, and for the support of the proposed design and constructed Works that are subject to investigation.
- (iii) Project Co shall address the concerns and/or modify the proposed design and constructed Works accordingly and provide all available technical information to the Road Safety Audit Team for consideration.
- (iv) The Road Safety Audit Team will render an opinion with the safety issue, and Project Co shall address the safety issue to the satisfaction of the Road Safety Audit Team and the City of Ottawa. The disposition and rectification of the safety concern is Project Co's full responsibility and obligation based on full and due consideration of input from the City of Ottawa and the Road Safety Audit team.

(h) Road Safety Audit Certificates

- (i) Project Co shall submit to the City of Ottawa's representative a Road Safety Audit Certificate called in the form attached as Appendix D - Form of Road Safety Audit Certificates to Schedule 15-2 – Design and Construction Requirements in respect of the Stage 1, Stage 2 and Stage 4 Road Safety Audits respectively. Each Road Safety Audit Certificate shall be signed by Project Co's

Design Manager, Project Co's Construction Contractor representative, Project Co's Project Co Representative, and the Road Safety Audit Team.

- (ii) Project Co shall provide the Independent Certifier with the Stage 4 Road Safety Audit Certificate. The Substantial Completion Certificate shall not be issued unless a Stage 4 Road Safety Audit Certificate has been submitted and signed by the Project Co's Design Manager, Project Co's Construction Contractor representative, Project Co's Project Co Representative, and the Road Safety Audit Team.

(i) Random Audits

- (i) The City of Ottawa retains the right to perform additional independent audits on any part of design and construction Works at any time.

6.18 Municipal Roads Improvements

(a) Leitrim Road

- (i) Project Co shall design and construct a new Bridge Structure including its approach embankments in order to grade separate Leitrim Road with the proposed Trillium Line Track corridor at a location approximately 260m west of the existing Leitrim Road / Gilligan Road intersection, where the new Track corridor shall cross the existing Leitrim Road corridor.

A. Project Co shall ensure the horizontal and vertical clearances for the proposed Bridge Structure meet the requirements of the applicable bridge codes as per Article 4 – Structural Design Criteria and Requirements of this Part 2.

B. Under a scenario in which Project Co's proposed grade separation facility may involve a road-over-rail grade separation configuration, Project Co shall design and construct the proposed Bridge Structure and associated approach embankments on a realignment of the Leitrim Road corridor that will be located to the north of existing Leitrim Road, such that the existing section of Leitrim Road between the Track and Gilligan Road can be used as a paved municipal service road, herein referred to as Leitrim Service Road.

i Project Co shall design and construct all the necessary improvements on the Leitrim Service Road so that it can provide unobstructed access to / from the following properties located on the south side of the existing Leitrim Service Road at all times during the staged construction and ultimately upon the completion of Works:

1. [REDACTED]
 2. [REDACTED]
 3. [REDACTED]
 4. [REDACTED]
 5. [REDACTED]
- ii Project Co shall design and construct all the necessary improvements on Leitrim Service Road to provide a suitable vehicle turnaround facility for the Design Vehicle specified for this Roadway in Appendix A of this Part 2, as well as for the controlling municipal emergency and maintenance vehicles to service all existing private approach accesses on Leitrim Road per the requirements of Clause 6.8 – Design Vehicles of this Part 2.
- iii Project Co shall ensure the condition of the pavement structure for the intended service road meets the general service life requirements specified in Clause 6.10 – Pavement of this Part 2.
- C. Under a scenario in which Project Co's proposed grade separation facility may involve a rail-over-road grade separation configuration, Project Co shall satisfy the following requirements for Leitrim Road:
- i Project Co shall design and construct the proposed grade separation facility and associated improvements to accommodate all horizontal and vertical clearances, Roadway geometry, and appropriate cross sectional elements, including roadside barriers, grading, drainage, and pathway connection requirements for Leitrim Road and shall satisfy all associated Roadway design safety requirements as per the Design Criteria in Appendix A of this Part 2.
 - ii Project Co's design and construction shall provide for full access with appropriate sight lines for all properties affected by Works in both temporary and permanent improvement conditions.
 - iii Project Co shall undertake a traffic analysis study and determine the appropriate type of traffic control for a proposed MUP crossing that will be crossing Leitrim Road at a location on the east side of the rail-over-road grade separation facility under this scenario. Project Co shall prepare a traffic report, including the assumptions and results of the traffic analysis, concluding the design and

construction requirements of the intended MUP crossing facility and seek the City's approval 30 days prior to the PFDD submission.

- (ii) Project Co shall design and construct all the necessary Roadway improvements on Leitrim Road, Gilligan Road, and Leitrim Service Road, as applicable, per the Design Criteria requirements specified in Appendix A of this Part 2. Project Co shall design and construct a signalized intersection at the intersection of Leitrim Road and Gilligan Road, corresponding to the lane configuration requirements shown in Appendix B of this Part 2.
- (iii) Project Co shall undertake a detailed traffic analysis including an intersection level of service analysis as per the City of Ottawa's TIA Guidelines, and confirm the control type, storage lengths and geometry and general layout of all intersections on Leitrim Road and Gilligan Road, and Leitrim Service Road, as applicable, using projected traffic and transit volumes for a 2031 horizon year. Project Co shall submit a comprehensive traffic report and include the results and recommendations of the above-noted traffic analysis and seek approval from the City at the early stages of the preliminary design, and a minimum of 20 Business Days prior to initiating the detailed design per the requirements of Schedule 10 – Review Procedure.
- (iv) Project Co shall design and construct the proposed Roadway improvements for Leitrim Road, Gilligan Road, and Leitrim Service Road, as applicable, to include all necessary traffic staging detours and temporary access requirements such that all temporary and permanent Works are contained within the Lands as defined in Schedule 33 – Lands.
- (v) Project Co shall provide the appropriate lighting requirements, including but not limited to, adequate and uniform light levels, appropriate light standards and all associated underground infrastructure along Leitrim Road, Gilligan Road, and Leitrim Service Road, as applicable, within the limits of the Works, per the requirements specified in Clause 6.15 - Street Lighting of this Part 2.
- (vi) Project Co shall reference the information provided in Schedule 15-2, Part 7 - Traffic and Transit Management and Construction Access for the specific traffic staging and access management requirements for all private approaches from the existing Leitrim Road and Gilligan Road during staged construction and temporary conditions.
- (vii) Project Co's design and construction of the Roadway improvements for Leitrim Road shall meet the requirements of Clause 6.17 – Road Safety Audits and Road Safety Design Reviews of this Part 2.

(b) Lester Road

- (i) Project Co's design and construction of the Track and Guideway Structure over Lester Road shall accommodate and protect for the future widening of Lester Road without a need to undertake any modification or addition to the Guideway Structure facility when Lester Road corridor is widened in the future. Project Co shall design and construct the Guideway Structure to accommodate all horizontal and vertical clearances, Roadway geometry, and all future cross sectional elements, including grading, drainage, and pathway connection requirements, for the future widening of Lester Road. For additional design and construction requirements of the Track and Lester Road Guideway Structure, refer to Article 4 – Structural Design Criteria and Requirements of this Part 2.
- A. Project Co's design of the Guideway Structure shall account for all the following specific cross-sectional elements for Lester Road:
- i The ultimate cross section for future Lester Road widening will have a typical 4-lane rural arterial undivided cross section with side ditches.
1. General-purpose lanes shall be 3.75m for inside lanes and 3.5m for outside lanes (i.e. the lanes beside shoulder) in both eastbound and westbound directions of traffic.
 2. Paved shoulders shall be 3.0m under the Guideway Structure and transition to typical 2.5m paved shoulders in the sections away from the Guideway Structure.
 3. A 3.0m MUP is planned to run along the north side of Lester Road under the Guideway Structure. The MUP will be located 1.5m offset from the outside edge of the (westbound) shoulder. Away from the Structure, the offset between the MUP and the outside edge of the westbound shoulder shall transition to 4.5m.
 4. All future improvements for Lester Road shall accommodate a design speed of 90 km/hr, with a posted speed of 80km/hr.
- ii The horizontal and vertical clearances under the proposed Guideway Structure shall meet the requirements of the applicable bridge codes as per Article 4 – Structural Design Criteria, and the requirements of this Part 2.

(ii) Project Co shall design and construct all necessary Roadway improvements to accommodate the System requirements for the proposed HGCWD equipment specified in Schedule 15-2, Part 3, Clause 10.2 – Scope of Work and the proposed Systems Maintenance Service requirements specified in Schedule 15-3, Appendix A – Attachment 3 – Clause 2 – Service Requirements.

(c) Airport Parkway

(i) Project Co's design and construction of the Track and Guideway Structure over Airport Parkway shall accommodate and protect for the future realignment and widening of Airport Parkway without a need to undertake any modification or addition to the Guideway Structure facility when the Airport Parkway is widened in the future. Project Co shall design and construct the Guideway Structure to accommodate all horizontal and vertical clearances, Roadway geometry, and all future cross sectional elements, including grading, drainage and pathway connection requirements, for the requirements of the future widening of Airport Parkway. For additional design and construction requirements of the Track and Airport Parkway Guideway Structure refer to Article 4 - Structural Design Criteria, and the requirements of this Part 2.

A. Project Co's design of the Guideway Structure shall account for all the following specific cross sectional elements for the Airport Parkway:

- i The ultimate cross section for the Airport Parkway will have a typical 4-lane rural arterial divided cross section with side ditches:
 1. The ultimate cross section of the future Airport Parkway realignment and widening will have a minimum 6m wide concrete median at the location under the proposed Guideway Structure.
 2. The horizontal and vertical clearances under the proposed Guideway Structure shall meet the requirements of the applicable bridge codes as per Article 4 – Structural Design Criteria, and the requirements of this Part 2.
- ii The Airport Parkway alignment will be subject to a minimum grade raise of minimum 1.2m above the existing pavement elevations in order to account for the environmental geotechnical conditions associated with the nearby wetland areas in this section. Project Co's design shall account for this grade raise requirement in addition to the vertical clearance requirements under the LRT Guideway Structure.

- iii Future Airport Parkway improvements shall accommodate a design speed of 90 km/hr with posted speed limit of 80 km/hr.
- iv General-purpose lanes shall be 3.75m for inside lanes (beside the raised median) and 3.5m outside lanes (i.e. the lanes beside the shoulder) in both southbound and northbound directions of traffic.
- v Paved shoulders shall be 3.0m under the bridge structure and transition to typical 2.5m paved shoulders in the sections away from the structure.

(d) Uplands Drive

- (i) Project Co's design and construction of the LRT Guideway Structure over Uplands Drive shall accommodate and protect for the future widening of Uplands Drive without a need to undertake any modification or addition to the Guideway Structure facility when Uplands Drive is widened in the future. Project Co shall design and construct the Guideway Structure to accommodate all horizontal and vertical clearances, Roadway geometry, and all future cross sectional elements, including grading, drainage and pathway connection requirements, for the requirements of the future widening of Upland Drive. For additional design and construction requirements of the Track and Uplands Drive Guideway Structure refer to Article 4 - Structural Design Criteria, and the requirements of this Part 2.
 - A. Project Co's design of the Guideway Structure shall account for all the following specific cross-section elements for Uplands Drive:
 - i The ultimate cross section for Uplands Drive will have a typical 4-lane rural arterial undivided cross section with side ditches.
 - 1. A 3m MUP is planned to run along the east side (i.e. along the northbound shoulder) of future Uplands Drive widened corridor under the bridge. The MUP will be located 1.5m offset from the outside edge of the (northbound) shoulder.
 - ii The horizontal and vertical clearances under the proposed Guideway Structure shall meet the requirements of the applicable bridge codes as per Article 4 – Structural Design Criteria, and the requirements of this Part 2.
 - iii Future Uplands Drive improvements shall accommodate a design speed of 90 km/hr with posted speed limit of 80 km/hr.

- iv General-purpose lanes shall be 3.75m for inside lanes and 3.5m outside lanes (i.e. the lanes beside the shoulder) in both eastbound and westbound directions of traffic.
- v Paved shoulders shall be 3.0m under the bridge structure and transition to typical 2.5m paved shoulders in the sections away from the structure.

(e) Earl Armstrong Road

- (i) Project Co shall design and construct a Bridge Structure, including its approach embankments, in order to grade separate the proposed Earl Armstrong Road with the Track corridor at a location approximately 760m east of the existing Earl Armstrong Road / Bowesville Road intersection, where the new Track corridor shall cross the Earl Armstrong Road corridor.
 - A. Project Co's design and construction of the Bridge Structure shall accommodate and protect for the future widening of Earl Armstrong Road as per the Design Criteria requirements specified in Appendix A of this Part 2 without a need to undertake any modification or addition to the Bridge Structure built by Project Co when Earl Armstrong Road is widened in the future to the north side.
 - i Under a scenario in which Project Co's proposed grade separation facility may involve a road-over-rail grade separation configuration, Project Co shall construct an Overhead Structure for a 2-lane Roadway. The future widening of Earl Armstrong Road will be accomplished through the construction of a separate Overhead Structure to accommodate future lanes.
 - ii Under a scenario in which Project Co's proposed grade separation facility may involve a rail-over-road grade separation configuration, Project Co shall construct a Guideway Structure that spans over a 4-lane Roadway cross-section as per the information provided for the future Earl Armstrong Road widening in Appendix A of this Part 2.
 - B. Project Co shall ensure the horizontal and vertical clearances for the proposed grade separation Structure meet the requirements of the applicable bridge codes as per Article 4 – Structural Design Criteria, and the requirements of this Part 2.
- (ii) Project Co shall design and construct the Roadway improvements on Earl Armstrong Road per the Design Criteria requirements specified in Appendix A and lane configuration specified in Appendix B of this Part 2.

- A. Project Co's design and construction of the proposed Earl Armstrong Road shall accommodate and protect for the future widening, realignment, and associated improvements of Earl Armstrong Road as per the requirements of the City:
- i Under a scenario in which Project Co's proposed grade separation facility may involve a road-over-rail grade separation configuration, Project Co shall demonstrate early in the design process and design and construct the proposed Earl Armstrong Road improvements and realignment, including the Overpass Structure, to be located as far to the south as necessary within the Lands such that the Roadway and Bridge Works constructed by Project Co will not be impacted by the future construction of a separate Overhead Structure to carry two future westbound lanes. The Roadway and Bridge Works that will be constructed by others under the future Earl Armstrong Road widening and realignment improvements will provide for the two westbound lanes and associated cross section elements in the future. The cross section for the westbound lanes on the future 4-lane Earl Armstrong Road shall be a reflection of the eastbound lanes about the outside edge of the 2.5m north shoulder or the proposed Earl Armstrong Road cross section as described in Appendix A of this Part 2.
 - ii Under a scenario in which Project Co's proposed grade separation facility may involve a rail-over-road grade separation configuration, Project Co shall demonstrate early in the design process and design and construct the proposed Earl Armstrong Road improvements and realignment, including the Guideway Structure and associated embankment approaches, within the Lands such that the Roadway and Bridge Works constructed by Project Co will not be impacted by the future construction of Earl Armstrong Road realignment and widening. The Roadway Works that will be constructed by others under the future Earl Armstrong Road widening and realignment improvements will provide for the two westbound lanes and associated cross section elements in the future. The cross section for the westbound lanes on the future 4-lane Earl Armstrong Road shall be a reflection of the eastbound lanes about the outside edge of the 2.5m north shoulder or the proposed Earl Armstrong Road cross section as described in Appendix A of this Part 2.
 - vi Project Co shall demonstrate in an early stage of the preliminary design process and seek approval from the City a minimum of 60 calendar days in advance of the PFDD submission that a feasible

and economical design can be achieved for such a future widening and realignment improvements of Earl Armstrong Road that would meet the City's planning and design requirements.

- B. Project Co shall design and construct a signalized intersection at the intersection of Earl Armstrong Road and Bowesville Road and associated access requirements to the Bowesville Park and Ride Facility as per the requirements of this Part 2 and associated Appendices.
- C. Project Co shall undertake a detailed traffic analysis including an intersection level of service analysis as per the City of Ottawa's TIA Guidelines, and confirm the control type, transit priority measures as per City requirements, storage lengths, and geometry and general layout of all Park and Ride accesses on Earl Armstrong Road as required using projected traffic and transit volumes for a 2023 horizon year per the requirements of Schedule 15-2, Part 4 - Stations. Project Co shall submit a comprehensive traffic report and include the results and recommendations of the above-noted traffic analysis and seek approval from the City at the early stages of the preliminary design, and a minimum of 20 Business Days prior to initiating the detailed design per the requirements of Schedule 10 – Review Procedure.
- D. Project Co shall design and construct the proposed Roadway improvements for Earl Armstrong Road to include all necessary traffic staging detours and temporary access requirements such that all temporary and permanent Works are contained within the Lands as defined in Schedule 33 – Lands.
- E. Project Co shall reference the information provided in Schedule 15-2, Part 7 - Traffic and Transit Management and Construction Access, for the specific traffic staging and access management requirements for all private approaches from Earl Armstrong Road during staged construction and temporary conditions.
- F. Project Co's design and construction of the Roadway improvements for Earl Armstrong Road shall meet the requirements of Clause 6.17 – Road Safety Audits and Road Safety Design Reviews, of this Part 2.

(f) Bowesville Road

- (i) Project Co shall design and construct a Bridge Structure, including its approach embankments, to accommodate for the grade separation of Bowesville Road with the Track corridor at a location approximately 180m south of the existing Earl

Armstrong Road/ Bowesville Road intersection, where the new Track corridor shall cross the Bowesville Road corridor.

- A. Project Co shall ensure the horizontal and vertical clearances for the proposed Bridge Structure meet the requirements of the applicable Bridge codes as per Article 4 – Structural Design Criteria and Requirements of this Part 2.
- (ii) Project Co shall design and construct the Roadway improvements on Bowesville Road per the Design Criteria requirements specified in Appendix A and Appendix B of this Part 2.
- A. Project Co's design and construction of the proposed Bowesville Road shall accommodate and protect for future improvements of Bowesville Road as per the requirements of the City.
- i In addition to the requirements for the design and construction of the intersection of Earl Armstrong Road and Bowesville Road as described in Article 6.18 of this Part 2, Project Co shall undertake a detailed traffic analysis, including an intersection level of service analysis as per the City's TIA Guidelines, to determine future improvements for the southern leg at the intersection of Earl Armstrong Road and Bowesville Road, using projected traffic and transit volumes for a 2031 horizon year, for the purpose of accommodating the future Roadway cross section on the Bridge Structure so that any future improvements on Bowesville can be accommodated without the need to reconstruct or modify the proposed grade separated Structure and retaining walls/embankments
- (iii) Project Co shall design and construct all the improvements on Bowesville Road necessary to accommodate the requirements of the Bowesville Park and Ride facility including all the associated Roadway, intersections, and access improvements as specified under Clause 6.18(h) – Bowesville Park and Ride Facility of this Article 6, Schedule 15-2, Part 4 – Stations, and as a part of the scope of Works.
- (iv) Project Co shall design and construct a signalized intersection at the intersection of Earl Armstrong Road and Bowesville Road, including the associated access requirements to the Bowesville Park and Ride Facility, as per the requirements specified in Clause 6.18(e) and (h).
- (v) Project Co shall design and construct the proposed Roadway improvements for Bowesville Road to include all necessary traffic staging detours and temporary

access requirements such that all temporary and permanent Works are contained within the Lands as defined in Schedule 33 – Lands.

- (vi) Project Co shall reference the information provided in Schedule 15-2, Part 7 - Traffic and Transit Management and Construction Access, for the specific traffic staging and access management requirements for all private approaches from Bowesville Road during staged construction and temporary conditions.
- (vii) Project Co's design and construction of the Roadway improvements for Bowesville Road shall meet the requirements of Clause 6.17 – Road Safety Audits and Road Safety Design Reviews of this Part 2.

(g) Leitrim Park And Ride Facility

- (i) Project Co shall design and construct the Leitrim Park and Ride Facility to include a bus station Facility with dedicated space for public parking. The bus station Facility shall include a bus loop, bus bays, bus lay-bys and bus station Platforms, ensuring all necessary bus turning movements are accommodated per OC Transpo's Transitway and Station Design Guidelines.
 - A. The proposed improvements, and the specific functional and performance requirements, such as number of parking spaces, bus Platforms, bus lay-bys and bus bays required for the Leitrim Park and Ride Facility shall meet the requirements of Schedule 15-2, Part 4, Article 3 – Station Specific Architectural Design Criteria and Schedule 15-2, Part 4, Appendix A – Trillium Line Station Functional Requirements.
- (ii) Project Co shall design and construct all the proposed improvements at the Leitrim Park and Ride as per the standards and requirements specified in Clause 6.9 – Facilities Operated by OC Transpo of this Part 2, unless specified otherwise in Clause 6.18 – Municipal Roads Improvements of this Part 2.
- (iii) Project Co's design and construction of the Roadway improvements for Leitrim Park and Ride shall meet the requirements of Clause 6.17 – Road Safety Audits and Road Safety Design Reviews of this Part 2.
- (iv) Refer to Schedule 15-2, Part 6, Article 2 – Design Criteria for the connectivity, landscape and streetscape requirements for the Leitrim Park and Ride Facility.
- (v) Project Co shall design and construct all temporary bus detours, temporary transit operations, traffic staging and access management strategies to ensure access and current functionality of the existing Park and Ride Facility is maintained during staged Construction and temporary conditions. Refer to Schedule 15-2, Part 7 - Traffic and Transit Management and Construction Access for the specific improvements noted above.

- (vi) Project Co shall undertake a traffic analysis according to the City of Ottawa's TIA guidelines in order to determine the layout geometry, lane configuration, intersection improvements, and traffic control types for the Park and Ride Facility accesses and all impacted Roadways within the limits of construction of Works including but not limited to Leitrim Road and Gilligan Road.
- A. The analysis shall include, but not be limited to, a network analysis and an intersection operation and capacity analysis including traffic operations at the new Park and Ride Facility. In the analysis, Project Co shall also consider the projected traffic and transit volumes for a 2031 horizon year, existing and potential developments in the area, and connectivity for pedestrians and cyclists.
- i The results of the analysis shall include, but not be limited to intersection layout configuration, traffic control types, and auxiliary storage lane requirements.
- B. Project Co shall summarize and submit the findings from the analysis in a detailed report to the City of Ottawa for approval, a minimum of 20 Business Days prior to initiating the detailed design.
- (vii) Project Co shall design and construct all internal access road layouts to accommodate all mixed traffic access from Gilligan Road. The layout of the Park and Ride Facility shall accommodate the turning movements of the appropriate design vehicle according to Clause 6.8 – Design Vehicles of this Part 2 and Clause 6.9 – Facilities Operated by OC Transpo of this Part 2.
- (viii) Project Co shall design and construct the Leitrim Park and Ride Facility to include an exclusive bus access into the bus terminal area in such a way that delays to buses resulting from operating in mixed traffic (including pedestrian and cyclist traffic) are minimized.
- (ix) Project Co shall evaluate the existing conditions and provide any widening or Pavement improvements requirement of the existing roads to accommodate safe bi-directional operation of transit buses. Project Co shall design and construct the widening within the existing ROW and within Lands Schedule 33 – Lands.
- (x) Project Co shall design and construct all intersections to accommodate transit bus access and operations between the local road networks and the proposed Leitrim Park and Ride Facility.
- A. Project Co shall confirm the appropriate traffic control type and necessary intersection improvements required at all existing and proposed intersections and where warranted, shall install transit priority measures to provide precedence to transit operations.

- B. Project Co shall develop and confirm the type of transit priority measures appropriate for each intersection, and shall seek approval from the City and OC Transpo prior to proceeding with the implementation of the proposed transit priority measures.
- (xi) Project Co's design and construction of the Leitrim Park and Ride Facility shall not reuse the existing Pavement structure either partially or totally in the new improvements unless Project Co can satisfy the following conditions:
- A. Project Co shall undertake a traffic assessment, detailed field survey, geotechnical investigation to evaluate the existing ground conditions, Pavement structure, and associated drainage conditions of the existing parking Site.
- i Project Co shall identify any risks associated with the substandard drainage and underlying ground conditions, evaluate the existing Pavement failure patterns using pertinent pavement condition assessment guidelines and standards and report on the adequacy of the existing subgrade and Pavement structure. Project Co shall calculate the remaining service life of the existing Pavement structure using appropriate lab and field tests and design methods. Project Co shall develop Site specific improvements and Pavement rehabilitation strategies in the proposed design and construction of Leitrim Park and Ride Facility to demonstrate that an acceptable design service life of the Pavement can be achieved that can meet or exceed the requirements of Schedule 15-2, Part 2, Clauses 6.10 – Pavement, 6.11 - Grading, and 6.12 - Drainage of this Part 2 and Schedule 15-1, Part 1, Clause 4.3 – Design Requirements, Table 1-4.1.
- B. Project Co shall demonstrate in the proposed design and receive approval from the City of Ottawa that use of the existing Pavement in the proposed design and construction will not compromise the future expansion of the Leitrim Park and Ride Facility as specified in Schedule 15-2, Part 4, Article 3 – Station Specific Architectural Design Criteria.
- C. Project Co shall submit the findings, results, and recommendations of the above-noted investigations in the form of a comprehensive report and receive approval from the City of Ottawa prior to advancing the design that would make use of the existing Pavement in the proposed design and construction of the Leitrim Park and Ride Facility.
- (h) Bowesville Park and Ride Facility

- (i) Project Co shall design and construct the Bowesville Park and Ride Facility in the southeast quadrant of the Earl Armstrong Road and Bowesville Road intersection within the Lands. The proposed Bowesville Park and Ride Facility shall include a bus station Facility with dedicated space for public parking. The bus station Facility shall include a bus loop, bus bays, bus lay-bys, and bus station Platforms, ensuring all necessary bus turning movements are accommodated per OC Transpo's Transitway and Station Design Guidelines.
- A. The proposed improvements, and the specific functional and performance requirements, such as number of parking spaces, bus Platforms, bus lay-bys and bus bays required for the Bowesville Park and Ride Facility shall meet the requirements of Schedule 15-2, Part 4, Article 3 – Station Specific Architectural Design Criteria and Schedule 15-2, Part 4, Appendix A – Trillium Line Station Functional Requirements.
- (ii) Project Co shall design and construct all the proposed improvements at the Bowesville Park and Ride as per the standards and requirements specified in Clause 6.9 – Facilities Operated by OC Transpo of this Part 2, unless specified otherwise in Clause 6.18 – Municipal Roads Improvements of this Part 2.
- (iii) Project Co's design and construction of the Roadway improvements for Bowesville Park and Ride shall meet the requirements of Clause 6.17 – Road Safety Audits and Road Safety Design Reviews of this Part 2.
- (iv) Refer to Schedule 15-2, Part 6, Article 2 – Design Criteria for the connectivity, landscape and streetscape requirements for the Bowesville Park and Ride Facility.
- (v) Project Co shall design and construct all temporary traffic staging and access management strategies to ensure property accesses and current access to and from the entire existing local road network is maintained during staged construction and temporary conditions. Refer to Schedule 15-2, Part 7 - Traffic and Transit Management and Construction Access for the specific improvements noted above.
- (vi) Project Co shall undertake a traffic analysis according to the City of Ottawa's TIA guidelines in order to determine the layout geometry, lane configuration, intersection improvements, and traffic control types for any accesses to the Park and Ride Facility, and all impacted Roadways within the limits of construction of Works, including but not limited to Bowesville Road and Earl Armstrong Road.
- A. The analysis shall include, but not be limited to, a network analysis and an intersection operation and capacity analysis, including traffic operations at the new Park and Ride Facility. In the analysis, Project Co shall also consider the projected traffic and transit volumes for a 2023 horizon year,

existing and potential developments in the area, and connectivity for pedestrians and cyclists.

- i The results of the analysis shall include, but not be limited to determining the intersection layout configuration, traffic control types, and auxiliary storage lane requirements.
 - ii Project Co shall ensure that the proposed design of intersections and local road improvements meet the requirements of the City's future development planned in the area. Project Co shall engage the City early in the preliminary design process in order to incorporate in the design, the necessary information from the future planned developments that may impact the design within the limits of Construction.
- B. Project Co shall summarize and submit the findings from the analysis in a detailed report to the City of Ottawa and receive approval, a minimum of 20 Business Days prior to initiating the detailed design.
- (vii) Project Co shall design and construct all access roads required to accommodate all mixed traffic access from Bowesville Road and / or Earl Armstrong Road per the requirements of this Part 2 and Schedule 15-2, Part 4 – Stations. The layout of the Park and Ride Facility shall accommodate the turning movements of the appropriate design vehicle according to Clause 6.8 – Design Vehicles of this Part 2 and Clause 6.9 – Facilities Operated by OC Transpo of this Part 2.
 - (viii) Project Co shall design and construct the Bowesville Park and Ride Facility to include an appropriate access, or accesses, for buses and general traffic into the intended Bowesville Park and Ride Facility in such a way that delays to buses, pedestrian and cyclist traffic are all minimized.
 - (ix) Project Co shall evaluate the existing conditions and provide any widening or Pavement improvements requirement of the existing roads to accommodate safe bi-directional operation of transit buses. Project Co shall design and construct the widening within the existing ROW and within Lands as per the requirements of Schedule 33 – Lands.
 - (x) Project Co shall design and construct all intersections to accommodate transit bus access and operations between the local road networks and the proposed Bowesville Park and Ride Facility.
 - A. Project Co shall confirm the appropriate traffic control type and necessary intersection improvements required at all existing and proposed intersections and where warranted, shall install transit priority measures to provide precedence to transit operations.

B. Where warranted, Project Co shall develop and confirm the type of transit priority measures appropriate for each intersection, and shall seek approval from the City and OC Transpo prior to proceeding with the implementation of the proposed transit priority measures.

(i) Limebank Road

- (i) Project Co shall design and construct the Roadway improvements on Limebank Road per the Design Criteria requirements specified in Appendix A of this Part 2.
- (ii) Project Co shall design and construct a grade separation Bridge Structure, including its approach embankments, at a location approximately 300m south of the existing Earl Armstrong Road/ Limebank Road intersection, where the new Track corridor shall cross the Limebank Road corridor.

A. Under a scenario in which Project Co's proposed grade separation facility may involve a road-over-rail grade separation configuration, Project Co shall construct an Overhead Structure, including its associated approach embankments, to carry the proposed Limebank Road over the Track corridor.

- i Project Co shall design and construct the Overhead Structure to accommodate for a future widening of Limebank Road further south without the need to reconstruct the southern approach embankments for the Overhead Structure.
- ii The entire raised length of Limebank Road over the Track corridor shall meet the 4-lane divided cross section requirements as specified in Appendix A of this Part 2. Project Co shall design and construct an appropriate transition for the improved Limebank Road to change its cross-section from the 4-lane divided urban cross section to the existing 2-lane undivided rural cross section beyond the southerly limits of the proposed grade raise.
- iii The overall length of the Limebank Road Overhead Structure shall provide the span required to:
 1. Carry Limebank Road over the Track corridor, and,
 2. Accommodate a collector Roadway on the north side of the Track corridor, and a MUP on the south side of the Track corridor, as prescribed in Clause 6.18(i)(iii)(C) of this Part 2.

- B. Under a scenario in which Project Co's proposed grade separation facility may involve a rail-over-road grade separation configuration, Project Co shall construct a Guideway Structure, including its associated approach embankments, which spans over the Roadway cross-section as described in Appendix A of this Part 2.
- i Project Co shall design and construct the single span Guideway Structure to accommodate for a future widening of Limebank Road without a need to reconstruct any part of the Guideway Structure.
1. The design of the Guideway Structure shall also accommodate and protect for a collector Roadway cross section, on the north side of the Track corridor, and a MUP on the south side of the Track corridor, as prescribed in Clause 6.18(i)(iii)(C) of this Part 2.
 2. The design of the Guideway Structure shall also protect for a future MUP connection between the north and south sides of the Track corridor on the east side of Limebank Road (minimum 7.0m between the east abutment and the east edge of the Limebank Road ROW).
- ii Project Co shall design and construct an at-grade signalized intersection at the intersection of Limebank Road and Connector Road.
1. Project Co shall undertake a detailed traffic analysis, including an intersection LOS analysis considering vehicular and non-vehicular road user needs as per the City of Ottawa's TIA Guidelines, and confirm the intersection control type, storage lengths and geometry and general layout, using projected traffic and transit volumes for a 2031 horizon year, including cyclists and pedestrians.
 2. Project Co shall submit a comprehensive traffic report and include the results and approval from the City at the early stages of the preliminary design, and recommendations of the above-noted traffic analysis and seek a minimum of 20 Business Days prior to initiating the detailed design per the requirements of Schedule 10 – Review Procedure.
- (iii) Project Co shall accommodate a collector Roadway cross section, on the north side of the Track corridor and a MUP on the south side of the Track corridor, as described below.

- A. Project Co shall design and construct the collector Roadway north of the Track corridor, herein referred to as Connector Road. Project Co shall refer to Clause 6.18(j) for the scope of the design and construction requirements of Connector Road.
 - B. Project Co shall design and construct an appropriate transition required for Connector Road as per the requirements of Clause 6.18 (j)(i)(D) of this Part 2.
 - C. Project Co shall protect for a future MUP south of the Track corridor. The future MUP shall have a minimum clear width of 7.0m and a minimum overhead clearance of 3.0m.
- (iv) Project Co shall ensure the horizontal and vertical clearances for the proposed grade separation facility meet the requirements of the applicable Bridge codes as per Article 4 – Structural Design Criteria and requirements of this Part 2.
- (v) Project Co shall undertake a detailed traffic analysis, including an intersection level of service analysis, as per the City's TIA Guidelines, to confirm the traffic control types and storage lengths and geometry and general layout for the limit of the Works on the southern leg of the Limebank Road / Earl Armstrong intersection, as required, using a projected traffic and transit volumes for a 2031 horizon year and taking into consideration all associated pedestrian and cycling requirements. Project Co shall submit a comprehensive traffic report and include the results and recommendations of the above-noted traffic analysis and seek approval from the City at the early stages of the preliminary design, and a minimum of 20 Business Days prior to initiating the detailed design per the requirements of Schedule 10 – Review Procedure. Project Co shall provide for all additional intersection improvements as required on the southern leg of the intersection according to the results of the above-noted traffic analysis.
- (vi) Project Co shall design and construct the proposed Roadway improvements for Limebank Road to include all necessary traffic staging detours and temporary access requirements such that all temporary and permanent Works are contained within the Lands as defined in Schedule 33 – Lands.
- (vii) Project Co shall reference the information provided in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access, for the specific traffic staging and access management requirements for all private approaches from Limebank Road during staged construction and temporary conditions.
- (viii) Project Co shall refer to Schedule 15-2, Part 6 - Urban Design, Landscape Architecture and Connectivity Requirements, for the pedestrian and cycling

- connectivity, landscape and streetscape requirements for Limebank Road and associated intersecting Roadways.
- (ix) Project Co's design and construction of the Roadway improvements for Limebank Road shall meet the requirements of Clause 6.17 of this Part 2.
- (x) Project Co shall protect for future access to/ from Limebank Road as per the requirements of the most current Riverside South community design plans and guidelines.
- (j) Connector Road
- (i) Project Co shall design and construct the entire length of the proposed Connector Road between Main Street and Collector D.
- A. The basic cross-section elements for Connector Road between the Limebank Road grade separation facility and Collector D shall include an 8.0m wide 2-lane urban collector undivided Roadway with a 2.1m unidirectional cycle track, located between the collector road and Track corridor, and a 5.1m wide segregated pedestrian and cycling facility on the opposite side.
- B. Project Co shall design and construct an appropriate connection/transition to the southern limit of the Collector D to accommodate the required turning movements of the appropriate design vehicle according to Clause 6.8 and 6.9 of this Part 2.
- C. Project Co shall design and construct an urban collector undivided cross-section for Connector Road in the section between Main Street and the Limebank Road grade separation facility. The proposed cross-section of this section of Connector Road shall consist of the following elements:
- i 4-lanes urban undivided cross-section consisting of one 4.0m wide shared traffic lane and one 3.5m wide curbside bus stop lane to accommodate bus operations at Platforms in each direction of traffic;
- ii Design and dimensions of the proposed Station Platforms required in the eastbound and westbound directions of traffic and design and construction specifications shall be as per the City of Ottawa Transitway and Station Design Guidelines;
1. Project Co shall design and construct the Terminal Station Platforms for Limebank Station per the requirements of Schedule 15-2, Part 4 – Stations.

- iii Cycling and pedestrian facilities shall include:
1. 2.1m wide cycle track shall be located behind the proposed bus Platform and between the eastbound Station Platform and the Track corridor;
 2. A 2.0m wide boulevard shall be provided between the back of each Platform and cycle track, noted above, along the entire length of the bus Platforms; and,
 3. 3.0m wide sidewalk on Connector Road shall extend further west along the north side of the above-noted cycle track.
- D. Project Co shall design and construct appropriate tapers on Connector Road corridor to transition from the 2-lane cross-section on the east end of the Connector Road to the 4-lane cross-section on the west end of the Connector Road.
- E. Project Co shall refer to Schedule 15-2, Part 6 - Urban Design, Landscape Architecture and Connectivity Requirements, for the connectivity, landscape and streetscape requirements along Connector Road.

(k) Main Street

- (i) Project Co shall design and construct a 7.0m wide 2-lane urban collector undivided Roadway to connect the west limit of Connector Road to Earl Armstrong Road as per the following cross section:
- A. One travel lane in each direction (northbound and southbound) with the centerline matching the centerline of the ROW;
 - B. 1.8m wide sidewalk, adjacent to the curbline, on the east and west side between Connector Road and the proposed PPUDO locations;
 - C. 3.0m MUP, adjacent to the sidewalk, on the east side between Connector Road and Earl Armstrong Road; and,
 - D. For additional information regarding the cycling and pedestrian facilities for Main Street, Project Co shall refer to Schedule 15-2, Part 6 - Urban Design, Landscape Architecture and Connectivity Requirements.
- (ii) Project Co shall provide a PPUDO on both sides of Main Street in the vicinity of the intersection with Connector Road per the requirements of Schedule 15-2, Part 6 – Urban Design, Landscape Architecture and Connectivity Requirements.

- (iii) Project Co shall design and construct Main Street with consideration for a future southerly extension of the Main Street to the west of Limebank Station.
- (iv) Project Co shall design and construct two controlled intersections on Main Street. One intersection shall be located at the southern limit of Main Street where it connects to the west end of Connector Road, which shall provide for two controlled pedestrian crossings across both Main Street and across Connector Road. Project Co shall design and construct another controlled intersection at Main Street / Earl Armstrong Road intersection.
 - A. Project Co shall undertake a detailed traffic analysis to determine the requirements of both intersections noted above, including an intersection level of service analysis, as per the City's TIA Guidelines, to confirm the traffic control types and storage lengths and geometry and general layout for the limit of the Works, as required, using a projected traffic and transit volumes for a 2031 horizon year and taking into consideration all associated pedestrian and cycling requirements. Project Co shall submit a comprehensive traffic report and include the results and recommendations of the above-noted traffic analysis and seek approval from the City at the early stages of the preliminary design, and a minimum of 20 Business Days prior to initiating the detailed design per the requirements of Schedule 10 – Review Procedure. Project Co shall provide for all additional intersection improvements as required on the southern leg of the intersection according to the results of the above-noted traffic analysis.
 - B. The intersection of Main Street, Connector Road and Earl Armstrong Road shall accommodate the required turning movements of the appropriate design vehicle according to Article 6.8 and 6.9 of this Part 2.

(l) Collector D

- (i) Project Co shall coordinate with the City of Ottawa early in the design process and evaluate the existing conditions of Collector D and provide any widening or Pavement improvements required for the existing Roadway to accommodate the an appropriate transition and connection from Connector Road to Collector D. Project Co shall design and construct any improvements on Collector D within the existing ROW and within the Lands identified in Schedule 33 - Lands.

ARTICLE 7 GEOTECHNICAL DESIGN CRITERIA AND REQUIREMENTS

7.1 Reference Documents

- (a) Design and construction of all geotechnical and foundation Work shall comply with the criteria contained in this Article, and the Applicable Law, guidelines or practices applicable to the Project, including but not limited to the following Reference Documents. In the event of a conflict between the criteria, commitments or requirements contained within one document when compared with another, the more stringent shall apply:
- (i) Criteria contained in this Article;
 - (ii) Schedule 15-2, Part 2, Article 9 – Protection of Existing Adjacent Structures;
 - (iii) Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements;
 - (iv) Schedule 17 – Environmental Obligations;
 - (v) Municipal Standards according to Master Agreement including Schedule B, Appendix 2, Standard and Guidelines;
 - (vi) OBC;
 - (vii) NBCC;
 - (viii) CHBDC;
 - (ix) OPSS/OPSD;
 - (x) CSA;
 - (xi) ASTM;
 - (xii) CFEM;
 - (xiii) MOECC;
 - (xiv) PEO, Guideline for Professional Engineers Providing Geotechnical Engineering Services;
 - (xv) AREMA; and,
 - (xvi) OHSA and Applicable Law.

- (b) Project Co shall comply with the Applicable Law, design manuals or practices applicable to the Project, issued by all relevant third parties including MTO and the City. Project Co shall submit design and construction plan for all geotechnical and foundation works including excavation, backfilling, underpinning, modifications, monitoring and mitigation plans for review and acceptance by all relevant third parties including City, MTO, Utility Companies, other third party owners. Project Co shall comply with the following documents and requirements:
- (i) Schedule 10 – Review Procedure.
 - (ii) To prevent impact to third parties' structures in the alignment, all Construction Activities such as groundwater control, excavation, underpinning, modification, and support of excavation systems shall meet third party stakeholders' requirements. In particular:
 - A. For construction within or in the vicinity of the NCC land, specific design approaches shall be considered to avoid adverse impacts of construction dewatering operations on NCC land and other existing Structures; and,
 - B. For construction near or under the Highway 417 Bridge, specific design approaches shall be considered to prevent settlement of or other damage to the Bridge.

7.2 General Requirements

- (a) Geotechnical and foundations design shall be carried out in accordance with design concepts used in the reference documents listed in Clause 7.1 of this Part 2 such as the principles of LSD based on Load-and-Resistance Factor Design and WSD based on AREMA. The factors of safety and allowable stress for the Track supports should be based on the functional requirements of the structure.
- (b) Project Co shall perform a geotechnical subsurface soil and groundwater conditions assessment using available data for the entire Guideway and shall provide a detailed and complete set of geo-engineering design reports including geo-engineering Design Criteria with a tabulated list of geotechnical and hydrogeological design parameters. The basis for selection of the Design Criteria should be provided for all components of any underground structures, all components of any retaining and support of excavation structures, and at grade and elevated structures. In addition, Project Co shall prepare stratigraphic profiles along the Guideway with proper cross-sections particularly for the underground sections along the alignment that are to be constructed by Project Co. The stratigraphic profiles shall include anticipated distribution of the various ground types and hydrogeological regimes and conditions, and Reports shall be submitted in accordance with Schedule 10 – Review Procedure.

- (c) Project Co shall review all existing geo-environmental data and information and develop an Excess Materials Management Plan. Further details on environmental compliance and management requirements are provided in Schedule 17 – Environmental Obligations.
- (d) Project Co shall retain the services of qualified consultants who hold a Professional Engineers of Ontario Certificate of Authorization and practice as a geotechnical consultant. Geotechnical laboratories shall be certified by CCIL and shall have participated and met the MTO correlation program for soil testing. Environmental laboratories shall be accredited by the CALA for analytical tests.
- (e) Project Co shall retain the services of qualified consultants who hold an Association of Professional Geoscientists of Ontario Certificate of Authorization and practice as a hydrogeological consultant.
- (f) Project Co shall submit details of any proprietary geo-engineering systems, for review by the City in accordance with Schedule 10 – Review Procedure. Project Co shall demonstrate a minimum 10 years of successful performance on at a minimum of three projects of such geo-engineering systems. These three projects must be of a similar scale to the proposed use on this Project.
- (g) The frost penetration depth for Ottawa is 1.8m. Project Co shall consider this and ensure sufficient frost protection is provided for all Structures.
- (h) Project Co shall demonstrate project experience designing and building structures founded on the sensitive marine clays in the Ottawa area, locally known as Leda Clays, and shall retain personnel who have verifiable local design and construction experience with Leda Clay.

7.3 Foundations

- (a) Foundations for structures shall be designed such that their displacements (Serviceability Limit States, as defined in the relevant codes and standards) are compatible with the structural design, function and performance requirements, and clearance envelope requirements over their Design Life. When a WSD is used, the allowable stress shall be checked under the various loading combinations defined in the relevant Codes and Standards.

7.4 Permanent Cut and Fill Slopes

- (a) Permanent cut and fill slopes and geo-structures shall be designed according to applicable Standards and with adequate safety margin (such as factor of safety), as described in the relevant Codes and Standards.

- (b) Total and differential post-construction settlements along the Track bed or Pavement including those due to frost heave shall meet the requirements of Article 3 – Trackwork and Article 6 – Roadways, Bus Terminals and Lay-bys, of this Part 2. Project Co shall ensure that the smoothness and cross-slope requirements are met, ponding and sheeting of water is prevented, Pavement drainage is maintained, and the function of Constructions and ditches is preserved.
- (c) No vertical offset at longitudinal joints in Pavement surfaces shall be permitted after construction.
- (d) No vertical offset at longitudinal or transverse joints along Station Platforms, interior walkways or at building connections shall be permitted after construction.

7.5 Permanent Retaining Structures and Cut & Cover Structures

- (a) The following requirements apply to new cut & cover structures, new retaining systems, and existing retaining walls and cut & cover structures:
 - (i) Permanent water-tight underground structures on the alignment shall be designed to resist groundwater pressures and shall account for the Project flood level requirements provided in Article 5 – Drainage and Stormwater Management Design Criteria, of this Part 2.
 - (ii) The lateral earth pressure coefficient corresponding to the characteristic at-rest conditions (K_o) and appropriate to the adjacent native ground or backfill soils shall be applied to determine the magnitude of the characteristic earth pressure distribution. The K_o conditions must be determined and then reduced according to the proposed structure's characteristics (stiffness, deformability, etc.). Project Co shall estimate, or measure K_o by conducting testing using the appropriate standard methods in the field and in the laboratory;
 - (iii) Consideration of friction piles, micropiles and anchored systems for resisting uplift forces shall be incorporated into the cut & cover foundations design, provided redundancy is built in the design. For micropiles, the required redundancy shall be achieved by using adequate resistance factor provided that a testing program as indicated in OPSS 903 is followed. For frictional piles, adequate resistance factors with or without a load test shall be used in accordance with relevant design Codes and Standards. For anchored systems, the requirements as indicated in OPSS 942 shall be followed. The design reduction factor to be applied to the uplift resistance capacity of the friction piles and micropiles shall be based on the type of structure, loading, allowable displacements, and soil and groundwater conditions.
 - (iv) Project Co shall not utilize side friction between the soil and Underground Structure walls to resist uplift, unless Project Co can clearly demonstrate that side

friction can be relied upon and will not induce detrimental effects to the Underground Structure. Project Co shall not utilize side friction between the soil and structure walls that have an exterior waterproofing system to resist uplift.

- (v) All temporary excavation support systems for permanent cut and cover structures shall be carried out in accordance with Clause 7.7 of this Article.
- (vi) The upper 1.8m as measured from lowest adjacent grade shall be discounted in any axial and lateral load analyses to account for possible future excavations around the pile group.

7.6 Services

- (a) All services including installation and reconstruction of water and sewer lines, engineering fill application, pipe bedding, cover and trench backfill material shall conform to the City requirements, including but not limited to requirements of Article 8 – Utility Infrastructure Design Criteria, of this Part 2.

7.7 Temporary Slopes and Retaining Structures

- (a) The performance of each temporary Works shall be sufficient for its service life. All temporary Work shall comply with the OHSA, relevant design Codes and Standards and the Project requirements applicable at the time of excavation and the additional criteria:
 - (i) Temporary retaining structures shall meet the requirements of limiting ground movements, such as surface settlement, as stipulated under this Article;
 - (ii) Protection of Existing Adjacent Structures in accordance with Article 9 - Protection of Existing Adjacent Structures, of this Part 2;
 - (iii) Design, installation, and testing of tie backs shall follow OPSS 942;
 - (iv) Project Co shall comply with third party requirements for tie-back de-stressing as stated in this Article. Removal of temporary support system shall follow OPSS 539;
 - (v) Temporary unsupported excavation side slopes shall meet OHSA requirements; and,
 - (vi) All elements of temporary retaining structures within the upper 2m of the ground surface shall be removed and properly disposed of upon completion of backfilling.

7.8 Earthwork and Geo Environmental

- (a) Backfilling and reuse of excavated material on City property and ROW shall follow City Standards, Schedule 17 – Environmental Obligations and third party standards.
- (b) Buoyancy corresponding to inundation of the fill to the flood level shall be considered in the design of using lightweight fills. Permanent flood protection shall be provided for the area in which the fill is to be used. Fuel spills, salt, wheel loading, penetration from landscaping, and penetration from sign foundation shall also be considered.
- (c) Geo-Environmental requirements are specified in Schedule 17, Part 4 - Contamination and Excavated Material Management.

7.9 Geotechnical Instrumentation

- (a) Project Co shall determine and install geotechnical instrumentation in the key and critical areas described as follows where special attention or continued monitoring is required. As a minimum, Project Co shall determine instrumentation requirements, frequency and duration of monitoring for construction-induced noise and vibration, displacement and strains for fill embankments, groundwater elevation and pressure, ground movements adjacent to deep excavations, temporary retaining structures (including piles, struts and tiebacks), Tunnel and Tunnel portals, permanent retaining structures, Utility Infrastructure, hydro towers, existing rail Tracks, highways, Roadways, pathways, existing buildings, bridges or other Structures along the alignment that shall remain in service.
- (b) Design of the geotechnical instrumentation and monitoring program shall be under the direct supervision of a Professional Engineer.
- (c) Staff for the design and implementation of the geotechnical instrumentation and monitoring program shall include personnel who have verifiable design and construction experience with similar programs.
- (d) In accordance with all applicable laws, regulations, and by-laws (as amended), Project Co shall decommission and dispose of all geotechnical, hydrogeological, and/or geo-environmental instrumentation installed by Project Co or the City for the purposes of this Project, at the end of construction or after the instrumentation is no longer required for Project activities. Project Co shall decommission and dispose of any existing geotechnical, hydrogeological, and/or geo-environmental instrumentation, that is documented in the Background Information or that may not be documented and otherwise encountered by Project Co during construction, used for monitoring/not used for monitoring on, in, or under the Lands. Project Co shall obtain acceptance from the City prior to decommissioning and disposal of any existing geotechnical, hydrogeological, and/or geo-environmental instrumentation, that is documented in the Background Information or that may not be documented and otherwise encountered by

Project Co during construction, used for monitoring/not used for monitoring, on, in, or under the temporary Lands as defined in Schedule 33 - Lands. Project Co shall provide decommissioning records to the City.

- (e) GIMP: Project Co shall prepare a comprehensive GIMP and submit to the City for review in accordance with Schedule 10 - Review Procedure. The GIMP shall span the Project Operations for the duration of construction, testing, and Commissioning. As a minimum, the GIMP shall include the following:
- (i) A DMP which shall be a GIS-based system using a secure internet connection capable of receiving and visualizing near real time monitoring data. The DMP shall be used to create and send alarm reports/notifications and create monitoring reports including batch reports if Response Levels defined by Project Co and indicated in Article 9 – Protection of Existing Adjacent Structures, of this Part 2 are exceeded. Project Co shall provide access credentials to the City for simultaneous users for the DMP. Project Co shall set up the DMP such that the City is immediately notified of exceedances.
 - (ii) Appropriate geotechnical instrumentation for Stations, Structures and Tracks. The instruments shall be capable of collecting and transmitting continuous real time monitoring data to be incorporated and visualized in the DMP. Collecting and transmitting real time monitoring data shall not be required when monitoring Structures that will not experience adverse impacts due to dewatering induced settlement as a result of construction excavation, such as Structures founded directly on intact bedrock or deep foundations extending to bedrock.
 - (iii) All instruments including existing instruments turned over to Project Co by the City and instruments to be installed by Project Co.
 - (iv) Typical installation details and location of additional instruments.
 - (v) Schedule for installation, taking baseline readings, frequency and duration of monitoring for each phase of Construction.
 - (vi) Construction-induced noise and vibration control and monitoring plan.
 - (vii) The plan and schedule for decommissioning and disposing of all additional instruments installed by Project Co as well as all existing instruments turned over to Project Co. Project Co shall notify the City of the intention to decommission instruments.
 - (viii) All Response Levels (refer to Article 9 – Protection of Existing Adjacent Structures, of this Part 2), as specified and defined by Project Co.

- (ix) A Response Action Plan, which shall consist of methods and means to respond to various Review and Alert Level scenarios Article 9 – Protection of Existing Adjacent Structures, of this Part 2 based on types of geotechnical instruments that indicate Review Levels. Project Co shall inform the City of subsequent response actions in accordance with the Response Action Plan. At a minimum, Response Action Plan should include the following:
- A. Names, telephone numbers, and locations of persons responsible for implementation of contingency plans;
 - B. Materials and equipment required to implement contingency plans;
 - C. Location on Site of all required materials and equipment to implement contingency plans;
 - D. Step-by-step procedure for performing works involved in implementation of the contingency plans;
 - E. Specific actions related to the Alert Level values for all instruments, including means of reducing or eliminating movements and rates of movements;
 - F. Inspection of affected facilities, structures and Utilities and performance of acceptable corrective and restorative measures; and,
 - G. Clear identification of objectives of contingency plans and methods to measure plan success.
- (x) All measures and specific instrumentation and monitoring requirements to protect Existing Adjacent Structures in accordance with Article 9 – Protection of Existing Adjacent Structures, of this Part 2.
- (xi) All measures and specific instrumentation and monitoring requirements for protecting heritage buildings identified in the Project Assessment Study Environmental Project Report and relevant updated revisions which are within the Project ZOI as defined in Article 9 – Protection of Existing Adjacent Structures, of this Part 2.
- (xii) For all Underground Structures, Project Co shall provide, install, maintain, and monitor for the duration of construction, testing, and commissioning a system of instruments that will indicate the pressures and deformations imparted to the permanent structures. The instrumentation shall include:
- A. Two arrays of pressure cells with one array on each long side of the Station. Each array shall consist of three cells installed at three different

elevations (top, middle and bottom levels along the vertical side walls and away from end walls). Pressure cells shall be installed behind the water proofing system on the overburden side, including soil and rock, prior to start of concrete pouring for the walls.

- B. An instrument on both sides of the longest side of the Station to measure the deformations. This instrument shall consist of an array of either MEMS gravity sensors separated by special joints to measure tilt along three axes, or in-place-inclinometers, or equivalent.
- C. Install a minimum of 3 equally spaced surface settlement monitoring points on both sides of the excavation along a line perpendicular to the excavation, with the first monitoring point located at the edge of the excavation, the second monitoring point located at the farthest point no further away than the limits of the Project ZOI outlined in Article 9 – Protection of Existing Adjacent Structures, of this Part 2, and the third monitoring point located equally between the first and second monitoring points. These lines of monitoring points shall be spaced a maximum of every 30 m running parallel to the excavation.
- D. Install in-place-inclinometers on both sides of the excavation spaced a maximum of 50m running parallel to the alignment. Inclinometers shall be placed a maximum allowable distance of 1m from the edge of excavation.
- E. Install piezometers on both sides of the excavation spaced a maximum of every 50m. Project Co shall locate and monitor piezometers to ensure the groundwater drawdown restrictions of Clause 7.11, of this Part 2, are followed.
- F. All the above instruments shall be connected directly or indirectly to permanent data loggers. Connecting instruments to permanent data loggers shall not be required when monitoring Structures that will not experience adverse impacts due to dewatering induced settlement as a result of construction excavation, such as Structures founded directly on intact bedrock or deep foundations extending to bedrock.
- G. All of the above instruments shall have a minimum daily reading frequency, when located less than or equal to 30m from the edge of excavation, and a weekly reading frequency when located greater than 30m from the edge of excavation.
- H. Project Co shall submit an updated monitoring report in electronic format, in accordance with Schedule 10 – Review Procedure every week.

- (f) Project Co shall establish permanent reference monuments and deep surveying benchmarks as required along the alignment in accordance with the requirements of this Article 7.
- (g) Provide a demonstration of the features of the instrumentation DMP GIS based system to the City prior to the start of construction and afterwards as modifications are made to the website.
- (h) Meet with the City as needed to discuss instrumentation levels and necessary actions to protect EAS.
- (i) Replace damaged or malfunctioning instrumentation. The City may order a temporary work stoppage in areas where there is insufficient working instruments to ensure the protection of EAS.
- (j) Accommodate the City in inspecting the installation of geotechnical instrumentation, related hardware, and in verifying the proper functioning of the instrumentation monitoring system including, but not limited to the collection, transmission, storage, backup, and reduction of data.

7.10 Monitoring Requirements

- (a) Project Co shall integrate the following monitoring requirements in addition to other monitoring requirements outlined in Clause 7.9 of this Part 2.
- (b) Project Co shall incorporate into the monitoring program, data from existing condition surveys, including data provided by the City.
- (c) The monitoring reports prepared and submitted by Project Co shall be in accordance with the requirements of Schedule 10 – Review Procedure.
- (d) Monitoring shall include logs and survey notes which contain the following information:
 - (i) Record of measurements of in-Tunnel or other deformations;
 - (ii) Construction staging, loading or other construction activities associated with the Works in the vicinity of instruments; and,
 - (iii) Record of any cracks in, or damage to any Structures.
- (e) Project Co shall indicate locations where, due to contractual interfaces or changes in the extent of the Project ZOI Article 9 – Protection of Existing Adjacent Structures, of this Part 2, re-baselining of instrumentation readings shall be conducted.

7.11 Groundwater Control – Dewatering/Unwatering and Depressurization

- (a) For the purposes of Clause 7.11 of this Part 2, Unwatering is defined as the removal of water that has accumulated in a project excavation or Tunnel and is an element of groundwater control. Groundwater control is defined as dewatering/unwatering and/or aquifer depressurization.
- (b) Project Co shall develop and submit plans and procedures for groundwater control (including effluent discharge) in accordance with Schedule 10 – Review Procedure. The plans and procedure shall include, but not limited to the following items:
 - (i) Detailed shop drawings of the entire dewatering system(s) that bear the seal and signature of a professional engineer licensed in Ontario, and include, but not be limited to, details, and calculations of proposed type of dewatering system(s), showing arrangement, location, and depths of components of system including details of screens and filter media, complete description of equipment and materials to be used, procedure to be followed, standby equipment, standby power supply, and proposed location(s) of points of discharge of water and abandonment of dewatering system(s), a description of any permits and approvals that pertain to the groundwater control activities;
 - (ii) A discharge plan that includes: Discharge location(s) including methods; procedures and equipment to convey water to Discharge locations; location and dimensions of treatment equipment; procedures for water testing; water quality laboratory analyses procedures, test results or analyses, and water treatment methods; location and construction details of monitoring observation wells, a description of any permits and approvals that pertain to the discharge activities;
- (c) Project Co shall apply for Permits, Licenses, Approvals and Authorizations, including PTTW and/or Environmental Activity and Sector Registry, and discharge permits (e.g., Municipal, Conservation Authority and/or Environmental Compliance Approval).
- (d) Design, construction, and operation of groundwater control measures shall not induce detrimental short- and/or long-term movements of surrounding Structures, infrastructure, and ground surface. Evaluation of detrimental movements shall follow provisions included in Article 9 – Protection of Existing Adjacent Structures, of this Part 2.
 - (i) Project Co shall develop plans and procedures for groundwater control (including effluent discharge), establish monitoring requirements, and carry out a hydrogeological impact assessment and associated risk assessment and submit to the City in accordance with Schedule 10 – Review Procedure. This process shall consider all required project Permits, Licenses, Approvals and Authorizations. Project Co shall ensure that any groundwater control, effluent discharge, and subsequent effects during construction or during the Design Life shall have no

adverse impact on the following features within the Project ZOI: properties, adjacent Structures, infrastructure, active groundwater supply wells, and environmental features. Specifically, the following potential impacts shall be managed/mitigated such that they are not/do not become adverse:

- A. Groundwater drawdown effects including impacts on the quantity and quality of groundwater available for groundwater dependent ecosystems and existing groundwater users;
 - B. Groundwater drawdown effects which may cause settlement of existing Structures or Utilities within the Project ZOI as required in Article 9 – Protection of Existing Adjacent Structures, of this Part 2; and,
 - C. Appropriate quantity and quality of dewatering effluent with respect to the receiver (e.g., Municipal sewer, natural environment, off-site receiver, etc.), in accordance with all applicable project permits and approvals.
- (e) Project Co shall obtain RVCA review and approval for any activity within RVCA or SNCA Regulated Areas and all Works shall be carried out in agreement with the applicable requirements and regulations of RVCA or SNCA.
- (f) Project Co shall design, install, operate, monitor, maintain, and decommission (as required) the project-specific groundwater control systems, as necessary to meet Project requirements and shall continue proper discharging of effluent according to the relevant City's Sewers Use By-law, as well as any other applicable regulatory (e.g., Conservation Authority and MOECC) approvals without any interruption or negative impact on existing Structures. It will be the sole responsibility of Project Co to verify the condition of the groundwater control systems and operate them as required.
- (g) Project Co shall submit, on a quarterly basis, the data obtained from all instrumentation utilized for monitoring including hydrogeological and geotechnical instrumentation to the City for review in accordance with Schedule 10 – Review Procedure.
- (h) Project Co shall conduct all monitoring required by the obtained permits and approvals (including daily pumping volumes).
- (i) Project Co shall submit the monitoring results to the applicable agencies as stated in the obtained permits and approvals in accordance with Schedule 10 – Review Procedure.
- (j) Project Co shall respond to/address any complaints received that are potentially related to groundwater control activities.

7.12 Seismic Design

- (a) Seismic Site classification

- (i) Project Co shall complete a Site classification and seismic response study and provide a report to the City in accordance with Schedule 10 – Review Procedure. Site classification and seismic response shall follow NBCC and OBC as applicable.
- (b) Seismic Load
- (i) The design of the Underground Structures shall use a dual-level seismic design criterion with an upper level design earthquake to provide a life safety performance objective and a lower level design earthquake for operational performance objective. The design shall conform to Article 4 – Structural Design Criteria and Requirements, of this Part 2, and the following:
- A. The upper level design earthquake is an MDE where the probability of exceedance is approximately 4% in the 100-year Design Life, which corresponds to the 2% probability of exceedance in 50 years that is specified in the NBCC. The Underground Structures shall be designed with adequate strength and ductility to resist loads and deformations imposed on the structures during the MDE, thereby preventing Structure collapse and maintaining life safety; and,
- B. The lower level design earthquake shall be the ODE where the probability of exceedance is approximately 20% in the 100-year Design Life, which corresponds to the 10% probability of exceedance in 50 years that is defined by the GSC using the NBCC seismic hazard maps. When subjected to ODE, the Underground Structures shall be designed to respond essentially in elastic manner. There shall be no collapse, and no damage to primary structural elements. The Structure shall remain fully operational immediately after the earthquake, at a full operational status.
- (ii) The design shall use ground deformation analysis methods that account for soil-structure interaction in assessing the seismic effect on Underground Structures. Project Co shall perform in-depth numerical modelling, such as dynamic finite element and/or finite difference methods (as required).
- (iii) For partially buried structures (structures partially above ground and partially below ground surface), the design shall account for the effect of the above-ground portion.
- (iv) Interior structure not rigidly connected to the exterior Tunnel Structure shall be analysed using the response spectra method. Restrained structures that oscillate in phase with or are rigidly attached to the Tunnel shall be analysed using ground deformation methods.

7.13 Subsurface Investigations and Testing Prior to Construction

- (a) Project Co shall review all provided geo-engineering data and be responsible to undertake additional subsurface investigations to enable the detailed design and construction of the Project. Results of investigations shall be provided to the City in accordance with Schedule 10 – Review Procedure. The actual design basis shall conform to the available and additional geo-engineering data. Copies of any reports and interpretations provided by Project Co for design should be submitted to the City to review for design consistency purposes in accordance with Schedule 10 – Review Procedure.
- (b) All field and laboratory testing shall be carried out in accordance with Applicable Law including but not limited to CSA, MTO or ASTM standards. The locations and elevations of all boreholes, test pits, cone penetration tests, and other field testing or sounding locations shall be surveyed in accordance with the requirements of Schedule 15-2, Part 1, Article 4 – Design and Construction.

ARTICLE 8 UTILITY INFRASTRUCTURE DESIGN CRITERIA

8.1 Project Co General Responsibility

- (a) The timing of Utility Work including relocations shall be subject to operational constraints. Project Co shall coordinate the scheduling of all Utility Work including relocation work with the relevant Utility Companies.
- (b) Project Co shall be solely responsible for identifying the actual locations and condition of all existing Utility Infrastructure to complete the Utility Work, identifying all Utility Infrastructure relocation requirements, developing and preparing a Utility Infrastructure Relocation Plan, in accordance with Schedule 10 – Review Procedure and performing all required work to protect, safeguard, remove, and relocate Utility Infrastructure as required and obtaining requisite consents from and with all Utility Companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation, and or Commissioning of Utility Infrastructure in, on, under, over, or adjacent to the Lands. The Utility Infrastructure Relocation Plan shall include:
 - (i) identification of existing Utilities;
 - (ii) recommended Utilities Work;
 - (iii) assumptions and considerations;
 - (iv) approach to, and documentation of, communication and coordination with Utility Companies including articulating an understanding of Utility Companies' operational constraints;
 - (v) approach to communication and coordination with other Stakeholders including businesses and property owners;
 - (vi) approach to managing service interruption to Utilities customers including property owners;
 - (vii) providing early identification and approach to mitigation of impacts to critical Utility Work;
 - (viii) identification of, and applications for, Permits, Licenses, Approvals and Authorizations required for Utility Work;
 - (ix) evidence of coordination with all other Utility Infrastructure relocations in the same area; and,
 - (x) approach to supplying Utility services to the Project.

- (c) Project Co shall prepare and submit a Utility Infrastructure Relocation Plan to each Utility Company and a fully coordinated overall Utility Infrastructure Relocation Plan to the City, in accordance with Schedule 10 – Review Procedure.
 - (i) Project Co shall submit the following Utility Relocation Plans, without limitation:
 - A. Utilities on Airport Lands;
 - B. Water infrastructure along the alignment from the South Ottawa Pumping Station to Leitrim Road;
 - C. South Keys Station; and,
 - D. Fibre Optics parallel to the alignment.
- (d) Project Co shall provide to the City, copies of transmittals only, for all submittals provided to and from Utilities Companies within two Business Days of the date of each transmittal. For clarity, transmittals shall be provided to the City for information purposes only.
- (e) Project Co shall provide within two Business Days all documentation to and from Utilities Companies upon the City's request.
- (f) Project Co shall prepare and submit a written workplan, in accordance with Schedule 10 – Review Procedure, separate from the Utility Infrastructure Relocation Plan which shall include:
 - (i) durations and timelines for each Utility relocation and or other strategies, by location; and,
 - (ii) identifying dependencies and conflicts with overall Works Schedule.
- (g) Project Co shall be solely responsible for identifying the requirements for and obtaining all consents and approvals, including without limitation, crossing and other agreements in favour of the City from Utility Companies and others having rights over and an interest in the Lands, whether below, at, or above grade.
- (h) All Utility Work shall be in compliance with all relevant codes and standards of each Utility Company and with the requirements of all Governmental Authorities, and with the requirements of this Project Agreement.
 - (i) The Utility Work shall preserve the existing Utility Company network performance and existing capacity subject to relevant codes and standards of each Utility Company and with the requirements of all Governmental Authorities, where Project Co has identified that Utility Infrastructure shall be relocated or removed and replaced.

- (j) Project Co shall provide access within two hours of request from all Utility Companies to their respective Utilities. Project Co shall provide the City uninterrupted access to all watermain valves.
- (k) Project Co shall coordinate Utility Work with the overall System design such that any Operations, Maintenance, repair and/or replacement activities undertaken by the Utility Company shall not interrupt the Operation of the System.
- (l) Project Co shall not construct, install or permit the construction or installation of any Utility Infrastructure on, in, under or over the Lands or any part thereof without the prior written consent of Utility Companies, the City, and any other entity whose consent is required and without obtaining all required permits and approvals.
- (m) Project Co shall replace all surface and subsurface features and Utility Infrastructure disturbed, damaged or temporarily removed during the activities related to Utility Work and reinstate in accordance with the requirements of this Project Agreement.
- (n) All Lane Closures, detour routes, lane shifts and diversions required to undertake Utility Work shall be in accordance with the requirements of this Project Agreement.

8.2 General Provisions for Utility Work

- (a) Project Co shall coordinate and perform Utility Work so as to minimize impact to continuity of service and disruption to property owners and customers of the Utility Companies to the satisfaction of the Utility Companies, private Utility owners and the City.
- (b) Utility Infrastructure shall be relocated such as to provide access, acceptable to the Utility Company, for Maintenance and repairs. Sufficient width shall be provided to accommodate all required Utilities and provide the necessary clearances as determined by the Utility Companies and any applicable City Standards;
- (c) The demarcation point between any Utility service and the System shall be defined as the point where the responsibility of ownership transitions from the Utility Company to the owner. The location and configuration of demarcation points between any Utility service and the System shall comply with relevant Utility Company standards and industry practices between the Utility Company and its customers. Where no such appropriate Utility Company standards and industry practices exists, the location and configuration of demarcation points shall be mutually agreed upon between the Utility Company and Project Co.
 - (i) For [REDACTED], the civil demarcation point shall be defined as the point where the ownership of the civil infrastructure associated with electrical services transitions from [REDACTED] to the City. The location and configuration of the

civil demarcation shall comply with [REDACTED]. The electrical ownership demarcation point may not be the same as the civil demarcation.

- (ii) For [REDACTED], the electrical demarcation point shall be defined as the point where the ownership of electrical infrastructure transitions from [REDACTED] to the City. The location and configuration of the electrical demarcation shall comply with [REDACTED].
- (d) Project Co shall provide or maintain access to maintenance holes and watermain valves located outside the Guideway by rubber tire vehicle.
- (e) Project Co shall not construct, relocate or reinstate Utilities to new, reconstructed, or existing MTO-owned Bridge Structures.
- (f) Project Co shall not be permitted to attach, construct, or relocate any fluid carrying Utilities to new, reconstructed, or existing City owned Bridge Structures.
- (g) Project Co shall be permitted to reinstate non-fluid carrying Utilities into existing conduit on existing City owned Bridge Structures that are otherwise not reconstructed.
- (h) Project Co shall be permitted to attach new non-fluid carrying Utilities to new, existing, or reconstructed City owned Bridge Structures. Utilities shall not be permitted under sidewalks, in parapet walls or directly suspended from thin deck slabs.
- (i) Project Co shall encase all inter city fibre optic carriers ([REDACTED]) conduit or cable crossings of MUPs, Roadways, and Tracks, in split steel. Project Co shall encase all inter city fibre optic carriers' conduit or cable located beneath Platforms and Foundations in split steel.

8.3 Protection of Utilities

- (a) Project Co shall be responsible for protection and all repairs as a result of any damages caused by any actions, or neglect of any actions, by Project Co or any Project Co Party to Utility Infrastructure. Project Co shall further be responsible for ancillary costs related to maintaining normal levels of service or incurred by the Utility Company as a result of these damages. Refer to Article 9 – Protection of Existing Adjacent Structures of this Part 2 for the minimum CIAR requirements for existing Utility Infrastructure within the ZOI and the baseline performance criteria for Utility Infrastructure impact mitigation to be used in the development of the GIMP Response Action Plan.
- (b) All Utility Infrastructure located at Commercial Close, or thereafter, on, in, under, over, or adjacent to the Lands (including Utility Infrastructure within any excavation) shall remain in service and be protected and preserved by Project Co throughout the Construction Period unless otherwise agreed upon by the Utility Company.

- (c) Project Co shall be responsible for any damage done by Project Co or any Project Co Party to Utility Infrastructure throughout the Construction Period.
- (d) For all existing and new Utilities crossing the Lands, Project Co shall utilize and adhere to all requirements of the Transport Canada document titled “Standard Respecting Pipeline Crossings Under Railways TC E10”. Requirements for TC E10 shall apply for all Track segments irrespective as to whether they are subject to the jurisdiction of the Minister of Transport pursuant to the Railway Safety Act.
 - (i) For all existing gravity sewer pipeline crossings, where no record drawing information is available, Project Co may assume requirements for TC E10 are already satisfied or may be waived for pipe segments located beneath the existing track alignment. Where new sidings are constructed or changes to Track alignments relative to existing pipeline crossings are made, Project Co shall adequately uncover pipe segments and verify that TC E10 requirements are satisfied, and/or reconstruct, modify, or provide suitable protection to satisfy requirements of TC E10 as necessary.
 - (ii) For all existing watermain crossings under existing Tracks, where record drawing information is available, there are no requirements to further modify or provide additional protection to satisfy requirements of TC-E10, providing the Track alignment is unchanged from existing and no new sidings are added over the pipeline.
 - (iii) For all existing watermain crossings where no record drawing information is available, Project Co shall adequately uncover the pipeline crossing, assess the pipeline for adherence to TC E10, and reconstruct or provide suitable protection to satisfy requirements of TC E10 as necessary.
 - (iv) For all existing [REDACTED] pipeline crossings where no record information is available, Project Co shall include time for [REDACTED] to assess the pipeline for adherence to TC E10 with reference to the final Trackwork design, and where necessary, coordinate for [REDACTED] to reconstruct or protect the pipeline to satisfy requirements of TC E10.
- (e) Project Co shall maintain the existing OC Transpo optical fibre feed to the Transitway Stations during the Construction Period and for the duration of the Maintenance Period. Any temporary communications arrangements to maintain the OC Transpo communications network during Construction shall not disrupt OC Transpo operations or degrade existing OC Transpo network performance.

8.4 Project Utilities Services

- (a) Project Co shall be responsible for all Utility Work for all temporary and permanent Utilities services for the Project necessary to comply with the requirements of relevant standards, codes and approvals, as described in this Project Agreement.

8.5 Location and Condition of Utility Infrastructure

- (a) Project Co shall be responsible for identifying and ascertaining the locations and conditions of all Utility Infrastructure, located on, in, under, over or adjacent to the Lands and ensuring compliance at all times with the provisions of this Project Agreement. Project Co shall not rely solely on previous engineering work, location plans, as-built drawings supplied by Utility Companies or other similar documents for confirming locations of Utility Infrastructure.

8.6 Project Co Responsibilities for Utility Work

- (a) All Utility Work shall be performed by, or under the supervision of, and at the risk and expense of Project Co subject to the rights of Utility Companies to specify who will perform the Utility Work. Without limiting the generality of the foregoing, Project Co shall be responsible for:
 - (i) obtaining all rights of entry or access to the relevant Utility Infrastructure in connection with the Utility Work and providing access to the relevant Lands if such Utility Work is to be performed by the Utility Company;
 - (ii) identifying all requirements in respect of the Utility Work, including determining the most effective strategies for undertaking the Utility Work;
 - (iii) liaising, arranging, coordinating, and entering into all necessary agreements with relevant Utility Companies in connection with the Utility Work, including obtaining any necessary consents or approvals in connection therewith, providing access for inspections and providing information and plans during and following completion of the Utility Work;
 - (iv) obtaining all Permits, Licenses, Approvals and Authorizations for the Utility Work;
 - (v) observing and complying with any instructions or directions relating to the Utility Work that may be issued by the City on its own behalf or on behalf of a relevant Utility Company;
 - (vi) securing or causing to be secured the entry into or execution of all relevant design, construction, crossing, and maintenance agreements, service contracts, and other agreements in connection with the Utility Work;

- (vii) Project Co shall complete any Utility Infrastructure abandonment as per the standards of relevant Utility Company and City standards, guidelines and specifications. Abandoned underground Utility Infrastructure which results from the relocation of Utility plant, shall be removed up to the first Utility structural chamber beyond the abandoned sections;
- (viii) For telecommunication Utility Companies, Project Co shall design and install all necessary temporary and/or permanent Civil Works associated with the relocation of the Utility Infrastructure, which may include duct banks, maintenance holes, handwells, vaults, pads, etc. for the purpose of the installation of the relevant telecommunication Utility Company's plant. The Civil Works shall be installed as per the standards and specifications of the corresponding Utility Company;
- (ix) For [REDACTED] Project Co shall install all necessary temporary and/or permanent Civil Works associated with the relocation of the Utility Infrastructure, which may include duct banks, maintenance holes, handwells, vaults, pads, grounding grids, etc. for the purpose of the installation of the [REDACTED]'s plant;
- (x) For [REDACTED], Civil Works design for specialty structures inclusive of Bridges, vaults, viaducts, buildings, vent shafts and other [REDACTED] structures shall be Project Co's responsibility and shall be coordinated with other [REDACTED] Civil Works design. The Civil Works shall be installed as per the standards and specifications of [REDACTED];
- (xi) The new installation, modification, relocation, and/or upgrade all Utility services and related assets for existing and new Stations and other systems as necessary to meet Project requirements; and,
- (xii) The installation of any heating equipment required for Track switches from the proposed connection with the Utility Company that is supplying the Utility to such heating equipment.
 - A. Refer to Appendix G of this Part 2 for connection details related to the supply of electricity from [REDACTED] and natural gas from [REDACTED]. Project Co shall at their discretion, request and utilize any of the proposed Utility supply points. Proposed Utility supply points are provided at no cost to Project Co, as related to [REDACTED] and [REDACTED]. Project Co shall coordinate their requirements with the City. Supply coordinates listed in Appendix G of this Part 2 are approximate, and exact final supply point locations shall be designated by the Utility Company.

- B. Any propane supply storage tanks shall be provided by the City. Project Co shall co-ordinate with the City to confirm the number and location of such propane storage tanks. Project Co shall be responsible for all costs to install such supply tanks, and corresponding supply lines.
 - C. All works related to heating equipment required for Track switches shall form part of the Project Co Utility Works.
- (xiii) The provision of new or alteration of low voltage electrical services for streetlighting and traffic signals as coordinated by City signals and streetlighting departments.
- (b) The Utility Companies shall be individually responsible for the following work which will be covered in the Utility Company Works Cash Allowance as noted in Project Agreement Section 20.13. For clarity, only Utility Work explicitly described here shall be subject to cash allowance. Work by the Utilities beyond the Utility ownership demarcation point shall not attributable to the Utility Company Works Cash Allowance. [REDACTED] work beyond the [REDACTED] civil demarcation point including wiring, transformers and other connection assets shall not be subject to the Utility Company Works Cash Allowance. As exceptions, any [REDACTED] work associated with a change in supply point where there is an existing supply, or where a change in a proposed supply point is requested, additional supply points are requested, or an upgrade to exiting connection assets is required, shall not be subject to cash allowance:
- (i) Telecommunication Utility Companies shall be responsible for the design and installation of any temporary and/or permanent plant works including wiring, cables, fibres, equipment, etc., installed or placed in, on, over, under or through the Civil Works including connections to existing Utility Infrastructure that is associated with Utility relocation. Utility Works performed associated with new telecommunication services shall not be attributable to the Utility Company Works Cash Allowance;
 - (ii) Inter city fibre optic carriers ([REDACTED]) maintain duct structure and direct burial cable fibres adjacent to existing Trackwork along the Expanded Trillium Line alignment. The respective carriers shall be responsible for design and construction for relocation of fibre optic cables and related duct structures where in conflict with SI. Project Co shall coordinate with fibre optic carriers and City to arrive at a final design.
 - (iii) [REDACTED] shall be responsible for the design of all necessary temporary and/or permanent Civil Works, excluding specialty structures as per Clause 8.6 of this Part 2, associated with the relocation of the Utility Infrastructure, which may include duct banks, maintenance holes, handwells, pads, etc. for the purpose of the installation of the [REDACTED]'s plant.

- (iv) [REDACTED] shall be responsible for the design and construction of all temporary and/or permanent plant works required including wiring, cables, equipment, etc., installed or placed in, on, over, under or through the civil works associated with the relocation of Utility Infrastructure.
- (v) [REDACTED] shall be responsible for design and construction of all necessary temporary and/or permanent Utility poles, line cover-ups, and associated wiring with the relocation of Utility Infrastructure.
- (vi) [REDACTED] shall be responsible for the design and construction of all temporary and/or permanent plant works required including wiring, cables, equipment, etc., installed or placed in, on, over, under or through the Civil Works associated with the relocation of Utility Infrastructure, that is operated and maintained by [REDACTED] on OMCIA lands. Refer to “[REDACTED]” in the background information for clarity on underground electrical that is operated and maintained by [REDACTED].
- (vii) [REDACTED] shall be responsible for the design and construction of all necessary temporary and/or permanent civil works associated with the relocation of the Utility Infrastructure, which may include duct banks, maintenance holes, handwells, vaults, pads, etc. for the purpose of the installation of the [REDACTED]'s plant.
- (viii) [REDACTED] shall be responsible for the design and construction of all temporary and/or permanent plant works required including wiring, cables, equipment, etc., installed or placed in, on, over, under or through the Civil Works associated with the relocation of the Utility Infrastructure.
- (ix) [REDACTED] shall be responsible for design and construction of all necessary temporary and/or permanent Utility poles, line cover-ups, and associated wiring with the relocation of Utility Infrastructure.
- (x) [REDACTED] shall be responsible for all design and construction of all temporary and/or permanent works associated with required relocation for their plant. Works associated with new natural gas services shall not be included in the Utility Company Works Cash Allowance.
- (xi) The City shall be responsible for final connections for watermains equal or less than 406 mm in diameter. The City shall also be responsible for installation of new water services and water meters, and disinfection of new water infrastructure where required.
- (xii) [REDACTED] shall be responsible for all design and construction of all temporary and/or permanent works associated with required relocation, modification and/or inspection for their plant.

- (c) Project Co shall be responsible for the cost of any temporary electrical services and associated energy accounts.
- (d) Inter city fibre optic carriers ([REDACTED]) located in the rail ROW south of station 27+100 (Reference Concept stationing) shall be relocated by others as enabling works in 2018. Project Co shall be responsible for costs that are not attributable to Utility Company Works Cash Allowance, for additional relocations of fiber optic carriers south of station 27+100 (Reference Concept stationing).
- (e) Project Co shall be responsible for the cost of modifications or relocations of [REDACTED] transmission towers between Earl Armstrong Road and Bowesville Road and any such requirements shall not be attributable to cash allowance.

8.7 Watermain Requirements

- (a) All watermain design and construction shall conform to all relevant codes, standards and City of Ottawa Design Guidelines – Water Distribution 2010 and Technical Bulletins.
- (b) Project Co shall coordinate the scheduling of all watermain relocation work with the City.
- (c) Project Co shall be responsible for City of Ottawa drinking water permits related costs for final connections, testing, chlorination and Commissioning of all water related works.
- (d) All watermain designs shall be subject to review and final approval by the City in accordance with Schedule 10 – Review Procedure.
- (e) Timing for the temporary removal of watermains from service for relocation, protection, or facilitating other Construction shall be subject to operational constraints. The City will review requests for isolations on a case by case basis with consideration to:
 - (i) Hydraulic modelling performed by the City to verify that adequate supply of water can be maintained;
 - (ii) Seasonal demand variations, where typically Maximum Day Demands are realized May 15th to Oct 15th of any calendar year, and Basic Day Demands are realized elsewhere. Exact dates are dependent on recent climatic conditions and vary from year to year;
 - (iii) Other capital works or Maintenance activities which may impact the water distribution network;
 - (iv) Available redundancy in water distribution system to ensure acceptable levels of risk to normal service delivery are maintained;

- (v) Unforeseeable conditions due to system failures or Maintenance which may impact water service delivery;
 - (vi) Winter potable water treatment and production operation capacities which may be reduced with colder water temperatures;
 - (vii) For large diameter watermains (greater than 406mm), isolation requests shall be made a minimum of 60 calendar days in advance of the date required, specifying the extents and duration of the isolation in accordance with Schedule 10 – Review Procedure; and,
 - (viii) Known constraints on watermain isolations and the removal of watermains from service. Refer to the “Trillium Line Extension Project Drinking Water Operational Constraints Matrix” for specific references in this Article and other background information.
- (f) Construction of, or near large diameter watermains (greater than 406mm), in a pressurized or non-pressurized state shall be subject to requirements of CIAR submittals in accordance with Article 9 – Protection of Existing Adjacent Structures, of this Part 2. The City retains the right to reject construction means and methods where in the City's opinion there is unacceptable potential for impacting feedermain integrity and or threatening normal service levels in ongoing water service delivery. Requirements for Construction monitoring including but not limited to settlement and vibration monitoring may be imposed by the City as deemed necessary and shall be accommodated by Project Co.
- (g) Project Co shall provide full time qualified inspection services where constructing or altering large diameter watermains (greater than 406mm) and related infrastructure (valves, chambers. etc.) to witness and ensure quality control activities are completed at prescribed intervals, materials, material handling and construction are as per design specifications and is completed in accordance with industry standards, manufacturer and City standard specifications, report and take corrective action to remedy deficiencies where required.
- (h) Project Co shall engage a company that can demonstrate a minimum of 10 years of experience in large diameter watermain installation, three references where large diameter watermain installation has been provided within the last five years, and describe the experience of said company, as well as the individuals who shall be responsible for the management and services delivery and their relevant experience and qualifications, to the City in accordance with Schedule 10 – Review Procedure.
- (i) For pre-stressed concrete pressure pipe watermains with diameter greater than or equal to 610mm, the following coating, lining and mortar special provisions shall apply:

- (i) The concrete mortar exterior coating mix shall have properties that limit the potential for chloride-induced corrosion by reducing the permeability of the concrete coating. The exterior pipe mortar shall be type 10HSF cement with high quality 9% silica fume additive in accordance with AWWA C205. The high quality silica fume shall comply with C.S.A A23.5-M98. The exterior mortar shall have a thickness of 25mm measured from the outer edge of the prestressed wires. The cement coating shall be able to withstand occasional freezing/thawing cycles during the lifetime of the pipe.
- (ii) The pipe exterior surface shall be completely coated in the factory with a polyurethane coating 40 mils DFT Corrotect, as manufactured by SICO Inc. or an equivalent approved by the City. The coating shall pass an A.C. Holiday Detector Test set at a voltage of 4000 Volts. The adhesion of the Corrotect onto the concrete shall exceed 700 psi (4830 kPa).
- (iii) All piping with coatings and linings delivered to the Site shall be inspected for defects and cracks. Any repairs to coatings and linings shall comply with the applicable AWWA and ASTM standards. Any damages to the pipe exterior surface shall be repaired by cleaning the area affected and completely coating with a polyurethane coating 40 mils DFT Corrotect, as manufactured by SICO Inc. or an equivalent approved by the City. A pipe shall be deemed as extensively damaged and the pipe will be rejected if defects or damages in any section of a pipe are numerous or severe enough that, in the City's judgement, it would be unsatisfactory to make separate repairs to the coating or linings.
- (iv) The exterior pipe joints shall be made using a pre-packaged grout consisting of one part type 10HSF cement with high quality 9% silica fume additive, in accordance with AWWA C205, to two parts of chloride free sand. The high quality silica fume shall comply with C.S.A A23.5-M98. The installation of the field grout shall follow the manufacturer's recommendations. The joint shall be poured using a "Stretch Coat" bituminous diaper that will remain in place after pouring the grout. The addition of excessive water to the grout mix will reduce strength and shall not be tolerated. In order to seal the joints, the diaper shall overlap the pre-stressed concrete pressure pipe Corrotect coating by a minimum of 50mm. The exterior polyurethane coating shall be cut back (not applied) 60mm from both pipe ends to ensure that the poured diaper grout be in contact with the pipe exterior mortar cover for optimal adhesion.
- (v) Pipe interior joints shall be mortar lined to completely fill the gap with an NSF 61 compliant mortar. All interior exposed steel shall also be similarly mortar lined with an NSF 61 compliant mix. An NSF 61 compliant epoxy coating shall be factory applied to the exposed steel of the bell interior and spigot exterior at the pipe joint (around the gasket area), where interior joints cannot be mortar lined due to size restrictions. The epoxy shall have a minimum thickness of 20 mils.

- (vi) At the tie-in connection closure piece, the welded slip sleeve and any exposed steel shall be grouted. The joint shall be mortar covered with grout using a "Stretch Coat" bituminous diaper or shall be concrete encased with the encasement covered with a Bituthene 3000 waterproof membrane which shall be formed in place.
- (j) Project Co shall not construct Foundations above or within 3m horizontally of watermains or valve chambers.
- (k) Project Co shall not construct or relocate watermains or valve chambers beneath or within 3m of any Platform or Foundation. Project Co shall not construct valve chambers within 3m of Bridges.
- (l) Project Co shall relocate all water valves and valve chambers out of the Guideway.
- (m) Project Co shall not construct Bridges within 3m horizontally of valve chambers.
- (n) Project Co shall not construct Platforms over or within 3m horizontally of watermains or valve chambers other than where specified below:
 - (i) Station 31+245, 406mm private sleeved watermain crossing the existing Confederation Station Platform; and
 - (ii) Station 28+340, 406mm sleeved watermain crossing the proposed extended Greenboro Station Platform.

8.8 Storm and Sanitary Sewerage System Requirements

- (a) All storm and sanitary sewer design and construction shall conform to all relevant codes, standards and City of Ottawa Sewer Design Guidelines 2012 and Technical Bulletins.
 - (i) Project Co shall conduct a precondition survey by way of CCTV on all storm and sanitary sewers within the ZOI as per the City of Ottawa Standard Tender Documents for Unit Price Contracts, Volume 1 and 2.
 - (ii) Project Co shall conduct post construction condition survey by way of CCTV within 90 days on all storm and sanitary sewers within the ZOI as per the City of Ottawa Standard Tender Documents for Unit Price Contracts, Volume 1 and 2.
 - (iii) Project Co shall conduct post construction condition survey by way of CCTV at a minimum of one year following completion of Construction on all storm and sanitary sewers within the ZOI as per the City of Ottawa Standard Tender Documents for Unit Price Contracts, Volume 1 and 2.

- (iv) Project Co shall conduct post construction condition survey by way of CCTV within 90 days for all newly constructed or modified storm and sanitary sewers as per the City of Ottawa Standard Tender Documents for Unit Price Contracts, Volume 1 and 2.
- (v) For sanitary or combined sewers greater than 1500mm diameter, all CCTV condition surveys shall include sonar sensing technology.
- (vi) Project Co, at the City's request, shall conduct additional CCTV surveys or other condition assessments where in the City's opinion may be impacted by Construction Activities.
- (vii) Where CCTV reports are received and, in the opinion of the City, pipe sections are not of satisfactory cleanliness to adequately assess the condition of the pipe, Project Co, at the City's request, shall be required to clean the respective pipe sections and re-inspect.
- (viii) Project Co shall not construct Foundations over or within 3m horizontally of sewers.
- (ix) Project Co shall not construct Bridges within 3m horizontally of sewer maintenance holes.
- (x) Project Co shall not construct Platforms over or within 3m horizontally of sewers other than where specified below:
 - A. Station 31+250, 300mm sanitary sewer crossing the existing Confederation Station Platform. Adjacent maintenance hole access shall remain;
 - B. Station 27+660 to 27+640, 1050mm storm sewer crossing the proposed South Keys Station Platform;
 - C. Station 27+645, 900mm storm sewer crossing the proposed South Keys Station Platform;
 - D. Station 27+640, two 1200mm storm sewers crossing the proposed South Keys Station Platform;
 - E. Station 27+635, 1200mm storm sewers crossing the proposed South Keys Station Platform; and,
 - F. Station 36+075, 1650mm West Nepean Collector crossing the proposed Bayview pedestrian Platform connecting Bayview Station to the

pedestrian Bridge overpass. Adjacent maintenance hole access shall remain.

- (xi) Project shall not construct sewer maintenance holes within 3m horizontally of Bridges.
 - (xii) Project Co shall relocate all sanitary sewer maintenance holes out of the Guideway.
 - (xiii) Project Co shall relocate all storm sewer maintenance holes out of the Guideway unless the maintenance hole is part of a storm sewer system dedicated to Guideway drainage.
 - (xiv) Project Co shall not construct or relocate sewers beneath or within 3m horizontally of any Platform or Foundation.
- (b) The employment of inverted siphons shall be prohibited.
 - (c) All sewer designs shall be subject to review and final approval by the City.
 - (d) Construction of, or near large diameter sanitary or combined sewers (greater than 750mm), shall be subject to the requirements of CIAR submittals in accordance with Article 9 – Protection of Existing Adjacent Structures, of this Part 2. The City retains the right to reject means and methods where in the City's opinion there is unacceptable potential for impacting sewer integrity and or threatening normal service levels. Requirements for construction monitoring including but not limited to settlement and vibration monitoring may be imposed by the City as deemed necessary.

8.9 [REDACTED]

- (a) Refer to “[REDACTED]” for specific references in this Article and other background information.
- (b) [REDACTED] shall designate the Supply Point locations for the project’s electrical connections and the ownership, control, and Maintenance demarcation points between [REDACTED] distribution system and the Expanded Trillium Line. The proposed Supply Points and available capacities are listed in Tables 1-1, 1-2, and 1-3 of Appendix E of this Part 2. [REDACTED] will designate the final Supply Point.
- (c) [REDACTED] will operate up to the electrical ownership demarcation point and may operate the customer’s first protective device in from [REDACTED] distribution system. [REDACTED] clarifies the customer’s interface responsibilities with the connection agreement. [REDACTED] defines three areas of responsibility between itself and the customer’s interface: ownership demarcation (‘O’), electrical control authority (‘C’), and maintenance authority (‘M’). All electrical devices and support

structures on [REDACTED]’s distribution system receive unique identifying nomenclature with the required ‘OCM’ suffix indicating the defined roles.

- (d) In the [REDACTED]’s Offer to Connect, Installation & Service agreement and Operation & Maintenance agreement associated with each project electrical connection, the on-going roles, responsibilities, and ownership shall be defined between the Utility Company, the City, and Project Co. These agreements shall be executed between the three parties within 30 Business Days after the electrical detail design is approved for each Project electrical connection and before construction starts for each Project electrical connection.
- (e) Project Co shall utilize existing [REDACTED] supply points and connection assets where possible. Refer to Table 1-3, Appendix E for [REDACTED] existing supply point locations, existing feeder capacity and capacity ratings of existing Station transformers and service connection assets. Where existing capacity is not sufficient, or where an alternate Supply Point location is required, Project Co shall be responsible for any required [REDACTED] system expansion, removal, or abandonments and upgrade of connection assets, including primary switchgear, Station transformers, metering and related construction. Refer to Table 1-2 Appendix E for alternate [REDACTED] Supply Points locations and available capacity where existing capacity is insufficient and Project Co elects to change or upgrade the capacity of supply point.
- (f) [REDACTED] shall purchase, install and own Supply Point connection assets including primary switchgear, Station transformers and metering equipment.
- (g) Project Co shall be responsible for the costs associated with any temporary electrical services and associated energy accounts.
- (h) Project Co shall file detailed maximum Supply Point loading schedule and its assumptions with [REDACTED] at least two years before energization of the Station/Facility is required.
- (i) Project Co shall ensure that [REDACTED]’s control authority and staff has 24/7 access to its primary circuits to control the distribution system, ensure public safety, and replace failed components, and a maximum field Emergency response time of 60 minutes notwithstanding a Force Majeure. Typical circuit restoration times are outlined in the “[REDACTED] Information to Support the City of Ottawa’s Proposed light Rail System – Stage 2” report. Project Co shall ensure it has only one control authority over the Project’s electrical system.
- (j) Other than the Utility Works identified to be paid by the City, Project Co shall pay for the Utility Works that may occur due to a requested change by Project Co in the Utility Owner’s Supply Point location and / or any additional Supply Points required.

- (k) Other than the Utility Works identified in this Project Agreement to be paid by the City, Project Co shall pay for the Utility Works with the “connection assets” (the portion of the distribution system used to connect a customer to the existing main distribution system, and consists of the assets between the designated [REDACTED]’s Supply Point on a distributor’s main distribution system and the electrical ownership demarcation point with that customer) that will be owned by the Utility Owner.
- (l) Automatic load transfer schemes may be deployed by Project Co where redundant electrical servicing is required. Such schemes are subject to [REDACTED] approval and any such scheme will be required to be break before make (open transition of greater than 100 milliseconds) configuration. Automatic transfer schemes shall have provisions for remote monitoring and blocking to the [REDACTED] control centre. Procedures related [REDACTED] ATS blocking shall be developed with consultation to [REDACTED] and included in the [REDACTED].

8.10 Utility Works Special Provisions

- (a) Leitrim Watermain Reconfiguration and OMCIAA servicing modifications
 - (i) Project Co shall undertake Utility Work to relocate the 610mm watermain servicing the Uplands area from the Ottawa South Pumping Station to OMCIAA lands.
 - A. General requirements shall be as follows:
 - i Construction on OMCIAA lands shall only occur between October 2019 and March 2020. The golf course may still be operational.
 - ii Project Co shall maintain water service supply and existing zone pressure to all services affected during Construction. Project Co shall maintain uninterrupted minimum fire flow pressure to OMCIA during construction. The OMCIA is serviced from the Ottawa South Pumping Station’s 610mm watermain and operates at 152m HGL. The 2W2C pressure zone servicing Hunt Club and surrounding Ottawa South Pumping Station operates at 130m HGL. See background graphic “TRI_OMCIA Airport Water Pressure Zones_RA.pdf” for the pressure zones’ boundary limits.
 - iii All inspection port flanges required for inspection of watermains shall follow City Standard Design Drawings W-10, modified as follows:
 - 1. The minimum clearance between the top of the flange to the valve chamber top slab shall be 750mm.

2. The minimum diameter of inspection port gate valves shall be 150mm.
 3. Project Co shall provide access to ground level centered above the flange complete with frame and cover.
- iv All new valve chambers and valves shall be accessible within the City ROW or [REDACTED]. All new valve chambers shall have access provided outside the fence line of the Expanded Trillium Line Guideway.
- v All new or reconstructed watermain crossings to the Expanded Trillium Line alignment shall cross the Track perpendicularly.
- vi Isolation valves shall be provided such that all watermain segments may be isolated independently.
- B. Specific Construction requirements shall be as follows:
- i Modify existing VC00956 and construct a new valve chamber on the west side of the Expanded Trillium Line alignment, outside the ROW limits on OMCIA lands. Construct a new 610 mm watermain connecting VC00956 to the new valve chamber.
 - ii Provide a 610mm connection between the new 610mm crossing of the Expanded Trillium Line and VC01472, to allow interconnect between the 610mm watermain and 914mm watermain.
 - iii Construct a new 610mm watermain with 610mm isolation valve servicing OMCIA lands from the new valve chamber to the airport watermain WAT30463. The watermain shall be located on OMCIA lands with a minimum separation of 25m from Expanded Trillium Line Track alignment.
 - iv Abandon the existing 610mm service from VC90056 to watermain WAT30463.
 - v The existing 610mm watermain from VC90056 to Leitrim Road shall be exempt from requirements for protection or relocation as related to TC-E10. The City will remove the watermain from service when no longer required for service.
 - vi Abandon the existing 610mm connection between VC01471 and VC01472.

- vii Where valve chambers and/or mains are relocated/reconstructed to respect requirements of TC-E10 or facilitate other construction, Project Co shall:
1. Maintain all existing watermain connections, valves, and connectivity between valve chambers VC01473, VC01474, VC01324, and provide VC01707.
 2. Maintain a minimum 6m clearance between the 406mm and 610mm parallel watermains on Leitrim Road.
 3. Provide one top mount inspection port flange in a valve chamber between valve 372020F019 and valve 372020F015 for future inspection of the 914mm watermain between VC01472 and VC01543.
 4. Provide one top mount inspection port flange in a valve chamber between valve 372019F046 and valve 372020F015 for future inspection of the 914mm watermain between VC01474 and VC01543.
 5. Provide one top mount inspection port flange in a valve chamber between valve 372019F044 and valve 372019F040 for future inspection of the 914mm watermain between VC01474 and VC01475.
 6. For any constructed 914mm watermain, provide one top mount inspection port flange in a valve chamber between isolation valves for future inspection of the 914mm watermain.
- viii Project Co shall remove/fill/abandon all valve chambers, valves, and watermains no longer required for service.
- (b) Electrical service construction restrictions for the NRC Uplands Road campus on OMClAA lands.
- (i) Project Co shall undertake Utility Work on the NRC-owned electrical service lines and pole(s) supplying the NRC Uplands Road campus located on OMClAA lands with the following restrictions:
- A. Permissible electrical service shut-downs to the NRC Uplands Road campus shall be limited to:
- i 2-day weekends;

- ii A maximum of 4 weekends total; and,
 - iii All submitted shut-down dates shall be subject to approval by the NRC.
- B. Project Co shall provide the NRC with a minimum of eight weeks written notice of an electrical service shut-down.
- (ii) The NRC-owned electrical service lines and pole(s) up to the [REDACTED] demarcation point are privately owned and shall not be attributable to cash allowance.
- (c) [REDACTED] Crossing
- (i) For the [REDACTED] crossing at approximately Station 18+840, general requirements shall be as follows:
- A. Project Co shall apply for and obtain a crossing agreement with [REDACTED] for the Guideway crossing of the pipeline.
 - B. Preliminary design shall be submitted to [REDACTED] for assessment to determine if preparatory works are required. Preparatory works may include pipe replacement, casing, change in cover, exposing of pipeline for coatings and or inspections.
 - C. The design of any modification and/or protections of the pipeline shall be managed directly by [REDACTED] or through a company retained by [REDACTED]. Relocation of the pipeline requires NEB approval.

8.11 Enabling Utility Works

- (a) The Sponsor, in conjunction with [REDACTED] and [REDACTED], is proceeding with design for the relocation any of ducts, fibers, pedestals and handholes as far as practical from the proposed Track alignment, to minimize conflicts, protection requirements and further relocations to be coordinated with Project Co from Greenboro Station southwards. It is the intent to complete these relocations in 2018.
- (b) The Sponsor, in conjunction with [REDACTED] will relocate and protect the 200 mm gas main crossing the Trillium alignment at Young Street. Protection and relocation will be provided to satisfy TC E10 requirements and rock wall excavation in accordance with the Reference Concept Track alignment, and be completed by May 31, 2020.

8.12 Traffic Fiber Conduit Requirements

- (a) Project Co shall complete the works in accordance with the criteria contained in this Article, the Project Agreement and the Applicable Law, including but not limited to the latest edition of the City of Ottawa Standard Specifications and Drawings.
- (b) Project Co shall undertake Utility Work to provide an empty duct for City Traffic Operations Fiber Optic at six designated locations.
 - (i) General requirements as follows:
 - A. Project Co shall construct the empty duct within the Guideway Lands from the communications closets at the designated Stations to a breakout point for City Traffic Operations staff to connect to the existing fiber optic system. A handhole conforming to City of Ottawa Standard Drawing T-1 shall be provided at the breakout point for the connection. Hand holes or pull boxes shall be provided approximately at 80m intervals along the constructed duct.
 - B. The duct shall be 100mm PVC pipe which shall include a pull rope for the City to install the cables after construction, inspection, and acceptance of the installed ducts.
 - C. Project Co shall coordinate with City Traffic Operations staff such that Traffic Operations staff is able to pull cable and perform maintenance along the cable run, including along the light rail ROW, before the Expanded Trillium Line enters service.
 - D. The duct shall be installed underground in the Guideway and Roadway and shall be surface mounted on abutments and Bridge Structures.
 - (ii) Designated Locations Breakout Point Coordinates
 - A. Gladstone Avenue – Gladstone Station
 - i X – 366322.33
 - ii Y – 5029636.22
 - iii Z - 62.8 +/-
 - B. Heron Road – Confederation Station
 - i X – 368620.48
 - ii Y – 5026679.29
 - iii Z - 81.4 +/-
 - C. Walkley Road – Walkley Station

i X – 370103.59
ii Y – 5025793.38
iii Z - 90.8 +/-

D. Hunt Club Road – South Keys Station

i X – 371103.87
ii Y – 5023772.10
iii Z – 97.7 +/-

E. Leitrim Road – Leitrim Station

i X – 372758.97
ii Y – 5019960.83
iii Z - 103.2 +/-

F. Uplands Road – Uplands Station

i X – 370778.17
ii Y – 5021672.12
iii Z – 102.0 +/-

ARTICLE 9 PROTECTION OF EXISTING ADJACENT STRUCTURES

9.1 Scope

- (a) This Article provides requirements for the following:
- (i) Determination of the Project ZOI, as defined below, to assess the potential impacts to EAS due to the Construction Activities associated with the Works;
 - (ii) Criteria for evaluating impacts on EAS;
 - (iii) Development of mitigation measures as necessary to ensure safety and continued operation of the EAS; and,
 - (iv) Pre- and post-construction condition surveys.
- (b) Project ZOI shall refer to the area within and adjacent to the Works, including EAS, that potentially may be impacted by Construction Activities associated with the Works including dewatering.

9.2 General Requirements

- (a) Project Co shall:
- (i) Determine the limits of the Project ZOI and identify all existing structures and Utilities both above and below ground that are within the ZOI. Assess the effects of construction related ground movements including dewatering on these structures and identify the structures and Utilities that meet the definition of EAS. Prepare and submit for the City review a report in accordance with Schedule 10 – Review Procedure documenting anticipated impacts. Integrate the pertinent requirements of this Article into the report.
 - (ii) Based upon the report conclusions, design and implement mitigation measures as necessary to ensure that the structural integrity of EAS is maintained and that the appearance, functionality, operability, and durability of EAS are unimpaired.
 - (iii) Perform pre and post-construction condition surveys to document the condition of the EAS. Surveys shall be submitted in accordance with Schedule 10 - Review Procedure.
 - (iv) Mitigate and remedy all damage caused by Construction Activities associated with the Works, including demolition, to pre-existing conditions. A complete report, that includes all temporary and permanent corrective measures, shall be submitted after completion of construction confirming all damages had been remedied.

- (v) Project Co shall obtain necessary Permits, Licenses, Approvals and Authorizations from third party owners of the EAS to perform necessary Works. For communication protocols, Project Co shall follow Schedule 18 - Communications and Stakeholder Engagement Obligations. Project Co shall not use any existing permits to enter to the EAS that had been granted for other projects or other purposes.
- (vi) Ensure that Utility isolation or relocations do not affect the electrical safety grounding of EAS.

9.3 Qualifications

- (a) Determination of the ZOI, evaluation of impacts on EAS and the design and implementation of mitigation measures shall be undertaken by staff that have verifiable design and construction experience with similar programs and be directly supervised by a Professional Engineer.
- (b) The individual responsible for the surveyors shall be a registered land surveyor in the Province of Ontario with experience in measurements of the types of accuracies that shall be required for geotechnical instrumentation monitoring.

9.4 Design Requirements

- (a) Project Co shall:
 - (i) Obtain pertinent information of EAS and Utilities.
 - (ii) Obtain all specific design, protection and monitoring requirements from owners of Third Party Facilities including but not limited to City requirements for excavations adjacent to structures including bridge components and other structures and Utility Companies
 - (iii) More specifically, prior to undertaking any excavations, Project Co shall provide the predicted movements (vertical, horizontal, rotational, tilt, relative movement) for review by the City. For such excavations, a detailed real time (24/7) monitoring plan to monitor settlements, ground movements and tilting/movement of adjacent bridge components shall be implemented in the GIMP and made available on DMP. City structures staff shall be notified, according to the communication protocols stipulated in Schedule 18 - Communications and Stakeholder Engagement Obligations, if any Alert Levels are exceeded. Project Co shall provide modelling and assessment of the anticipated settlement in a CIAR-2 level report as well as a sensitivity analysis of the impact of varying settlement levels on the City bridges to be undertaken in 5mm increments.

- (iv) Complete EAS verification study to include confirming information related to EAS locations, dimensions, elevations, foundations, structural details, materials, and other information necessary to complete a deformation analysis of the structures. Perform field surveys, Utility locates, and foundation test pits as needed.
- (v) Deformation Analysis
- A. Project Co shall consider the available Site specific geotechnical reports and reference documents to identify the Project ZOI. The Project ZOI shall be determined by Project Co using engineering analyses and shall include all sources of ground movements that may be caused by Construction Activities associated with the Works including dewatering, for temporary and permanent structures. At a minimum the Project ZOI shall be as follows:
- i A horizontal distance from the edge of any supported excavation or temporary slope equal to twice the excavation depth as measured from the existing ground surface.
- B. Design Reports:
- i Prepare and submit CIAR-1 and CIAR-2 in accordance with the requirements of Schedule 10 – Review Procedure. CIAR-1 and CIAR-2 shall include magnitude and distribution of ground movements as well as potential impacts on EAS. CIAR-1 is applicable to:
1. First level of assessment and screening for all EAS.
 2. EAS such as low rise commercial buildings and single family residences that are assumed to be flexible small frame buildings.
 3. EAS which are absent of any large rigid grade beam elements, which may have the potential to attenuate ground settlements.
 4. Small, low-rise non-critical EAS where the predicted impact poses no risk to public safety or loss of functionality.
 5. Utilities within the Project ZOI.

- ii To assess the magnitude of impact to EAS and facilities, CIAR-1 analysis shall include the following tasks as a minimum:
 - 1. Review of literature on impact assessment methodologies.
 - 2. Conduct building and Utility inventory by identifying buildings and Utilities within the settlement trough using building type and use survey.
 - 3. Overall evaluation of EAS and facilities potentially at risk.
 - 4. Detailed definition of damage levels.
 - 5. Determine strain, settlement, and angular distortion limits for each building.
 - 6. Determine joint rotation, joint pull-apart, and tensile strain limits for each Utility.
 - 7. Determine EAS or locations requiring a further CIAR-2 analysis.
- iii CIAR-2 analysis is generally appropriate for EAS that meet any of the following criteria:
 - 1. EAS recommended by the findings of CIAR-1.
 - 2. Exterior cladding systems that generally consist of non-load bearing masonry, precast concrete or glass.
 - 3. EAS that generally include deep, multi-storey basements which could possibly alter the slope of the ground settlement profile
 - 4. Mid-rise and high-rise EAS.
 - 5. Critical EAS that are considered to be of historical or cultural significance, heritage buildings or essential services buildings and Utilities that exceed a CIAR-1 predicted impact levels.
- iv The representative EAS for CIAR-2 analysis, as a minimum, shall be selected based on the following criteria:
 - 1. Results of CIAR-1.

2. Proximity to the cut-and-cover excavation zone or dewatering zone.
 3. Potential to sustain cut-and-cover excavation or dewatering induced settlement impacts.
 4. Type and sensitivity of superstructure and cladding.
- v As a result of this selection process, the CIAR-2 analyses are expected to provide an estimate of the potential structural impacts due to Construction Activities. The results of these CIAR-2 analyses shall be used to predict excavation induced settlement impact to other similar EAS within the Project limits.
- vi Project Co shall use established numerical simulation methods such as finite element method or finite difference method. Simplified numerical methods and empirical methods may be used only for CIAR-1 for screening purposes.

(b) Impact Mitigation Design

- (i) Design Structure-specific mitigation measures needed to prevent a loss in appearance, structural integrity, functionality, operability and durability of potentially impacted EAS and ensure safety and continued operation of the EAS. Demonstrate the effectiveness of the proposed mitigation measures by engineering analysis. Confirm and document that the proposed mitigation is acceptable to all potentially affected EAS owners which shall also include but will not be limited to City structures and Utility Companies. Determine instrumentation monitoring requirements; include Review and Alert Levels in the GIMP; refer to Schedule 15-2, Part 2, Article 7 – Geotechnical Design Criteria and Requirements for evaluating the effectiveness of the mitigation measures during construction that is consistent with the means and methods for construction. The DMP, as stated in this Article, shall be used to create and send alarm reports/notifications if Alert Levels are exceeded. Project Co shall inform the City of subsequent response actions taken by Project Co.
- (ii) Project Co shall prepare a response action plan, as stated in Article 2 – Geometric Design Criteria for Track Alignment, of this Part 2, which shall consist of preliminary methods and means to respond to various Review and Alert Level scenarios based on types of geotechnical instruments that indicate Review and Alert Levels.
 - A. The Review Level is a geotechnical instrument reading that triggers a set of review and mitigation actions to ensure that the Alert Level is not exceeded. Review Level is set at 10 mm movement.

B. The Alert Levels is maximum permissible geotechnical instrument reading that triggers consideration of temporary work stoppage to prevent damage to EAS. Alert Levels is set at 25 mm movement.

C. Project Co shall adhere to the allowable joint pull-apart, joint rotation and tensile strain in table below for Utilities within the Project ZOI.

Material	Joint Pull-Apart (mm)	Joint Rotation (rad)	Tensile Strain ($\mu\epsilon$)
Cast Iron	15 ⁽¹⁾	0.0075 ⁽²⁾	150 ⁽¹⁾
Steel	25 ⁽²⁾	0.0075 ⁽²⁾	550 ⁽²⁾
Ductile Iron	25 ⁽²⁾	0.0075 ⁽²⁾	500 ⁽¹⁾
RCP	25 ⁽²⁾	12.5mm/diam. ⁽²⁾	300 ⁽³⁾
Brick & Concrete	NA	NA	150 ⁽³⁾
Precast Concrete	25 ⁽²⁾	12.5mm/diam. ⁽²⁾	300 ⁽³⁾

1. Bracegirdle et al. (1996)

2. CIRIA No. 30 (1992)

3. North American Tunneling Proceedings (2014)

D. Project Co shall develop limits for concrete pressure pipe joint pull-apart, joint rotation and tensile strain in accordance with the pipe manufacturer's recommendations and industry standards, whichever is the more stringent.

(iii) Project Co shall include in the GIMP all measures and specific instrumentation and monitoring requirements for protecting EAS within the Project ZOI as defined by Project Co.

(c) Pre, during- and post-construction condition surveys

(i) Project Co shall be solely responsible to perform required condition surveys for the purpose of inspecting and documenting the existing condition of EAS prior to, during and after construction. Record information about EAS damage or repairs, defects, unusual aspects of construction, presence of sensitive equipment, and similar pertinent information. Perform this work in accordance with Applicable Law, relevant standards, regulations and by-laws including but not limited to the City municipal code. Survey information shall be submitted in accordance with Schedule 10 – Review Procedure.

(ii) Where pre-construction condition surveys for EAS are performed by Project Co, survey reports shall be prepared and submitted for review in accordance with

Schedule 10 – Review Procedure. The survey reports shall consist, at a minimum, of the completed standard form, photographs with photo description log sheet, and DVD of digital video and digital photographs. The report shall be stamped by the Professional Engineer responsible for performing the survey.

- (iii) Perform during- or post-construction condition surveys for EAS where the Response Levels of structure movements or deformation have been exceeded, or a damage claim has been received.

9.5 Existing Adjacent Structures Owner Interactions

- (a) Project Co shall:
 - (i) Follow communication protocols established in Schedule 18 - Communications and Stakeholder Engagement Obligations, for interactions with EAS owners and other impacted or potentially impacted parties.
 - (ii) Work with owners of EAS to perform required inspections. Develop and implement, where required, acceptable mitigation measures and geotechnical instrumentation monitoring requirements and perform pre- and post-construction condition surveys.
 - (iii) The process of identifying impacts to EAS and developing monitoring and mitigation requirements shall generally be as follows:
 - A. Step 1: Owners of potentially affected EAS, as identified in the CIAR-1, shall be briefed of the CIAR-1 findings by Project Co.
 - B. Step 2: CIAR-2 shall be prepared and provided to potentially affected EAS owners and the City.
- (b) Project Co shall consider each of the above steps as iterative depending on specific requirements of individual EAS owners including but not limited to the City, Utility Companies and other owners of Third Party Facilities. Project Co shall be proactive and thorough in their approach.
- (c) Develop and maintain a schedule of the EAS and other stakeholders that rely on EAS. This document shall be updated as required and shall be used to track the completion of the impact assessments and obtaining acceptances of the monitoring and mitigation plans including review and approval by all relevant third parties including but not limited to the City, Utility Companies and other third party owners. Submit the updated document to the City on a quarterly basis in accordance with Schedule 10 – Review Procedure requirements.

9.6 Future Adjacent Construction Requirements and Protection of Expanded Trillium Line Infrastructure

- (a) Assist the City with the review of submitted documentation for proposed development throughout the Project Term. Project Co review comments will be used by the City for approval of Project Construction and implementation procedures required prior to construction of future adjacent projects to ensure that no adverse impacts will be caused to the System. Project Co shall coordinate and cooperate with the City with respect to the established development review process recognizing that:
 - (i) The City will be responsible for performing development reviews in accordance with the process;
 - (ii) The City will retain an independent consultant and/or utilize internal staff resources to undertake the development reviews;
 - (iii) The City will be responsible for screening development applications that require a development review; and
 - (iv) Project Co shall be responsible for reviewing and commenting on the draft development review findings at the request of the City.

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**SCHEDULE 15-2
DESIGN AND CONSTRUCTION**

**PART 3
DESIGN AND CONSTRUCTION REQUIREMENTS – SYSTEMS**

ARTICLE 1 INTRODUCTION

1.1 General Overview

- (a) This Schedule 15-2, Part 3 – Systems is written using design standards typical of North America unless otherwise specified.
- (b) Project Co shall declare and apply the selected standards consistently throughout the full range of the systems design.
 - (i) Project Co shall provide the systems in accordance with the requirements set out in this Project Agreement and any deviations or variances to the application of the selected standards shall be subject to approval by the City.
- (c) Project Co shall provide the systems to include the ability to support the Expanded Trillium Line and expandability in the future.
- (d) This section provides a description of the elements contained within the general heading of Systems. Project Co shall ensure that the systems include the following functional elements:
 - (i) S&TCS;
 - (ii) Communications systems
 - A. CTS;
 - B. PA/PIDS system;
 - C. CCTV system;
 - D. IAC system;
 - E. T&I system;
 - F. SCADA system;
 - G. Voice and Data Radio System; and,
 - H. Fare Collection (infrastructure only. Fare collection equipment provided by others).
- (e) Project Co shall design the system elements to include training support elements including system simulation and control servers, operator workstations, and trainer workstations for the following systems:

- (i) S&TCS; and,
 - (ii) TVS.
- (f) The City shall test, integrate, Commission and maintain responsibility for all communications equipment upstream of the Confederation Line's Bayview Station all the way to the head-end management platforms at the TOCC and BCC.
- (g) Project Co shall design, procure, test, integrate, Commission and maintain responsibility for the new S&TCS and TVS including the field equipment, servers, operator workstations and the head-end management platform to be installed in the TOCC and BCC.
- (h) Project Co shall have access to install their equipment in the TOCC outside of Peak Period (as identified in Schedule 15-3 – Maintenance and Rehabilitation Requirements), outside of special event hours, or other critical times (Emergencies or security events) as determined by the City. Back room equipment that needs to be installed within the IT room can be installed anytime during the day as long as there is no impact to the day to day operations, i.e. power shutdown.
- (i) Project Co shall coordinate all access to install their equipment into the BCC with the City.

1.2 Systems Element Summary

- (a) S&TCS – detailed in Article 10 – Signalling and Train Control System, of this Part 3.
- (i) Project Co shall design, procure and install the S&TCS head-end management platform. The head-end management platform for the S&TCS is the system architecture made up of both hardware and software that provides the command and control capability for the Expanded Trillium Line's new S&TCS. It includes new operator workstations in the TOCC, and BCC along with the graphical user interfaces connected to servers running industry standard operating systems, and the communications transmission infrastructure required to support operations, monitoring and alarm handling of the field equipment along the alignment. The City has reserved space in the TOCC and BCC equipment rooms for switches and servers as well as space in the TOCC and BCC operational theaters for user workstations to facilitate the transition of Train Control Operations from Montreal to the TOCC.
 - (ii) Project Co shall ensure that the S&TCS design is based on a proven ATC architecture supporting a wide range of operating environments as required for the SI.
 - (iii) Project Co shall ensure that the S&TCS is designed to maximize safety, reliability, operational flexibility and fault tolerance.
 - (iv) Project Co shall design the S&TCS to support the operational performance and service plan as described in Schedule 15-2, Part 1, Article 3 – Operational Performance Requirements.
 - (v) Project Co shall procure and install two new operator workstations for the S&TCS in the TOCC operational theater and one new operator workstation for the S&TCS in the BCC operational theater. Functions shall vary based upon the responsibility and access rights of the person who is logged on at that workstation at any given time.

- A. The three workstations shall include visual displays, keyboards, telephones, head-set connection and headset, microphone, printer, and portable radio station.
- (b) Communications systems - detailed in Article 2 – Communications Transmission System, of this Part 3.
- (i) Project Co shall design the Expanded Trillium Line to include new and existing Stations and the New Walkley Yard. Project Co shall design the new Stations to receive communications systems as detailed in Article 2 – Communications Transmission System, of this Part 3. Project Co shall design the system so that all communications systems are remotely monitored and operated from the TOCC and the BCC.
- (ii) The City shall purchase all required server licenses, software modifications, data storage, and any other systems expansion required to tie-in the new field equipment at the head-end Platform. Project Co shall integrate, test, and Commission all communications equipment in the field.
- (iii) Project Co shall retrofit the Existing Trillium Line Stations with new communications systems as detailed in Article 2 – Communications Transmission System, of this Part 3. Project Co shall upgrade and replace all field equipment, cabling, and cabinet equipment as required to meet the new system requirements. Project Co shall install new communications equipment on Platform areas including PA Speakers, PIDS, CCTV, and Emergency telephones as required. Project Co shall assess existing conduit, power cabling, power systems, and cabinet/enclosures for reuse to support the new communications field equipment. No existing spares will be turned over for the Existing Trillium Line communications system
- (iv) Project Co shall provide dual redundant hi-speed network nodes linked via a new fiber optic cable infrastructure that runs along the entire alignment including Airport Station, the Airport Link and to the Walkley MSF. Project Co shall tie-in to the Confederation Line CTS at Bayview Station. Project Co shall design and install a minimum 24 Strand fiber optic cable run from the fiber optic trunk cable to the CIHs, new Station communications cabinets and the New Walkley Yard.

1.3 Systems Engineering Principles

- (a) Project Co shall design and implement all systems described in this Part following the Systems Engineering principles in accordance with the requirements set out in ISO/IEC 15288 and as described in Schedule 15-2, Part 1 – General Requirements.
- (b) Project Co shall ensure that the systems engineering approach is applicable for all levels in the system hierarchy and for all disciplines.
- (c) Submittal requirements are outlined in Schedule 10 – Review Procedure.
- (i) Project Co shall implement a SEMP that outlines the engineering organization, the facilities needed and where they shall be located; the interaction between each of the engineering phases and what criteria is necessary to be completed prior to moving on to the next phase; each of the design phases and the requirements, processes and steps taken to successfully complete each; how technical issues shall be resolved; description of

- implementation planning including training of users; and a description of how production shall be managed;
- (ii) Project Co shall develop a Testing and Commissioning Plan in accordance with the requirements set out in Schedule 14 – Testing and Commissioning;
 - (iii) Project Co shall implement a Documentation Plan that outlines what documentation shall be produced and in accordance with schedule milestones either internal or external;
 - (iv) Project Co shall produce and provide the City with all Expanded Trillium Line Project asset data for incorporation into the CMMS; and,
 - (v) The City will provide the prescribed format to Project Co for development and incorporation of the Expanded Trillium Line Project asset data.

ARTICLE 2 COMMUNICATIONS TRANSMISSION SYSTEM

2.1 General Requirements

- (a) Project Co shall design, install and test a closed loop fiber cabling infrastructure to connect the existing Stations, new Stations, New Walkley Yard and CIHs to the TOCC and BCC via a connection to the existing CTS at the Confederation Line's Bayview Station. An internet connection for the CTS is not required.
- (b) Project Co shall coordinate with the City to establish the CTS connectivity to the TOCC and BCC. Project Co shall provide a minimum of two 48 strand fiber cables for the Expanded Trillium Line and connect to the Confederation Line's existing 48 strand fiber cables at the communication room at Bayview Station. The City shall reserve two strands within the Confederation Lines 48 strand fibre cable to provide connectivity from Bayview Station to the TOCC where the S&TC network equipment and head-end servers will be located. Out of each 48 strand fibre, a minimum of 24 strand fiber cables shall be provided for the exclusive use of the City. 24 of the 48 strands shall be brought to each Station on the Expanded Trillium Line and terminated on the fibre entrance cabinet. The remaining 24 strands shall be left as dark fiber for future use by the City. The City shall reserve one conduit in the E106 east conduit riser space and one conduit in the W110 west riser space for Project Co to pull the fiber cables into the communications room and terminate them at a new fibre equipment cabinet. Each fiber cable shall be pulled through a separate conduit for physical separation and route diversity.
- (c) Project Co shall provide all field equipment, cabinets, and conduit/cabling Infrastructure at the stations, CIHs and along the alignment.
- (d) The City shall reserve rack space at the TOCC for Trillium Line S&TC equipment including network switches and head-end servers in the data room.
- (e) The City shall reserve spare rack #2 for Trillium Line equipment in the communications room at Bayview Station that will house the Project Co provided core network switch together with the Project Co provided fiber patch panel and fiber termination equipment required to connect the Trillium Line CTS to the Confederation Line's CTS. The new rack will be lockable and access restricted to Project Co staff for maintenance and system troubleshooting. Project Co shall make the physical connections from the new rack to the existing Confederation Line's CTS equipment cabinets.
- (f) Project Co shall produce the design, procure (including Pre-delivery Testing), install, conduct PICO, SAT, SIT, Commission, and Maintain all communications field equipment from the new equipment installed at Bayview Station through all of the Expanded Trillium Line Stations.
- (g) Project Co shall provide technical support to the City during system integration testing of the communications systems from the head-end management platform in the TOCC and BCC to the field equipment.
- (h) Train Control data for the Expanded Trillium Line shall connect to the TOCC and BCC over the CTS see Article 10 – Signaling and Train Control, of this Part 3 for details.
- (i) Project Co shall ensure the CTS is capable of providing automatic protection switching for link recovery in case of failure. Project Co shall design the CTS so that if a complete fiber optic cable

break should occur, the system shall perform a loop back operation, isolating the fault, and maintaining communications with all that remains connected to the network. Project Co shall design the CTS such that should a major node failure occur, the network shall automatically create and startup a new configuration without the node. Project Co shall design the CTS such that all restoration times shall be limited to a maximum of 50 milliseconds.

- (j) Project Co shall provide the system of fiber optic Infrastructure including conduits or trenches, pull boxes, man holes and fiber optic splice enclosures required for the CTS extension.

2.2 Operational Requirements

- (a) The TOCC, located at 875 Belfast Road, Ottawa, Ontario and the BCC, located at 805 Belfast Rd, Ottawa, Ontario, includes all of the systems and subsystems necessary to provide the command, control, and monitoring necessary for the delivery of the services with the exception of the Expanded Trillium Line S&TCS dispatch function and the Trillium Line TVS.
- (b) The City shall purchase all required server licenses, software modifications, data storage, and any other systems expansion required to tie-in the new field equipment at the Confederation Line Belfast MSF head-end.
- (c) Data from the new communications systems shall be transported back to the TOCC and the BCC for the integration by the City into the Confederations Line's head-end management platform.

2.3 Network Configuration

- (a) Project Co shall design the CTS to include a WAN component and LAN component. Project Co shall design the LAN to provide local network traffic switching and aggregation of the network traffic at each Station, CIHs and TOCC/BCC for transport over the WAN.
- (b) The City shall integrate the CTS equipment with the existing NMS located in the main communications room located in the TOCC. The City shall purchase any additional software required to accommodate the system extension. The City shall integrate, test, and Commission the expanded NMS.

2.4 Performance Requirements

- (a) Project Co shall design the CTS expansion for the Project to include fibre optic and copper cable plant, network transmission equipment, and other equipment necessary for a complete communications network. Project Co shall provide a minimum of 50% spare port capacity for future City use of the CTS.
- (b) Project Co shall design and install a high bandwidth and fault tolerant system. The system shall be of a compatible design with that of the existing City system and shall have no single point of failure. Project Co shall design the CTSA to be configured in a path-diverse topology in order to minimize single point failure. Project Co shall design the CTS network equipment to support fast (sub-50 milliseconds) automatic network recovery (self-healing) in the event of a network link failure.
- (c) Project Co shall design the CTS to include redundant power supplies. Project Co shall design the CTS so that in the event of a power outage, the equipment shall remain operational for a

minimum of 4 hours through the use of uninterruptible power supplies. An additional 8 hours of power shall be provided through the use of generators.

- (d) Project Co shall procure the specified CTS equipment to be compatible with the existing NMS which will allow the CTS equipment to be managed and monitored by the existing NMS in the TOCC and BCC.
- (e) The core switches within the Stations shall have a minimum of 4 X 10Gbps ports to connect on the ring to the next Station on the loop and interconnect the core switches/routers.
- (f) The core network switches/routers within the Station shall be interconnected using two 10 Gbps fibre interfaces. The switches shall be sized for the port density required within each Station including network connections on each core network switch/router for local critical equipment such as SCADA, VOIP gateways and CCTV NVRs, and PA network interfaces. All systems equipment with two network interfaces shall connect to a port on each of the core Station switches or access switches. If the core network switches/routers do not have the port density to support all network equipment in the Stations then additional access switches with high network interface ports shall be supplied to connect to CCTV cameras, and other equipment that only support single network connections. The access switches shall be connected to each of the core switches for redundancy. The core network switches located in each station shall support at a minimum the following features:
 - (i) Standard 19" rack mountable
 - (ii) Dual redundant hot swappable power supplies connected to the UPS and a separate electrical panel feed. Field replaceable fans
 - (iii) Local switch management
 - (iv) Minimum switch fabric non-blocking throughput of 40Gbps
 - (v) Provide switch aggregation or switch stacking
 - (vi) Support minimum 4 x 10 Gbps interfaces
 - (vii) Support minimum of 20 additional ports either SM or MM fibre or 10/100/1000 TX
 - (viii) Support the following network protocols:
 - A. G 8032 Ethernet Ring Protection and/or MPLS and/or SPB IEEE 802.1aq;
 - B. IEEE 802.1Q VLAN Tagging;
 - C. IEEE 802.3ad Link aggregation;
 - D. IEEE 802.1 Prioritizing;
 - E. IEEE 802.3w Rapid Spanning Tree;
 - F. IGMP V2, V3;

- G. IEEE SBP Shortest Path Bridging;
 - H. IEEE 802.3af Power over Ethernet; and,
 - I. SNMP MIBs for remote management.
- (ix) Port Security:
- A. All ports shall be disabled unless specifically configured;
 - B. Port security can be set by MAC address, Sticky mac address, VLAN trunk; and,
 - C. Learned MAC address.
- (x) Switch Security:
- A. Switch shall require user and password to login; and,
 - B. Remote MIBs to support SNMP V3 for security.

ARTICLE 3 TELEPHONE AND INTERCOM SYSTEM

3.1 General Requirements

- (a) Project Co shall design the T&I system to provide emergency and non-emergency voice grade communications. Project Co shall design the system such that telephones that are VoIP be routed through the existing Confederation Line's telephone system. Project Co shall design the T&I system such that the emergency telephone systems (emergency and elevator help) provide a direct connection to the TOCC. Project Co shall ensure that Staff telephones are deployed in specific locations in the Stations to support operations. Project Co shall ensure that maintenance telephones are deployed in the CIHs, vent plants and the New Walkley Yard and shall route through the existing Confederation Line's telephone system. The City shall expand the existing Confederation Line's PABX to support the new telephones and purchase new licenses and expansion modules as required. Project Co is not required to procure or install a new PABX.
- (b) Project Co shall design, install, test and Commission all of the T&I system infrastructure hardware at the Expanded Trillium Line Stations including conduits and cables located in the field up to Bayview Station.
- (c) Project Co shall provide the conduit and cabling infrastructure for the public telephones at the Expanded Trillium Line Stations but the instruments themselves shall be provided, connected and tested by a third party supplier.

3.2 Operational Requirements

- (a) Project Co shall design, install, connect, integrate, test and Commission all station T & I equipment and all equipment necessary to connect the T&I system to the nearest network node for transport of voice communications back over the CTS to the TOCC and the BCC. Project Co shall design the T&I system to provide Emergency and non-Emergency voice-grade communications for the Project. Refer to Schedule 15-2, Part 4 - Stations for locations. The system shall include the following telephones:
 - (i) ETEL;
 - (ii) FTEL
 - (iii) HINT;
 - (iv) ICP Phones
 - (v) ITEL;
 - (vi) STEL;
 - (vii) MTEL;
 - (viii) HFI; and
 - (ix) Public Telephones (by others).

- (b) The City shall upgrade the existing head-end management platform at the TOCC and BCC and the Confederation Line's existing PABX to accommodate the new T&I system equipment installed at the stations and the voice being brought back via the CTS.

3.3 Performance Requirements

- (a) Project Co shall design the VoIP ETELs, STELs and ITELs to be routed through the Confederation Line's PABX to the City's existing PABX.
- (b) Project Co shall ensure the Emergency and information telephone location/signage be properly identified to match the Confederation Line locations/signage. Emergency and information telephones shall be identical to existing phones including branding.
- (c) Emergency telephones shall be rated for outdoor use, with IP66 rated enclosures, and vandal-resistant. Refer to Schedule 15-2, Part 4 – Stations for location information.
- (d) Project Co shall design the Emergency telephones and elevator help telephones to interface with the CCTV system to automatically provide video of the area from where the call is being generated to the operator workstations at the TOCC and BCC, as defined by the Safety and Security assessment.
- (e) Project Co shall provide service telephones at each vehicle gate of the Airport Emergency route crossing to facilitate communication with the TOCC for non-Emergency access to the crossing.

ARTICLE 4 PUBLIC ADDRESS SYSTEM/PASSENGER INFORMATION DISPLAY SYSTEM

4.1 General Requirements

- (a) Project Co shall ensure all of the Expanded Trillium Line Stations are equipped with a PA/PIDS system to broadcast live and recorded announcements of arrivals, departures, general and Emergency/security information from the PA/PIDS console located in the TOCC and BCC. Project Co shall ensure the PA system provides uniformly distributed audio throughout public areas of the Stations. Project Co shall design the PA system to be synchronized with the Vehicle announcements for the Expanded Trillium Line to ensure that Station Platform announcements do not overlap/compete with onboard vehicle announcements.
- (b) Project Co shall design, procure and install all necessary conduit, cabling, mounting bracket hardware at each of the existing stations and each of the new stations.
- (c) Project Co shall procure, install, test and Commission the PIDS signs to accommodate message format being sent from TOCC and BCC.
- (d) Project Co shall design each new Station with PIDS signs to provide up-to-date, specific, location-based, visual operational and safety-related messages for Passenger awareness. Project Co shall design the PIDS to be individually addressable and shall be accessed from the existing PA/PIDS console located in the TOCC and BCC. Project Co shall ensure that under normal operating conditions, information presented on the PIDS shall include, but not be limited to: date, time, arrival time and destination of the next two Trains, safety messages, Train delays, holiday schedules, and other ad-hoc messaging. Project Co shall ensure that in an Emergency condition, the PIDS display both pre-programmed Emergency announcements and simultaneous visual display of the PA system Emergency announcements.

4.2 Operational Requirements

- (a) The City shall upgrade the Confederation Line's head-end management platform at the TOCC and BCC to accommodate the new signs installed on the Expanded Trillium Line.
- (b) The City shall be responsible for all licenses and fees associated with new hardware and software procured for the Expanded Trillium Line System.
- (c) Project Co shall design the PA/PIDS system to integrate with the existing GUI which shall serve as the means of interface between the system and the operator. The existing PA/PIDS servers are located at the Belfast MSF.
- (d) Project Co shall design the PA/PIDS system to integrate with the Expanded Trillium Line Trains and systems in order to provide accurate countdown messages to the Platform displays and for Train arrival messages over the PA system.

4.3 Performance Requirements - PA

- (a) Project Co shall design, procure, install and test the PA system at each of the new and existing stations including cabinets, speakers, microphones, amplifiers, DSPs, message storage equipment, etc.

- (b) The City shall upgrade the Confederation Line's head-end management platform at the TOCC and BCC to accommodate the new PA system equipment installed on the Expanded Trillium Line.
- (c) The City shall design and procure all appropriate head-end hardware/servers required to be installed in the Belfast MSF.
- (d) The City shall procure all licenses and pay all fees associated with new head end hardware and head end software required for the Expanded Trillium Line System.
- (e) Project Co shall design the PA system such that announcements are addressable to single and multiple zones within individual and/or groups of Stations. Separate zones with separate amplifying channels and speaker systems shall be accessible individually or in combination. The Project Co PA system design at Stations shall have up to five zones covering each Platform, mezzanine, and ancillary area.
- (f) The Project Co PA system design and installation shall maintain a uniformly distributed sound level at least 10 dB above ambient Station operating noise level measured at 1.5m above floor. Stations SPL shall be not less than 60 dB plus or minus 30 degrees off axis, 1.5m above the floor, at Vehicle ambient noise level.
- (g) The Project Co PA system design shall ensure that the automatic gain adjustment be provided based upon ambient noise levels captured by ambient noise sensors. The Project Co PA system shall adjust volume and clarity in proportion to the increase in noise level from a pre-set quiet level.
- (h) Project Co shall design and install a PA system capable of playing pre-recorded messages in both English and French.
- (i) Project Co shall design the PA system such that the component failures are minimized by redundancy. Project Co shall design a PA system with an availability (i.e. availability of all system hardware, cabling) greater than 99.9%.
- (j) The Project Co PA system shall be fully supervised with failure annunciation at the TOCC and BCC of all major system components such as preamplifiers, power amplifiers, supervision detectors, and power supplies.
- (k) Project Co shall design the PA system such that announcements from TOCC and BCC are delivered to the Station PA controllers over the CTS using TCP/IP. Each local PA Controller/DSP shall include a digital message store that will contain a digitally encoded set of pre-recorded messages and/or audio message “niblets” (e.g. .WAV files) that can be triggered from the TOCC/BCC or YCC via a short message code.
- (l) Project Co shall design the PA system such that in the event of a power outage, the PA system shall remain operational for a minimum of four hours through the use of uninterruptible power supplies. An additional 8 hours of power shall be provided through the use of generators.
- (m) The Project Co PA system design shall accept several competing inputs with successful transmission designated according to priorities as described in Clause 4.4 (d) below.

(n) The Project Co PA system design shall work in conjunction with the PIDS system to provide synchronous broadcasting of audio and visual pre-recorded announcements and to provide near-synchronous transmission of live announcements.

(o) The on-board system shall be capable of audio and visual messages on the Train in both English and French including accents on both upper and lower case letters as required

4.4 Performance Requirements - PIDS

(a) On each Platform, Project Co shall provide PIDS displays such that at least one display is visible and legible from any location along the Platform edge. Project Co shall ensure that Two-Platform Stations whether side or centre 90m in length have a minimum of two PIDS spaced no further than 30m apart. Longer Platforms may require additional PIDS. Project Co shall provide separate displays for each Platform edge on center Platforms. Project Co shall place displays to maximize visibility throughout the Platform area. Refer to Schedule 15-2, Part 4 – Stations for locations in accordance with ADOA requirements.

(b) The City shall integrate the Expanded Trillium Line's PA/PIDS system with the existing centralized message generator and dispatch functions at the existing PA/PIDS workstation in the TOCC and BCC to address individual zones, Stations, groups of Stations, or System-wide announcements for PIDS installed on the System. Project Co shall design the Expanded Trillium Line's Stations to have zones covering each Platform, mezzanine, and ancillary area that correspond with the PA system zones.

(c) Project Co shall integrate the PA/PIDS with the S&TCS to enable countdown messages at the stations on the PIDS and arrival messages on the PA system. Project Co shall design the PIDS with the capability of displaying messages in both English and French. Project Co shall design the PIDS such that all pre-programmed messages are provided in both languages.

(d) Project Co shall design the PIDS to accept several competing inputs with successful transmission designated according to assigned priorities. With the exception of item (i) below, message priority shall be controlled by the head and established as part of the message configuration in the order below:

- (i) Trigger from locally initiated emergency PA messages (PID sign displays a default message);
- (ii) TOCC/BCC initiated emergency messages entered by the TOCC/BCC operator;
- (iii) Train event messages (Train approach, departure, station closure, etc.);
- (iv) Informational messages (scheduled or ad-hoc); and,
- (v) Arrival/departure time messages.

(e) If required by relevant codes and standards, Project Co shall provide local microphones at each Station that allows ESP to make the highest priority PA announcements at those Stations pre-empting any messages from the head-end. In Stations that require an ICP, a local microphone shall be located at the ICP. These Station initiated PA announcements shall trigger a default PID message (e.g. "live message") and inform the head-end PIS (via SCADA) on the microphone's

usage. This message priority scheme shall allow emergency messages to pre-empt other message categories, and for approach/departure and informational messages to be rotated. Train approach and departure PA announcements (and PID messages when Train approaches/departs) will take priority over general messages.

- (f) Project Co shall design the PIDS to work in conjunction with the PA system to provide synchronous broadcasting of audio and visual pre-recorded announcements and to enable near-synchronous transmission of live announcements.
- (g) The City shall integrate the PIDS into the existing head-end management platform to be fully supervised with failure annunciation at the TOCC and BCC of all major system components such as PIDS displays, Station controllers, and power supplies.
- (h) The City shall ensure that all Expanded Trillium Line PIDS announcements are logged in a database on the existing head end PIDS system servers.
- (i) Project Co shall design all PIDS to display Station date and time, which shall be synchronised with the existing central time server over the CTS.
- (j) Project Co shall design the PIDS such that in the event of a power outage, PIDS equipment shall remain operational for a minimum of four hours through the use of uninterruptible power supplies. An additional 8 hours of power shall be provided through the use of generators.
 - (i) Project Co shall design the PIDS such that signs shall be blank when the sign is not operational.
- (k) Project Co shall ensure that all PIDS signs shall be environmentally housed to prevent damage from moisture, dust, and vandalism and installed at a minimum height of 3.048m.
- (l) Project Co shall design the PIDS to be rated for outdoor use, with IP66 rated enclosures, and vandal-resistant. Refer to Schedule 15-2, Part 4 – Stations for location information.
- (m) Project Co shall provide functionality that enables the PIDS to provide real-time berthing location information to customers for arriving and departing 40m and 80m Trains. The PIDS shall direct Passengers to the appropriate waiting area when a 40m Train is arriving at an 80m Platform.

4.5 PID Signs

- (a) Physical / Functional Attributes
 - (i) The overall size inclusive of housing shall be no larger than 1500mm (W) x 475mm (H) x 300mm (D), to accommodate space constraints along the Platforms. Refer to Schedule 15-2, Part 4 – Stations for location information.
 - (ii) The PID sign shall have a maximum weight of 70 Kg (for double-sided signs).
 - (iii) The PID signs shall feature the following characteristics:
 - A. Less than or equal to 8mm resolution pitch.

- B. High contrast display using a monochromatic amber colour LED full matrix on a black glare-free background (590nm wavelength).
- C. Ambient light adjustment - automated dimming of LEDs using ambient light sensors. E.g. in a darkened ambient light condition, LEDs would be dimmed to prevent eyestrain.
- D. All outdoor PID signs shall be equipped with sunlight readable LED's (up to 5000 cd/m² (nits) brightness level if required).
- E. Wide viewing angle (minimum 120 degrees horizontal and vertical).

(b) Mechanical Attributes

- (i) The PID sign shall be modular and designed for ease of service taking into consideration the clearances around the PID sign (reviewing adjacent architectural elements and spacing).
 - A. Keyed power switch and internal electronics accessible from the front top hinged doors, and;
 - B. Easily replaceable LED modules.
- (ii) The PID housing shall be vandal and graffiti resistant with break, shatter proof, and scratch resistant display glass, resilient against dust, discoloration, atmospheric pollutants and salty dust.
- (iii) PID signs should be able to sustain frequent cleaning using commercially available cleaning products approved by the manufacturer.
- (iv) The PID housing shall be constructed of aluminum, galvanized steel and/or stainless steel.
- (v) The PID housing components and fasteners shall be corrosion resistant.
- (vi) The PID housing colour shall be provided by the City.
- (vii) The PID signs shall be mounted from two HSS supports within which will run the power and data cables (installation by Project Co).
- (viii) Under a regular scheduled maintenance program, the Design Life of the PID signs shall be 20 years.

(c) Electrical

- (i) The main power supply shall be 90-132Vac, 1 phase, 60 Hz (110Vac nominal)
- (ii) Data connection - the PID sign shall accept either UTP CAT6 or Fibre depending on the distance to the network switch.
- (iii) The PID shall have CSA approval.

- (iv) The cable routing and conduit design shall be performed by the Project Co.
- (d) Data Communication
 - (i) Connectivity with the head end systems shall be through the CTS.
 - (ii) The PID signs shall be connected to PID controllers via a dedicated IEEE 802.3, which in turn shall interface with the CTS via dedicated IP switch ports in the Station's communications room.
 - (iii) A VLAN shall be created within the CTS that will segregate all PIDS traffic.
 - (iv) The PIDS shall use open standard communication protocol.
 - (v) Ethernet connection at 10/100 Mbps minimum using TCP/IP protocol.
 - (vi) Each PID shall have an addressable unique IP address.
 - (vii) Each PID shall have a unique alphanumeric ID.
 - (viii) Standard messages may be either sent from the head end system, or stored locally in the PID controller's local digital message store and be broadcast in response to instructions sent from the central equipment in the Belfast MSF.
 - (ix) The PID shall optionally have wireless WiFi 802.11b/g/n connectivity.
 - (x) The PIDS network shall be designed to handle an estimated network load of 100 kbps.
 - (xi) Each PID sign shall interface to a local network connected PID Controller (local digital message store) which shall communicate with the head-end PIDS to receive message content and in turn drive content to the PID signs. The PID sign controller shall be situated in the PID sign itself, or centrally in the Station communications room to manage all PID signs at the Station.
- (e) PID Layout Design
 - (i) The PID shall be ADA compliant spacing (in term of character height) as given below:
 - A. Character separation: 10%.
 - B. Line spacing: 35%.
 - C. Stroke thickness: 10% - 30%.
 - D. Character width: 55%.
 - (ii) The PID signs shall be designed to display three lines of text with a minimum character height of 76mm.
 - (iii) The arrival/departure time screen display shall emphasize the top line of text (using a larger font and/or bolded).

- (iv) The following examples describe an arrival/departure time screen display adhering to the given PID sign and character sizing constraints above:
- A. 176 x 40 pixel active display; 7.62mm pixel; active area measuring roughly 1341mm x 305mm (~1481mm x 445mm overall area with 70mm border).
 - B. 11 pixels height top line (83.83mm) and bolded.
 - C. 10 pixels height second and third lines (76.2mm) in height.
 - D. 224 x 48 pixel active display; 6mm pixel; active display measuring roughly 1344mm x 288mm (1484mm x 428mm overall area with 70mm border).
 - E. 14 pixels height top line (84mm) and bolded,
 - F. 13 pixels height second and third lines (78mm) in height.
- (f) The examples above can accommodate the 3-line arrival/departure time or a 3-line general announcement of up to 25 - 75mm mono-spaced characters - in practice, proportional characters shall be used which will accommodate more characters per line depending on message content.
- (g) Failure Monitoring/Diagnostics
- (i) The PID signs shall have built-in diagnostic capabilities and be monitored periodically by the PIS via a scheduled polling or subscribe/notify software architecture. The PID diagnostics and control shall include, but not limited to the following:
- A. Power supply unit failure
 - B. High temperature warning. Temperature sensor(s) shall monitor the overall temperature in the PID sign case. In the event of a high temperature condition, the PID sign shall automatically shut off and an alarm generated.
 - C. Pixel failure (test). Each PID sign shall have embedded self-cycling pixel test.
 - D. Brightness level test.
 - E. Communication failure/Message time out (handled by the head-end PIS).
 - F. Remote power cycle / re-boot function.
- (ii) Communications Failures
- A. Each PID sign's network connection shall be monitored.
 - B. The PID shall be capable of displaying a default message such as time and date or a preconfigured message stored locally in the display. The message shall be activated by user-defined scenarios, including but not limited to, loss of communication with the head end system.

- C. Locally stored default messages shall be displayed in the event that no content has been received from the PIS. If the communications fail (no heart beat message response), the display shall be blanked after a pre-set delay or shall default to a predetermined message stored locally (e.g. “Out of Service”).
- (iii) The head end PIDS shall log and timestamp all alarms/events.
- (iv) The PID shall optionally have a local RS232/485/422 serial maintenance port for maintenance and diagnostic capabilities.
- (h) Electrical and Cabling Design
- (i) Project Co shall ensure that design is stamped & sealed by a Professional Engineer.
- (ii) Racks
- Project Co shall supply and install all rack cabling required for connections between equipment. All cabling and wires shall be traceable within the shop drawings of the equipment racks.
- (iii) PID Sign Circuits
- All PID sign network cabling shall be designed to be routed and terminated onto the patch cords in the back of the appropriate network equipment rack located in the Facility's communications room
- (i) Cable Rating
- (i) All cables called up in Project Co's installation design shall be CSA approved and meet the requirements of NFPA 130.
- (ii) The insulation for all PIDS cabling installed shall be FT-4-ST1 as a minimum and specified with LSZH jacketing where cables are run through public areas.

4.6 Provision for City Provided Equipment

- (a) Scope of Work
- (i) Project Co shall provide the equivalent of one full height 480mm NEMA 4X weather-protected environmentally controlled cabinets at each Station on the Expanded Trillium Line for installation of City provided equipment.
- (ii) Space shall be reserved in the cabinet for City provided equipment such as Public Art, Nexus/Directory/Entrance PIDS, HASTUS, and fare collection electronics.
- (iii) Project Co shall install the conduits and cables from the cabinet for City provided equipment to the various device locations as defined in Schedule 15-2, Part 4 - Stations.

- (iv) Project Co shall provide and install the cabling to connect the Public Art, Nexus/Directory/Entrance PIDS and HASTUS equipment installed in the cabinet for City provided equipment to the CTS.

ARTICLE 5 VOICE AND DATA RADIO SYSTEM

5.1 General Requirements

- (a) Project Co shall procure the mobile radios for the Existing Vehicle Fleet, Expanded Trillium Line Vehicles, Maintenance equipment, and all required hand-held portable radios for Expanded Trillium Line maintenance activity. Project Co shall provide a total of 28 mobile radios for the Vehicles (one for each cab in each of 13 Vehicles and two spare mobile radios).
- (b) The City shall install, integrate, test and Commission the two new radio dispatch consoles into the existing radio system at 875 Belfast for TOCC. The City shall install, integrate, test and Commission the one new radio dispatch console at 805 Belfast for the BCC.
- (c) Project Co shall utilize the existing City of Ottawa public safety radio system.
- (d) Project Co shall design, supply, test, integrate and Commission the new Voice and Data Radio System on-board the Vehicles. The Voice and Data Radio System shall include custom radio features that are required to implement on-board live PA announcements from the TOCC over the radio system as well as vigilance and alerted data alarms to the TOCC radio dispatch console over the radio system.
- (e) Project Co shall be responsible for purchasing licenses and paying initial and on-going monthly fees for all Vehicle mobile radios and all Project Co required radios and equipment.
- (f) The City shall develop the performance specifications and design criteria for the Voice and Data Radio System with its service provider to refine design requirements for radio coverage along the alignment.
- (g) Project Co shall provide all cabling (coaxial, radiating, fiber, network, power) and all associated infrastructure to enable radio coverage in the 600m long Dow's Lake Tunnel, New Walkley Yard City spaces, and any new facilities along the alignment. For the purpose of redundancy, two radiating cables shall connect from the tunnel to a designated rack space in the Dow's Lake pump house.
 - (i) The radiating cables in Dow's Lake Tunnel shall connect from the Tunnel via a feeder coax cable to a designated rack space in the Dow's Lake pump house. The cabling, conduit and associated infrastructure shall be ready to enable the City to install and Commission radio repeater system in the tunnel and the pump house.
 - (ii) Actual cable specifications used shall depend upon link loss calculations; however Project Co shall install a minimum of two 1/2in coax cables, two 1/2in plenum rated coaxial cables and two 7/8in plenum rated radiating cables in the Dows Lake Tunnel including all required connection hardware such as coaxial power splitters/tappers, coaxial cable connectors and enclosures to house the tappers / splitters. One of the two 7/8 in cables shall be mounted on the western wall while the second cable shall be mounted on the eastern wall from the north portal to the south portal. The radiating cables shall serve as the signal source for the coverage enhancement.
 - (iii) For New Walkley Yard City spaces and new LRO facilities along the alignment, Project Co shall provision infrastructure space for a small antenna repeater system including

plenum rated coaxial cables, splitters, and a minimum of ten antennas to provide adequate coverage throughout the building.

- (h) The City shall provide all active electronics to support the repeater system.
- (i) Project Co shall provide the Voice and Data Radio System cabling and infrastructure to comply with NFPA 130 requirements.

5.2 Operational Requirements

- (a) The City shall produce the design, test, and manage the systems integration and Commissioning of the Voice and Data Radio System into the TOCC and BCC.
- (b) The City shall pay all associated access fees and on-going maintenance fees associated with the radios to be used by the City's operations personnel.
- (c) The City shall integrate the Expanded Trillium Line's Voice and Data Radio System equipment with the existing voice recording system equipment located in the data room at the Belfast MSF to record all radio voice conversations. The City shall provide all necessary expansion to the existing voice recorder to accommodate the Expanded Trillium Line's Voice and Data Radio System.

5.3 Performance Requirements

- (a) Project Co shall design, procure, install and test the Tunnel radio antenna system complete with directional antennas, radiating and coax cables, and mounting hardware and equipment necessary to propagate the necessary radio frequency coverage throughout the Tunnel areas for both voice and data radio.

5.4 Vehicle Onboard Radios

- (a) Project Co shall procure, retrofit and test the Voice and Data Radio System radios on the Existing Vehicle Fleet with new radios and any other equipment required to make them fully functional. The new radios shall include firmware making them capable of transmitting vigilance and silent alarms, and PA announcements from the TOCC and BCC.
- (b) Project Co shall procure, install and test the new Voice and Data Radio System radios and any other equipment required to make them fully functional onboard the New Vehicle Fleet. The new radios shall include firmware upgrades making them capable of transmitting vigilance and silent alarms and PA announcements from the TOCC and BCC.

ARTICLE 6 FARE COLLECTION

6.1 General Requirements

- (a) Project Co shall design, install, test and Commission the E&M infrastructure for the fare collection equipment including power outlets and conduit that connects the equipment cabinets to the designated Ticket Machine locations.
- (b) Project Co shall provision the Power source within the Station electrical service for all fare collection equipment needs. Project Co shall design each Ticket Machine and each fare gate with one individual 15 amp circuit.
- (c) Project Co shall design and provide data communication channels within the Station communications rooms or so that the fare vending equipment may communicate with the existing fare collection head end equipment and accounting personnel located within the TOCC and BCC.
- (d) The City shall design, procure, install, integrate, test and Commission all fare collection equipment (fare gates, Ticket Machines, data cabling and servers). Refer to Schedule 15-2, Part 4 – Stations for location and quantity information.
- (e) Project Co shall procure and install an interposing relay at each Station that when a fire alarm is initiated from the fire detection and alarm system to the interposing relay, it will cut power to the fare gates. By cutting power, the gates shall default open allowing customers to safely exit the facility.

6.2 Operational Requirements

- (a) Ticket Machine, power and data requirements:
 - (i) Project Co shall provide slab conduits to bring UPS protected power cabling from the Station power panel to the Ticket Machine. Refer to Schedule 15-2, Part 4 – Stations for locations and electrical details.
 - (ii) Project Co shall provide slab conduits from the communications room/cabinet to allow for data cabling to the Ticket Machines locations. Project Co shall ensure that no conduits or ducts are exposed.
- (b) Fare Gates, power and data requirements:
 - (i) Project Co shall provide power for the fare gates by a single circuit breaker protected line delivered by slab conduit to the base of each fare gate.
 - (ii) Project Co shall ensure that no conduits or ducts are exposed.

ARTICLE 7 CCTV SYSTEM

7.1 General Requirements

- (a) Project Co shall provide a CCTV system that serves both operational and security needs of the Project. The CCTV system shall allow operations, security staff and ESP the ability to monitor elements of the system remotely from the TOCC and BCC.
- (b) Project Co shall design the CCTV system with operational views of the Platforms that are made accessible to Operators on the Expanded Trillium Line through a wireless data connection to allow the Operator the ability to safely operate and monitor the Vehicle doors. Project Co shall undertake a risk and safety assessment of the System and shall install CCTV equipment and / or any other security devices as an outcome of the assessment.
- (c) The City shall integrate the Expanded Trillium Line's CCTV system with the existing head-end management platform to ensure that the OC Transpo Rail Controllers have supervisory control of the CCTV system. The City shall integrate the Trillium Line's CCTV system with the existing head-end management platform to ensure that the TOCC and BCC Controllers and Special Constables Unit Communications Officers each have access and the ability to view and the ability to control video from the CCTV system. The CCTV workstations have been provided in the TOCC and BCC as part of the Confederation Line Project.
 - (i) Project Co shall not be required to procure these workstations as part of the Trillium Line Project;
 - (ii) Project Co shall design, install, connect, integrate, test and Commission all station and facility CCTV equipment including cameras, cabinets, NVRs and all equipment necessary to connect the CCTV system to the CTS for transport of video back to the Belfast MSF.
- (d) Project Co shall ensure that all NVR's be connected to the CTS and able to transmit all required live and recorded video to the TOCC and BCC while multiple users are using the system at one time.
- (e) Project Co shall design and install all of the station CCTV System Infrastructure hardware including mounting brackets, conduit and cables.
- (f) Each Station shall have at least two NVRs to ensure redundancy. Each camera shall be assigned to a recording device via the VMS to balance the load on each NVR. Cameras located within the same area shall be recorded on a different NVR. The video storage capacity varies by Station. The NVR shall be capable of recording up to 200 channels however the system shall be designed to limit 50 cameras per recorder. All NVRs shall be the same model but with different hard drive sizes based on the total storage per NVR storage unit. Storage capacity shall be based on 30fps frame rate and native resolution of the camera being recorded for 31 days.
- (g) The total capacity of the NVR at each Station shall be based on the number of cameras at each station. Common factors affecting the NVR size shall include video compression, resolution, frame size and frame rate of cameras connected to the NVR.

- (h) Project Co shall provide commercially available, high quality cameras from reputable and established manufacturers. The cameras shall be fixed cameras and PTZ cameras. Cameras shall use 6.35mm or 8.5m CMOS type sensors and be able to operate in all expected light levels down to a level of <2 lux. The cameras shall be able to switch to black and white mode in low light conditions (below 0.1 lux).
- (i) The cameras shall be:
- A. High resolution fixed cameras, 1 MP, 3.3-12mm lens – Platforms, concourses, ETELs, escalators, elevator landings, stairs, communications equipment rooms/cabinets, bike racks, Tunnel portals and egress entrance/exits, yard perimeter fences and intrusion monitoring, monitoring of Train movements.
 - B. High resolution fixed cameras, 1 MP, 2.5-6mm lens – elevators.
 - C. High resolution fixed WDR cameras, 1 MP, 3-9mm – Platforms, Platform edges/Train doors, TSAs, Ticket Machines, fare gates.
 - D. Super high resolution fixed cameras, 2 MP, 3-9mm – external cameras for exterior of Stations and viewing large areas.
 - E. High resolution PTZ cameras, HD, 1.3 MP, 4.3-129mm – Platforms, PPUDO, parking lot and yard, yard perimeter fences and intrusion monitoring, monitoring of Train movements.
 - F. Identification cameras, 3-6mm - New Walkley Yard vehicle entrance.

7.2 Operational Requirements

- (a) Project Co shall design the CCTV cameras to meet the following requirements:
- (i) Provide CCTV in keeping with CPTED principles, including but not limited to CCTV coverage of entrances to washrooms, designated bicycle parking areas, Platforms, Train doors, corridors, and stairways;
 - (ii) CCTV cameras shall cover every door of the Train servicing the Station and general circulation areas, all entrances to Stations/Platforms and fare equipment; and,
 - (iii) CCTV coverage shall include all exterior areas of each Station including MUPS, Station plazas and general circulation areas.

7.3 Performance Requirements

- (a) Project Co shall design a CCTV system capable of determining intrusion into restricted areas through the use of sensors and/or video analytics. The CCTV system shall interface to the ETELs and access control system so that any events are automatically recorded at higher frame rates and resolution.
- (b) Project Co shall ensure that recorded video is capable of being reviewed and downloaded from the on-board Vehicle CCTV system while at a station or at the New Walkley Yard and

transmitted to the Belfast MSF for storage of the video for up to 3 years. Project Co shall design the CCTV system based on a distributed video storage architecture; some data shall be captured and stored at Stations, some shall be captured and stored on Trains. Project Co shall ensure that data will be stored in local NVRs at each Station and in Trains with minimum 1080P and 30 fps at H.264 compression. The NVR retention period should be programmable/adjustable up to a maximum of 31 calendar days but will be programmed to meet the current Policy requirements. The City shall expand the storage servers up to 3 years and system management servers installed in the data room at the Belfast MSF. The City shall specify, procure, install, integrate, test and Commission any additions/modifications to the existing Belfast MSF head-end equipment (VMS server and workstations); to accommodate any MSF expansion.

- (c) Project Co shall provide CCTV coverage for the areas outlined in this Article based on Good Industry Practices, for example as described in the most recent edition APTA Standards Development Program Recommended Practice CCTV (APTA IT-CCTV-RP-001-11).
- (d) Project Co shall design a CCTV system that complies with MFIPPA and the current Surveillance System for Transit Network Access and Privacy Policy dated 2016.
- (e) Project Co shall provide a CCTV system comprised of network based fixed, HD fixed, and HD PTZ digital cameras, along with associated power supplies, cabling, network media converters, video storage devices, viewing stations and control panels, all of which is managed by the IPVS. The CCTV sub-system shall provide records for post event review and analysis. Project Co shall ensure that cameras are to be rated for the environment installed, including day/night capabilities, heater/blower, appropriate housing, NEMA 4X (IP-66) rated and IEC 62262 IK10 impact resistant enclosures.
- (f) Project Co shall ensure that camera locations are strategically selected to ensure the views are clear, unobstructed, and not impaired by Structures, signage, foliage, intense lights, or any other obstacles. During installation, testing and Commissioning of the CCTV system, if camera views are blocked from viewing the intended coverage area, Project Co shall adjust the camera to a provide a clear view of the intended coverage area. Project Co shall ensure that camera views of the fare collection area shall be arranged to provide images of the customer's frontal interface with the Ticket Machines.
 - (i) Project Co shall design the CCTV system such that Fixed Cameras are installed to monitor the following locations:
 - A. Platform edges including Train doors;
 - B. ETELs located in TSAs;
 - C. Elevator cab and landings, escalator and stair landings;
 - D. Public and employee washroom entrances;
 - E. Tunnel access and egress entrance/exits;
 - F. Fare collection equipment;

- G. Restricted areas (equipment room entrances for public to non-public areas, electrical rooms, communications equipment rooms, mechanical rooms);
 - H. Bike racks; and,
 - I. Tunnel portals.
- (ii) Project Co shall design the CCTV system such that PTZ and/or fixed cameras are provided to monitor the following locations:
- A. Concourse level corridors/Passenger circulation areas;
 - B. Station Platforms (bus and Train);
 - C. Coiling grills at some Stations;
 - D. PPUDOs; and,
 - E. Exterior station areas including MUPS, Station Plazas and general circulation areas.
 - F. IAC controlled doors
- (iii) Project Co shall design the CCTV system such that high resolution cameras with low lux capabilities be installed to monitor Tunnel entrances.
- (g) The City shall integrate the CCTV system with the Emergency telephone systems. The City shall integrate the CCTV system such that upon activation of Passenger Emergency telephones or elevator help telephones, the CCTV system at the TOCC and BCC shall automatically display the CCTV camera with the best view of the telephone area. The City shall ensure that the displays shall appear at both Rail Controllers consoles and the Special Constables Unit Communications Officers consoles.
- (h) The City shall integrate the CCTV system with the IAC system. The City shall integrate the CCTV system to be capable of automatically displaying a view of the activated access control device, either via fixed camera or PTZ pre-set, upon activation of an IAC system alarm or use, whether authorized or unauthorized. The City shall be capable of including or excluding automatic display of video coverage of any device, type of device, specific event, or general event type as needed.
- (i) The City shall integrate the CCTV system to the MSF storage system for long term storage. Each alarm shall be assessed and if the video is required, a record will be created to the long term storage device by authorized Transit Staff.
- (j) The City shall integrate the CCTV system with the existing head-end management platform such that recordings are digitally watermarked to detect tampering. The City shall integrate the CCTV system into the existing head-end management platform such that access to recordings shall be restricted to OC Transpo personnel only.

- (k) Project Co shall design the CCTV system to ensure that the resolution and clarity of captured images is maintained under a range of lighting conditions from darkness through bright sunlight while ensuring optimal picture quality.
- (l) Project Co shall design the CCTV system to provide spare recording capacity to allow for the addition of up to 40% video inputs for future expansion.
- (m) The City shall integrate the Expanded Trillium Line's CCTV system into the existing head-end management platform such that an administrator can dynamically specify resolution and frame rate variation at a particular camera location for monitoring that location while not affecting the recording parameters.
- (n) Project Co shall design and install the CCTV cameras with de-icing and lens clearance protection. Project Co shall ensure that all cameras have a unique identity and provide a means of detecting image loss.
- (o) Project Co shall design the CCTV system such that the system shall store all recorded images in an accepted industry standard format.
- (p) Project Co shall design and implement the CCTV system such that in the event of a power outage, CCTV equipment shall remain operational for a minimum of four hours through the use of UPS. An additional 8 hours of power shall be provided through the use of generators.
- (q) Project Co shall design and install the CCTV cameras located in public areas in vandal resistance environmental enclosures. Refer to Schedule 15-2, Part 4- Stations for location information.
- (r) Project Co shall design the CCTV system and install the cameras such that they never directly view the sun. Project Co shall ensure that the field of view of cameras shall be adequately illuminated either by natural light or by luminaires. Project Co shall design the CCTV system such that within the field-of-view, particular care shall be taken to avoid extremes of light, shadow and reflection from extreme glazing.

ARTICLE 8 SCADA SYSTEM

8.1 Scope of Work

- (a) Project Co shall design and install a wayside SCADA system that provides supervisory control of the support systems. The existing head end systems servers are located at the Belfast MSF and manage all system controls and indications for the System. The wayside SCADA system shall integrate to the existing GUI and include the ability to filter out unnecessary indications and alarms according to user preference. SCADA system functions shall include:
- (i) BMS – Project Co shall design the BMS system to monitor Station mechanical and electrical equipment and report to the existing MSF head-end. Refer to Schedule 15-2, Part 4, Article 5 – Mechanical Design Criteria for details;

8.2 General Requirements

- (a) The Confederation Line SCADA head-end equipment consists of master terminal equipment, including servers and workstation GUIs, to control, monitor, gather data and communicate with field equipment. The SCADA system shall ensure that each point be sequentially scanned point by point under normal conditions and the status of all points shall be continuously transmitted to the existing SCADA head-end in the TOCC and BCC.
- (b) Project Co shall design, procure, install, connect, integrate, test and Commission all station SCADA interconnection equipment including RTUs and all equipment necessary to connect the BMS (station mechanical and electrical equipment) and SCADA system to the CTS for transmission of controls from the TOCC and BCC and indications and alarms from the Stations. Any additional RTUs required as part of the new S&TCS shall be provided and installed by Project Co.
- (c) The City shall upgrade the Confederation Line's existing head-end management platform on the servers located in the data room at the Belfast MSF to accommodate the new SCADA system equipment installed at the Stations and Facilities on the Expanded Trillium Line.
- (d) The City shall design, procure, install, test and Commission all head-end management platform hardware required in the BCC at the Belfast MSF.
- (e) The City shall procure and pay all licenses and on-going fees associated with new hardware and software required for the expansion of the Existing Trillium Line headend management platform.
- (f) Project Co shall design the SCADA system to ensure that signals transmitted from the RTUs to the processors at the TOCC and BCC shall be processed to provide monitoring information for all required subsystems, generate commands to be transmitted back to the RTUs, provide information for displays and alarm processing at the control consoles, and store information and historical data for future processing.
- (g) The City shall upgrade the existing Confederation Line's head-end management platform to ensure that for each new Expanded Trillium Line remote location, the system shall display the following items on the SCADA monitoring workstations in the TOCC and BCC:
- (i) Current system and subsystem status;

- (ii) Control panel status;
 - (iii) Remote control RTU functions;
 - (iv) Alarm handling and fault resets; and,
 - (v) Historical event logging.
- (h) The City shall update the existing SCADA system head-end management platform to ensure that schematic, one-line, pictorial, and alphanumeric displays of the Expanded Trillium Line SCADA system can be generated, altered, or deleted online by existing GUI.
- (i) Project Co shall design the SCADA system for ease of expansion and alteration in an economical and efficient manner to protect for future System expansion.
- (j) Project Co shall design and install, all Station, Facility and BMS SCADA infrastructure hardware including mounting brackets, conduit and cables.

8.3 Control and Monitoring Requirements

- (a) The City shall integrate the Trillium Line's new SCADA equipment into the existing head-end management platform. The City shall integrate the Expanded Trillium Line's SCADA equipment with the existing head-end management platform to ensure that the system provides indications from field equipment to the TOCC and BCC and controls from the TOCC and BCC to field equipment.
- (b) Project Co shall design the SCADA system to ensure that each remote monitored location provide a local HMI for local alarm annunciation and system control.
- (c) Project Co shall design the SCADA system to ensure that each communications cabinet/ signal case report status of intrusion detection and fire alarm to the TOCC and BCC's SCADA head-end management platform.
- (d) Project Co shall design the SCADA system to monitor the following operational items:
 - (i) Passenger Elements
 - A. Elevator status: on, off, maintenance, fault;
 - B. Platform PID status: on, off, fault;
 - C. Public Address status: on, off, fault;
 - D. Platform lighting status: on, off, fault;
 - E. Emergency Telephones: active; off; fault;
 - F. Intrusion detection alarms; and,
 - G. Other emergency alarms.

(ii) Wayside Elements

- A. Bungalow door status: open, closed;
- B. Switch heater control: low – medium – high; on/off;
- C. Switch heater status: on, off, fault;
- D. Dow's Lake Pump house critical alarms;
- E. Dow's Lake tunnel high water alarm;
- F. Dow's Lake radio repeater status: on, off, fault;
- G. GIDS alarms;
- H. Tunnel Ventilation;
- I. Escalators (where located);
- J. Platform heating (where located);
- K. Station power & backup generators; and,
- L. Other critical infrastructure alarms.

(iii) Other Elements

- A. Incoming utility power.

8.4 SCADA Configuration

- (a) Project Co shall design the SCADA system to ensure that the RTUs provide the interface between the field equipment and the CTS, which includes the CTS.
- (b) Project Co shall design the SCADA system to ensure that the SCADA RTUs utilize an Ethernet connection via the CTS to communicate with the existing TOCC and BCC head-end equipment. Error correction and detection schemes shall be used utilizing an industry standard (such as CCITT CRC-16) and, at a minimum shall:
 - (i) Detect all errors of up to 16 continuous bits; and,
 - (ii) Detect at least 99% of all error bursts greater than or equal to 16 bits.
- (c) Project Co shall design and implement the SCADA system to ensure that the wiring and cabling between the RTU and field devices are uniform in type, routing, and connection locations. Project Co shall design the SCADA system to ensure that the following field interface requirements be met:
 - (i) Signals between the RTU and CIHs/cases shall terminate at one centralized location.

- (ii) RTU terminations shall include test points and rapid disconnect.
- (iii) All wires and cables shall be labeled using a logically consistent labeling convention consistent with the existing system labeling.

8.5 Development and Configuration Tools

- (a) Project Co shall ensure that the SCADA system be designed such that no action or lack of action by the users or any malfunction of the SCADA subsystem equipment can cause an unsafe condition. Project Co shall design the SCADA system to ensure that should the system become completely inoperative, for any reason, the System shall continue to operate normally and safely.

8.6 Remote Terminal Units

- (a) Project Co shall ensure that the requirements for the SCADA RTUs are provided as follows:
 - (i) Solid-state, microprocessor-based with logic elements and auxiliary components configured on easily replaceable plug-in modules.
 - (ii) Provide interchangeability of modules; all RTUs shall be of a common design.
 - (iii) Operate normally unattended. RTU logic and configuration data shall reside in non-volatile memory.
 - (iv) Perform self-tests upon power up and on command from local test equipment and from the TOCC and BCC. Self-tests shall also be performed by input/output subsystems and input/output cards.
 - (v) Provide for Maintenance of input/output circuits (including disabling power to output circuits) and safe replacement of input/output cards while power is applied. Possess the capability to continue operation in outdoor weather conditions with 0 to 95% humidity (non-condensing).
 - (vi) Operate within a power supply range of plus or minus 5% of its nominal value and a frequency range of plus or minus 1% of its nominal value.
 - (vii) Support local initialization and troubleshooting with either a local control panel or workstation or portable test equipment.
 - (viii) Be modular in design to provide expansion of performance and capacity by adding subsystem modules. This shall include the ability to add a minimum of 20% more input/output subsystem modules.

8.7 Operational Requirements

- (a) Project Co shall design that the SCADA system to ensure that RTUs operate in a full-duplex mode in which each continuously scans and reports the status of indicators and commands.
- (b) Project Co shall ensure that the SCADA system RTUs be designed to continue operations with the loss of communication to head-end as a result of either communication equipment failures or

head-end equipment failures. Project Co shall ensure that upon return to service of failed equipment, the SCADA system shall automatically resume normal monitoring and management of that equipment.

- (c) Project Co shall ensure that the SCADA system RTUs are designed to continue operation in the electromagnetic environment where they shall be located, such as CIH, traffic cabinet and communications equipment cabinets.

8.8 Interface Requirements and Data Exchange

- (a) Project Co shall design the SCADA system RTUs to support discrete inputs and outputs via relay contact closures (or optically isolated solid-state equivalents such as silicon controlled rectifiers). Project Co shall ensure that all discrete inputs to the RTU shall be of the same type. Project Co shall ensure that all discrete outputs by the RTU shall be of the same type. Project Co shall ensure that the following SCADA system RTU input and output requirements are met:
- (i) Digital inputs to the RTU shall be from Form C relay contacts. The sensing voltage DC power supply shall be in the RTU domain.
 - (ii) Input and output signals shall be electrically isolated from the RTU.
 - (iii) RTU shall generate outputs via relays. Relays and transient suppression circuits shall be provided. RTU interface relays and relay contacts shall have a MTBF, at rated loads, of 5,000,000 cycles or more.
 - (iv) RTU outputs shall be momentary contact closures with a time duration that is stable and adjustable.
 - (v) RTUs shall prevent unintended action such as energizing output circuits upon power-up and power-restore.
 - (vi) A serial digital data interface may be used between the RTU and other processor-based devices, such as Train-to-wayside communications. All serial interfaces to RTUs shall be optically isolated.

8.9 Performance Requirements

- (a) Project Co shall design the SCADA system to ensure that the elapsed time from the first possible detection by an RTU or equivalent field device of an alarm or change of state, until display at the TOCC and BCC shall not exceed 2.0 seconds, unless otherwise approved.
- (b) Project Co shall design the SCADA system to ensure that when a user enters a command for any individual device control, the RTU shall generate the associated output signal, in the field, in no more than 2.0 seconds, unless otherwise approved. In the event a device equivalent to an RTU is used, the network shall deliver the command to the equivalent device in no more than 2.0 seconds, unless otherwise approved.
- (c) Project Co shall design the SCADA system to ensure that the specified SCADA system equipment have the ability to integrate into the existing system without degrading performance and security of the system. Project Co shall design the SCADA system to ensure that the HMI

hardware shall have TCP/IP with 10/100Mbs connectivity for network communication. Project Co shall design the SCADA system to ensure that the SCADA system HMI software comply with the Open Process Control standards to assure interoperability of the data servers between different RTU platforms.

ARTICLE 9 INTRUSION ACCESS CONTROL SYSTEM

9.1 General Requirements

- (a) Project Co shall design the IAC system to control access and provide for detection of intrusion into non-public or otherwise restricted areas in Stations and along the alignment. Project Co shall design the IAC system to ensure that intrusion sensors sound an audible alarm locally and trigger an automatic alarm notification to the workstation GUI in TOCC and BCC for unauthorized entry or tampering to IAC equipment.
- (b) Project Co shall design the IAC system to ensure that the major access control equipment in Facilities include smart card readers, request-to-exit detectors, door contacts, electrified lock sets, and ACPs. ACPs shall be connected to the local network switch associated with the CTS. Project Co shall design the IAC system to ensure that card readers and ACPs be designated matching products or equivalent to ensure system compatibility with the existing IAC system.
- (c) Project Co shall design the IAC System to ensure that all access-controlled doors in Stations and the New Walkley Yard are monitored by the CCTV system.
- (d) Project Co shall design, install, connect, integrate, test and Commission all station IAC equipment including door hardware, door control units, intelligent system controllers, power supplies, Ethernet switches, routers, equipment cabinets, fiber distribution panels and all equipment necessary to connect the IAC system to the CTS for transport of data back to the TOCC and the BCC. All IAC system field devices for the Expanded Trillium Line shall be compatible with the existing IAC system management platform at the TOCC and BCC. The IAC system shall use the same access control cards as used on the Confederation Line.
- (e) The City shall upgrade the Confederation Line's head-end management platform at the TOCC and BCC to accommodate the new IAC system equipment installed on the Expanded Trillium Line.
- (f) The City shall design and procure all appropriate head-end management platform hardware required to be installed in the Belfast MSF as a result of the Expanded Trillium Line.
- (g) The City shall be procure all licenses and pay all fees associated with new hardware and software procured for the Expanded Trillium Line system.
- (h) Project Co shall design, install, test and Commission all IAC infrastructure hardware including mounting brackets, conduit and cables.
- (i) Project Co shall provide a method to detect and identify any persons or objects that infringe into the guideway from the end of Station Platforms or intrusion at a portal.
 - (i) Project Co shall ensure that the gates at the end of the platforms utilize contact closure switches monitored by the SCADA system.
 - (ii) Project Co shall design, install, test and Commission a portal intrusion detection system to be used at tunnel portal entrances to monitor for intrusions by humans or other large objects into the tunnel.

- A. Project Co shall design the portal intrusion detection system to ensure that it is capable of being monitored by the SCADA or IAC system.
- (iii) Project Co shall ensure that upon activation of the portal intrusion detection system, an automatic 25 km/h speed restriction shall be applied to all Vehicles operating with the vicinity of the intrusion.
- (iv) Project Co shall design the portal intrusion detection system to ensure that train Operators are provided with an indication at the portal entrance that an intrusion has been detected.

9.2 Operational Requirements

- (a) Project Co shall design the IAC system to ensure that the system provide controlled access and detect intrusion of the following:
- (i) Public to non-public doorways;
- (ii) CIH;
- (iii) Station communication cabinets and/or communications rooms;
- (iv) Elevator machine rooms;
- (v) Escalator machine rooms;
- (vi) Electrical equipment rooms;
- (vii) Vent plants;
- (viii) Mechanical rooms;
- (ix) Crew/Operational Rooms;
- (x) Platform End Gates;
- (xi) ICP; and,
- (xii) Additional areas listed in Schedule 15-2, Part 5, Article 8 – Communication, Control and Security Systems.

9.3 Performance Requirements

- (a) Access Cards – Project Co shall design the IAC system to ensure that access cards be provided as follows:
- (i) Access cards shall be provided by The City to approved staff for entry into the CIHs, and vent plants. This system shall be compatible with the Confederation Line IAC system.
- (b) Project Co shall design the IAC system to ensure that access authorization be verified based on data submitted from any credential and retained in the system controller database, granting access by releasing electronic door locks once all correspondence is deemed accurate.

- (c) Project Co shall design the IAC system to ensure that all access decisions/credential transactions be processed locally at the card reader interface board as it receives data from the system controller, minimizing network traffic while also providing real-time access determinations.
- (d) Project Co shall design the IAC system to ensure that all cardholders have access based on Facility, card reader, time, and day. Project Co shall design the IAC system to allow access levels to be defined and to be applied to any or all cardholders. Project Co shall design the IAC system to ensure that access authorization be denied by credential holder, time of day, group of staff, shift, and any additional characteristics that are identified by the system controller database.
- (e) Project Co shall design the IAC system to ensure that provisions be made for remote signalling of the door opening to an IAC panel.
- (f) Project Co shall design the IAC system to ensure that the system provide a means to bypass zones for facilities/locations where certain alarm zones are not 24 hour zones and be capable of being armed and disarmed from the TOCC and BCC.
- (g) Project Co shall design the IAC system to ensure that the system incorporate an interface to the fire alarm panel to allow override of door locks for free egress in an emergency situation. Refer to Schedule 15-2, Part 4 – Stations for additional information.
- (h) Project Co shall design the IAC system to ensure that the system can be interfaced with the CCTV system to allow the display of video upon activation of an IAC alarm or use of an access control device at the TOCC and BCC.
- (i) Project Co shall design the IAC system to ensure that in the event of a power outage, IAC equipment shall remain operational for a minimum of four hours through the use of uninterruptible power supplies. An additional 8 hours of power shall be provided through the use of generators.
- (j) Project Co shall design the IAC system to ensure that the system shall be fully distributed system architecture, with access control and event processing undertaken by intelligent controllers, and shall be designed with the following capabilities:
 - (i) Support multiple card readers for access control, alarm input devices, and control outputs.
 - (ii) Designed for multi-tasking, capable of maintaining system operations while other applications are being performed in the host computer.
 - (iii) Prepare, process, and display video photo identification badges.
 - (iv) Equipped with a control panel to allow staff to open or close selected doors remotely. The panel shall have indicating lights to show door positions.
 - (v) Designed for 24-hour per day, 7 days a week operation.
 - (vi) Generate reports based upon system configuration database as well as historical system activity.

ARTICLE 10 SIGNALLING AND TRAIN CONTROL SYSTEM

10.1 Codes, Standards and Manuals

- (a) The works shall comply with the criteria contained in this Article, and all standards, regulations, policies, Applicable Law, guidelines or practices applicable to the Project, including but not limited to each of the following Reference Documents:
- (i) AREMA, Communications and Signal Manual;
 - (ii) Transport Canada Grade Crossing Standards;
 - (iii) Manual of Uniform Traffic Devices for Canada (MUTCD-C);
 - (iv) Ontario Electrical Safety Code;
 - (v) EN 50121-1, Railway Applications – Electromagnetic Compatibility;
 - (vi) EN 50125-3, Railway Applications - Environmental conditions for Equipment – Part 3: Equipment for Signalling and Telecommunications;
 - (vii) EN 50126, Railway Applications – The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS);
 - (viii) EN 50128, Railway Applications – Communication, Signaling, and Processing systems – Software for Railway Control and Protection Systems;
 - (ix) EN 50129, Railway Applications – Communication, Signalling and Processing systems – Safety Related Electronics for Signalling;
 - (x) EN 50155, Railway Applications – Electronic Equipment used on rolling stock;
 - (xi) EN 50159-1, Railway Applications – Communication, Signalling and Processing Systems;
 - (xii) EN50238, Railway Application – Compatibility between rolling stock and train detection systems
 - (xiii) IEEE Std. 1475, IEEE Standard for the Functioning of Interfaces Among Propulsion, Friction Brake, and Train-borne Master Control on Rail Rapid Transit Vehicles;
 - (xiv) IEEE Std. 1478, IEEE Standard for Environmental Conditions for Transit Rail Car Electronic Equipment;
 - (xv) IEEE Std. 1483, IEEE Standard for Verification of Vital Functions in Processor-Based Systems Used in Rail Transit Control;
 - (xvi) MIL-HDBK-217F, Handbook of Reliability Prediction of Electronic Equipment;
 - (xvii) MIL-HDBK-472, Maintainability Prediction; MIL-STD-470B, Maintainability Program Requirements for Systems and Equipment;

- (xviii) MIL-STD-471A, Maintainability Verification/Demonstration/Evaluation;
 - (xix) MIL-STD-810F, Test Method Standard for Environmental Engineering Considerations and Laboratory Tests; and,
 - (xx) Railway Association of Canada – Railway Signal & Traffic Control Systems Standards.
- (b) The entire S&TCS, including the inspection and test program, shall be in full compliance with all of the listed standards, regulations, and codes as relevant to each component of the S&TCS. .

10.2 Scope of Work

- (a) The existing S&TCS on the Existing Trillium Line is based on an ABS system with Track circuits and an overlaid ATP system. The ATP system consists of intermittent inductive automatic train stop devices referred to as the Indusi system. The Indusi system uses two magnets - one providing an over-speed warning device; the other acting as a positive train stop used to address a Signal Passed at Danger. The magnets are mounted on the outside of the rail at fixed distances from the signal, and used as a coupling device to activate the on-board ATP braking system. The Indusi system is considered obsolete and shall be eliminated. In order to achieve the City's operational objectives, Project Co shall replace the existing S&TCS with a new modern advanced S&TCS in accordance with this Article.
- (b) The new S&TCS shall provide a “Grade of Automation” as defined in the IEC 62290-1 at Level 1 (manual operation with ATP).
- (c) The new S&TCS shall provide continuous speed supervision and speed enforcement throughout the alignment to prevent derailments due to over speeds and to prevent signals passed at danger. Further, the onboard system shall provide Operators with information through a Train Operator’s display linked to master timetable, and including but not limited to:
 - (i) Train Crew identification;
 - (ii) Train identification;
 - (iii) Maximum safe speed and current speed;
 - (iv) Movement authority limits (i.e. distance to go, next stop, next signals);
 - (v) Enforcement warnings and activation (i.e. STOP signal violation, overspeed, etc.);
 - (vi) Dwell countdown timer and punctuality status (early, on time, late);
 - (vii) Door control indications including which side is enabled;
 - (viii) Onboard S&TCS high-level alarms, faults and messages;
 - (ix) Door control indication including which side is enabled; and,
 - (x) Onboard S&TCS high-level alarms, faults, and messages.

- (d) In the event of failure of the onboard S&TCS system, or for operation on non-equipped Track it shall be possible to operate the Train in cut-out mode. While cut-out is selected, the S&TCS System shall be prevented from controlling the Train.
- (e) The new modern advanced S&TCS shall be designed by the Project Co to address the primary goal of automatically stopping or slowing down a train before certain accidents occur including:
 - (i) Train-to-Train collisions;
 - (ii) Derailments caused by excessive Train speed; and,
 - (iii) Train movements through misaligned Track switches.
- (f) In order to achieve this primary goal, the S&TCS shall be designed to:
 - (i) Determine a Train's block occupancy, direction and speed;
 - (ii) Receive and analyze Track data;
 - (iii) Provide advance warning of movement authority limits, speed limits and Track conditions; and,
 - (iv) Engage the Train brakes and bring it to a controlled stop without the Operator's assistance.
- (g) Project Co shall develop the performance specification, produce the design, procure, conduct Pre-delivery Testing (including FAT), install, conduct PICO, SAT, SIT, Commission and Maintain the new S&TCS head-end management system, including back office equipment, servers, and user workstation within the TOCC and BCC.
- (h) Project Co shall design the new S&TCS system for the Expanded Trillium Line to be capable of:
 - (i) Providing ATP through enforcement of all civil speed restrictions and adherence to maximum curvature speeds based upon the entire Mainline Track alignment;
 - (ii) Providing ATP for Trains passing cab signals or wayside signals set to stop Train movement through engagement of on board automatic braking of the Train;
 - (iii) Enabling a continuous cab signaling for Train movement control with additional wayside signals available at signal controlled interlockings;
 - (iv) Facilitating the complex passing movements in and out of South Key Station;
 - (v) Facilitating passing movements through all the passing sidings through timetable-based signal controls; and,
 - (vi) Facilitating entrance and exiting of Vehicles between the New Walkley Yard and the Mainline Tracks by means of signal controlled interlockings.

- (i) The City shall reserve and allow Project Co access to four spare fibres in each of the Confederation Line's redundant 48 strand fibre optic cables at the TOCC and BCC to connect the Expanded Trillium Line's new S&TCS headend equipment to the new field equipment.
- (j) The City shall provide Project Co access to the building's cable/conduit pathways for Project Co to install LAN equipment for connecting the Expanded Trillium Line's new S&TCS head-end servers to the new Expanded Trillium Line's new S&TCS operator workstation located in the TOCC and BCC.
- (k) The City shall allow Project Co access to spare fiber within its existing Confederation Line's 48 strand fiber optic cables at Bayview Station to connect the Expanded Trillium Line's CTS to the Confederation Line's CTS.
- (l) The City shall reserve rack space in one of its equipment rooms at the TOCC to install the primary head-end server and the BCC to install the backup head end server for the new S&TC System. Space has been reserved in the TOCC and BCC to facilitate the transition of Train Control Operations from Montreal.
 - (i) Project Co shall design a new S&TCS to include a real-time head end GUI for Controllers to be able to easily monitor, control, and dispatch Trains as necessary throughout the day. The display shall provide and consolidate Train locations, switch status and positions, Train routes and signal block occupancy, equipment status and signal bungalow status, critical alarms, and, all standard Train Control and dispatch functions in a consolidated two monitor display configuration.
 - (ii) Project Co shall design a system that is fully integrated with all the field equipment and control of all required rail system elements including switch heaters, switch and signal controls, route setting, diamond controls (Walkley & Ellwood), yard signal and switch controls, Tunnel lunar light status, and any other functions that would reasonably be required to safely and efficiently operate the Expanded Trillium Line System.
 - (iii) Project Co shall design the system to provide automatic route and signal setting based on a timetable mode in order to manage the arrival/departure times of Trains at Stations and to coordinate the movements by Trains through the passing sidings. The system shall be possible to edit/change timetable schedules and to adjust timing parameters such as Station dwell times. The current signal system allows automatic route setting but provides no other higher-level functions such as Station departure indicators. The current signal system does not coordinate departure timing from adjacent Stations to enable fully coordinated Operator passing movements, i.e. maximum siding travel speeds without stopping. Project Co shall provide a new Train Control System (signals, cab controls, other) that manages Train Station arrivals, Station departure times (departure indicators or other methodology to be proposed by Project Co), and fully coordinates movements through passing sidings and junctions in order to minimize the probability of a Train stopping on the mainline. The system shall be capable of integration with OC Transpo's scheduling system.
 - (iv) Project Co shall design the system to allow for manual route setting to accommodate staging Vehicles in the morning; reduction of Trains at night; removal of Trains from service; and, degraded mode and recovery operations.

- (v) Project Co shall design the system capable of being configured to detect and report on passed stop signals (Rule 439 violations) to the TOCC and BCC. The integrated system shall enable other performance alarms including vigilance violation alarms, Train Emergency brake applications, Operator Emergency alarms, and Train over speed conditions. Refer to Schedule 15-2, Part 8, Clause 1.17 for descriptions of vigilance violation alarms.
- (vi) Project Co shall design the system to include a playback system that enables playback of Vehicle movements, signal status, and other key status indicators for a minimum of 120 calendar days. It shall be possible to create records of specific events for review at a later date.
- (vii) Project Co shall design the system capable of facilitating administration of CROR Track occupancy permits and other positive protection controls for Maintenance staff accessing the corridor through recording of permits/activity in electronic forms which are linked to required signal controls. System shall also facilitate recovery and positive protection requirements for Trains following system events or issues, e.g. dropped signals, shared block occupancy, reversing movements, etc. Integrated DOB, GBO, event logging, and other operations reporting shall be included.
- (viii) Project Co shall design the system to log and report all Vehicle movements to enable recording and capturing of all Station departure times, Station arrival times, dwell times, travel times, headways, and Station-Station travel times. The data shall be provided in a standard report format on a daily basis and shall also be available in a CSV file format for post-processing. Accuracy of the data shall be +/- 5 seconds.
- (ix) Project Co shall design the system to report all Vehicle movements against a standard timetable in order to be able to measure and report on actual versus scheduled departures and late arrivals (early, on time, and late). The data shall be provided in a standard report format on a daily basis and shall also be available in a CSV file format for post-processing. Accuracy of the data shall be +/- 5 seconds. The system shall provide other reports as necessary to support the performance management system.
- (x) Project Co shall design the system to provide a current Train graph (fleet position and time) and historical Train graph to enable analysis and reporting.
- (xi) Project Co shall design the system to integrate with the PA/PIDS system in order to enable current and next three Train arrival countdown messages, PA Train arrival messages, and other standard passenger information triggers.
- (xii) Project Co shall provide a real-time data feed to the City's PIDS and the City's ATIS. The system shall provide information to customers which includes but is not limited to current and next three train arrival countdown messages, GPS or equivalent Train location information, Station elevator status, Station open/close status, general Train punctuality status, Passenger counting information, and other common customer transit reporting elements. Project Co shall provide the server data feed to the City's systems to enable third-party real-time reporting of system status. The data feed shall be open data constructed in an XML format and will be designed to be interoperable with SIRI or other applicable standards. In order to facilitate timely integration with the City's

systems, Project Co shall submit the ATIS data format, data contents, and data server architecture to the City in accordance with Schedule 10 – Review Procedure.

- (xiii) Project Co shall procure all licenses and pay all fees associated with new hardware and software procured for the Expanded Trillium Line.
 - A. The S&TCS shall be based on a proven ATC architecture supporting a wide range of operating environments as required for the SI.
 - B. The S&TCS shall be designed to maximize safety, reliability, operational flexibility and fault tolerance.
 - (xiv) OC Transpo schedulers will build a Train service plan (headway, dwell times, etc..) for the scheduled service using the S&TCS headend software or software tool provided by Project Co, with a view to feeding this information back into HASTUS for crewing purposes. HASTUS is used by OC Transpo personnel to schedule operator shift assignments and work blocks. The current Existing Trillium Line schedule and timetable is created in HASTUS. This includes continued fine tuning of regular schedules as well as the scheduling of special service days, shutdowns, etc.
 - (xv) Once the Train schedule has been imported into HASTUS and processed by the scheduler, a HASTUS generated operator schedule shall be exported to the S&TCS to enable matching of Operators & Operator work assignments with specific Trains. Controllers shall have the ability to query Train information in the S&TCS software to identify the designated shift assignment, work block, and assigned Operator.
 - (xvi) On the Train assignment, operator shift assignment, operator work block, and Train arrival information shall be aggregated by Project Co supplied systems onto a simple screen or electronic display provided by Project Co in the Train Operator rooms identified in Schedule 15-2, Part 4, Clause 2.6 (a) (v) and (vi).
 - (xvii) HASTUS and other equipment Operator management systems shall be supplied, installed, and tested by the City. The City shall develop and input schedule, Operator assignments into these systems.
 - (xviii) The S&TCS (or other Project Co system) shall drive information required for the screen controller to display the desired information. File exchange shall occur in CSV format or other format to be finalized during design.
 - (xix) It is envisioned that as a minimum, the S&TCS head-end system shall be used to trigger Station countdown messages on the PIDS at the Stations (format to be confirmed), ATIS updates via an open data feed (XML), the automatic passenger count system, and an interface to the performance reporting system. The format shall be defined by Project Co.
- (m) Project Co shall design the system to support the operational performance and service plan as described in Schedule 15-2, Part 1, Article 3 – Operational Performance Requirements.
 - (n) Project Co shall have access to the City's fiber optic network but shall otherwise be responsible for providing the network equipment for a fully segregated S&TCS network into the TOCC and

BCC. Cabling work shall be completed in engineering hours but patching may be possible during normal business hours.

- (o) The City shall coordinate all access to the TOCC, BCC and Equipment Rooms as required by Project Co.
- (p) Project Co shall design the system such that the distance from the Train stop location on the Platform, to the end of the Track at all Terminal Stations shall be a maximum of 22.5m.
 - (i) Project Co shall ensure all SI including the S&TCS is designed to support this maximum dimension while still meeting all requirements.
 - (ii) Project Co shall be fully responsible for any additional work, system modifications, regulatory approvals that may be required to ensure this maximum dimension is not exceeded.
- (q) Project Co shall provide an S&TCS for the mainline that is capable of launching Trains from the New Walkley Yard to the mainline and exiting Trains from mainline to the New Walkley Yard at all times. The switch used to enter and exit the New Walkley Yard shall be controlled from the TOCC and BCC by means of an interlocking with wayside signals available for non-cab signal equipped Vehicles. The interlocking shall include a local control panel within the main signal bungalow that can be used to control the switch and Train movements if the TOCC and BCC are not available.
- (r) Project Co shall provide a separate S&TCS for New Walkley Yard that is capable of yard operation as described under Schedule 15-2, Part 5 – New Walkley Yard.
- (s) If required for the NRC Spur Line, Project Co shall provide a HGCWD for Lester Road in accordance with Transport Canada Grade Crossing Standards and as noted herein.
 - (i) Requirements
 - A. Project Co shall perform a complete grade crossing Site evaluation to determine the design updates required to the existing HGCWD system located at Lester Road. The crossing shall be equipped with all new HGCWD equipment as part of the S&TCS. The grade crossing protection solution shall include at a minimum the installation of new flashers, cantilevers, gates, crossing controller, and all associated equipment required to operate the crossing equipment.
 - B. Project Co shall verify the crossing equipment layout design will ensure that all components of the HGCWD meet the physical characteristics of the new overhead Bridge and the future roadway extension. Project Co shall verify that the physical locations of the HGCWD equipment comply with the visibility and sight line criteria as required by the Transport Canada Grade Crossing Standards and the City.
 - C. Project Co shall ensure that all of the equipment installed at the Lester Road crossing operates as specified in further detail elsewhere herein in accordance with Clause 10.13(b).

- D. The right of way at Lester Road is always for the Train as there is no means to stop the Train. Train stop signals shall not be required for the Lester Road crossing. The adjustments required to the Track circuits are those adjustments required to account for the widened Lester Road crossing area.
- (t) Project Co shall provide an interface to the S&TCS for the Airport Emergency services access road as noted herein.
- (i) Project Co shall design the S&TCS System to include the interface and equipment necessary to operate the Airport security fence sliding gate and simultaneously request the S&TCS to stop all approaching Trains to the crossing. This shall include the installation and interface of the Yelp Emergency vehicle detection and activation system.
- (ii) Although there will be no HGCWD system flashers or crossing gates to be provided at this private crossing, Project Co shall provide and install all required crossing warning signage in accordance with the Transport Canada Grade Crossing Standards.
- (iii) Project Co shall verify that the line of site for viewing approaching Trains in both directions from the crossing is unobstructed and compliant with requirements of the Transport Canada Grade Crossing Standards.
- (iv) Project Co shall ensure that all of the equipment installed at the Airport Emergency services access road crossing operate as specified in further detail elsewhere herein under Clause 10.13 (c).
- (v) Project Co shall provide CCTV coverage of the airport Emergency access road crossing.
- (u) Project Co shall supply and Maintain all necessary equipment including, hardware, software, spare parts and any additional items required for Operation and Maintenance of S&TCS.
- (v) Project Co shall provide functionalities and equipment to support all modes of operation in all relevant areas. Upon loss of remote control, local control intervention shall be required in failure or abnormal circumstances.
- (w) Project Co shall ensure that all Revenue Vehicles shall be equipped with S&TCS equipment meet the requirements set out in the Output Specification.
- (x) Project Co shall assess the need for equipping Maintenance Vehicles with S&TCS onboard equipment; otherwise they shall be considered non-equipped vehicles.
- (y) Project Co shall design S&TCS for the safe operation of the Trains, Maintenance Vehicles, non-communicating Trains, and non-equipped vehicles throughout the Expanded Trillium Line at all times.
- (z) Project Co shall provide all necessary wayside signs required for manual operation of Trains and work zones.
- (aa) Project Co shall provide Maintenance planning tools for S&TCS to support the asset management planning.

- (bb) Project Co shall provide training equipment in order to allow training of Maintenance staff, including troubleshooting, fault finding, and system updates.
 - (i) Project Co shall maintain the training equipment to be consistent with System operating functions and features.
- (cc) Project Co shall provide remote diagnostic capability and portable test units for S&TCS equipment.
- (dd) The new S&TCS for Trillium Line shall not be required to cover the NRC Spur Track. The adjustments required to the Track circuits at this location are those adjustments required to account for the widened Lester Road crossing area.

10.3 General Requirements

- (a) Project Co shall design all elements of the S&TCS to be failsafe and maximize the safety and security of all personnel, Passengers, and equipment.
- (b) Project Co shall design the S&TCS for the Operation and control of all equipped Revenue Vehicles.
- (c) Project Co shall design the S&TCS to accommodate the safe Operation of the Maintenance vehicles.
- (d) Project Co shall design the S&TCS to allow additional equipment for expandability and extendibility without replacement of previously provided equipment. This shall not prevent minor hardware and software upgrades.
- (e) Project Co shall modify or replace the existing Vehicle on-board ATP equipment, to support cab signaling.
- (f) Project Co shall provide and install new on-board ATP equipment for the new Vehicles.
- (g) Project Co shall design an S&TCS that is based on modern technology, standard off the shelf equipment that has been in service on another similar property for a minimum of five years.
- (h) Project Co shall design an S&TCS that is reliable, maintainable and provide the highest degree of safety for both riders and Vehicle.
- (i) Project Co shall design an S&TCS that provides broken rail detection, speed limit enforcement, and absolute stop enforcement.
- (j) Project Co shall design the S&TCS, for the Trillium Line Extension compliant to the recommended safety level requirements as specified within the AREMA Communication and Signal (C&S) Manual Section 17, Quality Principles. Project Co shall consider and provide the SIL for each Safety Critical function in reference to EN 50128/EN 50129. The final determined level of safety for the S&TCS shall be submitted in accordance with Schedule 10 – Review Procedure.

- (k) Project Co shall design and install the S&TCS to endure reasonable electromagnetic interference without causing or being affected by such inference. The S&TCS shall take into account the following:
- (i) Project Co shall produce a Track circuit design that does not permit from any source, power equipment, communication systems, On-board Vehicle equipment or any local Utility power lines to interfere with its operation.
 - (ii) If AF Track circuits are utilized they shall be designed in such a manner to minimize interference and crosstalk to a level that will not cause an unsafe condition.
 - (iii) Shielded wire, and twisted wire shall be utilized for EMI noise reduction.
 - (iv) Surge protection against lightning and other sources shall be provided.
 - (v) Proper grounding techniques shall be utilized throughout the S&TCS.
- (l) Project Co shall design the S&TCS to include the following minimum expandability and extendibility criteria:
- (i) additional Tracks;
 - (ii) additional interlockings;
 - (iii) additional Vehicles;
 - (iv) additional Station/Stops; and,
 - (v) technology refresh (i.e. hardware and software).
- (m) Project Co shall design the S&TCS to be capable of adapting to the foreseen conditions and constraints such as failures, Emergencies, weather conditions, abnormal conditions and interruptions. The S&TCS shall be Project Co's responsibility to identify and mitigate them while ensuring safe and reliable Operations at all times.
- (n) Project Co shall design the S&TCS to optimize the Train movements and operational speed in accordance with vertical and horizontal Track alignment.
- (o) Project Co shall design an S&TCS capable of reading and reacting to the inputs from supervisory and control systems as required.

10.4 Functionalities

- (a) Project Co shall design the S&TCS to include an ATP system.
- (i) All elements of the new S&TCS shall be provided with the same level of functionality, safety, protection, and redundancy as acceptable on the current system regardless of the assignment of functions among hardware or the terminology used.
 - (ii) Project Co shall provide as a minimum the following S&TCS functionality:

- A. Presence detection of Train vehicles within specific block sections of each segment that are based upon the minimum required safe braking distances;
 - B. Safe separation of following Train vehicle movements, while maintaining the required headway between them;
 - C. Determination and display of the appropriate signal aspect indications required for Train routing and changes in speed;
 - D. Enforcement of adherence to speed restrictions and reaction to signal overruns through application of automatic braking.
 - E. Interlocking switch machine control and indications;
 - F. Switch machine heater (hot air blower) control and indications; and,
 - G. Activation of HGCWD in accordance with the Transport Canada Grade Crossing Standards.
- (b) Project Co shall design the S&TCS with an interlocking system as follows.
- (i) Interlocking functions shall maintain vital fail-safe protection against collisions, derailment, conflicts and other hazardous conditions.
 - (ii) Interlocking system shall be designed in conformance with the latest AREMA Communications & Signals Manual.
 - A. Interlocking system shall be a type of VMIS or CBI or similar industry accepted technology.
 - (iii) Interlocking system shall be a system with interface to other subsystems of S&TCS (e.g. onboard, wayside, the TOCC, and the BCC).
 - (iv) Interlocking system shall be available in the event of major failure of other subsystems of the S&TCS.
 - (v) Interlocking system shall be designed to support not only Trains and Maintenance Vehicles but also to support non-communicating Trains and non-equipped vehicles along the Right-of-Ways.
 - (vi) Track circuits shall be used within interlockings to provide Train detection. Vital interlocking logic shall include control of traffic direction between interlockings. Traffic direction status shall be vitally maintained through power interruption and failures.
 - (vii) Project Co shall provide as a minimum the interlocking system functionality:
 - A. continuous Train detection throughout the interlocking;
 - B. switch position control and indication;
 - C. route call/set;

- D. approach locking/release;
- E. route locking/release;
- F. route conflict protection;
- G. switch locking/release;
- H. overlap locking/release;
- I. section locking/release;
- J. route override (e.g. call-on); and,
- K. field blocking (e.g. Track, signal, switch, route).

10.5 Control

(a) TOCC/BCC Head end Management Platform

- (i) The TOCC and the BCC shall serve as the command and control center for the Expanded Trillium Line. Controls and indications required for all wayside signals, Track circuits, switch machines, switch hot air blowers, house alarms, local control panel operations, power availability, and microprocessor status, and shall be transmitted to/from the TOCC and BCC via the fiber optic communication network.
- (ii) Project Co shall procure and install the hardware and software required at the TOCC and BCC in coordination with the City.
- (iii) Project Co shall design the S&TC head end management platform whereby the GUI displayed on one dispatcher's console can be displayed on another dispatcher's console as long as the required sign in credentials are entered.
- (iv) Project Co shall design the S&TC head end management platform whereby the GUI displayed on a dispatcher's console can be displayed at the TOCC and BCC supervisor's console as long as the required sign in credentials are entered.
- (v) The City shall integrate the S&TC system into the TOCC and BCC's operational theatre to facilitate the display of the workstation GUI onto the video display wall when required.
- (vi) The S&TC head end management platform shall be able to perform all control and monitoring functions required to safely operate the Expanded Trillium Line.
- (vii) Project Co shall design the S&TC system head end management platform to include redundant (primary and backup) servers with full fail-over capability. If the primary servers fail for any reason, the system shall fail over to the backup server without manual intervention.

- (viii) During the fail-over from the primary to the backup server, an alert shall be sent notifying the console operator that a server has failed and the failover has successfully occurred. Acknowledgment of the alert shall be required from the operator's console/workstation.
 - (ix) Once the S&TC system primary server has been successfully restored, the system shall be designed to automatically initiate a transition from the backup server to the primary server.
 - (x) During the transition from the backup to the primary server, an alert shall be sent notifying the console operator that a server has been restored and the transition has successfully occurred. Acknowledgment of the alert shall be required from the operator's console/workstation.
- (b) Wayside signals
- (i) Project Co shall design the S&TCS with a wayside signals at all Train entrance points to the interlocking and at end of each platform to support any operational requirements including departure indicators. The signal arrangement shall follow the Existing Trillium Line CROR signal configuration.
 - (ii) Project Co shall design the S&TCS with wayside signals for trains leaving station platform locations.
 - (iii) Project Co shall design the S&TCS such that wayside signals are mounted with the vertical center of the signal head approximately 2.6m above TOR.
 - A. Built in ladders shall be provided on high signal masts to permit the changing of aspect lamps.
 - (iv) Project Co shall design the S&TCS with signal heads and all associated equipment located outside the Trains' clearance envelope.
- (c) Central Instrument Houses
- (i) Project Co shall design all interlockings to be controlled from VMIS or CBI based system contained within a CIH.
 - (ii) Project Co shall locate the CIH within the interlocking area at a location to minimize the cable lengths to the interlocking wayside devices. Additional remote houses or cases shall be utilized to accommodate manufacture equipment limitations on cable lengths. CIH's shall be prefabricated units that have been prewired and tested at the factory.
 - (iii) Project Co shall design the CIH to be secured in accordance with Safety Certification and System Security Certification requirements.
 - (iv) Project Co shall design CIH with doors with locks. The doors shall also have an emergency bar on the inner side of the door which shall bypass the lock and open the door.

- (v) Project Co shall design the CIH to primarily house all microprocessor systems, relays, electronic switch controllers, etc. necessary to control the interlocking from the TOCC and BCC or from the local control panel within the CIH. Additional relays and supporting equipment may be located within the additional remote houses or cases.
- (vi) Project Co shall design the local control panel with switch controls, signal controls and Track and switch indications and switch heater status shall be provided. Project Co shall design the controls to select local or TCSS control, and local automatic or local manual control shall be provided.
- (vii) Project Co shall design a CIH that is resistant to corrosion and weather damage.
- (viii) Project Co shall design a CIH that is insulated to a level that minimizes heating and cooling loads for the HVAC and heating systems.
- (ix) A single phase feed shall be provided with appropriate step down transformer(s) and distribution panels for signal power and for bungalow power outlets, lighting, HVAC etc.
- (x) A transfer switch and an outside connection for a portable Emergency generator and pad for placement of that generator shall be provided.
- (xi) Power for vital signal systems shall not be grounded.
- (xii) A battery backup system, as described herein, shall be provided to power all signal and ATP systems including fixed block detection and switch operation.
- (xiii) HVAC and heating systems shall be provided with sufficient capacity to maintain room temperatures between 15°C and 22°C.
- (xiv) The CIHs shall be grounded. All racks in the CIH shall be connected to the earth ground bus.
- (xv) Where high density termination blocks are used in signalling equipment located within the CIH, the types used shall:
- A. Allow for circuit isolation without disconnecting wires from the terminal blocks;
 - B. Provide crimped terminations on wires to provide strain relief at the wire insulation;
 - C. Provide cable identification; and,
 - D. Provide evidence of environmental testing to EN50125-3 Environmental conditions for equipment, *Equipment for Signalling and Telecommunications*. Special attention shall be paid to the clearance and creepage requirements and lightning suppression for entrance rack terminations.
- (d) Switch Machines and Switch Heaters
- (i) Dual Control Powered switch machines provided shall:

- A. Have capability to be remotely controlled from TOCC and BCC;
 - B. Have heaters to prevent internal condensation;
 - C. Have a lockable hand throw lever used for manual mode of operation; and,
 - D. Have a record of reliable operation in heavy traffic/transit operation.
- (ii) Switch heaters shall be provided to prevent ice and snow from building up and immobilizing the switch points and switch rods. Switch heaters shall:
- A. Be controlled by the TOCC and BCC with local manual control available for Maintenance and troubleshooting;
 - B. Have sufficient thermal rating and appropriate controls to operate successfully in the climatic conditions outlined in Schedule 15-2, Part 1, Article 4 – Design and Construction;
 - C. Report the status of the switch heater (ON/OFF) for each switch to the local control panel and to the TOCC, the BCC; and,
 - D. Shall cause an alarm indication to the TOCC, the BCC and the local control panel upon failure of switch heaters status to correspond to command status.
- (iii) If electric switch heaters are used:
- A. A switch heater case shall be provided at each interlocking or group of interlockings to distribute power to each switch heater;
 - B. A main circuit breaker and disconnect shall be provided at each switch heater case; and
 - C. The power for the switch heater for each switch shall be separately current protected.
- (iv) If gas heaters are used:
- A. Flameout and ignition failure shall be provided; and
 - B. A safety analysis of gas heaters as well as the gas delivery or storage systems shall be provided.
- (v) If hot air blowers are used:
- A. Hot air blower powered by electric shall meet same requirements as electric switch heaters listed herein.
 - B. Hot air blower powered by gas or propane shall meet the same requirements as gas heaters listed herein.

- C. Air pressure flow switch shall be such that ignition is disabled until adequate pressure is developed.
 - D. High temperature protection shall be such that automatic shut-off for either thermostat failure or temperature exceeding 420 degrees Fahrenheit. Heater operation shall only be restored by manual reset.
 - E. Loss of Flame protection such that the ignition module closes the gas valve if after 10 seconds, no flame is sensed or if flame detection is lost for more than 1 second during normal operation.
- (vi) Switch machine controls shall provide overload protection and automatic recycling in case of obstructions.
- (e) Signal Cable
- (i) The design and manufacture of all signal cables shall meet the requirements of AREMA 10.3.17 for armoured cable.
 - (ii) Signal Cable used in Tunnels shall be provided with a low smoke zero halogen jacket.
 - (iii) If audio frequency Track circuits are provided, the twisted pair or pairs for each impedance bond shall be run in a separate cable from the cable for any other impedance bond. The use of multi twisted pair cables feeding multiple impedance bonds shall be prohibited.
 - (iv) Signal wires from cables shall be terminated with compression lugs.
- (f) Signal Cases and Junction boxes
- (i) Signal cases, junction boxes, and switch heater cases shall be constructed of stainless steel, aluminum or fibreglass with locking doors and neoprene door seals.
 - (ii) All cable wires shall be terminated on AAR terminal boards with links and double nut locking. Gold nut links shall not be used in unheated cases and junction boxes.
 - (iii) Signal cases and junction boxes shall be earth grounded.
- (g) Signal Battery Backup System
- (i) Project Co shall provide a battery backup system for the S&TCS that is capable of providing a minimum of four hours of backup power after the primary source of power is not available. An additional minimum of eight hours of supplementary backup power shall be provided by an external generator.
 - (ii) If batteries are used:
 - A. The battery bank system shall be constantly recharged by the primary power source. Therefore when the primary power source is out, the batteries are no longer recharged but will continue to provide power until the batteries are

exhausted. An external generator shall provide the second backup source of power.

- B. Battery banks shall be provided with redundant chargers.
- C. Battery charger filtering shall be sufficient that the ripple requirements of attached processor systems can be met even when batteries are not attached.
- D. Batteries provided shall be selected for the required capacity and minimal degradation of capacity with age and suitable for the environmental conditions outlined in Schedule 15-2, Part 1, Article 4 – Design and Construction.
- E. Batteries shall not be lead acid.

(iii) If a UPS is used:

- A. The UPS system shall provide a minimum of four hours operating time as the first backup source of power when the primary source of power is out. An external generator shall provide the second backup source of power for a minimum of eight hours.
 - B. The UPS equipment shall meet all CEC requirements and other applicable industry standards.
- (iv) Project Co shall size the batteries, UPS, and generator to provide sufficient backup power to handle all of the S&TCS components operating at the maximum power withdrawal requirements.
- (v) If the generator is “shared” with other systems, the power output of the generator shall handle all of the S&TCS components operating at the maximum power withdrawal requirements, in addition to the maximum power withdrawal requirements for the other shared systems.
- (vi) Project Co shall create and add a test procedure to the test plan for the backup system including testing of the generator.

(h) Broken Rail Protection

- (i) A broken rail protection subsystem shall be provided by Project Co as part of the Trillium Line Extension new S&TCS.
- A. The broken rail protection system shall be capable of providing direct input to the S&TCS or transmit data collated by alternative rail condition monitoring method to update the S&TCS to automatically apply any necessary speed restrictions required to prevent Trains from passing over Tracks where potential broken rails have been detected.
 - B. If Track circuits are used for this purpose, the use of insulated joints shall be kept to a minimum.

- C. If an alternative to a broken rail detection system is proposed it shall be subject to the following constraints:
- (i) The environmental temperature of the Track and associated Track system shall be monitored. The frequency of rail monitoring/testing shall be increased after experiencing ≥ 20 degree Celsius thermal swings in 12 hours or less;
 - (ii) The frequency and type of monitoring shall be commensurate with the type of Track used, its construction methods and the Track bed;
 - (iii) The seismic activity in the area shall be monitored. The frequency of rail monitoring /testing shall be increased after experiencing seismic activity that would exceed the design of the Track and Track bed or compromise structural integrity of the rail or stability of the Track bed.
 - (iv) The Track conditions shall be reported to the City at a minimum of every month. This report shall detail temperature change and any seismic activity during that time period.
 - (v) A fastening system that restricts the longitudinal and lateral movement of the rail following a break shall be provided.
- D. Project Co shall demonstrate that the alternative broken rail protection system has been assessed through a Safety and FMEA analyses. Any required mitigations or design changes shall be implemented before Trial Running.
- E. The broken rail protection system requirement applies to all Mainline Tracks and Airport Link Spur Tracks. It shall also apply to other Tracks (New Walkley Yard) if warranted by the Safety and FMEA analyses.
- (ii) All aspects of the final proposed broken rail protection system shall be subject to review and approval by the City prior to procurement and installation.

10.6 Performance

- (a) General
 - (i) The S&TCS shall be available as per Clause 10.9 or this Part 3.
 - (ii) The S&TCS shall provide the capability of automatic recovery when a part of the signaling system is temporarily unavailable due to a fault or error that is self-correctable without the need for direct attention by qualified signal maintenance personnel. Upon correction of the fault or error, the system shall be able to automatically restart to restore and re-establish contact with the rest of the signaling system. However, any such fault or error shall place any effected vital subsystems of the S&TCS in their most restrictive mode or status of operation until the fault or error is no longer an issue.
 - (iii) The S&TCS shall provide the capability of manual recovery when a part of the signaling system is unavailable due to a fault or error that is only correctable with direct attention

by qualified signal maintenance personnel. Upon correction of the fault, the system would require a manual restart in order to be able to restore and re-establish contact with the rest of the signaling system. Any such fault or error shall place all effected vital subsystems of the S&TCS in the most restrictive mode or status of operation until the fault or error is no longer an issue.

- (b) Headway
 - (i) The S&TCS shall be capable of maintaining the same 12 minute operating headway for Trains during peak hours as the Existing Trillium Line.
 - (ii) The S&TCS shall be capable to operate at a minimum headway, as mandated by the safe Train separation in accordance with the ATP function.

10.7 Failure Management

- (a) Project Co shall seek to ensure no single point of failure, or no common cause failures are creating any hazardous situation to the S&TCS.
- (b) The S&TCS shall be designed to be fault tolerant through modular design, redundancy and resiliency, otherwise fall back to a fail-safe state.
- (c) The S&TCS shall provide alarm indications of abnormal/failure conditions, including data recording and reporting.
- (d) The S&TCS alarms shall be categorized and prioritized in coordination with the Operator and the TOCC/BCC.
- (e) All essential equipment of S&TCS shall be battery backed up or powered by UPS.
- (f) The S&TCS shall not cause loss of Revenue Service operation in the event of a single or common cause failure.
- (g) The S&TCS shall be capable of transferring control from the TOCC and BCC to a local control area via manual commands and overrides in case of partial failure of network or equipment/functions.
- (h) The S&TCS shall provide the capability of transferring control from TOCC and BCC to local Controllers, while the TOCC and BCC or connection to TOCC and BCC control center is not operational.
 - (i) When the failed elements at TOCC and BCC are recovered, the S&TCS shall provide the capability of transfer of control from the local control back to TOCC and BCC.
 - (j) The S&TCS shall be capable of switchover from a failed element to a functioning one when a redundant element is available with no impact to service.
 - (k) All major S&TCS elements shall be monitored for malfunctions, failures, FLS issues and cyber security intrusions. This shall include both an incident message display and audible alarms.

- (l) The S&TCS shall be capable of turn back operation at special Trackwork locations via local control room even if TOCC and BCC is not available.

10.8 Safety

- (a) General Requirements
- (i) The S&TCS shall be designed to the fail-safe principles for bidirectional operation for semi-exclusive and exclusive ROW
 - (ii) The S&TCS shall ensure that the Train operation is safe and it shall remain in a safe state under any System or functional failures.
 - (iii) All potentially unsafe failure modes shall be detected and reported by the S&TCS.
- (b) Safety Standards and Submittals
- (i) The S&TCS shall meet the safety requirements of EN50126, EN50128 and EN50129 in accordance with Schedule 15-2, Part 1 – General Requirements.

10.9 Availability and Reliability

- (a) General Requirements
- (i) The reliability shall be determined and measured based upon hardware failures of the S&TCS equipment.
 - (ii) The availability shall be determined and measured based upon service affecting failures and functional failures of the S&TCS.
- (b) Availability and reliability standards
- (i) Availability and reliability calculation for the S&TCS shall be performed by using internationally recognized industry standards, such as MIL-HDBK-217F, and verified by using real service-proven data provided by Project Co with appropriate rational.
- (c) Availability and reliability demonstration
- (i) The S&TCS availability and reliability shall be demonstrated during demonstration period.

10.10 Maintainability

- (a) General Requirements
- (i) The S&TCS shall be designed to be accessible by maintainers with minimum relocation of equipment.
 - (ii) The S&TCS shall be designed to be capable of replacing of redundant elements of S&TCS without affecting the intended function.

- (iii) S&TCS shall provide remote diagnostic capability and portable test units with the following features:
 - A. built-in test and diagnostic capability;
 - B. built-in status and failure indication capability; and
 - C. central fault monitoring and alarm management capability.
- (iv) Project Co shall provide and have available an adequate number of spare S&TCS equipment to maintain the service requirements.

(b) Maintainability Standards

- (i) The S&TCS shall meet the reliability and availability requirements of an internationally recognized industry Standards such as, but not limited to MIL-STD-470B, MIL-STD-471A and relevant guidelines in MIL-HDBK-472.

10.11 Security

- (a) General Requirements
 - (i) The S&TCS shall provide secure access to its functionalities and equipment.
 - (ii) The S&TCS shall provide secure data transfer, storage and retrieval through cyber security.

10.12 Environment

- (a) The S&TCS shall meet all of the environmental requirements of regionally recognized industry Standards such as, but not limited to AREMA, IEEE 1478 and test method of MIL-STD 810F.
- (b) The S&TCS onboard equipment shall meet the requirements of EN 50155 and the environmental conditions outlined in Schedule 15-2, Part 1, Article 4 – Design and Construction.

10.13 Highway Grade Crossing Warning Devices

- (a) General
 - (i) HGCWD shall include flashing lights, crossing gates, bells, signal masts, cantilever structures, signs, approach and island Track circuits, foundations, conduit, cabling, equipment enclosures, crossing logic and associated materials, lightning/surge protection equipment, equipment appurtenances and subsystems as required for a complete safe, and reliable system.
 - (ii) HGCWD shall be designed and installed to meet requirements of the Transport Canada Grade Crossings Standards.
 - (iii) Grade crossing equipment shall meet the requirements of AREMA Communication and Signal Manual and the standards of the operating railroad.

(b) Crossing Operation

- (i) Control logic and indications for the crossing shall be located in the designated crossing house.
- (ii) The crossing approach limits shall be based upon the maximum approach speed and minimum required warning time. The actual activation of the crossing shall be controlled by a constant warning system based upon the actual speed of the approaching Train.
- (iii) The Grade crossing warning device sequence shall begin with activation of all of the flashing lights when a Train is detected approaching the crossing. All flashing lights at the crossing, including gate lights, shall flash in synchronization to form the standard railroad crossing alternating pattern. The light on the tip of the gate shall remain solid, while others are flashing.
- (iv) All bells shall emit sound while the lights are flashing and continue to sound until the gate arm has returned to within 10 degrees of its vertical position.
- (v) The gate arm shall begin to descend five seconds after the crossing warning system's signal lights begin to flash, and shall reach its horizontal position at least five seconds before the arrival of the Train. Caution shall be taken to eliminate any quick decent of the gate arm.
- (vi) All gates shall remain in the down position as long as any Train or rail vehicle occupies any section of the highway-rail grade crossing Track circuit limits. Once there are no other Trains detected on the approach and the entire Train has completely exited the crossing limits, the lights shall stop flashing, the bells shall stop ringing, and the gates shall rise back to the upright position. Caution shall be taken to eliminate any quick ascents of the gate arm.

(c) Special Crossing Operations

- (i) The Airport Emergency services access road at-grade railway crossing shall include special operational requirements as described in this Part 3. Project Co shall coordinate these operational requirements including design, procurement, installation, and testing of the crossing with the City and the OMCIAA:
- (ii) No flashers and gates shall be provided at this location, however a standard crossing Train detection system shall be implemented to operate the sliding security gates and allow access through the at-grade crossing.
- (iii) All operational and control components of the crossing shall be designed to operate as a “fail-safe” system, such that any failure of a specific component or function shall place the crossing in a fail-safe mode of operation. The fail-safe mode of operation shall not permit the sliding gates to open for the Emergency vehicles unless an override is conducted by the TOCC or BCC.
- (iv) The sliding security gates shall be constantly monitored by the S&TCS to be detected as fully closed. Any time the gates are detected as opened, the TOCC and BCC shall stop all

approaching Trains by placing the approach signal to stop. There shall be two modes of requesting access to the grade crossing and for the sliding gates to be opened:

- A. Emergency vehicles shall request activation through the YELP audio system. The TOCC and BCC shall be notified of the Emergency vehicle request activation. The S&TCS shall operate the sliding gates in the procedure noted herein.
- B. Non-Emergency vehicles or vehicles without the YELP system, shall request activation through an authorized phone or radio call to the TOCC and BCC. The S&TCS shall operate the sliding gates in the procedure noted herein.

(v) Sliding Gate Opening Procedure

- A. The S&TCS shall check to see if any Trains are already within the approach to the at-grade crossing. Trains shall be considered to be within the approach when the Train is past the point at which the Train can safely stop prior to the crossing, based on maximum approach speed and safe braking criteria.
- B. If train is detected already within the approach, the sliding gates shall remain closed until the Train has passed the crossing. Once the Train is confirmed past the crossing and the stop signal for other Trains has been confirmed, the sliding gates shall open and the Emergency vehicles can proceed across the Tracks.
- C. If no Trains are detected already within the approach, then any other approaching Trains are stopped prior to the crossing. Once the stop signal for Trains has been confirmed, the sliding gates shall open and the Emergency vehicle can proceed across the Tracks.
- D. Upon official notification by radio or phone call to the TOCC and BCC that the request for the grade crossing access is no longer required, the S&TCS shall close the sliding gates. Once the sliding gates are detected and confirmed to be fully closed, the S&TCS shall release Trains stopped for the crossing. The first Train stopped prior to the crossing shall proceed at reduced speed until past the crossing. Afterwards all future Train movements shall be returned back to normal operations and associated speeds.

(d) Materials and Fabrication

- (i) HGCWD equipment and materials, shall be designed, manufactured and installed in accordance with the latest version of Transport Canada Grade Crossing Standards, Manual of Uniform Traffic Devices for Canada (MUTCD-C) and AREMA, Communications and Signal Manual.
- (ii) Project Co shall coordinate procurement and installation of the security fencing gate equipment required for the Airport Emergency access road crossing with the City and the OMCIAA.

ARTICLE 11 CORROSION CONTROL

11.1 Reference Documents

- (a) Project Co shall provide corrosion control systems compliant with the criteria contained in this Article, and all standards, regulations, policies, Applicable Law, guidelines or practices applicable to the Project, including but not limited to each of the following Reference Documents:
- (i) CAN/CSA A23.1/A23.2 Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete. Canadian Standards Association;
 - (ii) CAN/CSA A3001 Cementitious Materials for Use in Concrete;
 - (iii) CAN/CSA C22.1 Canadian Electrical Code Part I Safety Standard for Electrical Installations;
 - (iv) CAN/CSA C22.2 Canadian Electrical Code Part II General Requirements;
 - (v) CAN/CSA C22.3 No. 4-1974(R2004) Control of Electromechanical Corrosion of Underground Metallic Structures;
 - (vi) ACI SP-77 Sulphate Resistance of Concrete. American Concrete Institute;
 - (vii) ACI 201.2R Guide to Durable Concrete;
 - (viii) ACI 222R Protection of Metals in Concrete Against Corrosion;
 - (ix) ACI 318 Building Code Requirements for Structural Concrete and Commentary
 - (x) ACI 439 4R Report on Steel Reinforcement;
 - (xi) ASTM C 452 Standard Test Method for Potential Expansion of Portland-Cement Mortars Exposed to Sulfate. ASTM International;
 - (xii) ASTM C876 Standard Test Method of Half Potentials of Uncoated Reinforcing Steel in Concrete;
 - (xiii) ASTM C1152 Standard Test Method for Acid-Soluble Chloride in Mortar and Concrete;
 - (xiv) ASTM C1218 Standard Test Method for Water-Soluble Chloride in Mortar and Concrete;
 - (xv) ASTM D512 Standard Test Methods for Chloride Ion In Water;
 - (xvi) ASTM D-516 Standard Test Method for Sulfate Iron in Water;
 - (xvii) ASTM G-51 Standard Test Method for Measuring pH of Soil for Use in Corrosion Testing;
 - (xviii) ASTM G-57 Standard Test Method for Field Measurement of Soil Resistivity using the Wenner Four-Electrode Method;

- (xix) NACE SP0187 Design Considerations for Corrosion Control of Reinforcing Steel in Concrete;
- (xx) NACE SP0290 Impressed Current Cathodic Protection of Reinforcing Steel in Atmospherically Exposed Concrete Structures;
- (xxi) TCRP Report No. 155 Track Design Handbook for Light Rail Transit Chapter 8, Corrosion Control;
- (xxii) Publication No. FHWA-NHI-00-044-2000 Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes. National Highway Institute, Federal Highway Administration, U.S. Department of Transportation;
- (xxiii) NFPA-130 Standard for Fixed Guideway Transit and Passenger Rail Systems; National Fire Protective Association; and
- (xxiv) Ontario Electrical Safety Code

11.2 Scope of Work

- (a) This Article describes the Design Criteria for corrosion control.
- (b) Project Co shall protect all new Structures and Facilities from corrosion, including the mitigation of stray current for the future electrification of the Expanded Trillium Line. Requirements for existing Structures shall be as per Clause 11.3 (x) (A) of this Part 3. As a minimum, the following new Structures shall be protected from stray current corrosion:
 - (i) Earl Armstrong Grade Separation;
 - (ii) Ecological Crossing;
 - (iii) Rail Bridge over Lester Road;
 - (iv) Rail Bridge over Hunt Club Road;
 - (v) Pedestrian Underpass North of Hunt Club Road;
 - (vi) Pedestrian Underpass North of South Keys Station;
 - (vii) Ellwood Diamond Grade Separation
 - (viii) Elevated Guideway to OMCIA Terminal;
 - (ix) Rail Bridge over Uplands Drive;
 - (x) Rail Bridge over Airport Parkway;
 - (xi) Bowesville Road Grade Separation; and
 - (xii) Limebank Road Grade Separation

11.3 General Requirements

(a) Summary

(i) The corrosion control criteria are separated into three categories: (1) stray current corrosion control, (2) soil corrosion control, and (3) atmospheric corrosion control. Project Co shall meet the following objectives for each of these categories in the order of priority shown below:

- A. Obtain City approval where required;
- B. Ensure continuity of Operations by eliminating corrosion-related failures;
- C. Maximize Design Life of System facilities by avoiding premature failure due to corrosion;
- D. Minimize annual Operation and Maintenance costs associated with material deterioration;
- E. Minimize the deleterious effects to facilities belonging to others caused by stray earth currents from transit operations; and
- F. Minimize cost of installed corrosion control elements.

(b) A project corrosion control and stray current mitigation coordination report shall be required by Project Co to address the corrosion control mitigation technologies to be employed, the coordination with the discipline designers, and the coordination with adjacent Utilities. Project Co shall produce and complete the Corrosion Control and Stray Current Mitigation Coordination Report no later than 120 days following Commercial Close.

(c) A NACE certified corrosion specialist or cathodic protection specialist with a certification in cathodic protection and 10 years of experience on transit systems with a similar level of complexity as this Project, shall serve as the responsible professional and shall approve and coordinate all elements of the corrosion mitigation measures for the Project.

- (i) Corrosion control measures shall be coordinated by Project Co with the other relevant disciplines including Track, signaling and Train Control, communications, EMI/EMC, facilities, safety, civil, structural, geotechnical, electrical, and mechanical.
- (ii) Corrosion control systems provided by Project Co for the Expanded Trillium Line shall be expandable without major reconfiguration, reconstruction, or duplication of equipment.

(d) Soil Corrosion Control

- (i) Soil corrosion control requirements apply to systems or measures installed to mitigate corrosion caused by soil, rock and groundwater.

- (ii) The designs required to mitigate soil corrosion control shall be implemented with the submission of the PFDD level of the first utility or structure design and completed within the Project duration for each identified Utility or Structure.
 - (iii) Project Co shall be responsible to obtain adequate soil/rock samples and ground water samples in areas of anticipated extensive below grade Construction at the reinforced concrete structures listed above in Section 11.2 b. The soil/rock samples shall be analyzed for resistivity (or conductivity), moisture content, pH, chloride and sulphate ion concentrations and for the presence of sulphides.
 - (iv) Project Co shall coordinate with the geotechnical engineering firm to obtain soil samples at a minimum of 10% of boring locations for chemical analysis testing to include moisture content, pH, concentration of chlorides, concentration of sulfates, presence of sulfides, and saturated resistivity to assess corrosivity.
 - (v) Project Co shall obtain in-situ soil resistivity measurements, in accordance with IEEE81, using the Wenner 4 electrode method at all structure locations listed above for comparison to the geotechnical sample chemical analysis.
- (e) Stray Current Corrosion Control
- (i) The minimum requirements apply to measures installed with fixed facilities.
 - (ii) Stray current corrosion control design shall be initiated within 30 days after Commercial Close and completed within the Project duration for each identified Utility or Structure.
 - (iii) A baseline stray current survey shall be performed for post-construction to establish proper installation of electrical continuity and test station installation.
- (f) Atmospheric Corrosion Control
- (i) Atmospheric corrosion control requirements apply to systems or measures installed to mitigate corrosion caused by local climatological conditions including condensation, temperature cycling, industrial and vehicle emissions, salt spray by motor vehicles and snow and air pollutants.
 - (ii) The requirements to be applied to all areas where atmospheric corrosion may be anticipated, are selection of materials of proven durability, protective coatings both barrier and sacrificial, sealants to prevent moisture intrusion and prohibiting the use of dissimilar metals.
 - (iii) Project Co shall ensure that the Bridge Design is not affected by the contamination from adjacent road de-icing or dust suppression, which includes but may not be limited to the following compounds:
 - A. Sodium Chloride (NaCl);
 - B. Calcium chloride (CaCl₂);
 - C. Magnesium chloride (MgCl₂);

- D. Potassium chloride (KCl);
 - E. Brines used in road de-icing/salting; and
 - F. The salt portion of abrasive mixtures and additives commonly used in road salts (ferrocyanides).
- (g) Coatings
- (i) Coatings specified for corrosion control of buried metallic or concrete facilities shall satisfy the following requirements:
 - (ii) Minimum thickness as recommended for the specific system, but not less than 380 microns in accordance with NACE International SP0169 and the manufacturers recommendations;
 - (iii) A chemical or mechanical bond to the metal or concrete surface; pressure-sensitive systems shall not be permitted; non-bonding systems may be permitted in special instances, after review by the City;
 - (iv) Minimum 15-year performance record for the intended service;
 - (v) Mill application wherever possible, with field application of a compatible system; and,
 - (vi) Mechanical characteristics capable of withstanding installation abuse during handling and earth pressure after installation for the Design Life of the System.
- (h) The design of cast-in-place concrete Structures shall be based on the following provisions with a minimum Design Life as outlined in Schedule 15-2, Part 1, Article 4 – Design and Construction:
- (i) Use Type I cement. ASTM C452-75 and ACI Publication SP-77 Sulfate Resistance of Concrete shall be used as guidelines for evaluating the sulphate resistance of concrete mixes with non-standard cement types;
 - (ii) Water/cement ratio and air entrainment admixture in accordance with the structural requirements to establish a dense, low permeability concrete. Refer to applicable sections of ACI 201.2R Guide to Durable Concrete;
 - (iii) Maximum chloride concentration of 250 ppm in the total mix (mixing water, aggregate, cement, and admixtures). The concrete mix shall be such that the water soluble and acid soluble chloride concentrations, at the concrete/ reinforcing steel interface, do not exceed 0.15 and 0.2 percent by weight of cement, respectively, over the life of the Structure. Refer to applicable sections of ACI 222R Corrosion of Metals in Concrete;
 - (iv) Concrete cover over reinforcing steel shall comply with appropriate codes and provide a minimum of 50mm of cover on the soil/rock side of reinforcement when pouring within a form and a minimum of 75mm of cover when pouring directly against soil/rock; and
 - (v) The need for additional measures, as a result of localized special conditions, shall be determined on an individual basis.

(i) Support Pilings

- (i) The following shall be applicable only to support piling systems which are to provide permanent support. Pilings used for temporary support do not require corrosion control provisions.
- (ii) Designs based on the use of metallic supports exposed to the environment, such as H or soldier piles, shall include the use of a barrier coating. The need for special measures, such as cathodic protection, shall be determined on an individual basis, based on type of Structure, analysis of soil borings for corrosive characteristics and the degree of anticipated structural deterioration caused by corrosion.
- (iii) Reinforced concrete piling, including fabrications with prestressed members, shall be designed to meet the following minimum requirements:
 - A. A minimum Design Life as outlined in Schedule 15-2, Part 1, Article 4 – Design and Construction.
 - B. Water/cement ratio and cement types in accordance with applicable codes.
 - C. Chloride restrictions for concrete with non-prestressed members shall be in accordance with applicable codes.
 - D. Chloride restrictions for concrete with prestressed members shall be in accordance with applicable codes, with exception that the concrete mix shall be such that the water soluble and acid soluble chloride concentrations, at the concrete/prestressed steel interface, do not exceed 0.06 and 0.08 percent by weight of cement, respectively, over the life of the Structure; and
 - E. A minimum of 75mm of concrete cover over the outermost reinforcing steel, including prestressing wires, if present.

(j) Concrete-filled steel cylinder columns, where the steel is an integral part of the load bearing characteristics of the support structure, shall be designed considering the need for special measures, such as increased cylinder wall thickness, external coating system, and/or cathodic protection. The design shall be determined on an individual basis, based on type of Structure, analysis of soil borings for corrosive characteristics and the degree of anticipated structural deterioration caused by corrosion.

(k) Stray Current Corrosion Control

(i) For Tunnel Structures

- A. Reinforcing steel in underground trackway structure invert shall be made electrically continuous. Minimum requirements for the reinforcing steel from the top of rail down shall include the following:
 - B. Welding of all longitudinal lap splices in the top layer of first pour reinforcing steel.

- C. Welding of all longitudinal members to a transverse (collector) member at intervals not exceeding 152 meters and at electrical (physical) breaks in the longitudinal reinforcing steel, such as at expansion joints.
 - D. Electrical interconnection of first pour reinforcing steel to second pour reinforcing steel at all collector bars through use of insulated copper cables or steel straps. Longitudinal steel in the second pour shall be made electrically continuous by tack welding all lap splices.
 - E. Test facilities shall be installed at each end of the structure and at every collector bar. Facilities shall consist of insulated copper wires, conduits, and enclosures terminated at an accessible location.
 - F. Precast segmented concrete ring tunnel construction shall meet the requirements in Section 3.1 and the following or be reviewed on an individual basis to determine alternative criteria when they cannot be practically modified to meet the provisions specified below:
 - G. Embedded steel reinforcing members shall be constructed without special provisions for establishing electrical continuity.
 - H. Connecting hardware between adjacent rings and ring segments shall be constructed without provisions for establishing electrical continuity between segments.
 - I. Any metallic components which will be exposed to the soils/groundwaters shall be coated with a fluidized bed epoxy resin system or coal tar epoxy system.
 - J. Application of a coal tar epoxy coating system to the external surfaces of each precast panel.
 - K. Steel liner tunnel construction shall be reviewed on an individual basis to determine the need for special measures, such as increased liner thickness, external coating system, and/or cathodic protection.
- (ii) For Elevated Guideway and Bridge Structures using column and bearing assemblies, tie and ballast
- A. This section applies to Elevated Guideway and Bridges that use a column and bearing assembly, but with tie and ballast Track construction. Welding of reinforcing steel in the deck is not required for this configuration.
 - B. A waterproof, electrically insulating membrane (with protection board on top of the membrane) shall be provided over the entire surface of the deck that shall be in contact with the ballast. The membrane system shall have a minimum volume resistivity of 1×10^{12} ohm-cm.
 - C. Electrical isolation of reinforcing steel shall be provided in deck/girders from columns, abutments, and other grounded elements. Isolation can be established through the use of insulating elastomeric bearing pads, dielectric sleeves and

- washers for anchor bolts and dielectric coatings on selected components. Use of bearings shall take into account the appropriate electrical grounding to ensure that stray current does not pass through the bearing race.
- (iii) For Elevated Guideway or Bridge Structures using column and bearing assemblies, direct fixation.
- A. This section applies to Elevated Guideway and Bridges that use a column and bearing assembly that can be electrically insulated from deck or girder reinforcing steel and shall have insulated Trackwork Construction.
 - B. Provide a fusion bonded epoxy coating to all reinforcing steel and provide a wire mesh current collector mat or provide electrical continuity of top layer reinforcing steel in the deck/girder by welding all longitudinal lap splices.
 - C. If the top layer of reinforcing steel is made electrically continuous, electrically interconnect all top layer longitudinal reinforcing steel by welding to transverse collector bars installed at breaks in longitudinal reinforcing steel, such as at expansion joints, hinges, and at abutments. Connect collector bars installed on each side of a break with a minimum of two cables.
 - D. If the top layer of reinforcing steel is made electrically continuous, provide additional transverse collector bars at intermediate locations to maintain a maximum spacing of 150m between collector bars.
 - E. Provide a ground electrode system at each end of the Structure and at intermediate locations to maintain a maximum spacing between ground electrode systems of 457m. The number, location, and earth resistance of the ground electrode system shall be determined on an individual structure basis.
 - F. Provide test facilities at each end of the Structure and at intermediate locations to maintain a maximum spacing of 152m between test points. The test facilities shall house test wires from the collector bars and ground electrode system, if present.
 - G. Provide electrical isolation of reinforcing steel in deck/girders from columns, abutments, and other grounded elements. Isolation can be established through the use of insulating elastomeric bearing pads, dielectric sleeves and washers for anchor bolts and dielectric coatings on selected components.
- (iv) For Elevated Guideway and Bridge Structures using bents and girders, tie and ballast
- A. This section applies to Elevated Guideway and Bridge Structures that use bent type supports with reinforcing steel extending into the deck/girders, but with tie and ballast Track construction.
 - B. Provide electrical continuity of the column/bent steel by fillet welding appropriate reinforcing to at least two vertical column bars. Make these connections to each of the two vertical bars at the top and bottom of the

- column/bent. The use of sacrificial reinforcing steel bars shall be considered to eliminate degradation of structural steel bars by welding.
- C. Provide electrical continuity of the deck longitudinal bars by fillet welding all lap splices or fillet welding sacrificial reinforcing steel bars and wire tying the structural bars together and to the welded reinforcing steel.
 - D. Electrically interconnect column/bent steel to deck/girder steel by fillet welding at least two vertical column bars to collector bars installed at bents or fillet welding sacrificial reinforcing steel bars between column/bent and deck.
 - E. Electrically interconnect column/bent steel to footing steel when column/bent steel penetrates the footing. Fillet weld at least two vertical column/bent bars to footing reinforcing steel.
 - F. Electrically interconnect pre or post tensioned cables to continuous longitudinal reinforcing steel by fillet welding a cable between each anchor plate and the longitudinal reinforcing steel.
 - G. Provide test facilities at each hinge and expansion joint and at every other column/bent, starting with the first column/bent from an abutment. Test facilities at hinges and expansion joints shall house bonding cables from adjacent collector bars on each side of the hinge/joint.
 - H. Facilities at columns/bents shall house two wires from vertical column/bent steel and from the collector bar at the top of the bent.
 - I. Provide a waterproof, electrically insulating membrane (with protection board on top of the membrane) over the entire surface of the deck that shall be in contact with the ballast. The membrane system shall have a minimum volume resistivity of 1×10^{12} ohm-cm.
- (v) For Elevated Guideway and Bridges using bents and girders, direct fixation.
- A. This section applies to Elevated Guideway and Bridge Structures that use bent type supports with reinforcing steel extending into the deck/girders.
 - B. Provide electrical continuity of top layer reinforcing steel in the deck/girder by welding all longitudinal lap splices.
 - C. Electrically interconnect all top layer longitudinal reinforcing steel by welding to transverse collector bars installed at bents and on each side of breaks in longitudinal reinforcing steel, such as at expansion joints, hinges and at abutments (deck side only). Connect collector bars shall be installed on each side of a break with a minimum of two cables.
 - D. Provide electrical continuity of all column/bent steel by welding appropriate reinforcing to at least two vertical column bars. Make these connections to each of the two vertical bars at the top and bottom of the column/bent.

- E. Electrically interconnect column/bent steel to deck/girder steel by welding at least two vertical column bars to collector bars installed at bents.
 - F. Electrically interconnect column/bent steel to footing steel when column/bent steel penetrates the footing. Weld at least two vertical column/bent bars to footing reinforcing steel.
 - G. Electrically interconnect pre or post tensioned cables to continuous longitudinal reinforcing steel by welding a cable between each anchor plate and the longitudinal reinforcing steel.
 - H. Provide test facilities at each hinge and expansion joint and at every other column/bent, starting with the first column/bent from an abutment. Test facilities at hinges and expansion joints shall house bonding cables from adjacent collector bars on each side of the hinge/joint. Facilities at columns/bents shall house two wires from vertical column/bent steel and from the collector bar at the top of the bent.
 - I. If electrical continuity of the reinforcing steel is not provided, other methods of stray current control may be employed such as the use of epoxy coated reinforcing steel and stray current collector mats with test facilities.
- (vi) For Elevated Guideway and Bridge Structures using concrete deck/exposed steel, tie and ballast
- A. This section applies to Elevated Guideway and Bridge Structures that use a reinforced concrete deck with exposed steel superstructure and have insulated Trackwork with tie and ballast Track construction. Welding of reinforcing steel in the deck is not required for this configuration.
 - B. Provide a waterproof, electrically insulating membrane (with protection board on top of the membrane) over the entire surface of the deck that shall be in contact with the ballast. The membrane system shall have a minimum volume resistivity of 1×10^{12} ohm-cm.
 - C. Provide electrical isolation of reinforcing steel in the deck and superstructure steel from columns, abutments and other grounded elements. Isolation can be established through the use of insulating elastomeric bearing pads, dielectric sleeves and washers for anchor bolts and dielectric coatings on selected components.
 - D. If electrical isolation of reinforcing steel in the deck and superstructure steel from columns, abutments, and other grounded elements cannot be obtained, then electrical continuity of metallic components within these latter elements shall be established by appropriate welding and bonding procedures.
- (vii) For Elevated Guideway and Bridges using concrete deck/exposed steel, direct fixation.
- A. This section applies to Elevated Guideway and Bridge Structures that use a reinforced concrete deck with exposed steel superstructure and shall have

- insulated Trackwork construction. This type of construction precludes the electrical insulation of deck reinforcing steel from superstructure steel.
- B. Provide electrical continuity of top layer reinforcing steel in the deck/girder by welding all longitudinal lap splices.
 - C. Electrically interconnect all top layer longitudinal reinforcing steel by welding to transverse collector bars installed at breaks in longitudinal reinforcing steel, such as at expansion joints, hinges, and abutments. Connect collector bars installed on each side of a break with a minimum of two cables.
 - D. Provide additional transverse collector bars at intermediate locations to maintain a maximum spacing of 150m between collector bars.
 - E. If the total structure length exceeds 3km provide a ground electrode system at each end of the structure and at intermediate locations to maintain a maximum spacing between ground electrode systems of 457m. The number, location and earth resistance of the ground electrode system shall be determined on an individual structure basis.
 - F. Provide test facilities at each end of the structure and at intermediate locations to maintain a maximum spacing of 150m between test points. The facilities shall house test wires from the collector bars and ground electrode system, if present.
 - G. Provide electrical isolation of reinforcing steel in the deck and superstructure steel from columns, abutments and other grounded elements. Isolation can be established through the use of insulating elastomeric bearing pads, dielectric sleeves and washers for anchor bolts and dielectric coatings on selected components.
 - H. If electrical isolation of reinforcing steel in the deck and superstructure steel from columns, abutments and other grounded elements cannot be obtained, then electrical continuity of metallic components within these later elements shall be established by appropriate welding and bonding procedures.
 - I. If electrical continuity of the reinforcing steel is not provided, other methods of stray current control may be employed such as the use of epoxy coated reinforcing steel and stray current collector mats with test facilities.

(viii) Retaining Walls

- A. The longitudinal bar overlaps in both faces of the wall, including the top and bottom bars in the footing, shall be tack welded to insure electrical continuity. Longitudinal bars in the footing shall be made electrically continuous to the longitudinal bars of the walls. Collector bars, bonding cables and test facilities shall be installed.
- (ix) Conduit shall be non-metallic, unless metallic facilities are required for specific engineering purposes or by code.

(x) Existing Bridge Structures

- A. Stray current corrosion control for existing Bridge Structures shall be addressed at the time of electrification of the Expanded Trillium Line and is not included in this Project Scope.

(xi) Corrosion control coatings

- A. Coatings shall have established performance records for the intended service and be compatible with the base metal to which they are applied.
- B. Coatings shall be able to demonstrate satisfactory gloss retention, color retention, and resistance to chalking over their minimum life expectancies.
- C. Coatings shall have minimum life expectancies, defined as the time prior to major Maintenance or reapplication, as determined by the manufacturer's standard.

(xii) Metallic-Sacrificial Coatings

- A. Acceptable coatings for carbon and alloy steels for use in crawlspaces, vaults, or above grade shall be as follows:
- B. Zinc (hot-dip galvanizing or flame sprayed);
- C. Aluminum (hot-dip galvanizing or flame sprayed);
- D. Aluminum-zinc;
- E. Cadmium and electroplated zinc (sheltered areas only); and
- F. Inorganic zinc (as a primer).

(xiii) Organic Coatings

- A. Organic coating systems shall consist of a wash primer (for galvanized and aluminum substrates only), a primer, intermediate coat(s), and a finish coat. Acceptable organic coatings, for exposure to the atmosphere, shall be as follows:
- B. Aliphatic polyurethanes;
- C. Vinyl copolymers;
- D. Fusion-bonded epoxy polyesters, polyethylenes, and nylons;
- E. Acrylics, where not exposed to direct sunlight;
- F. Alkyds, where not exposed to direct sunlight; and
- G. Epoxy as a primer where exposed to the atmosphere or as the complete system where sheltered from sunlight.

(xiv) Conversion Coatings

- A. Conversion coatings, such as phosphate and chromate coatings, shall be used as pre-treatments only for further application of organic coatings.
- B. Ceramic-Metallic Coatings (Cermets): this hybrid-type coating system shall be acceptable for use on metal panels and fastening hardware.

(xv) Sealants

- A. Crevices shall be sealed with a polysulfide, polyurethane or silicone sealant.

(l) Barrier Coating System

(i) One of the following barrier coating systems shall be used where corrosion protection is required but appearance is not a primary concern:

- A. Near white blast surface according to NACE NO. 2/SSPC-SP 10;
- B. Commercial blast surface according to NACE NO. 3/SSPC-SP 6;
- C. Near white blast surface according to NACE NO. 3/SSPC-SP 10; or
- D. Apply the coatings according to manufacturer's specifications.
- E. Use one of the following barrier coating systems where corrosion protection and good appearance is needed.

(ii) One of the following barrier coating systems shall be used where corrosion protection is required and appearance is a primary concern:

- A. Near white blast surface according to NACE NO. 2/SSPC-SP 10;
- B. Near white blast surface according to NACE NO. 2/SSPC-SP 10;
- C. Commercial blast surface according to NACE NO. 3/SSPC-SP 6;
- D. Commercial blast surface according to NACE NO. 3/SSPC-SP 6; or
- E. Apply the coating according to manufacturer's specifications.

ARTICLE 12 CELLULAR SYSTEM

- (a) Cellular System Infrastructure
- (i) Project Co shall provide all cabling (coaxial, radiating, fiber, network, power) and all associated infrastructure to enable cellular coverage in the Dow's Lake Tunnel. The cabling and associated infrastructure shall be ready to enable the City to install and Commission radio repeater system in the Tunnel and the pump house.
 - (ii) The City shall develop the performance specifications and design criteria for the cellular system with its service provider in order to refine final design requirements for coverage in the tunnel. The City shall provide all the active repeater equipment for the coverage.
 - (iii) Project Co shall incorporate into their design (design reviews, drawings, system integration) the radiating cable (and accessories) and ensure that all electrical, mechanical, physical interfaces are reviewed and approved.
 - (iv) Project Co shall install and test a minimum 3/4in radiating cable in Dows Lake Tunnel at a height adjacent or near to the vehicle passenger windows. The radiating cable, including mounting hardware shall be provided Project Co.
 - (v) Project Co shall provide a 1/2 in coaxial feeder cable from the Tunnel to the pump house and provided a dedicated rack space in the pump house.
 - (vi) Project Co shall provide fiber connections and power connections in the tunnel to support repeater units, as required, to be installed by the City. Project Co shall approve the mounting detail for the repeater units in the Tunnel.
 - (vii) Project Co shall provide appropriate number of conduits (for fibre and coax) from the Tunnel to the pump house, where the cellular base station will be located.
 - (viii) Project Co shall provide the cabling and infrastructure to comply with NFPA 130 requirements.

Trillium Line Station Functional Requirements

Station Name	Number of Entrances	Bus Connection	Bus Connection Type	Number of Bus Platforms required	Bus Layby Facility	Number of Bus Layby required	PPUDO	# of PPUDO Spaces	Park & Ride Spaces (Initial/Future)	Bus Operator Facilities	Bus Supervisor Office	Train Operator Facilities	Public Washrooms
Main Line													
Bayview	One	No	—	No	No	No	No	No	No	No	Existing	Exisitng	
Gladstone	Two, paid	Yes	On street	1	No	—	No	—	No	No	No	No	No
Carling	Existing	Yes	On street	1	No	—	No	—	No	No	No	No	No
Carleton	Existing	Yes	On street	—	No	—	No	—	No	No	No	No	No
Mooney's Bay	Existing	Yes	On street	—	No	—	No	—	No	No	No	No	No
Walkley	One Paid	Yes	Off Street/ Adjacent Transitway Station	—	No	—	No	—	No	No	No	No	No
Greenboro	Existing	Yes	Off Street/ Adjacent Transitway Station	Existing	Existing	10	No	Exisitng	Exisitng	Exisitng	—	Exisitng	—
South Keys	One Paid	Yes	Off Street/ Adjacent Transitway Station	Exisitng	—	—	No	—	—	—	—	Yes	—
Leitirm	One Paid	Yes	Off street	3	Yes	2	Yes	4	330/925	Yes	Yes	No	No
Bowesville	One Paid	Yes	Off street	3	Yes	4	Yes	4	800/Maximized, TBD by Project Co.	Yes	Yes	No	No
Limebank	One Paid	Yes	On street	9	No	—	Yes	6	No	No	No	Yes	Yes
Airport													
Uplands	One Paid	Yes	On Street	1	—	—	No	—	No	No	No	No	No
Airport	One Paid	Yes	—	—	No	—	No	—	No	No	No	No	No

APPENDIX B

Permanent Bus Stop Requirements

Station	Description	Permanent Bus Terminal Requirements													
		Platforms (length)	Shelters ¹	Sidewalk/curb type	Lighting	Station signage	Route signage	Map Frame	Bike Racks ²	Waste bins	Benches	Emergency phones	CCTV cameras	Passenger Information Displays ³	Bus Lay-up
Gladstone	Eastbound bus stop, south side of Gladstone Ave, east of Trillium Pathway	18m	✓	SC11	✓	✓	✓	✓	x	✓	✓	x	x	✓	x
	Westbound bus stop, north side of Gladstone Ave, east of Trillium Pathway	18m	✓	SC11	✓	✓	✓	✓	x	✓	✓	x	x	✓	x
Carleton	Southbound platform, west side of Campus Ave, south of Library Rd	No changes to platform anticipated												✓	✓ ⁴
Walkley	Eastbound bus stop, south side of Walkley Ave, east of Airport Parkway ramp	18m	✓ ⁸	SC11	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	x
Uplands	Westbound platform, north side of northernmost EY Centre access road, west of pick-up/drop-off roadway	53m	✓	Note ⁵	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	X
Limebank	North side of station, Eastbound side of roadway, adjacent to Station Plaza ^{6 7}	2x18m; 2xx20m	✓ ⁸	SC11	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	x
Limebank	North side of station, Westbound side of roadway, adjacent to Station Plaza ^{6 7}	2x18m; 3x20m	✓ ⁸	SC11	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	x

¹ On-street bus stops shall be provided with a standard 5' x 10' shelter. On arterial corridors, a curved roof shelter is required.

² Bike racks shall be included in LRT station designs, therefore are not required at any permanent bus stops in close proximity to LRT stations.

³ Passenger Information Display infrastructure shall be moved by OC Transpo at no cost to Project Co, however DB Co shall provide the ducts/feeds to the bus stops at cost to Project Co

⁴ Project Co shall provide two lay-up spaces near Campus Ave, north of Library Rd

⁵ As per OC Transpo Transitway and Station Design Guidelines

⁶ Each Platform is route assigned, combining of platforms is not permitted

⁷ Project Co shall provide 5m maneuvering space between each Platform, all 20m Platforms shall be located between the 18m Platforms

⁸ Denotes existing shelter(s) to be relocated from existing Trillium Line Train Platforms by Project Co.

APPENDIX C

Exemplary Station Signage and Wayfinding Drawings Confederation Line

APPENDIX C

[REDACTED]

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**SCHEDULE 15-2
DESIGN AND CONSTRUCTION – COMMON REQUIREMENTS**

PART 4 - STATIONS

ARTICLE 1 INTRODUCTION

1.1 Introduction

- (a) The Stations on the Expanded Trillium Line shall be efficient, universally accessible, sustainable facilities that provide Passengers with an enjoyable, comfortable, and safe transit experience.
- (b) Stations shall act as a catalyst for TOD and shall enhance connectivity to surrounding neighbourhoods while not precluding integration opportunities with future planned developments.
- (c) Project Co shall provide complete Stations and Ancillary Facilities to fully support the operational requirements of the Project while minimizing crowding, travel impedances and physical barriers.

1.2 Overview

- (a) The project consists of the design and construction of new Stations and the renovation and alteration of existing Stations for a total of thirteen Stations.
- (b) Project Co shall design and construct the Stations and all associated Facilities, and shall obtain necessary Permits, Licences, Approvals and Authorizations in accordance with Schedule 32- City Permits, Licences, Approvals and Authorizations (PLAA) for the same. Station Structures and systems shall be designed and constructed to satisfy the Design Life requirements of Schedule 15-2, Part 1, Article 4 – Design and Construction, Table 1-4.1 and as per CSA S478-95 (R2007) Guidelines on Durability in Buildings. Project Co shall provide the Facilities including but not limited to the following:
 - (c) Project Co shall provide Stations including:
 - (i) Line, Terminal, Transfer Stations. Some Stations function as one or more of these types.
 - A. A Line Station is located within the line and does not intersect with any, Train or Bus Station including the following Stations; Gladstone, Carling, Carleton, Mooney's Bay, Walkley, Bowesville and Uplands;
 - B. A Terminal Station is located at either end of the Train line including the following Stations; Bayview, Airport, and Limebank; and,
 - C. A Transfer Station intersects with bus service or Train service integrated with the Station and provides transfer of modes of transportation without requiring revalidation of fare including the following Stations: Bayview, Greenboro, South Keys, Leitrim, and Bowesville.
 - (ii) Two new Stations shall be constructed on the Existing Trillium Line: Gladstone, and Walkley.

- (iii) Four new Stations shall be constructed on the Trillium Line Extension; South Keys, Leitrim, Bowesville and Limebank.
 - (iv) Two new Stations that accommodate a single Vehicle from the Existing Vehicle Fleet shall be constructed on the Airport Link; Uplands and Airport. These Stations shall be expandable to accommodate future Platform extensions for two coupled Vehicles from the Existing Vehicle Fleet.
 - (v) The existing five Stations on the Existing Trillium Line shall be expanded to accommodate the Revenue Vehicles and upgraded: Bayview, Carling, Carleton, Mooney's Bay, and Greenboro.
- A. Upgrades to the existing Stations shall include but not be limited to:
- i. Installation of Project brand signage;
 - ii. Replacement of the PA system;
 - iii. Upgrading of PIDS;
 - iv. Upgrading of communications systems;
 - v. Upgrading of lighting;
 - vi. Upgrading of CCTV monitoring systems;
 - vii. Upgrading of electrical systems;
 - viii. Upgrading of TSA;
 - ix. Addition of redundant elevators where required by this Part 4;
 - x. Upgrading of elevators where required by this Part 4;
 - xi. Upgrading of landscaping;
 - xii. Upgrading of Platform furniture; and,
 - xiii. Accessibility upgrades.

(d) Project Co shall provide Ancillary Facilities including:

- (i) Bicycle Facilities;
- (ii) Bus Facilities;
- (iii) Bus Operator and Maintenance Buildings;
- (iv) Station Entry Plaza(s);
- (v) PPUDO;

- (vi) Off-street Non-Revenue Vehicle parking;
 - (vii) Pedestrian overpass or underpass structures;
 - (viii) Passenger shelter structures;
 - (ix) Structures containing mechanical, electrical, communications or other service equipment;
 - (x) Signal equipment enclosures;
 - (xi) Entrances;
 - (xii) Rail operator crew rooms;
 - (xiii) Bus lay-by areas; and,
 - (xiv) Maintenance Facilities: Refer to Schedule 15-2, Part 5 – New Walkley Yard.
- (e) Emergency Planning:
- (i) Project Co shall be responsible for the preparation, submission and Maintenance (including revisions as necessary) of fire safety plan(s), for approval by the authority having jurisdiction, pursuant to Ontario Fire Code, Section 2.8 Emergency Planning, where applicable, in accordance with Schedule 10 – Review Procedure.
- (f) Stations design shall consider pedestrian circulation as a critical element. Station designs shall facilitate the transfer of Passengers from one mode of transportation to another by minimizing transfer effort and to ensure safe exiting under Emergency conditions. Station capacity shall be planned and designed to serve the projected operations for Ridership Demand of the 2048 AM peak contained in this Part 4 and Schedule 15-2, Part 1, Article 3 – Operational Performance Requirements.
- (g) All new Stations shall be provided with space and Utility services provisions for installation of a fare control system including but not limited to fare control gates and Ticket Machines to be installed by the City.
- (h) Airport Station and Uplands Station are located on Airport Lands and are Federally Mandated Stations subject to review by the NCC. Project Co shall be responsible for design and construction of the Stations in accordance with the following:
- (i) The National Capital Act makes the NCC responsible for coordinating and approving projects related to Federal Lands and buildings in Canada's National Capital Region. The NCC is a Crown Corporation and therefore functions at a distance from the federal government, reporting to Parliament through the Minister of Canadian Heritage.
 - (ii) All individuals and federal organizations need NCC approval before undertaking projects on Federal Lands and buildings in Canada's National Capital Region.
 - (iii) The NCC's mandate to approve federal land uses, transactions and designs is set out in sections 12 and 12.1 of the National Capital Act.

- (iv) Project Co's approach to the Federally Mandated Stations shall be subject to review by the NCC and shall be assessed in terms of compliance with the guiding principles contained within this Project Agreement:
 - A. Project Co shall be responsible to develop designs and design documentation to support the City and the OMCIAA in obtaining NCC approval, including but limited to:
 - i. Attending meetings with the City, the OMCIAA and NCC;
 - ii. Providing design documentation, reports, renderings specifications, etc. to be used in the approval process; and,
 - iii. Project Co shall be responsible for presentations of the Stations/Project to the Advisory Committee on Planning Design and Realty at the NCC.
 - (v) Project Co Station designs shall reflect a quality of design consistent with the best practice of architecture, landscape architecture, urban design, and universal accessibility. Project Co's designs shall comply with the conditions contained in the NCC's approval letter dated September 14, 2017.
- (i) All Stations shall be designed and constructed to permit Emergency Vehicle access. If any new Works are required to ensure Emergency Vehicle access, then these Works shall be the responsibility of Project Co.
 - (i) At the following Stations, Emergency vehicle access can be via the bus transfer area: Greenboro, South Keys, Leitrim, and Bowesville.
 - (ii) At the following Stations, Emergency vehicle access can be via the nearest City street: Gladstone, Carling, Mooney's Bay, Carleton, Walkley and Limebank.
 - (iii) At Uplands Station, Emergency vehicle access can be from Uplands Drive via the EY Centre parking lot to the south of the Station.
 - (iv) At Airport Station, Emergency vehicle access can be from Airport Parkway Private.

1.3 Design Principles and Guidelines

(a) Accessibility

- (i) Project Co shall ensure all Stations and all public spaces excluding Maintenance spaces and services rooms, are designed to optimize accessibility for persons with disabilities in accordance with Universal Design principles. This will include satisfying the requirements of relevant federal, provincial and municipal accessibility legislation, standards, guidelines, practices and criteria, including but not limited to Transport Canada, Canadian Transportation Agency Code of Practice - Terminal Accessibility, AODA, OBC, COADS, as well as CSA Standards (including but not limited to CAN/CSA B651). The application of accessible design legislation, standards, guidelines, practices and criteria shall accommodate the needs of persons with different types of disabilities, including those with auditory, intellectual, physical, developmental, visual, learning, and mental health disabilities.

- A. Adequate clearances shall be provided to accommodate Passengers with mobility devices, luggage, strollers, bicycles, service animals, support persons, with access to benches, and equipment at Stations, public facilities, and all TSA's including Platforms at Stations and bus Platforms.
- (ii) Project Co shall ensure all accessible public spaces and interior routes are required to be connected to accessible entrances and accessible exterior routes.
- (b) Crime Prevention Through Environment Design as follows:
- (i) Project Co shall design all Station-related public accessible areas (Platforms, entrances and passageways, sidewalks, landscaping, PPUDO's cycling facilities, MUP's, parking areas, elevators, washroom access, Emergency access, plazas bus Platforms) using CPTED principles. An independently contracted CPTED review and report of the Project design shall be provided to the City by Project Co as part of each design submittal, all of the CPTED report requirements shall be incorporated into the Project by Project Co. The independently contracted CPTED review provided by Project Co shall be performed by a qualified CPTED practitioner or practitioners, in good standing with a recognized CPTED national or international organization and who holds current CPTED certification(s).
- (c) Project Co shall implement bird friendly design:
- (i) All glazing utilized in the Facilities shall be non-reflective type glazing; and,
- (ii) Expanses of glazing system in excess of 2m² shall include pattern to create a visual marker to allow birds to identify the Facilities as solid objects.
- (d) Snow Storage:
- (i) Project Co shall design and construct all bus Facilities with capacity for snow storage, including bus Platforms, Park & Ride lot, bus loop and bus lay-by areas in accordance with City Standards including OC Transpo Transitway and Station Design Guidelines.
- (ii) Where snow storage is planned within landscaped areas, Project Co shall use salt-tolerant landscape materials and vegetation.
- (e) Project Co shall design and construct all Stations with provision for Maintenance, including the following:
- (i) Access to Station areas without passing through fare gates;
- (ii) Access into and through Stations for Maintenance equipment;
- (iii) Consideration of roof and ceiling heights above finished floor elevation for Maintenance or replacement of ceiling mounted or supported items;
- (iv) Roof access and fall protection for roof mounted equipment; and,
- (v) Other requirements listed elsewhere in this Part 4.

- (f) Project Co shall develop a single architectural language for the Stations excluding Bayview and Airport Stations, to be implemented during design and construction. The architectural language shall be related to the architecture of the Stations on Confederation Line. The new Stations on the Expanded Trillium Line should provide an upgraded Passenger experience; however the architecture of the Confederation Line Stations is not expected to be carried over to the Expanded Trillium Line. The architectural approach to the Stations shall include the following:
- (i) Station entrances shall be prominent and shall have presence from the adjacent public street or Facilities such as Park and Rides. Station indicator signage shall be visible from a distance and be designed in accordance with the Confederation Line signage package as outlined in Article 7.5 (b) of this Part 4;
 - (ii) Each Station architectural, landscape and urban design shall be integrated with the contextual surrounding enhancing the civic nature of the Project;
 - (iii) Passenger flow to and through the Station shall be intuitive with the Station and landscape architecture offering visual clues and guidance to the Passenger; and,
 - (iv) Passenger amenities, fare control equipment, site furniture and wayfinding at Station entrances shall be planned and designed in a consolidated, efficient and coherent manner to avoid a cluttered layout and appearance. Unless site conditions prevent implementation, Station designs shall consider right Passenger flow.

1.4 Key Individuals

- (a) Design architect
- (i) Project Co shall assign a Design Architect with the qualifications identified in Schedule 9 – Key Individuals, to lead all aspects of the Stations and Ancillary Facilities design, planning and execution of the same for the Project including the following:
 - A. Responsible for the creation of and ensuring the execution of the architectural design of all facilities is consistent across the Project.
 - B. Responsible for coordination and integration of all signage and wayfinding, mechanical, structural, electrical, communications, and Systems, to ensure the integrity of the architectural design.
 - C. Responsible for Stations and Ancillary Facilities interface and coordination with the City and third parties.
 - D. Responsible for the interface with all Governmental Authorities.

ARTICLE 2 ARCHITECTURAL DESIGN CRITERIA

2.1 Introduction

- (a) This Article presents the specific general criteria that are necessary for Project Co to carry out the design and construction of the components and elements of Stations and other building-type Structures on the System.
- (b) Project Co shall design and construct buildings in accordance with all applicable codes and standards.
- (c) Where Design Criteria related to Site specific requirements differs from general requirements, Site specific Design Criteria take precedence over general Design Criteria.
- (d) Appendices to this article form part of the Project requirements.
- (e) Code Analysis
 - (i) Project Co shall perform a code analysis with respect to the OBC, NFPA 130 Standard for Fixed Guideway Transit and Passenger Rail Systems. For Federally Mandated Stations, a code analysis for the NBCC shall also be performed. The code analysis for each Station shall address the following minimum requirements:
 - A. Building Size, Use and Occupancy;
 - i. Building area and number of storeys;
 - ii. Mezzanines; and
 - iii. Description of Stations as either open or enclosed;
 - B. Structural design;
 - i. Including where the existing Transitway and Existing Trillium Line retaining walls form part of a Station;
 - C. Occupant load;
 - D. Construction requirements;
 - E. Interconnected floor spaces;
 - F. Spatial separation;
 - G. Fire department access;
 - H. Fire separations and compartmentalization;
 - I. Egress and exiting;
 - J. Fire protection systems, Emergency power and communication systems;

- K. Washrooms;
- L. Barrier Free Design; and,
- M. Alternative Solutions:
 - i. Description of performance; and
 - ii. Proposed method of compliance.

2.2 Codes and Standards

- (a) Project Co shall design and construct all Facilities in accordance with applicable laws, codes, standards, regulations, guidelines and Governmental Authority.
- (b) Where the requirements stipulated in this document or any referenced sources are in conflict, refer to Schedule 15-2, Part 1, Article 1 – Reference Documents and Submittals for order of precedence.
- (c) The following codes, standards and regulations shall apply to the Works:
 - (i) OBC;
 - (ii) AODA;
 - (iii) COADS;
 - (iv) OFC;
 - (v) OC Transpo Transitway and Station Design Guidelines;
 - (vi) The Ontario Heritage Act;
 - (vii) CSA including:
 - A. CAN/CSA B44 Safety Code for Elevators and escalators (latest edition including Appendix E);
 - B. CAN/CSA-B651 Accessible Design for the Built Environment;
 - (viii) MNECB;
 - (ix) CPTED as defined on the CPTED website: cptedontario.ca;
 - (x) OHSA;
 - (xi) MTO;
 - (xii) NBCC Applicable to Stations located on Federal Lands; and,
 - (xiii) NFPA.

(d) Application of OBC related to Stations:

- (i) Project Co shall determine the appropriate Group and Division applicable to the Station Facilities based on the Project Co's design;
- (ii) Notwithstanding the above, Project Co shall comply with the following:
 - A. Bayview Station Trillium Line Platform area is considered part of the Existing Bayview Station Building classified as a Rapid Transit Station and thus is required to comply with OBC 3.13;
 - i. Existing washrooms are not required to be upgraded to meet OBC 3.13 requirements;
 - B. Stations shall comply with the following clauses of OBC 3.13 Rapid Transit Stations:
 - i. 3.13.1.2. Definitions;
 - 1 Though the Existing Trillium Line does not meet the definition of rapid transit system, this does not relieve Project Co from compliance with OBC 3.13 as identified in this Article;
 - ii. 3.13.2. Construction Requirements – Applicable to all portions of Stations constructed over the Guideway, including existing fare control buildings;
 - iii. 3.13.3. Safety Requirements Within Stations;
 - iv. 3.13.4. Means of Egress;
 - v. 3.13.5. Fire Safety Provisions;
 - vi. 3.13.6. Required Sanitary Facilities, applicable at Limebank Station only; and,
 - vii. 3.13.8.4. Emergency Operation of Elevators.

2.3 Elements of Continuity and Variability at Stations

- (a) The design of each Station shall utilize a common vocabulary of elements and features that unify and identify the System as a whole and convey a sense of its public purpose.
- (b) The Station designs shall have continuity of overall functional layout and placement of operational devices and amenities.
- (c) Station design elements are divided into two classifications: Elements of Continuity and Elements of Variability as defined below.

- (i) Elements of Continuity provide consistent Station designs for the purpose of system-wide identity, functional consistency, and efficiency in capital, operations, and Maintenance costs.
 - (ii) Elements of Variability are not required to be consistent between Stations.
- (d) Project Co shall provide Station elements which are continuous or variable in accordance with Table 4-2.1:

Table 4-2.1 – Station Elements of Continuity (C) or Variability (V)

DESIGN ELEMENT	C or V
Wayfinding, Signage and Visual Displays	
Signage	C
Advertising	C
Vertical circulation	
Stair details (typical dimensions, details and finishes)	C
New elevator details	C
Existing elevator details	V
Sloped walking surfaces and ramp details	C
Communications	
Public address system and speakers	C
ETEL	C
Assistance for hearing impaired	C
Telephones	C
Transit information panels(TIP)	C
Closed-Circuit Television (CCTV) equipment	C
PIDS	C
Station control and security	
Transecure Area and equipment	C
Fare equipment **	C
Emergency exit and security gates	C
Site development – Outdoor Areas	
Road, sidewalk and pathway hardscape surface treatment*	V

DESIGN ELEMENT	C or V
Landscaping*	V
Street Furniture*	C
Retaining walls*	V
Bollards, bumpers*	V
Fences	V
Lighting	C
Bus Platform shelters	C
Trash and recycling receptacles	C
Bicycle rings/racks	C
Bicycle shelters	C
TWSI	C
PPUDO	C
Station – Interior Areas	
Doors, gates, and hardware	C
Floor finishes *	C
Wall and ceiling finishes public areas *	C
Light fixtures*	C
Canopies	C
Vents and ventilations Shafts	V
Handrails—public areas	C
Guardrails—public areas	C
Railings/handrails—emergency exits	C
Drinking fountains/bottle filling stations	C
Platform edge tile	C
Public stairway details and materials	C
Bus and Train Station Platform Shelters	C
Emergency stairway details and materials	V
Platform service gates	C
Fire hose cabinets	C

DESIGN ELEMENT	C or V
Washroom fixtures, accessories & finishes	C
Tactile Wayfinding system	C
Platform Furniture and fixtures	C
* Consistent within a range	** Provided and installed by others

- (i) Where elements of existing Stations are to remain, such as recently installed fare equipment, these elements shall be excluded from the requirements of Table 4-2.1.
- (ii) All elements of Bayview Station shall be consistent with the existing Station elements constructed under the Confederation Line.

2.4 Station Sizing and Capacity

(a) General:

- (i) Project Co shall provide Station designs sized to accommodate the anticipated Operational Performance Requirements outlined in Schedule 15-2, Part 1, Article 3 – Operational Performance Requirements utilizing the 2048 AM peak hour Passenger demand.
 - A. The design shall reflect Passenger volumes accommodating peak loads from arriving / departing Trains, entraining occupant load awaiting Trains, buses and standing Passengers.
 - B. Project Co shall design Uplands Station and site to accommodate events at the EY Centre.
 - i. Project Co shall design all Station components, including the exiting requirements for vertical circulation utilizing the crush load of a two Train consist, operating on a 12 minute headway.
 - ii. Project Co shall be required to construct the Station per item i above, with the exception of the Platform length which shall be constructed to accommodate only a one car Train.
 - iii. The required Platform width shall be constructed to satisfy the greater of the following:
 - 1 A minimum width of 5.0m;
 - 2 The width required for a one car Train Platform length; or,
 - 3 The width required when the Platform is lengthened to accommodate a two car Train.

- (ii) Project Co shall provide bus transfer Stations and Platforms to accommodate the peak hour bus transfer operations including Passenger flows and bus volumes
- (iii) Project Co shall design and construct Stations, Platforms and circulation elements both horizontal and vertical to meet the following minimum requirements:
 - A. Minimum emergency egress requirements shall satisfy the requirements of the OBC.
 - B. A Platform clearance time of no more than 0.8 times the shortest Headway anticipated under normal operations for the ultimate design capacity.
 - i. For centre Platform Stations, two Trains arriving at the same time shall be considered as the base case for modeling purposes.
 - ii. For side Platform Stations with a shared Concourse Level, two Trains arriving at the same time shall be considered as the base case for modeling purposes.

(b) Level of Service:

- (i) The following levels of service indicated below shall be provided in the design of public spaces as referenced in other parts of this article:

Location	Level of Service (LOS)	Measure
Platforms (Normal)*	C	0.8m ² per person
Platforms (Emergency)*	D	0.4m ² per person
Waiting Areas	C	0.8m ² per person
Passageways/bridges – 1 way	D	50 ppm per metre
Passageways/bridges – 2 way	C	40 ppm per metre
Stairways – 1 way	E	55 ppm per metre
Stairways – 2 way	D	35 ppm per metre

**Note: Normal Platform refers to the LOS during the daily peak 15 minutes.*

Emergency Platform refers to the LOS provided during an Emergency in which an incoming fully loaded Train shall evacuate onto a Platform with waiting Passengers at the daily peak 15 minutes.

- (c) Project Co shall provide calculations and Passenger modeling simulations to demonstrate that generous public spaces have been achieved in Station design and that a high LOS has been provided for Passenger circulation including calculations for all aspects of the Station circulation including but not limited to the interior circulation, vertical circulation, Platforms, Site circulation, bus Platforms, and at entries and exits. Stations design shall consider intuitive Passenger flow, minimizing obstacles and pinch-points. Calculations and Passenger modeling shall be submitted according to Schedule 10 – Review Procedure.
 - (i) Calculations and modeling shall be based on the operation parameters in this Part 4 and Schedule 15-2 Part 1, Article 3 – Operational Performance Requirements for 2048 AM peak ridership demand.

- (ii) The software utilized by Project Co shall be a proven and widely used product in the design and analysis of rapid transit and intermodal transit facilities.
 - A. Assumptions used in calculations and modelling simulations shall be confirmed and agreed upon between Project Co and the City, prior to completing any calculations or modeling.
 - (iii) The design of the Station Facilities shall be adjusted based upon the results of the simulation.
 - (iv) The Passenger simulation analysis shall be submitted in accordance with Schedule 10 – Review Procedure.
 - (v) Passenger modelling shall include all physical barriers, such as columns and Station furniture, and include surge spaces around station equipment such as fare equipment and elevators.
- (d) Surge spaces, queuing and runoff
- (i) Project Co shall be responsible for determining the amount of queuing space required at each element within the design to meet the LOS required in each area. The calculated requirements shall be equal to or greater than the requirements below for the following items;
 - A. Surge space provided at the top and bottom of public stairs shall be a minimum of 5000mm
 - B. Runoff provided space in front of an elevator shall be a minimum of 3000mm
 - C. Queuing distance provided at fare gates, entry and exit sides shall be a minimum of 5000mm measured from the leading and trailing limits of the gate pedestal.
 - i. Where rolling grilles or other similar devices are provided at a Station entrance, the coiling door shall not be located as such to reduce the required 5.0 metre surge space from the fare gate.
 - D. Queuing space provided at a Ticket Machines shall be:
 - i. A minimum of 3000mm when facing a wall or obstruction.
 - ii. A minimum of 2000mm when adjoining another queue space.
 - E. Queuing space provided at all doors for use by the public at the Station within the flow path of Passengers to and from entries, Platforms and vertical circulation, exclusive of coiling doors and grilles, shall be a minimum of 3000mm.
 - F. Where two or more elements listed above converge, the surge or runoff spaces shall be cumulative.
 - (ii) Queuing and runoff spaces listed in item (i) above are applicable to new Stations.

- A. Non-conformant queuing and runoff spaces including stairs elevators and fare equipment as currently constructed at existing Stations are not required to be modified, provided existing elements remain unmodified in Project Co's design solution.

(e) Platforms

(i) All Platforms on the Expanded Trillium Line shall comply with the following:

- A. The width of the Platform shall be the greater of the following: the minimum required in this article; the minimum required by OBC; the minimum required by NFPA 130; or the minimum width to satisfy the LOS and ridership requirements, and Schedule 15-2, Part 1, Article 3 – Operational Performance Requirements.
- B. Refer to Schedule 15-2, Part 3, Article 9 – Intrusion Access Control System for monitoring and detection requirements to detect unauthorized intrusions from Station Platforms to Track-level at Platform end gates.

(ii) Station Platforms:

- A. All Stations shall have a minimum 77m long Platform to accommodate the Train consist.
- i. Airport and Uplands Stations shall be constructed with an initial minimum Platform length of 40m with design allowances and provisions to allow extension of the Platform to a minimum of 77m.
- B. The scale and number of Platform elements within public spaces shall be organized to avoid clutter and maximize the proportions of open space.
- C. Non-public service areas or rooms may be located under vertical circulation elements.
- D. Station Platform width
- i. Side Platforms shall be a minimum of 5000mm wide.
- ii. Centre Platforms shall be a minimum of 10500mm wide, except for South Keys Station.
- iii. South Keys Platform shall be a minimum of 8290mm wide.
- iv. A clear circulation width from the Platform edge shall be maintained in accordance with OBC.
- E. In accordance with Schedule 15-2, Part 2, clauses 1.1(c) and (d), Station Platforms, with the exception of Limebank, Bowesville, Uplands and Airport, shall be equipped with slip-resistant retractable Platform edge extenders along the entire length of the Platform, and providing the required clearance for the passage of freight Trains through the Station Platform area in the retracted position.

(f) Ridership Forecast Data

- (i) Project Co shall be responsible for ensuring that the SI supports the Passenger demand in Table 4-2.2 and Table 4-2.3 below, and in accordance with this Part 4 and Schedule 15-2, Part 1, clause 3.4 – Operational Design and Construction Requirements.
- (ii) Project Co shall utilize a ratio of 90.0% to convert the AM peak hour ridership forecast to a PM peak hour ridership forecast.

Table 4-2.2: 2031 AM Peak Hour Ridership Forecast

Stations	2031 AM Peak Hour Ridership Forecast					
	NB Boardings	NB Alightings	NB Load	SB Boardings	SB Alightings	SB Load
Airport	80	0	-	0	130	-
EY Centre /Uplands	0	0	-	0	10	-
Limebank	410	0	410	0	80	0
Bowesville	870	0	1,280	0	130	80
Leitrim	280	0	1,560	10	10	210
South Keys	150	80	1,630	140	60	210
Greenboro	360	60	1,930	30	20	130
Walkley	40	20	1,950	0	20	120
Mooney's Bay	50	70	1,930	0	90	140
Carleton	60	1,390	600	30	1,020	230
Carling	0	240	360	190	0	1,220
Gladstone	0	90	270	130	0	1,030
Bayview	0	270	0	900	0	900

Table 4-2.3: 2048 AM Peak Hour Ridership Forecast

Stations	2048 AM Peak Hour Ridership Forecast					
	NB Boardings	NB Alightings	NB Load	SB Boardings	SB Alightings	SB Load
Airport	90	0	-	0	146	-
EY Centre /Uplands	0	0	-	0	11	-
Limebank	800	0	800	0	80	0
Bowesville	1,120	0	1,920	0	150	80
Leitrim	400	0	2,320	10	20	230

South Keys	160	220	2,260	140	70	240
Greenboro	350	160	2,450	30	20	170
Walkley	40	50	2,440	0	20	160
Mooney's Bay	50	140	2,350	10	100	180
Carleton	60	1,440	970	30	1,010	270
Carling	0	310	660	190	07	1,250
Gladstone	0	110	550	180	0	1,060
Bayview	0	550	0	880	0	880

2.5 Circulation and Egress

(a) Vertical Circulation

- (i) Project Co shall design and construct elevators in accordance with the following:
 - A. Where Station design requires elevators, except where noted in this section, each Station Platform, concourse, and entrance shall be serviced by redundant elevators or other alternative route as described in this Part 4.
 - i. The crossing of City or private streets to satisfy the redundancy requirements is prohibited.
 - ii. An alternative accessible means of vertical transportation such as a ramp shall be permitted, provided the alternative means is within 50m, when measured on the path of travel.
 - iii. Project Co shall ensure the alternative means, such as a ramp, is winter maintained and lit to minimum requirements of this Part 4.
 - B. Where Station design requires elevators, a minimum of one elevator serving each Platform, and all levels of the Station, shall be provided and sized to allow for an ambulance stretcher in the prone position and customers with bicycles. The other elevator shall provide redundancy for accessibility purposes.
 - C. All elevators shall meet the following general requirements:
 - i. Conform to all applicable Acts and codes, including the CAN/CSA B44 Safety Code for Elevators and Escalators (latest edition including Appendix E), OBC, NFPA, NBCC, AODA, CSA Accessible Design for the Built Environment CAN/CSA B651, and COADS;
 - ii. Be of components and construction designed to conform with Project Co's Maintenance responsibilities as defined in Schedule 15-3 – Maintenance and Rehabilitation Requirements;
 - iii. Traction elevators shall be provided where they serve more than 14m of travel; and,

- iv. No running time, cycle counters or trip counters that would cause the elevators to shut down or alter its operation in any way shall be provided.
- D. In addition all new elevators shall have the following:
 - i. The elevator car walls and hoistway walls shall be constructed utilizing glass. Both elevator cab and hoist way enclosure shall be constructed of glass to the maximum extent possible in all Stations.
 - ii. At a minimum, 50% of the total elevator cab and hoist way's vertical enclosure surface area shall be constructed of glass;
 - 1 Glass surfaces of the elevator and elevator hoistway shall be aligned.
 - iii. CCTV camera coverage shall be provided within the cab and at each landing;
 - iv. Access locations to elevators shall be weather protected so as to minimize the infiltration of precipitation into the elevator shafts and or cabs;
 - v. Elevator cab flooring shall be aluminum, rubber, or other durable, non-absorbent material with a non-slip surface with coefficient of friction of not less than 0.60;
 - vi. Elevators shall accommodate a minimum capacity of 1180kg, or the heaviest piece of equipment to be transported between levels for Maintenance, whichever is greater;
 - vii. The minimum inside cab dimensions shall be 1370mm wide x 2032mm deep with 915mm wide x 2135mm high doors for any door location other than centred which shall be a minimum of 915mmx2153mm or to accommodate the largest unit of Maintenance equipment that must be transported between the levels served, whichever is greater;
 - viii. Minimum car operating speeds shall be 0.5m per second for elevators with a travel distance of less than 20m and 1.0m per second for elevators with a travel distance of more than 20m;
 - ix. Elevator machine rooms shall be located as near as possible to hoist ways with a maximum distance of 20m, clear of public walking and landing areas;
 - x. Oil heaters shall be installed in the hydraulic elevator storage tank if the elevator is not in a heated area;
 - xi. Elevators shall be equipped with a self-recharging battery pack which shall maintain lighting, return the elevator to level of fire department access, open the doors, and render the elevator inoperative in the event of a power failure;

- xii. All elevator keying shall match the keying of the existing elevators within the Existing Trillium Line;
- xiii. Elevators shall be equipped with a help hands-free intercom/telephone connected with TOCC;
- xiv. Graffiti-resistant finish material in the cab interior shall be provided;
- xv. Elevators shall be equipped with a urine detection system;
- xvi. Lighting in elevator cabs shall be LED fixtures. Lighting shall be covered with a protective transparent shield to prevent vandalism;
- xvii. The operating status of the elevator shall be monitored by the BMS system and the TOCC;
- xviii. Elevators shall be controlled at the Station only;
- xix. Elevators intended for use in moving equipment to and from locations within the facility shall be sized to accommodate the intended equipment;
- xx. Elevator pit walls shall be lined with a non-porous material and shall be drained waterproofed; and,
- xxi. Existing elevators within Station Facilities that are used in Project Co design shall be replaced or refurbished to meet at a minimum the following:
 - 1 Existing cab and shaft doors shall be replaced with full glass doors;
 - 2 Existing control equipment and mechanical components shall be upgraded to be compatible with the BMS and TOCC monitoring requirements, including addition of CCTV; and,
 - 3 Project Co shall be responsible to make all upgrades to existing elevators in order to obtain certification of the equipment, including meeting updated accessibility standards.

(b) Project Co shall design and construct stairs and ramps in accordance with the following:

(i) Stairs

- A. New stairs shall be constructed of precast or cast in place concrete with precast concrete treads with cast in nosing. Tactile warning strips shall be provided as required by OBC, AODA and COADS.
- B. Exterior stairwells shall be fully weather protected or heat-traced to ensure safe usage during the winter;

- C. Sizing shall be per code minimum requirements and per LOS requirements as required elsewhere in this Part.
 - D. Project Co shall design and construct all stairways in compliance with the following criteria:
 - i. Open risers shall not be permitted;
 - ii. Continuous railings shall be provided on both sides of the stairs;
 - iii. Stairs rise and run shall be 30 degrees;
 - iv. Exterior stairway landing levels shall include a grated drainable catchment basin to trap grit, water and snow; and,
 - v. All public stairs, interior and exterior, shall include a bicycle wheel trough on one side of each flight of stairs.
 - 1 For new construction, the bicycle trough shall be integral with the stair construction.
 - 2 For existing stairs, the trough is permitted to be surface applied, provided the trough, fasteners and accessories do not reduce the required egress width.
 - 3 All bicycle wheel troughs shall include textured, non-slip surfaces to provide traction for bicycle wheels.
 - B. Existing stairs shall be refurbished or replaced to satisfy the Design Life requirements outlined in Schedule 15-2, Part 1, Article 4 – Design and Construction.
- (ii) Railings
- A. Guardrails and handrails where required by code shall meet all relevant accessible design standards and be provided as follows:
 - i. The design and construction of guardrails for all Stations shall be consistent in all aspect of design, materials, and dimensions. Guardrails for public areas, stairs, ramps and landings required by code shall be designed and constructed utilizing glazing, with point supported or framed glazing systems.
 - ii. Guardrail systems for locations other than, public areas, stairs, ramps and landing, are permitted to be of any material meeting or exceeding the guardrail requirements as per OBC.
 - iii. All handrails associated with public stairs shall be stainless steel pipe sections Type 304 alloy conforming to ASTM A167, with smooth brushed finish, supported by cast aluminum or stainless steel bracket supported from wall or guardrail system.

iv. Railings and Platform gates shall be provided at the Platform ends, if otherwise unprotected, and shall be set back a minimum of 300mm from the edge of the Platform or minimum distance of the freight Train envelope clearance requirement where applicable.

v. Vertical railing supports shall be welded flush to preinstalled embedded anchor plates.

(iii) Ramps

A. All interior and exterior ramps shall be designed and constructed to be universally accessible, including satisfying the requirements of OBC, AODA COADS and applicable CSA Standards, including but not limited to CAN/CSA B651; and,

B. Exterior ramps shall be fully weather protected or heat-traced to ensure safe usage during the winter.

(c) Project Co shall design and construct doors in accordance with the following:

(i) Where doors are provided in public spaces, power door operators shall be provided for at least one public door into each publicly accessible room and entrances or as required by COADS and the Building Code.

(ii) All doors shall have a 980mm minimum clear width.

(iii) Exposed edges of frameless transparent glass public doors and panels shall be framed with a 70% colour contrast material compared to surrounding wall surfaces.

(iv) Framed glass public doors shall be finished with a 70% colour contrast material compared to surrounding wall surfaces.

(v) Where door and frame assemblies are opaque, they shall be finished with a 70% colour contrast compared to surrounding wall surfaces.

(vi) All doors and gates securing the perimeter of the Station, inclusive of service doors, shall be provided with electronic key card access and shall be monitored at the TOCC through the IAC system.

(vii) All Emergency egress doors and gates shall be provided with an exterior light that remains on during all hours of darkness and shall be signed for restricted access.

(d) Project Co shall design and construct circulation in accordance with the following:

(i) Public Passageways

A. The design and construction of public spaces for all Stations shall be consistent;

B. Where a public passageway is in an open area, the main accessible path of travel shall be identified by tactile floor wayfinding indicators from entrances to the Platform level and all Passenger amenities;

- C. Floor drains and grilles shall be compatible with the use of mobility devices such as but not limited to canes and crutches, as per AODA 191 / 11 Regulation 413/12 Design of Public Spaces; and,
 - D. All public areas shall have full CCTV coverage.
- (ii) Non Public
- A. The minimal acceptable width of passageways for non-public use shall be the greater of the following: code calculated minimum, 1200mm, or sized as required to move equipment for Maintenance.
- (iii) Public-Use Pedestrian ways within Fare Paid Zone
- A. The absolute minimum clear width shall be 4000mm, unless existing to remain, or sized to satisfy the LOS indicated in other parts of this Article and meet or exceed the greater of the exiting requirements as set forth in the OBC.
 - B. The minimum clear height shall not be less than 3500mm, unless existing to remain.
- (iv) Public Use Pedestrian ways outside of the Fare Paid Zone (Underpasses, and Tunnels)
- A. Unless indicated otherwise, the minimum width shall be 6000mm, unless existing to remain or otherwise specified in the Project Agreement. Refer to Schedule 15-2, Part 6, Article 4 - Site Specific Desired Outcomes for Site specific requirements;
 - B. The minimum clear height of the structure shall not be less than 3000mm;
 - C. The minimum clear height to any signage, light fixtures, etc., shall be 2700mm; and,
 - D. Lighting shall conform to the requirements in Schedule 15-2, Part 6 – Urban Design, Landscape Architecture and Connectivity Requirements.
- (e) Project Co shall design and construct Emergency Egress in accordance with the following:
- (i) Egress to Track level from the Platform along the length of the Platform for purposes of satisfying code exiting requirements is prohibited except as per clause (ii) below.
- (ii) Where required, exit off the Platform in accordance with the following:
- A. Doors/gates protecting the Platform shall be sized appropriately to satisfy code requirements.
 - B. Doors/ gates at Platform shall be equipped with panic device hardware.
 - C. The position of doors/ gates shall be monitored at the TOCC. Unauthorized opening of the gate shall sound an audible signal in the Station and notify the TOCC.

- D. At Track level a fence to prevent public access to the Tracks and or crossing the Tracks.
 - i. Guardrail system shall be designed and constructed to meet the OBC requirements for a guardrail including but not limited to structural capacity and balustrade spacing.
 - E. The path of travel shall lead to a public way, be lit, and winter maintained.
 - F. Crossing of the Tracks to access the public way is strictly prohibited.
- (iii) At Stations, exits forming part of the emergency egress route shall direct Passengers onto City property only, unless otherwise indicated elsewhere in the Project Agreement.
- (iv) Where pathways connecting a Station Platform to a MUP or roadway, or roadway sidewalk are provided to satisfy Emergency egress from the Stations the walkways shall be designed and constructed follows:
- A. Provided with lighting.
 - i. The lighting level shall at a minimum meet the requirements of OBC for emergency egress lighting; and,
 - ii. Lighting shall be interconnected with the fire alarm system and be activated only in the event of an Emergency situation.
 - B. Project Co shall winter maintain the pathway to ensure pathway is kept clear of snow and ice during all hours of operations.
- (f) Project Co shall design and construct Station entrances in accordance with the following:
- (i) Project Co shall provide doors, rolling grilles or ornamental gates or other means to secure the Station building public entrances during hours of non-operation for all Stations with elevators, inclusive of Bayview Station.
 - (ii) At Leitrim, Bowesville, and South Keys Stations, each mode of transportation shall be capable of being secured separately when hours of operation differ.
 - A. At Transfer Stations public access to/from the bus Platform shall be maintained 24 hours per day.
 - B. Ticket Machines shall be accessible to Bus customers outside of the Fare Paid Zone.
 - (iii) All doors, rolling grilles, etc. used to secure the Stations shall be equipped with electrically operators, and controlled both locally and remotely from the TOCC.
 - (iv) For Stations other than those with elevators, securing the Station will be achieved by the City through deactivation of the fare gates during non-operational hours.

- (v) Project Co shall provide recessed floor grilles at all new Station entrances located directly adjacent to the fare gates:
- A. The floor grill shall extend the full width of the fare gate array and a minimum distance of 2.5m from the leading and trailing face of the fare gate pedestal;
 - B. Each floor grille shall be equipped with a floor drain; and,
 - C. Each floor grill drain and drainage pan shall be heat traced.
- (g) Project Co shall design and construct tactile floor wayfinding in accordance with the following:
- (i) Provide tactile floor wayfinding throughout all Stations inclusive of bus Facilities and bus boarding locations within the Fare Paid Zone, in compliance with OBC, COADS and CAN/CSA B651: Accessible Design for the Built Environment.

2.6 Functional Requirements

- (a) Project Co shall design and construct Stations to meet the functional requirements as indicated in Appendix A of this Part 4:
- (i) Where bus services are provided, the design and construction of the Stations shall provide all surface facilities including bus Platforms, drives, slips, etc. to accommodate all buses including articulated and double decker buses.
 - (ii) All OC Transpo facilities, (bus operator rooms, rail Operator rooms, washrooms, lunchrooms, etc.), shall be Universal Design.
 - (iii) In addition to meeting OBC, all washrooms shall be designed and constructed to meet the requirements of COADS.
 - (iv) Where required in Appendix A of this Part 4, bus operator Facilities shall be provided as follows:
 - A. All bus operator Facilities at all Stations shall be standalone Facilities.
 - B. All bus operator Facilities shall be located as to separate OC Transpo bus operators from Passenger areas and bus Platforms.
 - C. New Facilities shall be constructed to meet the requirements of the City's standard bus operator building, and non-specified standard drawings and specifications needs to be reviewed and confirmed by OC Transpo for elements that are not detailed in the Transitway Manual.
 - D. All bus Stations shall be provided with a designated walking area for bus operators to safely walk between the bus lay-up and bus operator facility.
 - E. Program elements within the facility shall include the following:
 - i. Multiple occupancy male washroom with ceiling mounted embossed stainless steel partitions with the following plumbing fixture count;

- 1 Two lavatories;
 - 2 Two water closets; and,
 - 3 One urinal.
- ii. Multiple occupancy female washroom with ceiling mounted embossed stainless steel partitions with the following plumbing fixture count;
 - 1 Two lavatories; and,
 - 2 Two water closets.
 - iii. Universal washroom satisfying the requirements of COADS and CAN-CSA B-651;
 - iv. Janitor closet with mop sink, accessible from within the Facility;
 - v. Breakroom with kitchenette with sink, and casework for concurrent use by four people;
 - 1 Space and services for a microwave oven, refrigerator vending machine and toaster oven; and,
 - 2 Water drinking fountain with bottle filler.
 - vi. All accessories in staff areas, such as toilet seat covers toilet tissue, soap, paper towel dispensers, and disposal units shall meet OC Transpo specifications;
 - vii. General power requirements, including dedicated power circuits for each of the following: microwave oven, refrigerator and toaster oven; and vending machines;
 - viii. Staff work areas;
 - ix. Maintenance room with slop sink, accessed from the exterior and from the staff area;
 - 1 Room shall be a minimum of 60m², with no side less than 6m;
 - 2 Shall be equipped with a personnel door and a 4m wide overhead door to the staff area; and,
 - 3 Shall have at a minimum of one floor drain.
 - x. Building entry and Maintenance room shall have electronic access control;
 - xi. Mechanical and electrical support rooms;

- 1 Project Co shall provide a building automation system per Article 5 - Mechanical Design Criteria of this Part 4 that is compatible with existing OC Transpo building management system.
- xii. Conditioned communication room to support of City equipment; and,
- xiii. New buildings shall be designed and constructed with materials compatible with the adjacent Station and be consistent with the Confederation Line bus operators buildings;
- F. Buildings shall provide illumination level of 25fc to be achieved via natural daylighting over 75% of all floor spaces and windows conforming to City's standard bus operator building requirements;
- G. Building shall be equipped with telephone and data services.
- i. All staff spaces shall be equipped with data and communications outlets.
- H. The flooring in all spaces excluding building service support spaces and the Maintenance space shall be finished with Stonehard flooring system or other similar resinous flooring system as approved by the City.
- (v) Project Co shall provide Operator rooms at Limebank and South Keys Stations, the design and construction of the Operator rooms shall at a minimum include the following:
- A. Breakroom with kitchenette with sink, and casework designed for concurrent use by six people;
- B. In addition to general power requirements, Project Co shall provide dedicated power circuits for each of the following: microwave oven, refrigerator, vending machine, and toaster oven;
- C. Data/communication Outlets to support a minimum of two computer workstations;
- D. Phone line;
- E. Space for a refrigerator, microwave oven, vending machine, and toaster oven;
- F. Water drinking fountain with bottle filler;
- G. Double tier lockers
- i. 16 unit, 300mm w x 300mm d x 900mm h each;
- H. Universal single occupancy male washroom;
- I. Universal single occupancy female washroom;
- J. Located directly adjacent to Platform;

- K. The flooring in all spaces shall be finished with Stonehard flooring system or other similar resinous flooring system as approved by the City;
 - L. In addition to general requirements, Project Co shall provide a dedicated space for Operator sign-in including redundant workstations, electronic crew time clock system, radio charging station for up to 12 radios, and a small lockable filing space for keys, forms, and other paraphernalia; and,
 - M. Project Co shall provide space for and provide one 32" wall mounted electronic display with power and data connection for the HASTUS system.
- (vi) Project Co shall provide one 32" wall mounted electronic display with power and data connection for the HASTUS system within the existing Operator room at Bayview Station.
- (b) Rail Superintendent office
- (i) A Rail Superintendent's office shall be provided at Limebank Station:
 - A. Shall be located adjacent to the rail Platform within the Station;
 - B. Shall be have a minimum area of 12m² with no side less than 3m;
 - C. Shall be conditioned; and,
 - D. Shall be equipped with a minimum of two data and two telephone connections.
- (c) Bus supervisor's office
- (i) Bus supervisor's office shall be provided at the Transfer Stations as indicated in Appendix A of this Part 4. The bus supervisor's office shall have the following requirements:
 - A. Shall be located at bus Platform level, within the Station;
 - B. Shall be located adjacent to the bus transfer Platform and contain a line of Site to monitor bus operations.
 - C. Shall be have a minimum area of 12m² with no side less than 3m;
 - D. Shall be conditioned;
 - E. Shall be accessed from the bus Platform area;
 - F. Shall be equipped with a minimum of two data and two telephone connections; and,
 - G. Shall be provided with two operable windows.
- (d) Public Parking:

- (i) Park and Ride Facilities shall be provided at Leitrim and Bowesville Stations.
- (ii) All Park and Ride Facilities shall be designed and constructed as follows:
 - A. Vehicle parking spaces:
 - i. Shall be between 2.6m to 2.75m wide;
 - ii. Surface lot parking spaces shall be 90 degree;
 - iii. A maximum of 5% of parking spaces located in each Park and Ride lot is permitted to be reduced to a width of 2.4m provided the spaces are clearly signed for compact cars only; and the resulting area difference between standard and compact vehicle parking space, shall result in an increase in total parking vehicle spaces by the equivalent vehicles area difference.
 - iv. Reduction of in width permitted in City of Ottawa Zoning By-law, Parking Space Provisions (Sec. 106) subsection (3) shall not be applicable to this Project.
 - v. Shall be 5.2m in length, except for parallel parking spaces which shall have a minimum length of 6.7m;
 - vi. Each Park and Ride lot shall have 0.5% of the initial parking spaces with provisions for charging stations for plug in electric vehicles including the following:
 - 1 Power conduits, handholes, etc., including a dedicated 208/240V,50A circuit for each charging station;
 - 2 Conduits, handholes, etc., for data and communications connection to each charging station;
 - 3 Foundation and concrete slab for each charging station; and,
 - 4 Identification and operating signage for each charging station.
 - B. Drive aisles:
 - i. Drive aisle within the parking area shall be a minimum of 6.7m wide.
 - C. Designated and dedicated area for snow storage requirement in accordance with City Standards including the OC Transpo Transitway and Station Design Guideline.

2.7 Project Elements

- (a) Project Co shall design and construct Train Platforms in accordance with the following:
 - (i) Platform Height

- A. The finished level of the Platform at Platform edge shall be level with finished floor height of the vehicle.
- (ii) Platform Drainage
- A. The cross slopes of the Platforms shall not exceed 2% with a minimum of 1% toward the Track or away from the Track.
 - B. The longitudinal cross slope of the Platform surface shall not exceed 1.5%.
 - C. The path of travel lanes on the Platform shall comply with OBC, NFPA and all accessibility requirements.
 - D. Snow removal:
 - i. Storage of snow on the Train Platform surface shall not be permitted.
- (iii) Service Outlets
- A. Service outlets for power and water shall be as follows:
 - i. Electrical – provide 15 A/120 V split receptacles at 20m intervals along the Platform area and one receptacle in each TSA; and,
 - ii. Water Hose Bibs – at a minimum provide one tamper proof hose bib on each Platform:
 - 1 Water hose bibs shall be designed, located, and selected as to be protected from freezing.
- (iv) Service/Maintenance Personnel Access Requirements
- A. Project Co shall provide access from the Platform to Track level at each end of each Station Platform. Access off of the end of the Platform shall be restricted by gate with latch and fencing. Gate shall be signed and alarmed to prevent unauthorized access. Gate status shall be monitored by the TOCC.
- (v) Platform barriers:
- A. All side Platform configured Stations shall be provided with a continuous intertrack barrier fence between Tracks.
 - i. Barrier type shall be 1960mm high from top of Track, and be of premanufactured galvanized or powder coated steel construction.
 - ii. The barrier shall extend a minimum of 15m beyond the end of the Station Platform at each end of the Station.
 - iii. The barrier shall be non-climbable and designed to allow visibility from Platform to Platform.

- iv. A gap of no more than 100mm between the bottom of the barrier and the surface below, (ballast, concrete, etc.) shall be permitted.
- (vi) Inter-car barrier protection on all Platforms, except Airport and Uplands Stations, as follows:
- A. Comprised of flexible bollards spaced as required to provide a clear distance between bollards that is not greater than 200mm;
 - B. Centred on the coupling of any two car Train;
 - C. Minimum length of 6.0m;
 - D. Located within the detectable Platform edge warning tile;
 - E. No less than 900mm above the Platform finish floor level;
 - F. Color shall be safety yellow; and,
 - G. The Platform design shall not prohibit the future installation of an inter-car barrier system at Airport and Uplands Stations.
- (vii) All Platform floor finishes shall meet the following requirements:
- A. The finished floor material shall have a non-slip surface with a coefficient of at least 0.60.
 - B. All Platform edges adjacent to Tracks shall have a cane-detectable, tactile warning strip, 610mm wide, extending full length of the Platform comprised of a non-slip, yellow surface.
 - C. Platform floor shall have a minimum 70% contrast in colour and texture from the flooring in the areas approaching the Platform.
 - D. The height of all Station Platforms above top of rail shall be 574mm such that a maximum vertical height difference of +16mm and -16mm is maintained to the Revenue Vehicles at all times.
 - E. The horizontal gap between the finished Platform and the Revenue Vehicles entrance shall be a nominal 50mm and to a maximum of 76mm at all times during boarding and alighting of Passengers.
 - F. The use of floor hatches and or floor access doors within the Platforms shall not be permitted.
 - G. Minimum 70 % colour-contrasting textured, non-slip tile wayfinding paths shall be provided to help locate vertical circulation elements by providing tile paths down the centre of the Platforms to the bases of stairs, and elevators.
 - i. Paths shall include all standard Transecure demarcations at the TSA.

(b) Project Co shall design and construct fare collection and control in accordance with the following:

(i) Project Co shall plan, design and construct all Stations with all power and communications conduit and Utilities provisions for installation of a fare control system including fare control gates and Ticket Machines to be supplied and installed by the City.

A. Fare control equipment provisions and requirements do not apply to existing Stations, (Bayview, Carling, Carleton, Mooney's Bay, and Greenboro), where existing equipment is previously installed and not modified by Project Co.

B. Each entry shall be provided with a minimum of two standard fare gates, two wide fare gates and two Ticket Machines. The designated “accessible” gate shall always be the one on the left when entering the paid zone with the second wide gate at the other end of the array.

C. Each fare gate array shall be contiguous and not broken or obstructed by any other elements, including structural components within the fare array or surge space.

D. Project Co shall provide minimum clear working distances from the fare gate pedestals as follows:

i. When approaching the fare array from the non-fare paid side provide 130mm on the left side of the fare array to a wall, barrier, or obstructions of any kind.

ii. When approaching the fare array from the non-fare paid side provide a minimum of 475mm on the right side of the fare array a wall, barrier or obstructions of any kind.

iii. Barriers to delimit the Fare Paid Zone at the gate array shall be located in the center of the length of a gate array and installed perpendicular to the gate arrays.

iv. In addition to the clearance requirements above, Project Co shall provide space in the array for one addition of one fare gate in the future to the right of the gate array. This space shall be protected for by providing a 1.5m high glass barrier centred on the fare gate pedestal.

(ii) The following Table indicates the minimum quantities of fare collection and control equipment required at each Station subject to revision based on the Project Co's Station designs and Passenger modelling and approved by the City:

Expanded Trillium Line					
Station	No. of Station Entries *	Ticket Machines	Smartcard Enable Fare Gate		
			Regular Gate	Wide Gate	Total Fare Gates

Bayview**	1	2	2	2	4
Gladstone	1	2	4	2	6
Walkley	1	2	3	2	5
South Keys	1	2	2	2	4
Leitrim	1	2	3	2	5
Bowesville	1	2	4	2	6
Limebank	1	2	2	2	4
Uplands	1	2	2	2	4
Airport***	1	2	0	4	4

* In the event that Project Co's Station design varies the number of entrances from the quantity indicated in the table above, the quantiles of fare control equipment shall be modified and approved by the City.

** For new entry only. Excludes the existing Station entries.

*** Fare equipment provisions to be provided by OMCIA Passenger Terminal Building expansion project. Quantities indicated are for reference only.

- (iii) Project Co shall ensure that all building services and feeds are sized appropriately to accommodate the fare gate and collection equipment.
- (iv) Project Co shall provide a 1.5m-high minimum glass barrier adjacent to the fare gate equipment and extending to a wall or other building element to provide protection of the Fare Paid Zone.
- (v) Project Co shall plan and design the location of fare gate and collection equipment as to ensure the year round operation of the equipment by ensuring protection of the fare gate and collection equipment from direct precipitation, including wind-driven rain, snow, and sleet and drifting snow in accordance with clause 2.7(d)(iv)A. Fare vending equipment placement shall also mitigate glare from sunlight on the screen.
- (vi) Project Co shall ensure consistent location of fare collection devices at Stations and in keeping with the Stations on the Existing Trillium Line and weather protection requirements.
- (vii) Project Co shall ensure the integrity of the Fare Paid Zone at all Stations.
- (viii) Project Co shall ensure all fare equipment located in public spaces shall be provided with overhead canopies to provide equipment and customers while using the equipment with weather protection.
- (ix) Project Co shall design Stations fare collection equipment to be flush, fixed and integrated with Station infrastructure, unless otherwise noted, to avoid removal by unauthorized persons. In addition:
 - A. Project Co shall prepare all surfaces for installation of the fare collection equipment and system elements by the City's Fare Collection System provider.

- B. Ticket Machine shall be installed to allow Ticket Machine doors to open 180 degrees for servicing. While in the open position the Ticket Machine door shall not preclude customers from using the second machine. Adjacent Ticket Machines shall be separated by a minimum of 900mm.
 - C. Freestanding equipment shall be permitted provided Project Co ensures sufficient queuing and circulation space as well as space required for Maintenance and restocking activities, without compromising Passenger movement through the Station.
 - D. Project Co shall provide and install all conduit, cable ducts, and shall be concealed within walls, under slabs, within chases, etc., the use of exposed conduit and cable duct is prohibited in public spaces.
 - E. Within existing City structures, if the use of exposed conduit is required in public spaces for the installation of fare equipment, Project Co shall conceal conduits, etc. by painting, enclosing in chases or otherwise treating the conduits, junction boxes, cable ducts, etc. to blend in with the surface to which the item is attached.
 - F. Project Co shall provide the required supporting infrastructure, space, and Utility services provisions for power and communications connections, including but not limited to walker ducts and conduits:
 - i. Power shall be provided on an individual circuit per fare gate on UPS protected circuit, and with power being cut off by the fire alarm; and,
 - ii. Communication conduit from all fare equipment is to feed into communication room or communication cabinet.
 - G. Fare gates and Ticket Machines post installed anchor system require concrete embedment of 150mm. Project Co shall ensure location and or depth of concrete reinforcing is coordinated with the mounting requirements of the equipment ensuring there is no conflict between the anchor and reinforcing steel.
 - H. Project Co shall provide concrete mounting and walking surface at the fare control line between the floor grille assemblies, level with surrounding floor finish.
- (x) Project Co shall provide CCTV coverage of the fare control equipment as follows:
- A. Full CCTV coverage for inbound and outbound Passenger flows at the fare control line.
 - B. Full CCTV coverage of Ticket Machine and views of customer interactions with machines.
- (xi) Project Co shall work in coordination with the City to ensure all supporting infrastructure and systems related to fare vending and control equipment have been accommodated and provide uninhabited access, and to ensure schedule coordination for equipment installation, testing and Commissioning with the City's fare control contractor, etc.

(c) Fare Paid Zone:

- (i) Project Co shall plan, design and construct all Stations with segregated fare paid and non-Fare Paid Zones.
- (ii) The Fare Paid Zone of the Station and all fare paid transfer areas shall be segregated from non-Fare Paid Zones by continuous 1.8m fencing or barrier.
- (iii) Fare paid zones at Leitrim and Bowesville Stations shall be planned and designed to allow Passengers to transfer between bus and Train within the Fare Paid Zone of the Station.
- (iv) The following additional requirements shall apply for bus Transfer Stations:
 - A. Fare paid transfer area of Stations shall be designed to prohibit transferring Passengers from crossing bus traffic;
 - B. All islands provided within a bus transfer area shall contain a combination of barriers not limited to fencing, landscaping, other physical elements to prevent Passengers from traversing bus traffic to access the Station and bus Platforms or other Passenger destinations;
 - C. Project Co shall provide an entrance to allow Passenger access to the bus Station area when the Train Station is secure during non-operational hour:
 - i. The entrance shall be designed and constructed to be harmonious with the architectural design of the adjacent Train Station;
 - ii. Project Co shall provide signage and wayfinding for the entrance within the bus Station and from the public side;
 - iii. The entrance shall be secured with an overhead coiling grill monitored during Train non-operational hours; and,
 - iv. Notwithstanding requirements to secure the Train operations, Passengers shall have access to Ticket Machines during Train non-operational hours.
 - D. Project Co shall provide a minimum of three bicycle racks within the Fare Paid Zone of all Transitway/LRT transfer locations. As per Schedule 15-2, Part 6, Clause 2.7 (b) (vi), there shall be sufficient space to double the quantity of bicycle racks without modification to the built design.
- (v) Project Co shall maintain the integrity of the Fare Paid Zone allowing Passengers to transfer between the Expanded Trillium Line and Confederation Line in the design of Bayview Station.

(d) Weather protection:

- (i) Weather protection shall be provided via Platforms shelters and at Station entrances and waiting areas to provide Passengers with comfort and protection from inclement weather

- conditions: rain, snow (and all other forms of precipitation), wind, heat, and UV protection.
- A. Canopies at Station entrances shall be integrated with the Station.
 - B. Canopies shall be provided on façades of Station entrances facing streets.
 - (ii) Station elements and associated Facilities shall accommodate the operational demands of the Expanded Trillium Line, be compatible with the surrounding environment, and minimize the distance between Station entrance/egress points.
 - (iii) Where bus stops are located directly adjacent to a Station outside of the Fare Paid Zone, the position of the Station entrance/egress points shall allow direct access to and from the Station.
 - (iv) Fare Control requirements:
 - A. All fare gates shall be weather protected from rain infiltration and snow accumulation at fare gates in accordance with the following:
 - i. Project Co shall design the Station entries to limit exposure of the fare gates to direct precipitation in the form of rain and wind blown rain to 1.1% (95 hours) of the hours in a year; and,
 - ii. Project Co shall design the Station entries to limit exposure of the fare gates to direct precipitation in the form of snow to 6.1% (265 hours) of the total hours between October 15 to April 15 months;
 - B. Project Co shall conduct microclimate studies for each new Station entrance confirming compliance with the requirements of clause 2.7(d)(iv)A. In addition,
 - i. The microclimate studies shall be based on the last 30 years of historical climatic data available for the City of Ottawa;
 - ii. Each entrance/fare line shall be assessed using desktop computer simulation to ensure compliance with the Project requirements, unless otherwise agreed to by the City;
 - iii. Existing fare control Structures that are modified by Project Co shall be subject to the requirements of clause 2.7(d)(iv)A; and,
 - iv. Project Co shall validate the values required by clause 2.7(d)(iv)A for each entrance of each Station by computer simulation and shall submit the findings of the micro climate simulation in accordance with Schedule 10, as part of the Works Submittal for each Station.
 - C. Project Co shall be responsible to implement any required design changes as a result of the findings of the microclimate studies for each required submission. For further clarity:

- i. In the event that Project Co makes modifications to any entry design following the submission of the final micro climate study, Project Co, at no cost to the City and without schedule impact, shall resubmit the microclimate study for the affected Station to ensure conformance with the requirements of clause 2.7(d)(iv)A. Should the study indicate nonconformance with the requirements, Project Co shall redesign and repeat the process until conformance with clause 2.7(d)(iv)A is confirmed.
- (v) Clear minimum heights:
- A. Clear minimum heights at Concourse Level shall be:
 - i. 3000mm from top of finished Concourse Level at Stations to underside of all suspended elements, including signage; and,
 - ii. 3500mm from top of finished Concourse Level to underside of ceiling at Stations.
 - B. Clear minimum heights at Platforms shall be:
 - i. 2700mm from top of finished Platform Level at Stations, excluding Passenger waiting shelters, to underside of all suspended elements, including signage;
 - ii. 4400mm from top of Track to underside of ceiling at Stations where Vehicles operate only, and 6706mm where freight train vehicle clearances are protected for; and,
 - iii. 4500mm from top of Track to underside of structure at Stations where Vehicles operate only, and 6706mm where freight train vehicle clearances are protected for.
 - C. Clear minimum heights at Station entrances shall be:
 - i. 4000mm from top of finished Station entrance level to underside of ceiling at Stations; and,
 - ii. 3000mm from top of finished floor to underside of all suspended elements, including signage.
- (vi) Roof design features shall include, but are not limited to the following:
- A. Skylights to allow natural daylight to reach the Platform surface.
 - B. Roof accessibility systems such as hatches and retractable ladders, for cleaning and Maintenance if required.
 - C. Fall protection measures that form a permanent part of the roof Structure.

- D. Heat traced gutters and downspouts for roof drainage tied directly into a SWM system.
- E. Snow guards shall be provided on all roofs where roof design contributes to possibility of falling snow and ice.
 - i. Project Co shall be responsible for the design of snow guard systems.
 - ii. Particular attention shall be paid to the design and placement of snow guards on areas of roof above Station entrances and areas of roof adjacent to spaces of public circulation or gathering such as sidewalks and bus Platforms to ensure the protection of the public from falling snow and ice.

(vii) Roof requirements:

- A. Roof structures shall cover all vertical circulation elements (stairs and ramps within the Stations, stairs and ramps providing access to the Stations outside of the Fare Paid Zone and elevators);
 - i. Where Emergency egress only stairs or ramps are provided with heat tracing controlled by temperature and moisture detection, weather protection elements including roof coverage shall not be required.
- B. Project Co shall be responsible for all interfaces and implications of the Platform roof structure, including the following:
 - i. Interface of roof structure with Train;
 - ii. Integration of lighting and signage requirements: and,
 - iii. Integration of any other Station or systems element.
- C. Any and all roof top equipment shall be completely screened from all public areas, inclusive of views from within the Project Lands and all surrounding areas and within in the Station.

(e) Shelters:

- (i) Shelters on Platforms shall be placed adjacent and parallel to the Platform edge, to provide clear Platform area for circulation, sized according to accommodate Passenger activity and shall provide clear sightlines of incoming Trains and buses, and to be approved by the City.
- (ii) Equipment, furniture, signage, lighting, amenities, and other elements shall be integrated into the shelter structure.
- (iii) Shelter panels for weather protection shall be transparent tempered glass, and graffiti-resistant.

- (iv) Shelter side panels shall be of sufficient transparency to provide maximum visual surveillance of the Platform area to discourage vandalism and increase Passenger safety, to meet CPTED requirements.
- (v) Project Co shall plan for Platform shelters to be located on the Station Platforms as follows:
- A. Project Co shall provide OC Transpo shelters on all Platforms.
- i. One shelter per Train Platform per direction shall be a TSA meeting the requirements per this Article;
 - ii. A reduction in the number of required shelters on Train Platforms is permitted provided alternative means of equivalent sizes, functions and weather protection is included on the Platform;
 - iii. On bus Platforms, Project Co shall provide and install a minimum of one bus shelter as per OC Transpo specifications, at each bus stop location as indicated in Appendix A of this Part 4, including power and communications provisions for City provided PIDS; and,
 - iv. Project Co shall remove existing shelters located on the existing Train Platforms, install the shelters as follows:
 - 1 Project Co shall install nine shelters at Limebank Station as per Appendix B of this Part 4;
 - 2 Project Co shall install one shelter at Walkley Station per Appendix B of this Part 4; and,
 - 3 Project Co shall be responsible for the removal, storage and installation of all existing shelters to be repurposed and responsible to make good for all damage incurred prior to turn over to the City.
- B. Project Co shall provide on demand Passenger radiant heating system in all TSA shelters on each Train Platform and the TSA shelter on bus Platforms. Radiant heating element shall equal the shelter length.
- C. All new non-TSA shelters shall be equipped with the following:
- i. Rough in for a minimum of 2 doors with power door actuators;
 - ii. Lighting, according to the Transitway and Stations Design Manual;
 - iii. Benches that comply with COADS/AODA;
 - iv. Transit Information Panel; and,
 - v. All shelters shall be provided with rough in and provisions for future installation of radiant heaters.

- (vi) Project Co shall provide on street bus Facilities in accordance with Appendix B to this Part 4.
- (vii) Project Co shall provide shelters on Train Platforms per the following:

Station	Northbound or Single Side Platform			Southbound Platform			Total # of New Shelters	Notes
	# of New TSA Shelters	# of New Standard Shelters	# of Ex'g Standard Shelters	# of New TSA Shelters	# of New Standard Shelters	# of Ex'g Standard Shelters		
Bayview	1	-	-	1	1	-	3	-
Gladstone	1	1	-	1	1	-	4	-
Carling	1	2	2	-	-	-	3	Existing Shelters to be relocated
Carleton	1	3	2	1	3	2	4	Existing Shelters to be relocated
Mooney's Bay	1	-	2	-	-	-	1	Existing Shelters to be relocated
Walkley	1	1	-	-	-	-	2	-
Greenboro	1	-	2	-	-	-	1	Existing Shelters to be relocated
South Keys	1	-	-	-	-	-	1	-
Leitrim	1	2	-	1	-	-	4	-
Bowesville	1	2	-	1	-	-	4	-
Limebank	1	1	-	-	-	-	2	-
Uplands	1	1	-	1	-	-	3	-
Airport	1	-	-	-	-	-	1	Standard shelter not required due to integration with Airport Terminal building
Total	12	8	8	6	3	2	39	

Table notes:

1. Project Co shall design and provide rough in for a minimum of four shelters inclusive of the TSA on all Train Platforms with the exception of Bayview “southbound” (existing) Platform, Uplands and Airport Platforms which shall have only the number of shelters provided per the table and South Keys which shall have rough in for one shelter in addition to the TSA shelter.
2. In the event Project Co’s Platform design results in a different configuration, Project Co shall consult with the City to confirm the number and types of shelters required at each Station and Platform.
3. Where shelter quantities are listed per direction, Project Co shall design the Station in either a two side Platform or a center Platform configuration.

(f) Transecure Areas:

- (i) Project Co shall provide one TSA at all individual Station Platforms, including connecting bus Platforms.
- (ii) On Train Platforms, the TSA shall be located near the centre of the Platform length to align with the door of a car in both a one or two-car consist Train operation.
- (iii) TSA’s shall be provided with the following features:
 - A. Signage indicating location of TSAs and indicating the amenities available in the TSA, which shall be consistent at all Stations;
 - B. Each TSA shall have fixed CCTV security coverage with a minimum of 2 cameras, PTZ cameras shall not be used for TSA;
 - C. Enhanced lighting level of 220 lux;
 - D. Transit information panels that show scheduled times, maps, and other relevant information shall be included;
 - E. A clock integrated with the TIPs shall be viewable from the TSA;
 - F. Companion seating;
 - G. Emergency phones at accessible height with handles, braille, and user-friendly directions;
 - H. Emergency cabinet with fire extinguisher;
 - I. Infrastructure conduit, and associated structural element to support/mount a pay phone;
 - J. Accessible seating for four including seating with handles and backs;
 - K. Tinted glass or anything that compromises safety or sightlines shall be prohibited from use in the TSAs;
 - L. Garbage and recycling receptacles shall be provided adjacent to the TSA;

- M. All TSA Train Platform and bus Platform shelters shall be provided with timed, Passenger activated heating;
- N. Project Co shall design and provide tactile wayfinding on the Platform floor surface to the TSAs shelter and from TSAs to the Platform edge;
- O. All TSAs shall be fully enclosed and equipped with two accessible doors outfitted with power operated push button operators;
- P. Be equipped with a floor drain inside the enclosure; and,
- Q. Provisions for AED equipment as follows:
 - i. Space for an AED cabinet, size to be coordinated with the City during the design phase of the contract;
 - ii. Project Co shall provide electrical rough in for AED charging and AED cabinet heater; and,
 - iii. Project Co shall provide SCADA rough in for monitoring the AED and AED cabinet. AED shall be monitored at the TOCC.

(g) Station Entrances

- (i) Entries for use by the public shall be equipped with a Maintenance access and exit door, and rolling grilles or ornamental gates or other means to secure the Station buildings during hours of non-operation in accordance with clause 2.5 (f) of this Part 4.
 - A. All doors, inclusive of coiling grilles shall be capable of being remotely opened, closed and locked from the TOCC;
 - B. The status of all doors shall be remotely monitored by the TOCC; and,
 - C. The Maintenance access door shall lead to the Fare Paid Zone. No Maintenance equipment shall enter the Station via the fare gates.
- (ii) Where doors are provided at Station entries, the entries shall have at least one set of accessible, double, automatic sliding glass entrance doors with full-width entry mats with drainage pans, or one pair of power operated swing doors.
- (iii) Each mode of transportation at Transfer Stations shall be capable of being secured separately when hours of operation differ.
 - A. Public access to/from the bus station at Transfer Stations shall be maintained 24 hours per day.
 - B. Bus Passengers shall have access to Ticket Machines during bus operating hours.
- (iv) All doors, rolling grilles, etc. used to secure the Stations shall be equipped with electric operators, and controlled both locally and remotely from the TOCC.

- (v) Project Co shall coordinate the exiting requirements and lock down of Station entrance from the Airport Passenger Terminal Building with OMCIAA at Airport Station during the design development stage.
- (h) Project Co shall provide service areas at Stations as follows:
- (i) Ensure that the service areas do not interfere with traffic patterns or normal operations
 - (ii) Lay-out of equipment rooms shall facilitate removal and replacement of equipment.
 - (iii) Project Co shall determine the necessity and scope for all service spaces required to operate the Stations beyond the Operator spaces and other required spaces identified in the Project Agreement. In addition:
 - A. Project Co shall not be restricted from utilizing mechanical, communication, and electrical equipment cabinets or from locating on Platforms. If located on Platform they shall be located at ends of Platforms only, provided there is no reduction in the Platform level of service, or impede snow removal and storage operations, or cause restriction on the clear sight lines of oncoming Trains, and in accordance with CPTED principles. They can be located adjacent to the Platform,
 - B. All equipment cabinets located on the Platform or located within the Fare Paid Zone and accessible to Passengers shall be of stainless steel construction.
 - (iv) All Stations with the exception of Bayview and Airport shall be designed for the connection of truck-mounted emergency generator(s). Refer to Article 6 – Electrical Design Criteria, of this Part 4 for additional information regarding emergency power/generator requirements.
- (i) Advertising:
- (i) Project Co shall provide all infrastructure to support advertising in the Stations, including power, data communications to support digital advertising;
 - (ii) Each advertising location shall be provided with lighting in accordance with IESNA standards to illuminate static advertising;
 - (iii) Each Station shall have a minimum of three locations for advertising within the Fare Paid Zone, with dedicated wall areas of 1.5m x 2.5m minimum; and,
 - (iv) Location and type of advertising shall be coordinated with the City during design.
- (j) Project Co shall provide Public washroom features as follows:
- (i) Fixed CCTV coverage of the exterior of the washroom entrance doorway of each washroom.
 - (ii) Each public washroom shall provide infant changing facilities in each public washroom.
 - (iii) Ceiling hung, embossed stainless steel panel, toilet partitioning.

- (iv) Surface mounted, dead bolt type toilet stall hatch.
 - (v) Coat hooks on the stall door above head level.
 - (vi) Graffiti-resistant mirrors at each wash basin.
 - (vii) Soap dispensers, toilet tissue dispensers, towel dispensers and disposal units.
 - (viii) Wash basins built into a counter or vanity.
 - (ix) Project Co shall use industry standards and practices to heat and ventilate public washrooms without doors or with doors in the open position during winter design conditions.
 - (x) Vandal-proof fixtures shall be equipped with automatic water controls.
 - (xi) Toilet compartments and cubicles door and partition thickness: a minimum of 25mm; pilaster thickness: a minimum of 32mm.
 - A. No system shall contain material capable of supporting growth of bacteria, fungi, mould, etc. or encourage the harbourage of insects or mites. No system shall, to any appreciable degree, develop or shed electrostatic charges.
 - B. All fasteners shall be concealed or tamper proof.
 - (i) Entrances to washrooms shall be designed according to CPTED principles with a labyrinth style access.
- (k) CCTV
- (i) Project Co shall provide full CCTV camera coverage and associated systems performance for Stations and Facilities as follows:
 - A. As indicated elsewhere in this Part 4;
 - B. All public spaces shall have CCTV coverage, excluding washrooms;
 - C. Entrances to Maintenance access areas;
 - D. Train Station Plazas and Train Station exteriors;
 - E. Bus Facilities at Transfer Stations;
 - F. Bicycle parking;
 - G. Park and Rides;
 - H. Entrances to Stations; and,
 - I. Elevators, and all stairs runs and landings.
- (l) Emergency phones:

- (i) Project Co shall provide Emergency phones providing direct audio connection to the TOCC as follows.
- A. Provide one Emergency phone at each entrance on non-fare paid side, and in general Passenger circulation area;
 - B. Provide a minimum of two Emergency phones on each Train Platform;
 - i. Shall be spaced a no more than 30m;
 - C. In addition to the Emergency phones required on Platforms each TSA shall have an Emergency phone;
 - D. Provide Emergency phones spaced not more than 50m in any direction in surface Park and Ride facilities;
 - E. Provide Emergency phones at 30m apart on all bus Platforms, in addition to the Emergency phone at the TSA;
 - F. Provide Emergency phones along isolated pathways, underpasses or breezeway; and,
 - G. Provide Emergency phones at new designated PPUDO.
- (ii) Provide Emergency phones at outdoor locations. Emergency phones shall be identified with a blue marker light.
- (m) Payphones:
- (i) Project Co shall provide provisions for public pay phones in accordance with the following:
- A. Provide conduit and space for one pay phone at every bus and Train Platform in addition to the payphone required in the TSA;
 - B. Provide conduit and space for one payphone in each TSA;
 - C. Provide conduit and space for pay phones at new PPUDOs;
 - D. All designated space and public phones shall be fully accessible; and,
 - E. The City will arrange with a Third Party Contractor for payphone installation and Maintenance of public payphones.
- (n) Transit Information Panels:
- (i) Project Co shall provide TIPs as follows:
- A. Provide two TIPs on each Train Platform in a side Platform configuration, excluding TIPs located within the TSAs;

- B. Provide four TIPs on each Train Platform in a centre Platform configuration, excluding TIPs located within the TSAs;
 - C. Provide two TIPs at each Station entry prior to the fare gate, located outside of the fare paid area:
 - i. Shall be accessible 24/7 when Station is closed;
 - D. Provide at a minimum one TIP, located after the fare gate, inside the Fare Paid Zone, excluding TIPs located on Platforms and at the TSAs. Where a Station has two or more entrances, where Passenger traffic does not converge before accessing the Platform Level, provide TIPs inside the Fare Paid Zone at each entry;
 - E. Provide a minimum of one TIP in each bus shelter;
 - F. Provide one TIP in each TSA located on bus and Train Platforms;
 - G. TIP panel size (1.2m x 1.3m) shall be confirmed during design phase; and,
 - H. All TIPs shall be backlit.
- (ii) Project Co shall equip each shelter in a bus Station with one TIP.
- (o) Project Co shall provide clocks displaying time of day connected to the NTP server, with a minimum of one clock per Platform, including bus Platforms at Terminal/Transfer Stations.
- (i) Project Co shall provide clocks meeting the following minimum requirements:
 - A. Including digital LED display;
 - B. Capable of full operation in an outdoor environment, exposed to the elements in a dry bulb temperature range of -40°C to 40°C;
 - C. Capable of displaying both time and date simultaneously as follows:
 - i. Capable of displaying 12:00 or 24:00 hour time in hours mins and seconds, with the option to configure with or without seconds being displayed;
 - ii. Capable of displaying date in varying formats and sizes, maximum character height shall be no greater than that of the time display; and,
 - iii. Capable of displaying time independently with or without date being displayed.
 - D. Minimum cap character height for time display of 150mm;
 - E. Have amber character colour and background with a minimum colour contrast of 70%. Amber colour shall be consistent with amber colour utilized in the PIDS; and,

- F. Clock display shall meet or exceed all accessibility requirements referenced in this Part 4.
- (p) Trash and recycling receptacles:
- (i) Project Co shall provide trash and recycling receptacles in the following locations and minimum quantities:
- A. Three on each Platform including one located at the TSA except at Airport and Uplands Stations;
- i. Project Co shall provide two trash and recycling receptacles on each Train Platform including one located at the TSA at Airport and Uplands Stations.
- B. One located on each mezzanine or Concourse Level of the Station;
- C. All receptacles provided in public spaces shall be transparent to allow visual identification of their contents;
- D. Where provided, all receptacle groups shall be four stream receptacles to separate at source; organics, paper, glass, metal and other refuse; and,
- E. Receptacles shall not be integrated into cabinets with other customer amenities such as TIPS or Emergency phones.
- (q) Platform seating:
- (i) Project Co shall provide three benches that can accommodate three Passengers per bench seating on each Train Platform per direction except at Airport and Uplands Stations;
- A. Project Co shall provide one bench that can accommodate three Passengers per bench seating on each Train Platform at Airport and Uplands Stations in addition to the TSA.
- (ii) Project Co shall provide seating for three on each bus Platform for every two bus bays at Terminal/Transfer Stations;
- A. Bench locations shall be coordinated with the City and shall not impede snow removal equipment movement and pedestrian flow.
- (iii) Armrests and backrests shall be provided on all benches and designed according to AODA standards, and,
- (iv) The location of Platform seating shall not interfere with access to overhead lighting and equipment.
- (r) Project Co shall provide PIDS as follows:
- (i) Train Platform/Concourse PIDS

- A. Project Co shall provide PIDS signs to provide up-to-date, specific, real time, location-based, visual operational and safety-related messages for customer awareness in all Stations.
 - B. PIDS shall be provided in all Stations, in locations and quantities including, but not limited to:
 - i. Two PIDS at all Station Platforms;
 - ii. One PID at each Station level with a fare line, and as required at end of Line Stations;
 - iii. PIDS shall be visible and readable from both the unpaid and paid sides of the fare line; and,
 - iv. All PIDS shall be double sided except where flush mounted on a wall.
 - C. PIDS shall be individually addressable and shall be accessed from the existing PA/PIDS console located in the TOCC. Under normal operating conditions, information presented on the PIDS shall include, but not be limited to, date, time, minimum next three arrival time and destination of the next Train (one arrival time per line); safety messages; Train delays; holiday schedules; and other ad-hoc messaging. In an Emergency condition, the PIDS shall display both pre-programmed Emergency announcements and simultaneous visual display of the PA system Emergency announcements. Refer to Schedule 15-2, Part 3, Article 4 - Public Address System/Passenger Information Display System, for additional requirements.
- (ii) Nexus/Directory/PIDS
- A. Project Co shall coordinate, design, construct and equip each Station with the structural, mechanical, electrical and communications infrastructure provisions to support the installation of City supplied PIDS and enclosures. Project Co shall identify designated locations including, but not limited to, one PID at the concourse level of each Station; one PID at the nexus points between modes at Transfer Stations; one PID outside each fare gate; one PID at each bus Platform entrance; and one PID at each after hours entrance.
 - B. The locations shall be incorporated into the Station design with consideration given to: mounting surfaces, sightlines, wayfinding, accessibility, vandalism, and security.
 - C. Project Co shall coordinate and supply required infrastructure at these locations including: power and communications requirements, blocking within walls, ceiling structure, or posts as required and identified by the City.
 - D. The City will provide and install the required PID components including enclosures and mounting hardware.
 - E. PIDS at these locations will be operated using a City-supplied application and software controlled through the City network.

- F. PIDS at these locations will be maintained by the City.
- (iii) Bus Station PIDS
- A. Project Co shall equip each bus Station with provisions to support the installation of City supplied PIDS and enclosures. Project Co shall identify designated locations including; one PID for each shelter, one PID at each bus stop Platform, one PID on each bus Platform centrally located at the entrance to the Train portion of the Station and shall allow for viewing from either side of PID.
- B. Locations shall be incorporated into the Station designs considering: mounting surfaces, sightlines, wayfinding, accessibility, vandalism, and security.
- C. Project Co shall coordinate and supply required infrastructure at these locations including: power and communications requirements, blocking within walls, ceiling structure, or posts as required and identified by the City.
- D. The City will provide and install the required PID components including enclosures and mounting hardware.
- E. PIDS at these locations will be operated using a City-supplied application and software through the City network.
- F. PIDS at these locations will be maintained by the City.
- (s) Algonquin wayfinding wheel
- (i) At each Station, an Algonquin wayfinding wheel shall be installed at either the entry, concourse, Platform or Station Plaza;
- A. The City will be responsible for the production of the wayfinding wheel for each Station.
- B. Project Co shall incorporate the wayfinding wheel into the design and shall be responsible for the installation and placement of this element in accordance with guidelines and standards provided by the City.
- C. The location of the wayfinding wheel at each station shall be co-ordinated with the City through the design review process.
- D. The City will undertake consultation with the appropriate Aboriginal representatives, (including the Algonquins of Ontario) during the design stage to ensure cultural appropriateness of the location of the Algonquin wayfinding wheel and provide this input to Project Co for incorporation into Project Co's design.
- (t) Public Art
- (i) Project Co shall support the City in implementing a digital art program at South Keys, Gladstone and Bowesville Stations, including, but not limited to, participation in

technical review for art project proposals, acting in an advisory role to the artwork selection jury and necessary coordination for installation of selected art projects.

- (ii) Project Co shall provide power and data in support of the digital art program including rack space as outlined in Schedule 15-2, Part 3, clause 4.6.
- (iii) The final power and data connection locations shall be determined during the design phase in co-ordination with the City. Stations and locations of Public Art shall be as follows:
 - A. Project Co shall provide power and data infrastructure at South Keys Station as follows:
 - i. At the west fare controlled entrance plaza;
 - ii. On the Platform to support a potential free-standing installation to be provided by City artwork;
 - iii. Between the rail and the Transitway; and,
 - iv. Within the new underground portion of the Station connecting to the Transitway Structure.
 - B. Project Co shall provide power and data infrastructure at Gladstone Station as follows:
 - i. On each the northbound and southbound Platforms; and,
 - ii. A minimum of two locations within the new Station Plaza.
 - C. Project Co shall provide power and data infrastructure at Bowesville Station as follows:
 - i. At the new Station Plaza; and,
 - ii. On the primary Train Platform.

2.8 Materials

- (a) Materials used for the construction of Stations shall be low VOC and contain recycled content to the maximum extent possible where not specified below:
 - (i) Cast in Place Concrete:
 - A. Provide steel materials with postconsumer recycled content of not less than 60%.
 - (ii) Precast Concrete:
 - A. Provide steel materials with postconsumer recycled content of not less than 60%.
 - (iii) Architecturally exposed structural steel:

- A. Provide steel materials with postconsumer recycled content of not less than 25%.
 - B. AEES shall conform to CISC Code of Standard Practice for Structural Steel, APPENDIX I, as supplemented by CISC Guide for Specifying Architecturally Exposed Structural.
 - C. All structural steel exposed to public view shall be AEES as follows:
 - i. Exposed structural steel that is 6m or greater measured vertically or horizontally from a walking surface and is visible to a person standing on that walking surface shall be Category 2 AEES; and,
 - ii. Exposed structural steel that is less than 6m measured vertically or horizontally from a walking surface and is visible to a person standing on that walking surface shall be Category 3 AEES.
 - D. All exposed structural steel shall be finished with a high performance coating.
- (iv) Painted metal fabrications:
- A. Provide steel materials with postconsumer recycled content of not less than 25%.
- (v) Stainless steel fabrications:
- A. Provide steel materials with postconsumer recycled content of not less than 25%.
 - B. Where finish quality may be compromised by the percentage of postconsumer recycled content, provide materials with the maximum postconsumer recycled content acceptable to the selected manufacturer.
- (vi) Aluminum materials:
- A. Aluminum curtainwall skylights systems:
 - i. Provide aluminum materials with postconsumer recycled content of not less than 50%.
 - B. Aluminum extrusions fabrications, etc.:
 - i. Provide aluminum materials with postconsumer recycled content of not less than 25%.
- (vii) Glazing:
- i. Provide glass products with postconsumer recycled content of not less than 25%.
 - ii. Sealants used inside of the weatherproofing system protecting interior spaces shall have a VOC content of not more than 100 g/L.
- (viii) Overhead coiling grilles:

- A. Where used to secure Station entrances and to secure bus Platforms from Train Platforms, coiling grilles shall be as follows:
 - i. Curtain Material: Stainless steel, ASTM A666, Type 316.
 - ii. Curtain consisting of a network of minimum, 8mm diameter horizontal rods, or rods covered with tube spacers.
 - iii. Bottom Bar: Stainless Steel tube, finished to match grille.
 - iv. Grille Curtain Jamb Guides: Stainless steel angles with stainless steel mounting brackets.
 - v. Each grille shall be equipped with an electric operator
 - vi. Operator shall be controlled both locally and remotely from the TOCC
 - B. Shall have manual operation device for use in the event of motor failure or power outage and shall:
 - i. Provide connection for off-site remote control by TOCC.
 - ii. Provide a Safety edge located at grille bottom bar, full width, electro mechanical pneumatic sensitized type, wired to immediately stop grille upon striking object, and reverse downward grille travel, with a hollow covered seal.
- (ix) Graffiti-resistant
- A. Graffiti-resistant coating to be applied to all porous opaque surfaces including but not limited to concrete, masonry and stone up to a minimum 2.5m above adjacent floor/ ground or where surfaces are reachable to tag.
- (x) Architectural cast in place concrete
- A. All concrete left exposed as the final finish outside and within Stations shall be architectural, cast in place concrete.
 - i. Provide architectural cast in place concrete in accordance with CSA-A23.1/A23.2, 8.3 Architectural Concrete and ACI 347.3 Guide to Formed Concrete Surfaces, including proposed reference samples and mock-up field samples.
 - ii. Architectural Cast in Place Concrete Finishes.
 - iii. Finish: Smooth.
 - iv. Formed Concrete Surface: CSC3 as defined in ACI 347.3R, Table 3.1a – Description of formed concrete surfaces.
 - v. Colour: Light grey.

- vi. Limit of Concrete Surface Irregularities.
 - vii. Consistent with CSC3 concrete surfaces per ACI 347.3R.
 - viii. Tie Holes: Uniform profile and diameter, in symmetrical layout, filled with plugs matching appearance of adjacent concrete.
- B. Related Unformed Surfaces: Strike off smooth and finish with a texture matching adjacent formed surfaces, at tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces.
- C. Mock-up field samples: Preconstruction mock-up field samples shall be made for each finish or shall incorporate all finishes proposed to be utilized, using equipment, materials, and procedures planned for the actual construction. The City shall examine the mock-up field samples and compare them with the reference samples prepared in accordance with CSA-A23.1/A23.2, clause 8.3.2 for approval prior to ordering formwork. The panels should be full-size to match the actual work as closely as possible. Additional samples shall be cast by Project Co to the satisfaction of the City to achieve the required matching. Mock-up panels shall be standalone elements and are prohibited from form permanent construction of any facility. The sample(s) shall serve as the standard for acceptance of the finished construction.
- i. Construct field mock-ups using same procedures, equipment, and materials that will be used for production of architectural concrete. Accepted field mock-up shall serve as the reference to which architectural concrete will be compared for periodic and final acceptance. Construct field mock-ups at an acceptable location on Site.
 - ii. Provide a simulated repair area to demonstrate an acceptable repair procedure. Repair procedure shall provide an acceptable color and texture match. Protect from physical damage and retain mock-ups until final acceptance of architectural concrete.
 - iii. Construct a minimum 3m x 3m mock-up for Platforms, for review and acceptance using procedures detailed
- D. Periodic acceptance
- i. Project Co's architect shall periodically observe completed portions of architectural concrete for conformance with accepted field mock-up. The frequency of periodic acceptance and acceptance criteria shall include at a minimum, including but not limited to:
 - 1 A minimum of one review of in place formwork prior to first placement of architectural concrete for a Station;
 - 2 At a minimum the architect shall witness the first placement of architectural concrete in a Station; and,

3 At a minimum the architect shall be present for the removal of the formwork of the first architectural concrete pour and assessment of finish for a Station.

E. Patching and repair procedures:

- i. Surface sacking or abrasive blasting to conceal surface imperfections shall not be permitted without prior approval from architect and City.
- ii. Patching and repair procedures shall be prepared and submitted to the architect for review and approval, prior to submission to the City for the same.

(xi) Bird protection devices

- A. Provide a system of bird control using devices to prevent pest birds from landing, roosting, nesting or climbing on horizontal surfaces at Stations, except for the roof exterior, tops of windscreens, light fixtures, security fences, handrails, guardrails, stone, and architectural concrete.

(xii) Ceiling material:

- A. Project Co shall install ceiling material in the public area of all Stations with the exception of Bayview Station and Airport Station that is consistent with the material utilized in the existing Stations. The ceiling material shall be as follows:
- i. Material shall be Longboard Siding and Soffit, manufactured by Mayne Coating Corporation or equal;
 - ii. Profile shall be 150mm V-groove prefinished extruded aluminum soffit with an integrated venting system and matching accessories; and,
 - iii. Material shall have alluminate bonded wood grain finish to match existing. Existing material finish is Light Cherry 1406/01-716.

(xiii) Floor grilles (applicable to new Station entries with fare control equipment)

- A. Provide manufacturer's Heavy duty aluminum or stainless steel floor-grille assemblies, consisting of treads joined together by cross members, and with support legs and other components needed to produce a complete installation, including locking devices for each panel.
- B. Shall be AODA, COADS, and CSA B651 compliant.
- C. Frames: Manufacturer's standard frames, including perimeter frames, of size and style for grille type, for permanent recessed installation in floor, complete with installation anchorages and accessories, same material and finish as grilles. Provide concealed frameless supports except at perimeter frame.

ARTICLE 3

STATION SPECIFIC ARCHITECTURAL DESIGN CRITERIA

3.1 Introduction

- (a) Project Co shall design and construct Stations in accordance with the requirements and scope particular to each individual Expanded Trillium Line Station within this Article.

3.2 Bayview Station

- (a) Bayview Station is a Transfer Terminal Station being constructed as part of the City's Confederation Line project. Project Co is responsible for ascertaining all as-built conditions of Bayview Station. The existing Station Platform on the west side of the alignment shall remain in-place. An extension to this Platform with a minimum length of 77m to accommodate a Train shall be provided, as well as a second 77m minimum length Platform on the east side of the Station to allow Bayview to operate as a two-Track Station.
- (b) Project Co shall be responsible for any and all modifications of the existing Station Platform to maintain the Platform gap specified in this Part 4.
- (c) A partially enclosed glazed and secure corridor is required to provide a customer connection between the western and eastern Platforms. The materials and the architecture design and finishes of this corridor connection shall match the materials and architecture design and finishes of the as-built Station.
- (d) The new Platform, Platform extension, public concourses, and entrances shall have perimeter windscreens per the Confederation Line Station design.
- (e) A new PID indicating next Train arrival times on the eastern Platform near the existing vertical circulation shall be provided to direct customers on the correct Platform to wait for the next Train.
- (f) Project Co shall provide a pedestrian Bridge, vertical circulation, a new fare controlled entrance and a new entrance plaza at the western Train Platform extension per the following:
- (i) Project Co shall provide an entrance plaza and pathway connections to the existing pathway system. The entrance plaza shall serve both the new fare controlled entrance and the vertical circulation core of the pedestrian Bridge outside of the Fare Paid Zone;
 - (ii) The fare controlled entrance, vertical circulation and Bridge shall not be required to be detailed per the existing Bayview Station. It is acceptable to utilize a framed glazing system; however, the architectural language shall complement the existing Confederation Line Station;
 - (iii) The new entrance shall be directly accessible, meeting the requirements of AODA, COADS and CSA B-651, from the new plaza and to the Bridge vertical circulation core via a weather protected connection;
 - (iv) The Station entrance and the Bridge shall be secured independently to allow each element to function with one or the other secured;

- (v) Project Co shall provide a fully enclosed non fare-paid pedestrian Bridge connection from the development at 900 Albert to the west Station Platform area:
- A. Project Co shall coordinate the design and construction of the Bridge with the developer including the connection location, expansion joints, etc.;
 - B. The Bridge shall be designed to limit snow and ice from falling onto surfaces below the Structure;
 - C. The Bridge shall be provided with a glazing system that allows for glazing to be replaced from the inside of the Bridge;
 - D. The Bridge and vertical circulation core shall be ventilated in accordance with OBC and ASHRAE 62.1;
 - E. Project Co shall construct the Bridge to connect to 900 Albert Street at elevation 63.0. The centre of the Bridge connection point shall be geographically located at N 5030196.0542, E 365787.4679. The accuracy of the location shall be within +/- 150mm parallel to the property line;
 - F. The Bridge level shall be served by vertical circulation on the west side of the alignment consisting of stairs and two elevators;
 - G. All elements of the Bridge and vertical circulation core shall satisfy all minimum requirements of the Project Agreement;
 - H. The Bridge and Bridge support Structure shall have the following clearances from the previously relocated WNC at the east side of the site:
 - i. Vertical clearance from underside of Structure and any finishes, conduits, etc. to grade above the WNC shall be at a minimum 5.0m;
 - ii. All above grade Structural supports shall provide a minimum 5.0m clearance from the face of any new Structure to the exterior face of the WNC;
 - iii. No part of the Structure shall be within 5.0m of the WNC access shaft Structure to the north of the Bridge location;
 - iv. The Bridge Structure shall be designed and constructed in a manner not to impart any load on the previously relocated WNC;
 - I. The eastern most supporting Structure shall be located to allow the developer to install shoring on the City's property for the underground portion of 900 Albert Street. A minimum of 1.0 m west of the property line shall be available for this purpose; and,
 - J. Project Co shall design and construct the Bridge to be self-supporting and shall not impart any lateral or vertical load to 900 Albert Street structure.

- K. The developer shall be responsible for the weather tight connection to the Bridge and 900 Albert Street including the expansion joint and expansion joint cover. Project Co shall coordinate the required width of the joint, not to exceed 300mm, and provide the appropriate substrate required to allow the installation of the joint between the Bridge and 900 Albert Street by the developer.
 - L. The Bridge, vertical circulation, and connection between the fare paid entry and point of connection at 900 Albert Street shall have full CCTV coverage;
 - M. The minimum inside clear width of the Bridge shall be no less than 4.0m measured between Structural supports and or railing system or glazing system support members; and,
 - N. The minimum inside clear height of the Bridge shall be no less than 3.5m measured between the finished floor level and the underside of the lowest element of either the finished ceiling material or structural member.
 - O. Project Co shall be responsible for provision of temporary barriers to prevent access to the Bridge by the public and temporary weather protection required to protect the end of the Bridge until such time as the Bridge connection becomes operational following the construction of the adjacent development.
- (vi) All above grade building elements of the entry, Bridge and vertical circulation elements shall meet the minimum horizontal and vertical clearance requirements from the western most existing freight rail as required by Transport Canada's, Standards Respecting Railway Clearances, Diagram 1; and,
 - (vii) The Bridge shall have a minimum 5.3m of clearance from TOR to any element of the Bridge on both the northbound and southbound Expanded Trillium Line Tracks.

3.3 Gladstone Station

- (a) Gladstone Station shall be a new Line Station located north of Gladstone Avenue.
- (b) A single Station fare paid entrance shall be centred upon the alignment with a new Station Plaza integrated with the existing Gladstone Avenue Bridge. The Station entrance and façade shall be set back a minimum of 18.0m from the face of Gladstone Avenue curb measured at the centre of the alignment. No component of the Station structure with exception of a roof overhang shall be within the setback distance.
- (c) Project Co shall provide a new Station Plaza with a minimum area of 500 m². The required plaza area shall be measured from the curb face of Gladstone Avenue to the building entry and façade, and between the vertical face of the east and west Train alignment trench at the northern edge of the existing Roadway Bridge.
- (d) Project Co shall segregate the eastern edge of the public plaza from the north-south MUP with landscape and urban design elements to prevent the mixing of pedestrian and cyclists in the plaza near the Station building. The elements creating the barrier for cyclists shall allow for the passage of pedestrians. The design shall provide a mixing zone for pedestrians and cyclists. Bicycle parking required as per Schedule 15-2, Part 6 – Urban Design, Landscape Architecture and Connectivity Requirements, shall be provided at the east side of the plaza.

- (e) Passenger Southbound Revenue Service Trains shall always use the western Track within the Station and northbound Revenue Service Trains shall always use the eastern Track within the Station.
- (f) Design the Station Platform to protect for potential falling rocks from rock cut onto the Platform, and to discourage graffiti on the rock cut. Project Co shall keep the rock cut a minimum of 1m away from the Platform.
- (g) Project Co shall include accommodation for snow storage from the Station Plaza.
- (h) Project Co shall design and construct the Station to accommodate future overhead connections from development on both the east and west side of the alignment as follows:
 - (i) Station structure shall be designed to accommodate second floor loading:
 - A. The future second floor level shall be at 6.0m above the Station entry level.
 - (ii) Station vertical circulation elements, stairs and elevators shall be designed and constructed to allow for extension to the future second floor level. Vertical circulation elements shall be continuous from each Platform to the future second floor level.
 - (iii) The future second floor and vertical circulation shall be within the Fare Paid Zone:
 - A. Fare control equipment shall be located within the future development connections. Project Co shall size services capable of supporting the additional fare control equipment; and,
 - B. Shall provide pathways of adequate size capable of being extended to the upper level to support the fare control equipment.
 - (iv) Project Co Work Submittals shall indicate the locations and accommodations of the future connections.
- (i) Project Co shall provide on street bus stop and shelter, as per Appendix B, and shall provide TWSI connecting the bus stop with the Station fare gates at the entrance.
- (j) The Station shall be designed for both Tracks to operate in Revenue Service allowing the simultaneous loading/unloading of Passengers on both Tracks.

3.4 Carling Station

- (a) Carling Station is an existing Line Station located north of Carling Avenue served by an entrance from the adjacent MUP to the east of the alignment.
- (b) Project Co shall determine the extent of work associated with the existing Structure to satisfy the Design Life and Handback requirements defined in the Project Agreement.
- (c) Project Co shall provide a new elevator serving the Station entrance and Station Platform. In addition to the new elevator, Project Co shall replace or refurbish the existing elevator and elevator equipment to satisfy the requirements set forth in this Part 4.

- (i) All elevators shall be within the Fare Paid Zone.
- (ii) If an additional Station entrance is required to meet elevator and Passenger flow requirements, Project Co shall design and construct entrance to accommodate fare control and requirements otherwise prescribed in this Part 4.
- (d) Design and construction of the Station shall not preclude a future connection to the future hospital site, south of Carling Avenue.
- (e) Project Co shall provide on street bus stop and shelter per Appendix B, and shall provide TWSI connecting the bus stop with the Station fare gates at the entrance.
- (f) The Station has an existing fare paid entrance, which shall remain. Project Co shall be responsible for any design, construction or relocation modifications needed at the entrance enclosure.

3.5 Carleton Station

- (a) Carleton Station is an existing Line Station with two Platforms serving Carleton University and surrounding areas. The Station is located between Campus Avenue and University Drive at the intersection of Campus Avenue and Library Road.
- (b) The Station has two existing fare paid entrances one from the east and one from the west. The existing fare control enclosure shall remain. Project Co shall be responsible for any design, construction or relocation modifications needed at the entrance enclosure.
- (c) If an additional Station entrance is required to meet Passenger flow requirements, Project Co shall design and construct the entrance to accommodate fare control and requirements otherwise prescribed in this Part 4.
- (d) Project Co shall protect existing public art and including sight lines from both Platforms, to coordinate with the Public Art Program.
- (e) Project Co shall provide a pedestrian underpass Structure north of the Station Platform. The pedestrian underpass Structure shall be designed and constructed as follows:
 - (i) The southern inside face of the pedestrian underpass shall be located between 13.5m and 15.0 m north of the northern end of the existing Platform end;
 - (ii) Project Co shall determine the final length of the Structure based on the following:
 - A. The Structure shall extend a minimum of 1.5m beyond the eastern and western outside edge of the existing Platform edge or 1.5m beyond new Platform extension edge;
 - B. The extent and construction of the Structure shall not prohibit the future construction of elevators and stairs leading to the east and west entries in the future; and,
 - C. The length of the Structure shall be sufficient as to allow for extension of the Structure and construction of stairs and elevators at a future date without interruption to Revenue Service.

- (iii) The underpass Structure shall have a minimum clear width of 4.5m clear and a clear height of 3.5m;
 - A. Haunches of a concrete Structure not exceeding 600mm x 600mm shall be permitted within the clear opening;
- (iv) The underpass Structure shall be designed and constructed to prevent the ingress of water; and,
- (v) The east and west ends of the underpass Structure shall be designed and constructed to allow for extension in the future.
- (vi) The Station shall be designed for both Tracks to operate in Revenue Service allowing the simultaneous loading/unloading of Passengers on both Tracks.

3.6 Mooney's Bay Station

- (a) Mooney's Bay Station is an existing Line Station located south of Heron Road.
- (b) The Station shall be served by one fare paid entrance located west of the alignment accessible from the adjacent MUP. The existing fare control enclosure shall remain. Project Co shall be responsible for any design, construction or relocation modifications needed at the entrance enclosure otherwise prescribed in this Part 4.
- (c) Project Co shall design and construct Platform extension with all related shelters, and requirements.

3.7 Walkley Station

- (a) Walkley Station shall be a new Line Station located south of Walkley Road adjacent to commercial property to the east.
- (b) The Station entrance shall be located a minimum of 8m and no further than 20m from the northern side of the existing Walkley Road sidewalk to accommodate the Station Plaza.
- (c) The fare paid entrance and Station Plaza shall be accessed directly from Walkley Road with the fare gates located at street level.
- (d) Project Co shall provide stairs and elevators from the entrance to the Platform within the Fare Paid Zone.
- (e) Project Co shall provide a combination of signage, architectural elements, and landscape features directly adjacent to Walkley Road to clearly announce the Station location from Walkley Road.
- (f) Project Co shall design the Station not to preclude a future entrance from the MUP on the east side of the Station in the vicinity of the southern Platform emergency egress location.

3.8 Greenboro Station

- (a) Greenboro Station is a Transfer Station on the Existing Trillium Line.

- (b) Project Co shall protect existing public art and to coordinate with the Public Art Program.
- (c) Project Co shall design and construct Platform extension with all related shelters, and requirements.

3.9 South Keys Station

- (a) South Keys Station is an existing Transitway Station located adjacent to the South Keys Shopping Centre that Project Co shall expand to serve as a Transfer Station between the Airport Link and Expanded Trillium Line Trains.
- (b) Project Co shall provide Platform canopy coverage in the form of an architectural roof to shelter the short-term layover Airport Link Passengers transferring to the Expanded Trillium Line Trains.
- (c) Project Co shall design and construct the Station to allow for a non paid connection from the MUP west of the Expanded Trillium Line corridor to the existing Transitway entrance and through to the parking lot of the retail development to the east. Project Co shall not be required to expand the width of the existing Expanded Trillium Line Structure or modify the existing unless otherwise required by Applicable Law, (i.e. the OBC for exiting purposes). The non-fare paid connection shall be open to the public 24 hours per day, seven days a week from both the east and west entrances and allow the new Station Train Platform to be secured during Train non-Revenue Service Hours.
- (d) Project Co shall provide a minimum of one fare paid entrance. The fare paid entrance shall be from the passageway connecting the MUP on the west side of the Expanded Trillium Line corridor to the existing Transitway entrance.
- (e) Project Co shall design and construct a new pedestrian underpass Structure from the MUP on west side of the alignment to connect with the entry plaza and roadway on the east side of the Transitway.
 - (i) Project Co shall be responsible to construct only the portion of the Structure from the MUP on the west side of the alignment to a point east of the alignment. Project Co shall determine the eastern extent of the Structure as follows:
 - A. Eastern extent shall not impact the operations of the existing Transitway and Transitway Station operations during construction;
 - B. Eastern extent shall be as such to allow for the completion of the underpass Structure at a later date without interruption to Train Operations of the Trillium Line;
 - C. The pedestrian underpass shall be a minimum of 6.0m wide. The centreline of the new Structure shall be no greater than 33m north of the centreline of the existing tunnel Structure;
 - D. Project Co shall provide detailing to allow for underpass Structure to be extended east; and,
 - E. Project Co shall determine eastern termination methods.

- (ii) Western extent of the pedestrian underpass Structure shall be secured to prevent unauthorized entry, but allow for inspection
- (f) Project Co shall construct a new entrance plaza to serve the existing east Transitway entrance in accordance with Schedule 15-2 Part 6, Article 4.1(h) and as follows:
- A. The Plaza design shall maintain fire route access from the east west access road to the cinema located south of the Station;
 - B. Shall maintain service vehicle access to businesses adjacent to the Transitway;
 - C. Shall maintain public vehicular access to the automotive service center located adjacent to the Transitway; and,
 - D. Shall protect for the future construction of a fare paid entrance as follows:
 - i. Fare paid entrance shall meet the minimum requirements for the installation of the minimum quantity of fare equipment, minimum queuing distances and maintenance access in accordance with this Part 4.
 - ii. The fare paid entrance shall accommodate a covered walkway connection to development to the south allowing for a continuous pedestrian covered connection with a minimum width of 7.0m; and,
 - iii. Protection for future works shall include providing the area of the entrance building and south of the entrance building, free of foundations, utilities, building services and building system elements that would otherwise prevent the construction of the future Structures without relocation.

- (g) Project Co shall protect existing public art and to coordinate with the Public Art Program.
- (h) The Station shall be designed for both Tracks to operate in Revenue Service allowing the simultaneous loading/unloading of Passengers on both Tracks.

3.10 Leitrim Station

- (a) Leitrim Station is an existing bus Station and Park and Ride located south of Leitrim Road. The new Leitrim Station shall be a Line and Transfer Station with a Park and Ride Facility.
- (b) The new Station shall have at a minimum one fare paid entrance with access to the Park and Ride Facility and PPUDO.
- (c) The Station shall be designed and constructed to allow the bus Platform to remain accessible to the public while securing the Train Platform during Train non-Operating Hours.
- (d) The Park and Ride Facility shall be designed and constructed to accommodate initial capacity and design allowance for ultimate capacity configuration. Project Co shall design the initial and full buildout of the Park and Ride as follows:

- (i) Initial design and construction shall accommodate 330 spaces; on completion of Station for Revenue Service.
 - (ii) The ultimate parking capacity shall be no less than 925 spaces.
 - (iii) The initial design including; grading, SWM features; sidewalks, accessible spaces, snow storage area, landscaping, drive aisles, lighting, CCTV and Emergency phones, etc. shall be constructed to be expandable to the ultimate capacity.
 - (iv) All electrical systems including the building service, and stand by power systems shall be sized for the ultimate buildout of the Park and Ride Facility.
 - (v) In the initial layout design, Project Co shall demonstrate in detail how the initial layout can be expanded to the ultimate parking capacity of 925 spaces with no upgrading and/or upsizing of the initial layout features and with no interruption of service on the initial layout.
 - (vi) Refer to civil requirement related to reuse of existing paving.
- (e) No portion of the Station shall violate the Airport Zoning Regulations.
- (f) Each Platform shall be served by a minimum of one elevator, one ramp and one public access stair for use during operational hours.
- (g) The Station shall be designed for both Tracks to operate in Revenue Service allowing the simultaneous loading/unloading of Passengers on both Tracks

3.11 Bowesville Station

- (a) Bowesville Station shall be a new Station located east of Bowesville Road and south of Earl Armstrong Road. The new Bowesville Station is a Line and Transfer Station with a Park and Ride Facility.
- (b) The new Station shall have at a minimum one fare paid entrance with access to the Park and Ride Facility and PPUDO.
- (c) The Station shall be designed to allow the Bus Platform to remain accessible to the public while securing the Train during Train non-Operating Hours.
- (d) The Park and Ride facility shall be designed and constructed to accommodate initial capacity and design allowance for ultimate capacity configuration. Project Co shall design the initial and full buildout of the Park and Ride as follows:
 - (i) Initial design and construction shall accommodate 800 Spaces; on completion of Station for Revenue Service.
 - (ii) The ultimate parking capacity shall be maximized on the available property.
 - (iii) The initial design including; grading, SWM features; sidewalks, accessible spaces, snow storage area, landscaping, drive aisles, lighting, CCTV and Emergency telephones, etc. shall be constructed to be expandable to the ultimate capacity.

- (iv) All electrical systems including the building service and stand by power systems shall be sized for the Ultimate buildout of the Park and Ride Facility.
 - (v) In the initial layout design, Project Co shall demonstrate in detail how the initial layout can be expanded to maximize the number of parking spaces with no upgrading and/or upsizing of the initial layout features and with no interruption of service on the initial layout.
 - (vi) The Park and Ride/bus surface facilities shall have a minimum of one shared entrance from Earl Armstrong Road. In the event Project Co's design involves rail over Earl Armstrong Road and/or Bowesville Road, Project Co shall provide multiple access points to the surface facilities.
- (e) The Station shall be designed for both Tracks to operate in Revenue Service allowing the simultaneous loading/unloading of Passengers on both Tracks.
 - (f) Each Platform shall be served by a minimum of one elevator, one ramp and one public access stair for use during operational hours.

3.12 Uplands Station

- (a) Uplands Station shall be a new Line Station located east of Uplands Drive adjacent to the EY Centre.
 - (i) The Station shall be designed to have either a center Platform or two side Platforms allowing the simultaneous loading/unloading of passengers on both Tracks.
- (b) The Station shall have one fare paid entrance serving the EY Centre and future development north of the alignment.
- (c) Project Co shall provide bus stop shelter, lighting, power, and TWSI connecting the bus stop with the Station fare gates at the entrance.
- (d) The Station shall have a minimum 6m wide non fare paid connection to allow access from the north to the EY Centre.
- (e) The Station Plaza and Site shall be designed to accommodate EY Center event patrons, which is not reflected in the Passenger Demand Forecast.
 - (i) The largest event will experience a tidal flow of 5,000 persons per hour out of the EY Centre. It is anticipated that 50% of the total flow will utilize the Station.
 - (ii) The Station Plaza shall be designed and constructed with an on street bus stop and bus shelter.
- (f) Project Co shall realign the access road directly in front of the EY Centre, reconfigure the existing parking and bioswale to allow for a direct sightlines and access to the Station from the EY Center entrance.
- (g) The Station shall be designed for both Tracks to operate in Revenue Service allowing the simultaneous loading/unloading of Passengers on both Tracks.

- (h) Each Platform shall be served by a minimum of one ramp and one public access stair for use during operational hours.
- (i) Project Co's design shall protect for the addition of one elevator to each Platform. Future elevator location shall be included on all submissions.

3.13 Airport Station

- (a) Airport Station shall be a new elevated Terminal Station located adjacent to the airport departure roadway structure and the Airport Passenger Terminal Building;
 - (i) The Station Platform shall be located no further northeast from column line M of the existing Airport Passenger Terminal Building than that as required to accommodate the 22.5m from the buffer stop, unless otherwise agreed with the City and OMCIA during the design phase of the Project.
- (b) The Station entrance and lounge will be an extension of the Airport Terminal Building and shall be constructed by the OMCIAA;
- (c) The Station Platform shall be at the same elevation as the third level of the Airport Passenger Terminal Building;
- (d) The City has entered into an agreement with the Airport Authority where by the Airport Authority will extend the existing Airport Passenger Terminal Building structure to the new Station. Project Co shall support the City in coordination of the design and construction of Airport Station including:
 - (i) Attend design and construction meetings with the Airport Authority;
 - (ii) Preparing drawings and presentation materials to be used in coordination meetings with the Airport Authority and the NCC;
 - (iii) Providing drawings in PDF and *.DWG formats to be used by the Airport Authority for design coordination;
 - (iv) Project Co shall be responsible for the design and construction of the Expanded Trillium Line System components as detailed in this Project Agreement;
 - (v) Project Co shall submit final issued for construction drawings, no later than October 4, 2019 to the City in PDF and DWG format, in accordance with Schedule 10 – Review Procedure;
 - A. Final issued for construction documents shall be reliant and binding; and,
 - (vi) Project Co shall complete all work on the Station in accordance with Schedule 15-2, Part 1, Clause 5.3, with the exception of works to be completed within the Airport Passenger Terminal expansion area including the installation of PIDs and CCTV cameras.
- (e) Project Co shall design and construct the Station, Platform, Guideway and Guideway Structures to allow the Airport Authority to construct the Airport Passenger Terminal Building expansion including the Station entrance and lounge directly adjacent;

- (i) Specific layout and detailing of the Station, Platform and Guideway Structure shall be coordinated with the OMCIAA and the design of the Airport Passenger Terminal Building expansion.
- A. The Airport Passenger Terminal Building expansion and Expanded Trillium Line structures shall be independent Structures;
- B. The design and construction of the Guideway and Platform support piers and piers caps/bents, shall allow the Airport Passenger Terminal Building expansion to be constructed directly adjacent to the Guideway including cantilevered structural supports;
- C. The OMCIAA shall provide all expansion joint covers between the two Structures. Project Co shall coordinate requirements of the Expanded Trillium Line Structures to accept expansion joint covers with the OMCIAA; and,
- D. In the event Project Co's design varies the location of the Platform with respect to the southern end in relationship to column line M of the existing Airport Passenger Terminal Building as indicated on Proposal Drawing 646120-BBA-S3AP-44DK-2001, Project Co shall:
- i. Maintain the Platform area as indicated on Proposal Drawing 646120-BBA-S3AP-44DK-2001 for access into the Airport Passenger Terminal Building Expansion from the south and east;
 - ii. Provide additional Platform length in excess of that indicated on Proposal Drawing 646120-BBA-S3AP-44DK-2001 to allow the initial 40m minimum platform length for the boarding and alighting of Passengers;
 - iii. Project Co shall provide a Platform edge barrier system where Platform length is provided beyond the train stopping location on the Platform to prevent passenger from entering the guideway when a Train is at the stopping location on the Platform; and,
 - iv. Provide all amenities including weather protection (windscreen and roof), snow melting system, signage etc., for the entire Platform inclusive of the required 40m and any extension resulting from Clause 3.13 (e)(i)D.
- (f) Project Co shall be responsible for the design and final installation of PIDS and CCTV cameras within the Airport Passenger Terminal Building expansion including cabling and devices.
- (i) The OMCIAA is responsible to provide rough-in of PIDS and CCTV cameras in coordination with Project Co including conduits, raceways, and back boxes.
 - (ii) Project Co shall coordinate the location of the PIDs and CCTV cameras located in the Airport Passenger Terminal Building expansion with the City and the OMCIAA.
- (g) Project Co shall design and construct the Station Platform to be harmonious with the design of the Airport Passenger Terminal Building.

- (i) Windscreens and Platform canopy materials and details shall be consistent with the existing elements on the Airport Passenger Terminal departure level;
 - (ii) Project Co shall provide full height windscreen glazing for the Platform extending the entire length of the Station Platform;
 - (iii) Project Co shall provide Platform roof for the entire length of the Platform;
 - A. Platform canopy shall extend the greater of 2.5m from the Platform wind screen or 50% coverage of the Platform width.
 - (iv) Project Co shall provide an automated in-slab heat trace system as part of the Station Platform to maintain the Platform clear and free of ice and trace amounts of snow accumulation:
 - A. Platform heat trace system shall be automatically controlled by temperature and moisture sensors. The system shall be controlled by SCADA with ability to be monitored and controlled at the TOCC and by OMCIAA; and,
 - B. Building utilities, power, water, etc., required for the heat trace system shall be provided from the Airport Passenger Terminal Building.
 - (v) In addition to CCTV cameras required for coverage of the Station, Project Co shall provide rough in for CCTV system to be monitored by the OMCIAA.
 - A. Project Co shall be responsible to provide rough-in of CCTV cameras in coordination with the OMCIAA including conduits, raceways and back boxes.
 - B. Project Co shall coordinate the number and location of CCTV cameras with the City and the OMCIAA.
 - C. Project Co shall grant the OMCIAA access as required for installation commissioning and maintenance of CCTV cameras within the Station.
 - D. Project Co shall provide a fully enclosed TSA shelter on the Station Platform;
 - i. TSA shelter shall be custom designed and fully integrated with the OMCIAA architectural language;
 - ii. TSA shelter shall be identical in size to the standard shelter utilized on the Trillium Line; and,
 - iii. TSA shall have the same amenities, in the same location as the standard TSA shelter utilized on the Trillium Line.
- (h) Fire Life Safety
- (i) Project Co shall work jointly with the OMCIAA to develop a comprehensive Fire Life Safety plan for the Station including NBCC code review for the integrated entrance;

- (ii) Project Co shall be responsible for the Fire Life Safety requirements of the Station Platform area including exiting and coordination of the fire alarm systems of the Train Platform and the Airport Passenger Terminal Building;
- (iii) Project Co shall be responsible for the fire department connection located at the discharge location of the Emergency egress stair and dry standpipe system for the Platform; and,
- (iv) The OMCIAA shall be responsible for fire protection of the Airport Passenger Terminal Building expansion.

3.14 Limebank Station

- (a) Limebank Station shall be a new Terminal Station located west of Limebank Road, south of Earl Armstrong Road and east of Main Street.
- (b) The new Station shall have at a minimum one fare paid entrance with access to Main Street, the north east-west Connector Road, and the future south east-west Connector Road.
- (c) The Station shall be designed as an urban Station with direct access to the on-street bus Facility located to the north of the alignment.
- (d) Project Co shall provide two Emergency phones located at the bus stops on the east-west Connector Road, one per each direction of travel.
- (e) Project Co shall provide a Station plaza with a minimum size of 400 m² that will serve the Station entry access fronting on Main Street and connection to the on-street bus Facilities to the north.
- (f) The Station entry shall be setback a minimum of 8.0m from the eastern ROW of the future Main Street extension.
- (g) The Station shall be designed to allow both Tracks to operate in Revenue Service allowing the simultaneous loading/unloading of Passengers on both Tracks.

ARTICLE 4 STRUCTURAL DESIGN CRITERIA

4.1 Introduction

- (a) For the purpose of Structural design pertaining to this Article, a Station comprises the building(s), Site access, parking, Tracks, Platforms, Ancillary Facilities, and all appurtenances necessary to conduct Passenger transportation.
- (b) Project Co shall design and construct Stations and Facilities in accordance with this Article. The structural design shall include design of new members, inspection and documentation of existing Structures impacted by the Station construction and corresponding rehabilitation design and construction.
- (c) In addition to the submittals required elsewhere, the structural engineering services shall include the preparation of complete calculations (appropriately indexed), coordination with other disciplines and general review of construction. Structural calculations shall be provided to the City in each required submission.
- (d) In addition to the requirements set forth in Article 4 of this Part 4, requirements for Pedestrian Bridges not forming part of the Station Structure are included in Schedule 15-2, Part 2, Article 4 - Structural Design Criteria and Requirements.

4.2 Reference Documents

- (a) The structural design shall comply with the criteria contained in this Article, and all standards, regulations, policies, Applicable Law, guidelines or practices applicable to the Project, including but not limited to each of the following Reference Documents. In the event of a conflict between criteria, commitments or requirements contained within one document when compared with another, the more stringent shall apply:
 - (i) OBC;
 - (ii) NBCC; where applicable
 - (iii) User's Guide – NBCC: Structural Commentaries (Part 4); where applicable
 - (iv) CAN/CSA S6 - CHBDC*;
 - (v) CAN/CSA A23.1/A23.2 - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete;
 - (vi) CAN/CSA A23.3 - Design of Concrete Structures;
 - (vii) CAN/CSA O86 - Engineering Design in Wood;
 - (viii) CAN/CSA S16 - Design of Steel Structures;
 - (ix) CAN/CSA S304.1 - Design of Masonry Structures;
 - (x) CAN/CSA S136 – North American Specification for the Design of Cold-Formed Steel Structural Members;

- (xi) *Note: Portions of the Station that support Vehicle loads shall be considered Train Structures. Train Structures shall be designed to satisfy the requirements of this Article and Schedule 15-2, Part 2, Article 4 - Structural Design Criteria and Requirements and shall meet or exceed the applicable building code(s) and the CHBDC.
- (xii) Canadian Foundation Engineering Manual;
- (xiii) CAN/CSA S478 – Guideline on Durability in Buildings;
- (xiv) ACI 201.2R – Guide to Durable Concrete;
- (xv) AREMA Manual for Railway Engineering hereinafter referred to as the AREMA Manual
- (xvi) ACI 360R – Design of Slabs on Grade;
- (xvii) CSA S448.1 – Repair of Reinforced Concrete in Buildings and Parking Structures;
- (xviii) AISC/CISC Steel Design Guide Series 11 – Floor Vibrations Due to Human Activity;
- (xix) OHSA;
- (xx) PEO Professional Engineers Providing Services for Demolition of Buildings and Other Structures;
- (xxi) MTO Structure Rehabilitation Manual;
- (xxii) MTO Ontario Structure Inspection Manual;
- (xxiii) MTO Structural Manual;
- (xxiv) MTO Structural Steel Coating Manual;
- (xxv) OPSS and OPSD;
- (xxvi) ASTM E2018 Standard Guide for Property Condition Assessments: Baseline Property Condition Assessment Process;
- (xxvii) ASCE Structural Condition Assessment of Existing Structures;
- (xxviii) AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges;
- (xxix) City of Ottawa Transitway and Station Design Guidelines; and,
- (xxx) ISO 12944-5 Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 5: Protective paint systems.

4.3 General Requirements for Station Structures in Expanded Trillium Line

(a) Ground Level Platform Framing

- (i) Where the new Platform is in proximity to cause an impact on an existing adjacent structure, Project Co shall design and construct the new Platform without reducing the

performance level of the existing adjacent structures. Evaluate the effects on the existing structures of excavation, vibration and long-term settlement during design stage.

- (ii) Project Co shall design and construct the Station structural system to allow for the expansion of the Station Platform in the future without any reinforcing or alterations.
- (iii) Project Co shall utilize hot-dip galvanized or stainless steel concrete reinforcement within 120mm from the top surface of the Platform slab.

4.4 Station Specific Structural Design Requirements

- (a) Project Co shall provide Station Specific Structural Design Requirements
 - (i) Gladstone Station
 - A. Project Co shall design and construct roof and canopy structures covering the Platform to accommodate snow drifting from all higher adjacent horizontal surfaces including adjacent higher building structures and ground level surfaces.
 - B. Project Co shall provide a barrier/vehicle guard rail at adjacent high ground level surfaces accessible to maintenance vehicle and when the drop of elevation is more than 500 mm. The barrier/vehicle guard rail shall be capable of resisting vehicle impact load as per OBC.
 - C. Refer to Schedule 15-2, Part 2 – Article 7 – Geotechnical Design Criteria and Requirements for requirements on rock face protection.
 - (ii) Walkley Station
 - A. Project Co shall account for the impact of the new construction, on adjacent existing retaining wall of the Walkley Bridge abutment, including the foundation. Project Co shall mitigate in the design and construction, any increased loading on the existing Structure in accordance with the applicable codes and standards.
 - B. Project Co shall design and construct new guardrail at the Station entrance to resist vehicle impact load in accordance with OPSD.
 - (iii) South Keys Station
 - A. Project Co shall limit the additional settlement of existing structures resulting from the new embankment to a maximum of 10mm. Limit the additional stresses in the existing structures resulting from the new embankment, such that there are no cracks wider than 0.2mm.
 - B. The existing railway Structure shall be part of the Station Structure. Project Co shall comply with the requirements in Article 4.11. Project Co shall evaluate and rehabilitate the Structure in compliance with the requirements of OBC, AREMA, SRM and CHBDC.

4.5 Stations Constructed on Federal Lands

- (a) Stations located on Federal Lands are subject to the regulations of the NCC. Project Co shall design Stations on Federal Lands in accordance with requirements of both the OBC and the NBCC. Stations outside of Federal Government lands shall comply with the requirements of the OBC.

4.6 Durability

- (a) Project Co shall provide materials, details and protection systems to meet or exceed the specified requirements for durability in OBC and CHBDC.
- (b) Project Co shall provide time-dependent design calculations, including corrosion, fatigue and creep shall be based on the required Design Life as outlined in Schedule 15-2, Part 1, Article 4 – Design and Construction.
- (c) Project Co shall provide testing report for chloride penetrability for concrete of exposure class C-1 and C-XL in accordance with Schedule 10 – Review Procedure.
- (d) Project Co shall provide stainless steel reinforcing steel in substructure concrete within the splash zone of adjacent Roadways. Splash zone shall be as defined in MTO Structural Manual.
- (e) Project Co shall utilize hot dip galvanized steel for exposed structural steel and reinforcing steel in concrete when within 1m of all walking and vehicular surfaces, stairs, ramps, that are subject to foot and vehicular traffic.
- (f) Project Co shall install hot dip galvanized steel reinforcing in concrete where de-icing salt could be applied directly on the surface, or brought about by foot traffic.
- (g) Project Co shall design and construct all structure members not within the heated space to be capable of withstanding freeze-thaw effects without negatively impact the design objectives.
- (h) Project Co shall design and construct members detailed to minimize exposed surface area and avoid pockets, crevices, recesses, re-entrant corners, and locations that collect and retain water, debris, and moisture.
- (i) Project Co shall design and construct Structures to provide access for Maintenance and inspection with conventional techniques included in MTO's Ontario Structure Inspection Manual, Structure Rehabilitation Manual and Structural Manual for all components of the Structure. Inspection and Maintenance access and maintainability shall meet the requirements in clause 1.8.3 in CSA S6-14.
- (j) Project Co shall design all structural components exposed to weather conditions predicated on routine inspection and Maintenance procedures being instituted.

4.7 Station Structural Loads

- (a) Project Co shall provide design Structures utilizing dead loads in accordance with the following:
- (i) Project Co shall use standard mass densities for materials, unless analysis or testing indicates that other criteria shall be used. Perform a sensitivity analysis for the actual

weight where a variation might affect the adequacy of the design or in cases where the construction may vary from normal practice.

(b) Project Co shall provide design Structures utilizing live loads in accordance with the following:

- (i) Live loads include the Vehicle design loads and highway vehicular loads specified in Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements as well as all floor and roof live loads as described in the design codes and standards specified earlier in this Article.
- (ii) Vehicle Live Load:
 - A. Refer to Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements for Train loads.
 - B. Design Platforms and ramp slabs wider than 3m and accessible to Maintenance Vehicles for a concentrated vehicle load as per OBC, or the maintenance vehicle load as defined in CHBDC, whichever produces the more critical structural responses.
 - C. Design sidewalks, Plazas and other open areas wider than 3 m, adjacent to road way and without permeant barrier to separate the roadway from the area, the supporting structure for CL-625 ON truck load as defined in CHBDC, or fire truck load as per OBC, whichever produces the more critical structural responses. Design Structural members within that area for collision force defined below.

- (iii) Design electrical equipment rooms, pump rooms, machinery rooms, storage rooms, service rooms, battery rooms and fan equipment rooms containing fire ventilation equipment for a specified live load of 12kPa, or the actual equipment load where greater than 12kPa, applied uniformly over the entire area, or on any portion of the area, whichever produces the most critical effects in each member.
- (iv) The minimum specified live load on the Platform extenders shall be 12kPa, and maximum deflection in level Platform position shall be 2mm.

(c) Project Co shall design Structures utilizing environmental loads in accordance with the following:

- (i) Snow, rain, ice, ice accretion, wind and earthquake loads shall be as described in the design codes outlined earlier in this Article using the OBC Importance Category of “Normal”.
- (ii) Include allowance for the build-up of ice on Track slabs and the build-up of compacted snow on vertical faces of barrier walls and Platform support walls adjacent to Track slabs at exposed parts of above grade Stations where the potential for such build-up exists. The magnitude of these loads shall suit the planned snow removal system.
- (iii) Design Station Structures, partitions and affected non-structural elements to resist the piston effect wind pressures from transit Vehicles. The minimum uniform design pressure for these elements shall be 2.0 kPa in either the positive or negative direction.

(d) Project Co shall design Structures utilizing Fatigue Loading in accordance with the following:

- (i) Assess ridership criteria determine the expected number of Trains the Structure will support during its Design Life. Apply a service load analysis for fatigue to affected structural elements and is generally based on the number of full loading cycles that are applied to the Structure. The loading cycles applied to each member and connection shall include the number of Vehicles, trucks or wheel load passes, whichever produces the most critical effect.
- (e) Project Co shall design Structures utilizing Earth Loading in accordance with the following:
 - (i) Vertical and horizontal earth pressures acting on retaining walls and Underground Station Structures: refer to Schedule 15-2, Part 2, Article 7 – Geotechnical Design Criteria and Requirements and Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements.
 - (ii) Design Structures which retain earth for horizontal earth pressure due to earth against the Structure and load surcharges resting on the soil above or beside the Structure.
 - (iii) Vertical pressure from superimposed earth load shall be based on a mass density of 22 kN/m³, for compacted, granular materials. Consider a minimum earth load assuming that one metre of fill may be removed for road or Utility construction shall.
- (f) Project Co shall design Structures utilizing water/buoyancy/flood loading in accordance with the following:
 - (i) Consider the effects of water pressure and buoyancy whenever groundwater is present. Establish high and low water tables for the life of the Structure with due consideration given to the possibility of future changes in groundwater elevation.
 - (ii) The design shall take into account the effect of water pressures during the construction sequence.
 - (iii) During construction and backfill operations, observe and control the elevation of the groundwater so that the calculated total mass of Structure and backfill shall always exceed the calculated uplift due to buoyancy by a safe margin. The backfill shall be considered as the volume contained within vertical planes defined by the outside limits of the Structure.
 - (iv) Local flooding may also add load to underground Structures. Design of the Structure shall make allowance for flood elevations based on 100 year flood data.
- (g) Project Co shall design Structures utilizing adjacent Structure/additional surcharge loading in accordance with the following:
 - (i) Horizontal and vertical distribution of loads from foundations of existing buildings shall be determined by Project Co.
 - (ii) Determine the minimum and maximum loads which can be transferred to the underground Structure. Where possible, these loads shall be based on the actual design loads for the Adjacent Structure. In the absence of this information, Use the methods in the Reference Documents in clause 4.2 of this Part 4 to evaluate probable loading of the existing Structure. The loading shall have at least the minimum level of performance on

the objectives and functional statements stated or implied in Reference Documents in clause 4.2 of this Part 4.

- (iii) When performing the above analyses, determine the need for all permanent underpinning of buildings or Structures.
- (h) Project Co's design and construction of Structures shall allow for Thermal, Shrinkage, and Creep Loading in accordance with the following:
 - (i) Project Co shall consider the secondary effects due to the stresses and movements resulting from temperature changes, thermal gradients, creep and shrinkage in the design and construction of all Structures. Project Co shall determine these loads and the appropriate design solution in accordance with the requirements of OBC, NBCC, CAN/CSA S6 and AREMA, as applicable.
 - (i) Project Co's structural design and construction shall allow for Other Loads and Effects in accordance with the following:
 - (i) as applicable to the use and occupancy for the Structure or element under consideration;
 - (ii) as required by the design codes, standards and references listed in this Article;
 - (iii) Refer to Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements for Vehicles and Vehicle loads;
 - (iv) Construction loads, construction staging loads and Maintenance loads;
 - (v) Loads due to fan induced airflows during operation of fire ventilation fans;
 - (vi) Loads induced on the Structures by tolerable differential settlement;
 - (vii) Loads to protect for future expansion where applicable; and
 - (viii) Other loads and effects specified in Schedule 15-2, Part 2, Article 9 - – Protection of Existing Adjacent Structures and Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements where applicable.

4.8 Load Combinations

- (a) Project Co shall design and construct Structures utilizing Load Combinations in accordance with the following:
 - (i) Load factors, resistance factors and load combinations shall be in accordance with the applicable building and Bridge codes for the particular Station and structural element under consideration.
 - (ii) Refer to Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements for load factors, resistance factors and load combinations for Station Structures supporting Vehicles.

- (iii) Where the Station structure is subject to Vehicle load, Project Co shall design the structure based on OBC and CHBDC.
- (iv) For Structures carrying more than one Track, Project Co shall determine the combination of Vehicle axle loads on one or more Tracks which produces the most critical effect.

4.9 Design Considerations of Retaining Walls:

- (a) Project Co shall ensure that the design considerations and factors influencing the behaviour of retaining walls shall be as per CAN/CSA S6 and OBC. The design of any retaining wall is Site specific, necessitating the need for specific geotechnical input and an understanding of wall construction methods. Provide architectural enhancement of walls where specified in the architectural design.
- (b) Project Co shall design and construct retaining walls to resist the following loads:
 - (i) Superimposed surface and subsurface loads (Adjacent vehicles and Structures);
 - (ii) System imposed forces (trackway vicinity);
 - (iii) Earth or rock pressures and hydrostatic pressures;
 - (iv) Earthquake lateral pressures;
 - (v) Wind Loads, where required;
 - (vi) Self-weight;
 - (vii) Loads during construction;
 - (viii) Thermal, shrinkage, and creep loads; and
 - (ix) Other retaining wall loads specified in Schedule 15-2, Part 2, Article 7 – Geotechnical Design Criteria and Requirements and Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements.
- (c) Project Co shall analyze retaining walls for:
 - (i) Stability against sliding;
 - (ii) Stability against bearing failure and overturning;
 - (iii) Settlement;
 - (iv) Overall stability;
 - (v) Structural strength;
 - (vi) Protect for future wall repair when locating retaining walls;
 - (vii) Provide Compensating Construction where existing retaining walls are impacted by the Station renovations as required by OBC and NBCC, as applicable; and

- (viii) Other requirements specified in Schedule 15-2, Part 2, Article 7 – Geotechnical Design Criteria and Requirements and Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements.

4.10 Other Design Considerations:

- (a) Project Co shall ensure that the design of the structural foundations, superstructures, systems, elements and connections meet all of the requirements stipulated in the codes, standards and references listed in this Article.
- (b) Project Co shall slope structural members to provide drainage where required.
- (c) Project Co shall include the deflection and vibration control measures in their design:
- (i) All structural members shall have adequate stiffness to limit deflections which may adversely affect the strength and serviceability of the Station Structure.
 - (ii) In members supporting Train loads, deflections due to live load, including dynamic factors, shall not exceed 1/1000 of the span for interior spans and 1/300 for cantilever arm length.
 - (iii) Limit the maximum total (dead and live load) long term total deflection considering creep and cracking for members supporting Train loads to 1/500 of the interior spans and 1/180 of cantilever arm length.
 - (iv) Design members not supporting rail loads, such as roofs, concourse and Platform slabs to standard acceptable engineering practices for serviceability taking into consideration the flexibility, or lack of flexibility, of the materials supported by the Structure.
 - (v) Proportion members and systems supporting the light rail System so that the natural frequency of the first mode of vertical vibration is greater than 2.5 Hz.
 - (vi) Design floor systems susceptible to vibration in accordance with AISC/CISC Steel Design Guide Series 11 – Floor Vibrations Due to Human Activity, to meet the acceptance criteria for indoor footbridges.
- (d) Project Co shall design and construct foundations as follows:
- (i) Settlements
 - A. Design foundations so that total and differential settlements do not adversely affect the strength or serviceability of the Station Structures.
 - B. Design Structural members and systems supporting Vehicles so that total and differential settlements do not adversely affect the operation and serviceability of the Vehicles.
 - (ii) Pile design and detailing shall meet requirements in OBC, MTO Structural Manual, CHBDC. If requirements are not specific in those documents, Project Co shall follow the requirements in AASHTO LRFD Section 10.

- (iii) Provide measures to prevent frost heave. The acceptable measures shall be taken from Reference Documents in Section 4.2.
- (e) Project Co shall include the following seismic design for elements of Structures, non-structural components and equipment.
 - (i) Seismic Importance Category for Station Structures shall be “Normal”.
 - (ii) Design elements and components of buildings, non-structural components and equipment for earthquake loads and effects as required by OBC and NBCC.
 - (iii) The load factor for earthquake effect on Vehicle shall be in accordance with Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements.
- (f) Project Co shall design and construct waterproofing in accordance with the following:
 - (i) The following application shall be sealed to prevent water ingress:
 - A. Underground pits, shafts and rooms.
 - B. Platforms, walkways, Track structure and roadways over rooms or spaces
 - C. Walls and floors off buildings subject to hydrostatic pressure.
 - (ii) The design measures shall provide zero leakage for the Design Life of the Structure.
 - (iii) The material and construction of waterproofing shall follow requirements in ASTM, OPSS and CAN/CGSB.
- (g) Project Co shall design and construct fire protection in accordance with the following:
 - (i) Structural elements and load bearing assemblies shall be of the required type of construction and shall have fire resistance ratings as required by the code analysis and the architectural design.
 - (ii) Provide concrete cover to reinforcing steel in reinforced concrete elements as required, to provide the required fire resistance rating for the element or assembly.
 - (iii) Provide intumescent paint where the architectural design utilizes exposed structural steel assemblies that require a fire resistance rating.
 - (iv) Adhesive anchors shall not be used for connections for structural assemblies required to have a fire resistance rating.
- (h) Project Co shall protect for the future replacement of elevators, transformers, ventilation fans and other large/heavy equipment without strengthening and/or temporary removal and replacement of structural members.
 - (i) Project Co shall locate columns away from public circulation areas. When columns are unavoidable, minimize the column cladding and size so as to maximize sightlines and customer circulation.

4.11 Existing Structures:

- (a) Project Co shall include the following with respect to the conditions of existing Structures affected by new construction:
- (i) An existing structure is considered modified under one or more of the following situations:
- A. Geometries are modified,
 - B. Material properties are modified,
 - C. Support condition are modified,
 - D. loads are changed,
 - E. Environmental condition is changed,
 - F. A new member is attached to an existing structural member resulting in load sharing between the new and existing members, or
 - G. Project Co's Geotechnical Engineer shall define the zone of influence in accordance with *User's Guide - NBCC 2015, Structural Commentaries (Part 4 of Division B), Commentary on CSA S6 (C6)*, and *CFEM*.
- (ii) Project Co shall demonstrate that the performance of the modified existing Structure meets all the applicable standards and requirements in this Article, regardless of the deficiencies in the existing Structures at the time of Contract Award, where deficiencies could be resulted from construction, material, design, normal course of deterioration, or damage prior to the Commercial Close.
- (iii) The structural soundness of the existing member affected by the construction shall be investigated to ensure it is capable of supporting the new member within the Design Life of the new member.
- (iv) Project Co shall inspect and document the conditions of the existing structures affected by the construction. The content and the documentation of the inspection shall follow the requirements in MTO Structure Inspection Manual, MTO Structure Rehabilitation Manual, ASTM E2018 or ASCE Structural Condition Assessment of Existing Structures. The requirements in the above references apply only when appropriate. Necessary additional or alternative criteria are subject to Approval.
- (v) Refer to Schedule 15-2, Part 2, Clause 4.4(q)(ii) for requirements for Structures within ZOI.
- (b) Project Co shall design and construct the renovation of Existing Structures in accordance with the following:
- (i) Comply with OBC and NBCCC as applicable. If the structural member is exposed, comply with MTO Structure Rehabilitation Manual.

- (ii) Comply with the Heritage Act as applicable.
 - (iii) Obtain background drawings, specifications and construction records for the affected Structures.
 - (iv) Perform as built surveys to verify the accuracy of the background drawings.
 - (v) Excavate test pits to verify the size and depth of existing foundations.
 - (vi) Conduct destructive investigations to verify existing conditions.
 - (vii) Conduct materials testing to determine and verify existing material properties.
 - (viii) Comply with the requirements for Basic Renovation or Extensive Renovation as determined by the code analysis at each location.
 - (ix) Provide Compensating Construction as required by OBC and NBCC, as applicable.
 - (x) Perform selective demolition in accordance with OBC and NBCC as applicable,
 - (xi) Repair any damage caused by the Work to the satisfaction of the property owner.
- (c) Project Co shall include the following with respect to the interface between existing and new deck Structures supporting pedestrian and vehicular traffic:
- (i) At locations where new framed floors are built adjacent to existing floor/Bridge Structures, design and construct new Structure in a manner that minimizes the vertical differential movement at the interface between Structures so that normal serviceability of the Station is maintained under permanent and transient loads. Joints between new and existing slabs shall be flush with no vertical offsets that could create pedestrian tripping hazards or bumps under wheel loading. The design shall address: long term deflection (creep) of concrete; differential live loading; total and differential footing settlement; beam and slab camber; expansion joint cover design; and other effects where applicable.
- (d) Where existing Structures are incorporated into or form part of the Station Structures, rehabilitate the existing Structures as required to meet the required Design Life as per Schedule 15-2, Part 1, Article 4 – Design and Construction.
- (i) Estimate the remaining life of the existing structure using a method and parameters recommended in peer-reviewed publications. Submit documents supporting the estimated remaining life to the City for review and approval.
 - (ii) The inspection, evaluation and rehabilitation of the existing structure shall follow the requirements in the Reference Documents in clause 4.2 of this Part 4.

4.12 Reinforced Concrete

- (a) Project Co shall design and construct reinforced concrete in accordance with the following:
- (i) This Subsection applies to reinforced, prestressed, and precast concrete Structures.

- (ii) Provide a nonslip surface finish in accordance with CAN/CSA A23.1 at exterior slabs subject to pedestrian traffic and at other locations required by the architectural articles.
- (iii) Provide hardener at exposed concrete floors.
- (iv) Joints in Structures
 - A. Provide expansion joints, contraction joints and construction joints: in accordance with the all applicable codes and standards and in accordance with good industry practice; to control shrinkage stresses and minimize shrinkage cracking; and to meet or exceed the requirements for durability specified in clause 4.6 of this Article.
 - B. Provide waterstops in all joints below grade.
 - C. Construction joint locations shall be planned in advance in order to minimize the number of joints while still keeping the length of individual concrete pours within standard acceptable maximum lengths. The shape of the pour as well as the amount of reinforcement in the section shall be taken into consideration when determining joint location and spacing.
- (v) Field sampling and testing of concrete and acceptance criteria for quality assurance shall follow the requirements in OPSS 1350.

4.13 Structural Steel

- (a) Project Co shall design and construct Structural Steel in accordance with the following:
 - (i) The Code of Standard Practice for Structural Steel published by the CISC shall be referenced with respect to the furnishing of structural steel.
 - (ii) Design of structural steel Structures shall be in accordance with CAN/CSA S16 Design of Steel Structures and CAN/CSA S6 Canadian Highway Bridge Design Code, where they are applicable.
 - (iii) Design of cold formed steel Structures shall be in accordance with CAN/CSA-S136 North American Specification for the Design of Cold-Formed Steel Structural Members.
 - (iv) All structural steel left exposed and viewable by the public shall be AEES:
 - A. Project Co shall provide AEES in accordance with CISC Code of Standard Practice for Structural Steel, Appendix I as follows:
 - i. Category 3 AEES: AEES that is within 6m vertically or horizontally of a walking surface and is visible to a person standing on that walking surface.
 - ii. Category 2 AEES: AEES that is not defined as Category 3 or that can be viewed at a distance greater than that specified in Category 3.
- (v) Provide concealed connections where required by the architectural design.

(vi) Protection of Steelwork

- A. Project Co shall endeavour to make all parts of a Structure accessible for inspection, cleaning and Maintenance. Where this is not possible, consideration shall be given to concrete encasement of steelwork, use of special protective coatings or the use of atmospheric corrosion resistant steel.

(vii) Protective Coatings

- A. Protect Structural steel members and connections exposed to weather, high humidity or water spray against corrosion in accordance with MTO Coating Structural Manual. Minimize localized corrosion likely to occur from entrapped water, excessive condensation, or from other factors by suitable design and detail. Provide positive means of drainage to prevent standing water on steel surfaces.
- B. Painting of interior structural steel shall meet the requirements of ISO 12944-5 for the applicable corrosive environment and desired Design Life of the coating system.
- C. Co-ordinate the protective coating systems with the architectural design.
- D. The minimum protection system shall be painting with a high performance coating system.
- E. Where hot dip galvanized protection system is utilized, the following shall apply:
- i. Protection shall be restored when damage to the galvanized coating has occurred during welding or as a result of rough handling or abrasion.
 - ii. Where exposed to public view, all galvanized surfaces shall be finish painted.

(viii) Project Co shall not use steel deck for Structures exposed to the exterior or to deicing salts.

4.14 Masonry

(a) Project Co shall design and construct masonry in accordance with the following:

- (i) Design of masonry Structures shall be in accordance with CAN/CSA S304.1
- (ii) Horizontal joint reinforcing shall be galvanized.
- (iii) Design masonry Structures to resist all applied vertical and lateral loads as required by the OBC (and the NBCC where applicable). This requirement applies to load-bearing and non-load-bearing masonry.

4.15 Concrete Slabs on Grade

(a) Project Co shall design and construct concrete slabs on grade in accordance with the following:

- (i) Design Track slabs in accordance with AREMA, CAN/CSA S6 and ACI 201.2R.
 - A. Refer to Schedule 15-2, Part 2 – Civil and Guideway, for Track slab Design requirements.
 - B. Transition areas require special considerations. Design of transition areas shall account for the susceptibility of backfill soil material to settlement behind bridge abutments. An approach slab shall be used in these areas.
- (ii) Design Platform and other slabs on grade in accordance with CAN/CSA A23.3 and ACI 360R.
- (iii) Remove existing fill material below slabs on grade and replace with engineered fill to a depth and extent as required to meet the limitations for settlement specified in clause 3.8 (d) of this Article. Reuse of existing excavated fill material is subject to Geotechnical Engineer's confirmation that the existing fill is suitable for re-use.
- (iv) Design and construct the interface between Track slabs and Platform slabs to maintain the vertical distance between top of rail elevation and finished Platform elevation as required by the Vehicle with short and long-term differential settlements not to exceed the tolerance specified by the Vehicle manufacturer for vertical offset between the Track and finished Platform elevations. Refer to Schedule 15-2, Part 8 - Vehicles for Vehicle and Platform construction tolerance.
- (v) Provide control joints or other measures to prevent uncontrolled shrinkage cracking.
- (vi) Where the location and spacing of transverse joints in Track slabs does not match the location and spacing of joints in the adjacent Platform slabs, provide connection design and detailing at the interface between slabs to address differential concrete shrinkage.
- (vii) Design joints to prevent vertical differential movement between slab panels.
- (viii) Provide slopes to drain slabs and prevent ponding.
- (ix) Provide subdrainage systems below slabs at locations where the potential exists for the groundwater elevation to reach the underside of the slab subbase.

ARTICLE 5 MECHANICAL DESIGN CRITERIA

5.1 Introduction

- (a) Project Co shall design and construct mechanical systems for the Stations and Ancillary Facilities of the Project in accordance with this Article.
- (b) The requirements within this Article shall govern the functional, operational and control requirements of the HVAC, Plumbing & Drainage Systems, Fire Protection Systems, and BAS for the Project.

5.2 Reference Documents

- (a) Project Co shall design and construct all applicable codes, standards, regulations, policies, applicable laws, guidelines or practices applicable to the Project requirements, including but not limited to the latest version of each of the following documents. In the event of a conflict between criteria, commitments or requirements contained within the document and this Article when compared with another, the most stringent shall apply.
 - (i) OBC;
 - (ii) NBCC;
 - (iii) OFC;
 - (iv) OESC;
 - (v) CEC;
 - (vi) CSA;
 - (vii) OHSA;
 - (viii) AHRI;
 - (ix) AMCA Standards;
 - (x) ANSI Standards;
 - (xi) ASHRAE Standards and Handbooks;
 - (xii) MNECB;
 - (xiii) Green Energy Act;
 - (xiv) ASPE;
 - (xv) ASME;
 - (xvi) ASTM;
 - (xvii) NEMA;

- (xviii) SMACNA;
- (xix) TIAC;
- (xx) PDI;
- (xxi) UL;
- (xxii) ULC;
- (xxiii) NFPA Standards;
- (xxiv) Governmental Authorities

5.3 General Requirements

- (a) Project Co shall design and construct all mechanical systems including equipment, ductwork, pipes, supports, accessories, and their connections to the Structure to resist seismic force and to accommodate building seismic deflection in accordance with the OBC. Additionally, where mechanical infrastructure crosses expansion joints, or other places where differential lateral displacement may occur, the piping, ducts etc. shall be attached in a manner that accommodates the differential movement.
- (b) All floor-mounted equipment shall be installed on concrete housekeeping pads designed and constructed to facilitate the weight and inertia of the equipment.
- (c) Roof-mounted equipment shall be installed on supports/roof curbs provided by the equipment manufacturer.
- (d) Project Co shall coordinate associated architectural and structural requirements for mechanical systems.
- (e) Provide adequate service spaces around all equipment. As a minimum, such spaces shall not be less than that indicated in the equipment specification and installation instructions.
- (f) Mechanical equipment and systems shall be designed so that the maximum noise transmitted by the systems does not exceed OHSA and ASHRAE Standards.
- (g) Where new mechanical systems are connected to existing mechanical systems, the existing mechanical systems shall be modified to suit the requirements of new systems. The modifications shall be in compliance with OBC, codes, standards, and meet requirements set forth in this Article.
- (h) Project Co shall provide technical calculations for review during each phase, in accordance with Schedule 10 – Review Procedure.
- (i) TAB and commissioning shall be performed for all mechanical systems.
- (j) Requirements set forth in this Article for Stations shall also apply to service facilities located in Tunnels.

(k) Electric motors shall be NEMA premium efficiency. Fractional horsepower motors shall be electronically commutated motors.

(l) All mechanical systems and equipment shall be designed and installed to eliminate the transmission of vibration and noise to other part of the building and to applicable standards, regulations and codes. Provide vibration isolators for mechanical equipment and components.

5.4 Station specific Requirements

(a) Bayview Station

(i) Project Co shall design and construct a new partially enclosed glazed connection corridor that shall be naturally ventilated per ASHRAE 62.1. Where natural ventilation is inadequate, mechanical ventilation shall be provided. Adequacy of natural ventilation shall be confirmed by calculation or a computer program.

(b) Carling Station

(i) Project Co shall modernized the existing elevator as per requirements of all elevator related articles, the existing mechanical systems serving the elevator equipment and elevator shaft shall be modified or new systems be provided to satisfy the requirements set forth in this Article.

(c) Leitrim Station

(i) Project Co shall design and construct a private sanitary sewage system at Leitrim Station.

A. Private sanitary sewage system capacity shall be sized by Project Co to accommodate the Station's bus Operator's building, as determined by occupancy and use calculation in accordance with OBC plus an additional 20%.

B. Drinking water to the new Station shall be serviced from the existing Municipal drinking water infrastructure. The use of wells to provide drinking water services to the Station shall not be permitted.

(d) Bowesville Station

(i) Drinking water to the new Station shall be serviced from the existing Municipal drinking water infrastructure. The use of wells to provide drinking water services to the Station shall not be permitted.

(e) South Keys Station

(i) Project Co shall ensure the new pedestrian underpass and the new Station expansion are naturally ventilated and ventilation is adequate. The environment of the public areas of the existing Station shall not be affected by the new Station. Where natural ventilation is inadequate, mechanical ventilation shall be provided. Adequacy of natural ventilation shall be confirmed by calculation or a computer program.

5.5 HVAC

- (a) Project Co shall provide HVAC in accordance with the following:
- (i) HVAC design parameters for Stations and Ancillary Facilities shall be as follows:
- A. System concepts shall be based on the energy conservation guideline of the MNECB, OBC, and ASHRAE 90.1.
 - B. Rooms that service equipment that require reliability, such as communication rooms, telephone rooms, signal rooms, elevator machine rooms shall be adequately positively pressurized to mitigate infiltration of brake dust from Train movements.
 - C. Rooms containing equipment that requires condition control shall be designed to suit the equipment as per the manufacturer's recommendations or the occupancy requirements, whichever are the most stringent.
 - D. Rooms that are occupied shall be provided with outside air requirements per person as defined in ASHRAE, and, if found to be applicable, air-conditioning, based on the number of occupants, and heated, all to suit staff comfort conditions.
 - E. Rooms that are unoccupied and do not require condition control for equipment shall have a minimum air change rate as determined to suit the room functions.
 - F. Rooms that contain equipment and systems that may give off airborne particles, odours, or chemicals shall be exhausted to outside at grade level.
 - G. Washrooms and janitor rooms shall be exhausted to outside at grade level.
 - H. Battery rooms shall be exhausted to outside at grade level via duty and standby exhaust fans.
 - I. Air-conditioning systems serving elevator machine rooms shall be designed such that elevator equipment shall be operational during Station fire Emergency.
 - J. HVAC systems serving critical rooms such as communication rooms, signal rooms, control rooms, telephone rooms shall be designed such that those equipment shall be operational during Station fire Emergency.
 - K. Elevator shafts shall be provided with HVAC to meet requirements CSA B44 and elevator manufacturer.
 - L. Maximum room design temperatures shall be selected to suit the room function and occupancy.
 - M. Spaces requiring heating only shall have ventilation systems (as a separate system or a combined heating and ventilating system if deemed size appropriate) that provides cooling by introducing ambient (outside) air at a rate to limit the

maximum space temperature to 5.5°C above ambient (outside) temperature unless otherwise required in this Article.

- N. Where feasible, systems shall be designed to be capable of providing free cooling by introducing 100% ambient (outside) air. Where the use of outside air results in unacceptable air change and flow rates, provide mechanical air conditioning.
 - O. Outside air intakes shall be located at grade level to avoid the introduction of dirt, debris, fumes, odours, noise, irritants and biological agents from traffic and other external sources.
 - P. All occupied or unoccupied spaces, rooms that contain critical equipment shall have individual temperature control.
 - Q. All equipment, dampers, fittings installed in ductwork shall have flange duct connections.
 - R. The analytical design of the ventilation systems serving the public area of the Stations shall be carried out by the use of a certified applicable computer modeling program.
- (ii) HVAC design Conditions
- A. The HVAC outdoor design conditions for both underground and above ground Stations shall be as per OBC.
 - B. The HVAC indoor design conditions for Station spaces shall be as detailed in Table 4-5.1 below
 - C. Project Co shall determine the indoor environmental requirements for all support spaces not included in Table 4-5.1 in accordance with Applicable Law, and within the manufacturer's operating range of equipment housed within the space.

Table 4-5.1 - HVAC Indoor Design Conditions

Space/Room	Minimum Temperature (°C)	Maximum Temperature (°C)	Outside Air per Occupant(l/s)	Air Filtration (MERV)	Humidity Summer / Winter (%RH)
Fare Equipment Room	22	26	12	12	50/30
Lunch Room	22	24	17	8	50/10
Bus supervisor's office	22	24	17	8	50/10
Multi-purpose Room	22	24	17	8	50/10
Public Washrooms	18	5.5 (See Note ii)	(See Note iii)	8	-

Notes:

i. Ventilation design shall maintain space temperature design for 5.5° above outside ambient summer design temperature. Space may be included in central air handling system that provides heating and cooling if justified by first cost as add-on to space(s) that require mechanical cooling.

ii. Provide mechanical exhaust system at exhaust rate as required by the OBC. Provide outside air for exhaust air make-up. Recirculation of supply air to this space is not permitted.

(b) HVAC equipment and systems

- (i) Select equipment to provide the highest operating efficiencies available.
- (ii) Mechanical equipment shall be commercial or industrial grade.
- (iii) To the extent practical, condensing units shall be located at grade or heat from condensing units shall be rejected to outside at grade.
- (iv) Condensing units shall not be located in Tunnels, shafts, or any other areas subject to brake dust and debris.
- (v) Condensing air for ducted condensing units shall be taken from a location at grade, free from brake dust and debris.
- (vi) Heat recovery systems as well as free cooling shall be utilized to facilitate energy conservation as per ASHRAE 90.1, OBC and local standards.
- (vii) The level of fresh air supplied to occupied space shall be automatically controlled for energy conservation.
- (viii) Gas-fired unit heaters shall be high efficiency with stainless steel burner.
- (ix) Heating systems shall be integral with cooling systems. Heated spaces shall be heated with electric heaters where heating and cooling air-handling units are not provided for the space.
- (x) For above grade buildings only, indirect high efficiency gas-fired heating equipment may be considered.
- (xi) Provide electrical radiant heaters for all Train and bus Platform TSA shelters.
 - A. Heaters shall be monitored and controlled by the BAS.
 - B. Each unit(s) serving a shelter shall be independently controlled by a customer activated switch, controlling a rated contactor with a maximum run time of 15 minutes. Contactor shall have a hand-off-auto selector switch with pilot light.
 - C. The BAS shall prevent the operation of the heaters when the ambient temperature is greater than 5 degrees Celsius.
 - D. Heaters shall be UL/ULC listed for horizontal outdoor surface and suspended mounting.

- E. Enclosures shall be a minimum 20 gauge cold rolled steel finished with powder coated paint.
 - F. Reflectors shall be one-piece construction and a minimum 0.030 gold anodized aluminum with the proper angle to reflect infrared heat.
 - G. Elements shall be double tubular infrared quartz tube with high thermal shock characteristics.
 - H. Each individual unit shall be rated at 4,200W minimum; and
 - I. Heaters shall nominally extend the full length of the shelters and TSAs.
- (xii) Electric duct heaters shall be provided with SCR control.
- (xiii) Electric unit heater shall be provided with remote wired wall mounted thermostat.
- (xiv) Electric force flow heater shall be provided with remote wired wall mounted thermostat.
- (c) Ductwork
- (i) Ductwork shall be galvanized steel unless otherwise specified. Construction, joints, fittings and accessories shall be in accordance with the latest SMACNA standards and the OBC.
 - (ii) Ductwork serving shower exhaust, battery exhaust, humidifiers (two meters downstream), and other corrosive gas or high moisture air shall be stainless steel.
 - (iii) Flexible ducts shall be manufacturer pre-insulated.
 - (iv) Flexible ducts shall not be used in Stations.
- (d) Supply Diffusers, Registers and Grilles
- (i) Diffusers shall be extruded aluminum construction with manufacturer applied finish, and opposed-blade adjustable-volume dampers.
 - (ii) Registers and grilles shall be extruded aluminum construction a with manufacturer applied finish.
 - (iii) Registers and grilles shall be equipped with opposed-blade, adjustable-volume dampers.
- (e) Intake and Exhaust Wall Louvers
- (i) Wall louvers shall be weather resistant, extruded aluminum construction with an insect/bird screen.

- (ii) Wall louvers located in public areas shall be located at high level and out of reach of Passengers.
- (f) Volume Dampers in Branch Ducts
 - (i) Adjustable volume dampers shall be provided for all branch ducts serving more than one outlet.
- (g) Backdraft Dampers
 - (i) Dampers shall be counter balancing type for assisted damper operation.
- (h) Silencers shall be made of not less than 22 gauge Type G90 galvanized steel or stainless steel to match material of connecting ducts.
- (i) Access Doors
 - (i) Duct access doors shall be provided at each damper, duct heater, and any other accessories and equipment that require Maintenance.
 - (ii) Access doors installed in insulated ducts shall be pre-insulated.
 - (iii) Access doors shall be made of same material as ducts they serve.
- (j) Fire Dampers
 - (i) Fire dampers shall be Type B or C dynamic dampers.
- (k) Thermal Insulation
 - (i) Externally applied thermal insulation shall be provided for the ductwork as per ASHRAE 90.1 and OBC, and as indicated below.
 - (ii) Insulate exhaust air ducts and plenums 3m from the exhaust louver.
 - (iii) Insulate outside air ducts and plenums to air handling equipment.
 - (iv) Exhaust air duct from a shower area where duct is in unheated space.
 - (v) All supply or return air duct transporting air that is above or below the conditioned space design temperature or in an unconditioned space.
 - (vi) Insulation jacketing in public areas or to public view shall be minimum 0.5mm thick rigid aluminum sheet.
- (l) Acoustic Lining
 - (i) Acoustic lining is acceptable at supply and suction ducts of air handling equipment only when installation of silencer is unfeasible.
 - (ii) Interconnecting ductwork between the men's and women's washrooms shall be acoustically lined to prevent cross-talk.

- (m) Humidifier
 - (i) Humidifier shall be in-duct type.
- (n) Air Filtration
 - (i) All return air and make-up air shall be filtered.
 - (ii) The air filters shall be standardized in type and sizes. Where make-up air intakes are located that excessive dirt, debris may be introduced, filters shall be upsized.
 - (iii) Filters shall be standardized in type and sizes.
 - (iv) Differential pressure gauge shall be provided across each filter bank and monitored by BAS.
- (o) HVAC piping
 - (i) Non-metallic piping shall not be used in the Facilities.
 - (ii) Steel pipe shall be ASTM A53 Grade B, minimum Schedule 40; natural gas pipe shall be ASTM A53 Grade B, minimum Schedule 40, seamless.
- (p) Instrument Test Ports:
 - (i) Provide instrument test ports to recommendations of SMACNA/HVAC and in accordance with manufacturer's instructions.
- (q) HVAC Systems Controls
 - (i) Each item of equipment shall have an independent control panel to control the operation of the equipment.
 - (ii) Where interface between systems (e.g. heating/cooling) is required, a local control panel shall provide control of the equipment. Controls shall be such that simultaneous cooling & heating of the same space is not possible.
 - (iii) All control panels shall incorporate the ability to send a trouble alarms via the BAS or SCADA to the TOCC.
 - (iv) Equipment in public spaces shall have vandal/tamper resistant housing and mounting.

5.6 Plumbing and Drainage

- (a) Project Co shall provide plumbing and Drainage in accordance with the following:
 - (b) General design requirements
 - (i) Each Station shall be serviced by one municipal water connection split prior to the property line for two service connections. Each service is provided with an

isolation valve at the property line. One connection shall be metered for potable water and one un-metered to serve the fire protection systems.

- (ii) To the extent possible, piping shall not be embedded in concrete structure.
 - (iii) Piping shall not be routed through critical equipment rooms.
 - (iv) Equipment requiring drainage shall not be located directly over critical equipment rooms.
 - (v) All domestic cold water and domestic hot water pipes shall be insulated as per ASHRAE 90.1 and OBC with a minimum of 25mm thickness insulation.
 - (vi) All horizontal sanitary pipes and pipes subject to exterior surface condensation shall be insulated with 25mm thickness insulation.
 - (vii) All storm pipes shall be insulated with 25mm thickness insulation.
 - (viii) Insulation jacketing in public areas or to public view shall be 0.5mm thick rigid aluminum sheet.
 - (ix) The incoming domestic water pipes, main sanitary and storm pipes shall be one nominal size oversized to accommodate future expansion. Where new plumbing and drainage systems are connected to existing systems of the existing Station, the existing incoming domestic water pipe, main sanitary and storm pipes shall be replaced with new as required, and the requirements in this Article shall apply.
 - (x) Domestic cold and hot water pipes, hot water recirculation pipes within the Stations or Facilities shall be copper as per OBC.
 - (xi) Isolation valve shall be provided at each domestic cold water and domestic hot water main branches and branches that service group of fixtures, area, floor, and equipment.
 - (xii) Storm, sanitary and vent pipes within the Stations or Facilities shall be copper (less than 100mm in diameter) or cast iron (100mm or greater in diameter).
 - (xiii) Non-metallic pipes shall not be permitted within the Stations or Facilities, with the exception of buried pipes that are permitted by codes and local authorities.
 - (xiv) Buried non-metallic pipes shall be provided with tracer wires.
 - (xv) Metered cold water shall be provided for the leased area.
 - (xvi) Sanitary and vent pipes rough-in shall be provided for the leased area.
- (c) Piping systems
- (i) Pipes and fittings

- A. Pipes and fittings shall be selected to suit the fluids they are to convey. Pipes and fittings shall be selected such that they exceed the minimum with respect to quality and wall thickness that is allowed for the service and pressure.
 - B. Corrosion control measures shall be provided for buried pipes where required.
 - C. Piping exposed to freezing temperatures shall be heat traced and insulated.
- (ii) Cold water service
- A. The domestic cold water shall be metered per the City of Ottawa requirements.
 - B. Each service shall have a main shut-off valve immediately inside the structure wall.
 - C. Where service water pressure is above the recommended, pressure reducing valve assemblies shall be provided.
 - D. Provide pressure gauge at water incoming pipes.
 - E. Provide pressure gauges at pump suction and discharge pipes.
 - F. Provide pressure gauges at inlet and outlet pipes of pressure reducing valves, backflow preventers, and strainers.
 - G. Minimum fixture service requirements shall be calculated in accordance with the OBC.
- (iii) Hot water service
- A. Water heaters shall be commercial grade electric (or alternatively natural gas-fired for above grade buildings) meeting the requirements of ASHRAE 90.1 / OBC SB-10 and MNECB.
 - B. Project Co shall avoid runs of hot water supply piping that exceed 15m, otherwise, hot water recirculation pump shall be provided.
- (d) Plumbing fixtures and specialties
- (i) Plumbing fixtures shall be water conserving type and shall meet the consumption outlined in the OBC, ASHRAE 90.1
 - (ii) Shock-absorbing devices shall be provided at each pipe riser, branch, group of plumbing fixtures and other locations in accordance with standard PDI-WH201.
 - (iii) Emergency eye / face wash and shower stations

- A. Emergency eyewash station with tempered water shall be provided in the following spaces:
 - i. Electrical battery rooms or any other room containing acid batteries;
 - ii. Janitorial Rooms and any other rooms containing chemicals; and,
 - iii. HVAC equipment rooms.
 - B. Station rooms containing a significant amount of chemicals shall be provided with eye/face washes and showers.
- (iv) Hose bibs and wall hydrants
- A. Provide hose bibs or wall hydrants in all service rooms including HVAC rooms, pump rooms, washrooms, refuse rooms, and open areas such that all open areas of the buildings and the concourses, Platforms shall be reached with a 30m hose. Hose bibs are not required in electrical or communication rooms.
 - B. Provide non-freeze hose bibs or wall hydrants in locations subject to freezing.
 - C. Wall hydrants in public areas shall be wall recessed and lockable.
 - D. To be equipped with integral backflow preventers.
- (v) Drinking Fountains
- A. Drinking fountains shall be provided at Concourse Levels as required in Article 2 – Architectural Design Criteria, of this Part 4, and as in the Appendices to this Part 4.
 - B. Drinking fountains shall be provided in Operator's Facilities.
 - C. Drinking fountains shall feature bottle refill and built-in cooler.
 - D. Drinking fountains shall be complaint with AODA and COADS.
- (vi) Floor drains
- A. Provide floor drains in all areas, shafts or rooms where any source of water can be expected, including: public areas, mechanical rooms, HVAC rooms, pump rooms, janitor rooms, washrooms, valve rooms, ventilation rooms, elevator machine rooms, electrical rooms, elevator pits, Operator Facilities, and service trenches.
 - B. Floor drains in elevator and escalator pits shall be equipped with backwater valves.
 - C. Provide floor drain at foot grilles at Station entrances.

- D. Provide funnel floor drains for condensate and water disposal.
 - E. Floor drains, funnel floor drains and floor cleanouts shall be heavy duty.
 - F. Floor drains shall be provided with trap seal primers.
 - G. Floor drains exposed to freezing temperatures shall be heat traced.
- (vii) Trench drains
- A. Provide trench drains at top and bottom of stairs at Station entrances and outdoor stairs.
 - B. Provide trench drains at bottom of other stairs.
 - C. Provide trench drains at Track level within Stations
 - D. Provide trench drains at pedestrian underpasses.
 - E. Trench drains shall be heavy duty.
 - F. Trench drains shall be provided with trap seal primers.
- (viii) Sump pumps & sewage ejectors
- A. Sump pumps and sewage ejectors shall be duplex configuration with 100% redundancy.
 - B. Submersible sump pumps shall be equipped with stainless steel quick connection, installation guide bars.
 - C. Sump pits shall be equipped with stainless steel ladder, stainless steel gas-tight cover.
 - D. Large pumps shall be provided with permanent monorail lifting devices.
 - E. Provide pressure gauges at sump pump discharge pipes.
 - F. Sanitary pumps servicing elevator pits shall not be located in the elevator shaft.
 - G. Storm sump pits shall be provided with a sediment trap section.
 - H. Where oil or grease may be present in the sanitary, oil sensor shall be provided.
 - I. Pump control panels shall be stainless steel construction and facilitate fault or trouble signals back to TOCC via the SCADA system.
 - J. All pumping stations shall incorporate level controls with high-level alarms that shall be sent to TOCC via the SCADA system.

5.7 Fire Protection

(a) Project Co shall provide Fire Protection in accordance with all of the following:

(i) General design requirements

- A. Fire water service shall be provided with double check detector assembly and installed as per requirements of the City.
- B. Provide fire pumps as required to meet code requirements.
- C. Provide complete automatic sprinkler system for areas of each Station including the Storage Tracks, Tail Tracks, and Ancillary Facility as required by the OBC, NFPA-130, NFPA-13, and Governmental Authorities.
- D. Provide complete standpipe system for all Station and ancillary Facility, and portions of Tunnels within 20m of the Platform. The standpipe system shall meet the requirements of OBC, NFPA-130, NFPA-14 and Governmental Authorities.
- E. Provide NOVEC 1230 clean agent fire suppression systems for all communications, transit control, telephone equipment rooms and any other rooms of similar function, in compliance with NFPA-2001.
- F. Provide portable fire extinguishers as required by the OBC, OFC, NFPA-10, and Governmental Authorities.
- G. Non-metallic pipes shall not be permitted for fire protection systems unless for buried pipes and permitted by codes.
- H. Flexible pipes shall not be permitted for fire protection systems.
- I. Drum drips in unheated areas for dry systems shall be heat traced and insulated.

(ii) Sprinkler systems

- A. Sprinkler systems shall be wet type if not subject to freezing weather conditions; otherwise dry-pipe systems are acceptable upon approval by local authorities.
- B. Pipes shall be steel pipe of minimum Schedule 40 meeting ASTM A795/A795M or ASTM A53/A53M Grade B and NFPA 13.

(iii) Standpipe systems

- A. Standpipe systems shall be Class I or III, as required by the local Fire Department.
- B. Provide standpipe systems for the Storage Tracks and Tail Tracks in the Stations.
- C. Fire protection cabinets in public areas shall be flush mounted wall recessed stainless steel.

- D. Fire protection cabinet shall contain a portable fire extinguisher.
- E. Pipes shall be steel pipe of minimum Schedule 40 meeting ASTM A795/A795M or ASTM A53A/53M Grade B and NFPA 13.
- (iv) Clean agent fire suppression systems
 - A. Where rooms are protected by clean agent fire suppression systems, raised floor and ceiling spaces in these rooms shall be provided with fire suppression systems.
 - B. Audible and visual alarms shall be provided within the room as well as outside in normally occupied staff room.
 - C. Pipes shall be seamless steel pipe of minimum Schedule 80 and as required in NFPA-2001.
- (v) Portable fire extinguishers
 - A. Station rooms containing a significant amount of electrical, electronic, and signal equipment shall be provided with CO₂ fire extinguishers, in addition to dry chemical fire extinguishers.
 - B. An additional Class A fire rated water pump tank extinguisher shall be provided within all Stations.
 - C. Extinguishers in public areas shall be installed in wall recessed stainless steel cabinets.
- (vi) Fire department connections
 - A. Free standing or wall mounted connections and signage constructed of polished bronze or chrome plated bronze. Project Co shall verify the type required by Governmental Authorities.

5.8 Building Automation System

- (a) Project Co shall provide an open-protocol BACnet Ethernet LAN BAS system for each Station and each Ancillary Facility to control and monitor all systems, components, and equipment in this Article.
 - (i) Station BAS system shall be compatible with the BAS systems of the Existing Confederation Line System.
 - (ii) All Ancillary Facilities supporting bus operations shall be compatible with the existing OC Transpo BAS system.
- (b) Project Co shall provide an OWS at each Station and each ancillary facility, complete with a Graphical User Interface, printer, all computer hardware and software.

- (c) Project Co shall design and construct systems, components, and equipment that are controlled by BAS to have their own local standalone controllers and monitoring.
- (d) Project Co shall design and construct each workstation to be connected to the TOCC, and communicate with other control systems.
- (e) Project Co shall ensure that the System has minimum 25% spare points and is expandable for future system expansion without hardware upgrade.

ARTICLE 6 ELECTRICAL DESIGN CRITERIA

6.1 Introduction

- (a) This Article presents the basic electrical design guidelines, codes, and standard references that Project Co shall follow throughout the electrical design process of the Stations.
- (b) Reuse of existing Station infrastructure is permitted in accordance with the following:
- (i) Project Co shall replace all major distribution equipment with a remaining life expectancy of less than 15 years from the date of installation and commissioning. In addition, Project Co shall replace all existing communication, security, and life safety equipment that has less than 5 years of remaining life expectancy at Substantial Completion that is compatible with the new systems.
 - (ii) Project Co shall perform all rehabilitation, refurbishment etc., as identified in the manufacturer documentation for all existing equipment retained for use in Project Co's design.
 - (iii) Project Co shall limit the loading (KVA, Amps) on existing services and power distribution equipment where used for the purposes of expanding existing distribution to meet new load demand such as not to exceed 80% of the existing distribution equipment rating. Where the loading of the existing distribution equipment exceeds 80% of its rating with the addition of new loads to meet station expansion, DB Co shall replace such equipment with new equipment that shall meet the new load demand and include a minimum of 25% capacity for future expansion.
- (c) Electrical spaces shall be properly located and sized to facilitate the installation and Maintenance of equipment.
- (d) The design of the Station electrical systems shall provide for safe, reliable, and continuous operation.
- (e) Accessibility shall be provided to permit removal and replacement of major equipment. These requirements are intended to promote uniformity in the design approach and to standardize the type of equipment and its location throughout the System.
- (f) Electrical power distribution equipment shall be heavy-duty construction and shall provide arc flash hazard mitigation features to limit PPE to level 2 or lower.
- (g) For the design of all electrical systems, sustainable design elements shall be utilized where applicable and practical as recommended by CAN/CSA 802, EnergyStar®, RoHS.
- (h) The electrical distribution system shall distribute power for Passenger Station lighting, heating, ventilation and other equipment and systems. Power and circuit requirements for signal and communication systems are subject to other Articles.
- (i) All electrical equipment shall be individually identified by unique number matching equipment schedule designation. The label shape, letter size, color coding and background color shall be standardized for the Project. Project identifying labels shall be designated for: cable trays, conduits, junction boxes, cables/wires and all electrical and electronic equipment. In addition to

the identification labels, approval labels shall be provided as required per CSA, ULC, [REDACTED], or [REDACTED].

6.2 Reference Documents

- (a) Project Co shall design and construct the Station and Facility electrical systems in accordance with the criteria contained in this Article, all standards, regulations, policies, Applicable Law, guidelines or practices applicable to the Project, including, but not limited to, each of the following Reference Documents. In the event of a conflict between criteria, commitments or requirements contained within one document when compared with another, the more stringent shall apply:
- (i) OBC*;
 - (ii) NBCC*;
 - (iii) OESC;
 - (iv) CEC, Part I: Safety Standard for Electrical Installations;
 - (v) ANSI;
 - (vi) ULC;
 - (vii) NEMA;
 - (viii) CSA;
 - (ix) IESNA Lighting Handbook;
 - (x) IESNA, IES RP-20 – Lighting for Parking Facilities;
 - (xi) ASHRAE 90.1;
 - (xii) City of Ottawa Standards;
 - (xiii) NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems;
 - (xiv) NFPA 110: Standard for Emergency and Standby Power Systems;
 - (xv) ASME A17.1: Safety Code for Elevators and Escalators;
 - (xvi) IEEE;
 - (xvii) IEC;
 - (xviii) [REDACTED] Specifications;
 - (xix) [REDACTED] Specification;
 - (xx) OC Transpo Transitway and Station Design Guidelines;

(xxi) [REDACTED];

(xxii) IDA-IES; and,

(xxiii) EEMAC.

**Note: Stations located on Federal Lands shall meet the requirements of both the OBC and the NBCC.*

6.3 Basis for Design

(a) Project Co shall provide the Basis for Design in accordance with the following:

(b) Electrical Load Classification

(i) Normal systems include loads which, if de-energized, would have no effect on Passenger safety or adverse effect to Facility systems. This load classification includes all non-essential Station loads and the majority of Station lighting. These loads can tolerate occasional prolonged power outages and do not require a backup power source.

(ii) Emergency systems classed per NFPA 130 and NFPA 110

A. Level 1 systems include loads such as Emergency egress lighting, communication systems (if used in Emergency response procedures) and fire alarm systems that cannot tolerate normal electrical supply outages and require an Emergency power supply.

B. Level 2 systems include loads such as fire pumps, Emergency ventilation and smoke removal systems, sewage pumps, and elevators that require a reliable power source, feeders from two separate and distinct Utility substations or combination of sources as approved by the AHJ.

**Note: Project Co shall perform FMEA and vulnerability/system assurance/reliability analysis in order to determine any other Safety Critical loads that require emergency power.*

(c) Calculations

(i) Project Co shall perform short-circuit calculations to determine the AIC rating of the electrical distribution system based upon the actual available short-circuit value or per-unit impedance values obtained from the [REDACTED] at the electric service entrance or point of connection.

(ii) Project Co System device coordination and selectivity shall be based on calculated short-circuit values and used for selection of ratings and settings of protection devices.

(iii) Project Co shall complete voltage drop calculations for maximum loads, long run circuits and feeders, and under motor starting conditions. Motor circuit calculations shall be based on an 85% lagging power factor. Branch circuit

voltage drop from service entrance distribution equipment to point of utilization shall not exceed 5%.

- (iv) Project Co shall complete lighting-level calculations for all interior and exterior spaces in conjunction with architectural and/or landscaping design. The point-by-point method utilizing computer-generated calculations shall be used to validate adequate illumination levels and boundaries. The software used shall be industry recognized and the calculations shall follow IESNA procedures. Calculation results shall include maximum, minimum, and average illumination levels along with the appropriate uniformity ratios. Calculations shall also include luminaire locations, mounting heights, manufacturer's catalog data sheet with product selections and options indicated, lamp data sheet, wattage, lumens, color rendering index, color temperature, room surface reflectance values, light loss factors, and photometric file used. Lamp or LED fixture color rendering temperature shall be consistent throughout the Station and the Station Site, complement architectural finishes and have CRI of 80 or more within the Station and a CRI of 70 or more throughout the Station site and other areas.
 - (v) Project Co shall complete arc flash hazard calculations for equipment that is required to be field marked for arc flash warning per CAN/CSA Z462. Hire a Professional Engineer to perform calculations based on actual distribution system installed, actual minimum and maximum available Utility short circuit current and according to IEEE 1584 and CAN/CSA Z462. Values to be calculated shall include, but not be limited to: (a) flash protection boundary in units of centimeter from equipment; (b) incident energy at 45.72cm working distance from equipment in units of calories per square centimeter (cal/cm^2). The calculated values shall be permanently displayed on equipment arc flash hazard warning labels.
 - (vi) Project Co shall provide computations for service, feeder and branch circuit loads based on the nominal system voltage used and applicable demand factors in accordance with the Canadian Electrical Code.
 - (vii) Project Co shall provide protection for future growth for all major electrical equipment and [REDACTED] service feeders as identified by OC Transpo and the City of Ottawa plus an additional allowance of at least 25% of the total loading, rounded upwards to the next standard rating (KVA or A). Before determining the size of service an economic analysis shall be made to determine the most feasible way of protecting for the future growth. Special consideration shall be given to requirements for load growth, for anticipated usage and life expectancy with particular attention to the possibility of adding heavy loads such as elevators and escalators, electric heating etc.
- (d) Electrical Safety Provisions
- (i) EGFP shall be provided as required by the latest applicable codes. Ground fault "annunciation only" shall be provided where EGFP is required by code for equipment or feeders serving Level 2 Emergency Systems.

- (ii) PGFP shall be provided on branch circuits that have equipment or outlets for which personnel protection is required by either the latest applicable codes or Good Industry Practice.
- (iii) Arc flash hazard warning labels shall be provided on the equipment as per required code. Flash boundary and incident energy values shall be displayed.

6.4 Functional Requirements

- (a) Project Co shall provide the Functional Requirements in accordance with the following:
 - (b) Electrical Service
 - (i) The secondary voltages described herein are the basis of the Reference Concept electrical distribution design. Project Co may select alternative voltages for secondary distribution system.
 - (ii) The [REDACTED] supply strategy for Stations is discussed in [REDACTED].
 - (iii) A supply point shall be identified by Project Co in coordination with the [REDACTED] authority near each At-Grade Station.
 - (iv) Each Station on the Expanded Trillium line shall be provided with existing or new [REDACTED] supply per the [REDACTED], with the exception of Airport Station, which shall receive Station electrical power from the Airport Passenger Terminal Building, and Carleton Station which receives power from a low voltage metered service from a [REDACTED].
 - (v) Project Co shall utilize existing services and connection assets where possible. The capacity of existing services and connection assets shall be as identified in this Schedule 15-2 – Design and Construction Requirements.
 - (vi) Where new services are being provided for new Stations, supply points shall be designated and with a reserved capacity of 1 MVA.
 - (vii) Primary switchgear and transformers shall be provided and owned/maintained by [REDACTED].
 - (viii) The electrical demarcation point shall be at the secondary side of the transformer. The Civil demarcation point shall be at the property line nearest the designated supply point.
 - (ix) Project Co shall be responsible for civil work beyond the Supply Point including manholes, duct banks, equipment pads, coordinating civil design with [REDACTED]. Project Co shall be responsible for the cost of electrical design and installation including cables, switchgear, transformers as performed by [REDACTED] from the supply point to the electrical demarcation point. Costs for [REDACTED] shall be attributable to Utility Company Works Cash Allowance; refer to Schedule 15-2, Part 2, Article 8 – Utility Infrastructure Design Criteria.

- (x) [REDACTED] shall be responsible for design and installation of wiring and connection assets up to the electrical demarcation point.
- (xi) The existing Carleton Station is fed from a 100A, 3PH, 600V service from [REDACTED], Project Co shall review the existing loads and service capacity supplied from [REDACTED] and assess if the existing incoming electrical service is sufficient meet the new load requirements. If the existing capacity is deemed insufficient to provide the design upgrades, Project Co shall coordinate with the [REDACTED] Construction Services Department for upgrades to the electrical service to the station utilizing the 13.2kV high voltage service available at [REDACTED] and its preferred equipment vendors. The supply point shall be coordinated with [REDACTED] Construction Services Department. Project Co shall provide a 13.2kV/0.6 kV, 3 phase, 4 wire 60Hz transformer, primary side disconnect switch and sub metering. The electrical demarcation point for the station shall be the nearest breaker on the secondary side of this transformer. Project Co shall be responsible for civil work from the 13.2kV supply point including but not limited to manholes, duct banks, equipment pads, coordinating civil and electrical design with [REDACTED] Construction Services Department. Project Co shall be responsible for the cost of all electrical and civil design and installation from the 13.2kV supply point to the electrical demarcation point. Revenue metering requirement shall be coordinated with [REDACTED] during detail design stage.
- (xii) Stations shall receive an underground service from [REDACTED] at 600VAC, 3phase, 60Hz. Project Co shall coordinate with [REDACTED] to arrange connection at the supply point. Design shall be a transformer installed on an exterior pad or installed within a vault. The demarcation point between [REDACTED] and Project Co responsibility shall be the secondary side of the [REDACTED] owned on site transformer and the cable terminations for service feeders at [REDACTED] disconnect. Project Co shall coordinate with [REDACTED], as referenced in the [REDACTED], all requirements related to the installation of the on-site transformer and underground duct-banks. Passenger Stations shall be provided with 600VAC main switchboard, revenue class metering, associated downstream power distribution panels, feeders to 600VAC and 208/120VAC equipment. Main electrical room/cabinet shall contain, in addition LV transformers, UPS (if applicable), LV lighting control cabinet, heating controls, etc. In the event of power outage Emergency lighting, fire alarm and other emergency equipment loads shall be connected to UPS or batteries as required by OESC.
 - A. Connection for a mobile generator shall be provided in all Stations. The portable generator system shall be used only for stand-by operation during prolonged Utility outages and is independent of the required emergency (UPS or battery) power supply systems.
- (xiii) Electrical protection devices shall be automatically coordinated with upstream/downstream distribution system in order to minimize disruption to the operations.
- (xiv) Electric heat tracing shall be provided where required by the mechanical and architectural design.

- (xv) All Emergency service raceways/feeders shall be fire rated in accordance with applicable codes requirements. Main feeder raceways shall be embedded in concrete slabs/walls and shall be rated for at least two hours.
 - (xvi) The superstructure and substructure shall accommodate all required embedded ducts for interior and exterior electrical services as applicable.
- (c) Metering and Monitoring
- (i) Utility revenue metering shall be provided as required by [REDACTED].
 - (ii) For loads servicing the Expanded Trillium Line at Bayview Station, these shall be metered separately by a [REDACTED] provided revenue class meter.
 - (iii) Remote monitoring system shall be provided for:
 - A. Station main switchboard breakers position;
 - B. Voltage availability at the main buses;
 - C. Customer energy metering at main service; and,
 - D. Fire Alarm per CAN/ULC S561.
- (d) Duct banks, Manholes and Handholes
- (i) Duct banks and manholes shall be designed in accordance with the seismic criteria defined for the Project. Duct banks shall be designed to include at least 25% spare capacity to protect for future growth and expansion. Refer to Paragraph 5.3 (b) (vii) above for direction. In addition, space shall be provisioned for a 24 way fibre to be installed for a separate highways IT network in coordination with the City Highway Operations Department. All ducts to be roped.
 - (ii) Underground ducts shall be sloped to manholes to provide adequate drainage. Provide concrete encasement where required by applicable code.
 - (iii) Manholes and/or handholes shall be designed as per City Standards.
- (e) Electrical Rooms
- (i) Electrical rooms or cabinet shall have sufficient space to house all required equipment. Adequate space shall consider minimum working clearances, conduit entry points and routing, equipment removal / replacement, building repair and ventilation requirements.
- (f) Grounding and Bonding
- (i) The Station electrical distribution system shall be solidly grounded, designed to meet OESC.

- (ii) The grounding electrode system shall be supplemented and bonded together with an embedded ground grid on each side of the Tracks for side Platform Stations. The Passenger Station grounding grid shall not be interconnected with any Traction Power (DC) grounding system. Project Co shall coordinate interconnection grounding points with signal and communication systems to avoid noise propagation.
 - (iii) Project Co shall provide a separate grounding system for signalling and communication. All signal and communication equipment including cables shall be properly grounded.
 - (iv) All non-current-carrying metal enclosures and all alternating current equipment shall be securely connected/bonded to the Station grounding system.
 - (v) Each metallic equipment housing shall provide a welded boss for attaching a protective ground connection and shall be sized for expected trip currents.
 - (vi) Natural gas piping and pipe connected to an active cathodic protection system shall be avoided with the exception where required by the corrosion protection
- (g) Emergency and Standby Power Sources
- (i) Power sources shall be selected based on efficiency, reliability and most economic life cycle cost as per CAN/CSA and NFPA requirements.
 - (ii) Emergency and standby power sources are identified as follows:
 - A. Standby on-site internal combustion engine generator;
 - B. *Mobile generator;
 - C. UPS system;
 - D. Central battery system or battery packs for unit equipment; and
 - E. **Second Utility power source – Dual/redundant Utility power source for loads classified emergency Level 2.
- *Note: Provisions for quick connection for a mobile generator shall be provided in At-Grade Stations and where practical for underground Stations. The mobile generator system shall be used only for stand-by operation during prolonged Utility outages and is independent of the required emergency power supply systems.*
- **Note: Authorities having Jurisdiction shall review the design and approve the dual redundant Utility service feeders as emergency power supply source.*
- (iii) When standby fixed mounted engine generators are to be installed outdoors, a completely enclosed weatherproof/sound attenuated housing to protect the generator from adverse weather conditions and reduce sound levels for

surrounding residential neighbourhoods shall be provided. Enclosure shall have critical grade silencing suitable for residential installation. Project Co design shall follow NEMA/IEC/EEMAC enclosure/environmental protection standards.

- (iv) When second Utility power source is selected, Emergency lighting, fire alarm and other Emergency equipment loads shall be connected to a UPS or battery system as required for loads classified as “emergency level 1”. Automatic transfer switches serving life safety loads shall be equipped with means of bypass to both sources.

(h) General Purpose Receptacles

- (i) In public areas, general purpose receptacles shall be GFI and provided at 20m distance, and shall have lockable covers, with the exception of outlets located in the TSA. No more than six outlets shall be connected to a branch circuit.
- (ii) GFI receptacles shall be provided also for Station sign boxes and art elements where required.
- (iii) In non-public areas general purpose receptacles shall be provided at 7m apart and shall be supplemented where needed for fixed equipment. No more than five outlets shall be connected to a branch circuit.
- (iv) A flush-mounted duplex ground fault type receptacle with weatherproof lockable cover shall be provided close to hose bibs.

(i) Lighting

- (i) The lighting systems for Stations, Park and Ride areas, pedestrian walkways, trackway, bus Platforms, Tunnels and Tunnel portals shall be coordinated with architectural/landscaping and signage/wayfinding design objectives. Lighting design shall be consistent across all Stations. Standardization of lighting system components is required for perceptual unity and to simplify Maintenance. Lighting design shall be consistent with the principals, philosophy and frame work for lighting design as contained in The Lighting Handbook, Tenth Edition as published by the Illuminating Engineering Society. The recommended maintained illumination targets for items not listed in Table 4-6.1 and Table 4-6.2 shall be based on visual observers group 25-65 for all public spaces as recommended by IESNA, unless otherwise dictated by the building code or accessibility standards. The lighting design shall meet the illumination levels and uniformity requirements for both day and night time operations.
- (ii) Lighting levels shall define and differentiate between task areas, decision and transition points, Platform edges and areas of potential hazard. In addition to quantity of light, it is essential that lighting be designed to minimize glare and provide uniform distribution. Luminaires shall be selected, located, and/or aimed to accomplish their primary purpose while producing a minimum of objectionable glare and/or interference with task accuracy, vehicular traffic, and neighbouring areas.

- (iii) Luminaires that emit light above the horizontal plane shall be avoided in the exterior design, unless luminaires are located under overhangs or other architectural features shielding the sky from upward light. Luminaires shall be provided with full cut-off optics and if necessary external shielding to minimize light spill-over onto adjacent properties. L. Refer to IESNA TM-11-2000, Light Trespass for Roadway Lighting, and to IDA-IESNA MLO 2011 and addendum A for IESNA TM-07-15 for all other exterior lighting.
- (iv) The lighting system shall be efficient using LED light sources and auxiliary equipment. Lighting equipment shall be vandal-resistant where accessible to the general public.
- (v) The lighting system shall be designed to satisfy OBC, AODA, CPTED, IESNA, ULC, CE, FCC, CB and CAN/CSA B651 requirements.
- (vi) Minimum illumination levels shall meet the criteria listed in Table 4-6.1 below:

Table 4-6.1: Facility Interior

Illuminated Area	Illumination Targets		
	E_h lux	E_v lux	Uniformity Ave: Min
Platform Edge	200 @ floor	60 @ 5'AFF	2:1
Station Rail Platform	100 @ floor	30 @ 5'AFF	2:1
Fare Vending	200 @ 3'AFF	100 @ 4'AFF	3:1
Information Kiosk	300 @ 3'-6" AFF	150 @ 5'AFF	3:1
Stair, Ramps and Escalator Landings	100 @ floor	50 @ 5'AFF	2:1
Pedestrian Tunnels and Concourse	50 @ floor	20 @ 5'AFF	3:1

Transecure Area	200 @ floor	100 @ 5'AFF	2:1
Public Washrooms (General)	150 @ 3'-5" AFF	50 @ 5'AFF	
Plumbing Fixtures	300 @ Top of Plumbing Fixture	100 @ 3'-6" AFF	2:1
Lavatory	150 @ 3'-0" AFF	200 @ 3'-5" AFF	
Building Entries Vestibules Indoor /High Activity			
Day	150 @ floor	75 @ 5'AFF	2:1
Night	100 @ floor	50 @ 5'AFF	

*Note: 1.) All lighting, including, but not limited to Normal and Emergency lighting illumination levels, shall be designed to meet or exceed OBC, accessibility requirements, and security requirements including but not limited to, AODA, COADS, CPTED, ULC, CE, OC Transpo Design Guidelines and CAN/CSA B651 requirements. 2.) Illuminated areas and values not listed in this table shall be per IESNA- Illumination Handbook, 10th Edition. 3.) Table 4-6.1: Facility Interior is applicable to all areas within the Fare Paid Zone of the Station utilized for Train operations and service; and interior spaces of enclosed Ancillary Facilities.

- A. Provision of emergency lighting systems is required by code. Emergency power shall be available at stable system voltage within 10 seconds or less. All batteries shall be sized to continuously carry the rated illumination for a minimum time required for evacuation and as required by applicable code.
- B. Emergency lighting fixtures shall be the same model and type as the rest of the lighting fixtures with the addition of emergency battery pack.
- C. Lighting system shall be designed so that the failure of any single luminaire or lighting circuit in areas accessible to the public does not leave an area in total darkness.
- D. Lighting layout shall be coordinated with other building elements so as not to affect the illumination.
- E. BAS system shall monitor and control Station lighting system. Where Facility remote control system is not provided, the following controls shall be provided:
 - i. Station central key / timer control system including override switches for service areas;
 - ii. Exterior luminaires, including luminaires in signage, shall be group controlled by photo-cell and/or the facility BAS system. Exterior light control shall include a Maintenance bypass switch (Hand-Off Auto) located on external wall of the facility for night services such as snow plow and cleaning;

- F. Exterior Lighting areas as required for safety and comfort shall meet requirement of City Standards, IDA-IESNA MLO 2011, IESNA RP-33 and addendum A for TM-07-15, and ANSI/ASHRAE/IESNA Standards 90.1 Exterior Lighting Section.
- G. Site lighting criteria shall be adopted to maintain safe light levels while avoiding off-site lighting and night sky pollution. Computer software shall be utilised to model the Site lighting Technologies to reduce light pollution include full cutoff luminaires, low-reflectance surfaces and low-angle spotlights shall be used.
- H. Exterior lighting shall be designed to satisfy OBC, CPTED, AODA, IESNA, ULC, CE, FCC, CB requirements.
- I. Minimum illumination levels shall meet the criteria listed below:

Table 4-6.2: Exterior Areas

Illuminated Area	Illumination Targets		
	E_h lux	E_v lux	Uniformity Ave: Min
Building Entries Canopied Outdoor-High Activity	10 to 40 @ grade according to location/ Lighting Zone	6 to 20 @ 5'AFF according to location/ Lighting Zone	2:1
At-Grade Pedestrian Crossing	20 to 10 @ grade	10 to 5 @ 5'AFF	4:1
Bicycle Parking Area (Covered)	40 to 10 @ grade	20 to 6 @ 5'AFF	2 to 4:1
Bicycle Parking Area (Uncovered)	20 to 10 @ grade	8 to 1 @ 5'AFF	2 to 4:1
Shelter and Ticket Information Area	20 to 10 @ grade	20 to 6 @ 5'AFF	3 to 6:1
Bus Platforms	100 @ grade	40 @ 5'AFF	2:1
Exterior Station Building (Public Area)	20 to 10 @ grade	4 to 0 @ 5'AFF	3 to 6:1
Stairwell	50 @ grade		4:1
Pedestrian Underpasses and Overpasses	Night 40 @ grade	Night 20 @ 5'AFF	3:1

Pathways in the vicinity of Busways	20 to 10 @ grade		6 to 4:1
Pathways/MUPs in the vicinity Stations, as required in Schedule 15-2, Part 6 – Urban Design, Landscape Architecture and Connectivity Requirements	20 to 10 @ grade	4 to 0 @ 5'AFF	6 to 4:1

**Note: 1.) All lighting, including but not limited to Normal and Emergency lighting illumination levels, shall be designed to meet or exceed OBC requirements, accessibility requirements, and security requirements including but not limited to, AODA, COADS, CPTED, ULC, CE, OC Transpo Design Guidelines and CAN/CSA B651 requirements. 2.) Illuminated areas and values not listed in this table shall be per IESNA- Illumination Handbook, 10th Edition.*

- (vii) With the exception of items listed in Table 4-6.2 above, lighting levels for Park and Ride surface lots shall be designed and constructed in accordance with IES RP-20 in conjunction with the requirements contained in the OC Transpo Transitway and Station Design guidelines.
- (j) Fire Detection and Alarm System
- (i) All Stations shall be provided with a fire detection and alarm system in accordance with the applicable codes CAN/ULC S561 and standards.
 - (ii) The fire detection and alarm system shall be a zoned, non-coded, addressable, microprocessor-based system with automatic alarm initiation, addressable smoke detectors, and automatic multi-detector algorithm for alarms initiated by smoke detectors.
 - (iii) Fire panels shall include the ability to verify alarms (2 stages) prior to evacuation. The fire alarm wiring system shall be electrically supervised. The system shall be designed such that the TOCC is notified to validate the event and determine if the fire department is to be dispatched when an alarm signal takes place.
 - (iv) The fire detection and alarm system shall be provided with an emergency power supply, consisting of either a generator and/or battery source. The emergency power supply shall power the supervisory function of the fire alarm system for no less than 24 hours and full function for no less than 30 minutes. Upon failure of the normal power source, immediate transfer to the emergency power supply shall take place with no loss of information in the process.
 - (v) The fire detection and alarm system shall be connected to the TOCC and monitored by the City's ULC listed monitoring company.
 - (vi) A fire alarm annunciator panel with a flush mounted vandal resistant polycarbonate shield shall be provided at every Station in a readily accessible location to fire fighters upon entering the Station. The annunciator panels shall be monitored simultaneously by the City's ULC listed monitoring company.
 - (vii) Manual pull stations need not be installed in areas accessible to the public.

- (viii) Visual signal devices shall be installed such that the signal from one device is visible throughout the floor area in which they are installed.
- (ix) Fire alarm/PA overrides shall be through SCADA.
- (k) Power for systems and communication equipment
 - (i) Power or conduit complete with pull wire shall be provided as required.
- (l) Conduits and Raceway
 - (i) Conduits installed in finished areas of new construction shall be concealed in walls, below or in slabs, or above suspended ceilings. Exposed conduits shall not be run on the exterior surface of buildings. Conduits shall not be run through structural members across pipe shafts or ventilation duct openings.
 - (ii) Conduits in concrete slabs shall be placed between the bottom and top reinforcing steel. Separate conduits to ensure proper concrete bond.
 - (iii) Conduits shall not be embedded in waterproofed or waterbearing walls.
 - (iv) Conduits penetrating exterior walls of any Structure (other than handholes, manholes, or pullboxes) below grade, at grade floors, or below grade floors shall be sealed to prevent moisture migration.
 - (v) Grounding-type expansion fittings shall be installed in raceways every 60m or less of linear run or wherever structural joints are crossed to allow for expansion and contraction.
 - (vi) Project Co shall provide the raceway system and cable pulling for equipment described and identified by facility/systems and the City. Raceways shall be designed to include at least 25% spare capacity to protect for future growth and expansion. Refer to clause 6.3 (b) (vii) of this Part 4 for direction.

ARTICLE 7 WAYFINDING AND SIGNAGE

7.1 Introduction

- (a) This article describes wayfinding and signage performance requirements for the Project including performance criteria for wayfinding and signage design.
- (b) The performance specifications provide brand neutral examples for the application and integration of a comprehensive wayfinding and signage system with the specific architectural and art finishes and features of the Project.

7.2 Goals & Objectives

- (a) The overall goal of this Article is to provide a standard signage and wayfinding system that makes transit Facilities easy to identify and navigate System wide, that utilize language and visual techniques that people understand, comply with accessibility guidelines, integrate with the design approach of other design disciplines and assist in delivering a successful journey for Passengers.
- (b) The objectives for the wayfinding and signage program are as follows:
 - (i) To improve the overall function and aesthetics of the Project by providing accessible, attractive, identifiable and understandable signage;
 - (ii) To improve wayfinding for Passengers by providing map, text and or pictograph signage for important Station destinations and features;
 - (iii) To provide plain language signage and not ‘over sign’ Stations;
 - (iv) To develop Project outcomes that inform and meet the timing of the design requirements for Station pre-engineering and final designs; and
 - (v) To achieve the above goals sustainably.

7.3 Scope

- (a) This Article includes requirements for the design, manufacture, supply, delivery, storage, assembly, installation, protection, inspection and testing of all components as described herein, necessary to achieve and deliver a successful, comprehensive and integrated wayfinding and signage system for the Project.
- (b) The wayfinding and signage system shall be consistent with the Confederation Line signage and wayfinding system.
- (c) The wayfinding and signage system includes but is not limited to providing signage that addresses the following areas and uses:
 - (i) Station identification signage - Signage that identifies a Station and is visible whether approaching a Station by foot, bicycle, transit vehicle, taxi or private vehicle;

- (ii) Community orientated wayfinding signage - Signage that identifies and provides a link to other modes of transport, public services, landmarks, pedestrian and bicycle routes or significant destinations in the general vicinity of each Station;
- (iii) Station located wayfinding signage - Signage that assists the movement of Passengers through a Station or to facilities located within the Station. This includes signage that identifies and or directs users to and from Platforms, exits, ticketing and fare payment facilities, information services, elevators, TSAs, escalators, accessible pathways, bicycle routes through each Station, taxi and connecting bus services;
- (iv) Navigation signage - Signage that works in conjunction with (iii) and provides wayfinding through the available multi modal forms of transportation by identifying directions, major destinations, adjacent Stations and confirms the appropriate transport service. Signage indicating the locations of transit information panels shall be provided;
- (v) Schedule and service status signage - Signage that displays real time information on the status of transport services communicated through the use of dynamic visual displays, panels, electronic updates and audio announcements when a service is operating, due to arrive, delayed or cancelled and provides information and notices for hours of operation, trip schedules and timetables; and
- (vi) Regulatory and Utility signs - Signage used within a Station that provides users and staff with regulatory notifications such as no smoking, hazards, no littering, emergency exit, emergency phones, fire alarms, elevator buttons, rules of use, disclaimers, etc. Standard traffic signage is also required for private vehicles and for buses circulating through or around a Station.

7.4 General Responsibilities

- (a) Project Co shall design, fabricate, install, and Maintain all wayfinding equipment.
- (b) The Project Co shall propose content of all wayfinding equipment, including signage (directional, orientation, information, regulatory, commemorative), electronic displays, transit information panels, and maps, and will provide such content to City to review at the appropriate stage of design.
- (c) Proposed wayfinding equipment shall be coordinated and compatible with Confederation Line wayfinding equipment.
- (d) Wayfinding equipment shall support and contribute to the transit customer experience on the System and overall transit network.

7.5 General Requirements

- (a) Reference Documents
 - (i) The design and construction of wayfinding and signage shall comply with the criteria contained in this Article, and all standards, regulations, policies, Applicable Law, guidelines or practices applicable to the Project, including but not limited to each of the following Reference Documents. In the event of a conflict between criteria, commitments

or requirements contained within one document when compared with another, the more stringent shall apply:

- A. OBC;
- B. AODA;
- C. COADS;
- D. OC Transpo Transitway and Station Design Guidelines.
- E. Confederation Line Signage and Wayfinding documents,
- F. Canadian Transportation Agency, Code of Practice, Passenger Terminal Accessibility
- G. Canadian Transportation Agency, Code of Practice, Removing Communication Barriers for Travelers with Disabilities
- H. City of Ottawa Construction Specifications and Details; and
- I. Ontario Traffic Manual.
- J. OC Transpo Signage and Wayfinding Manual

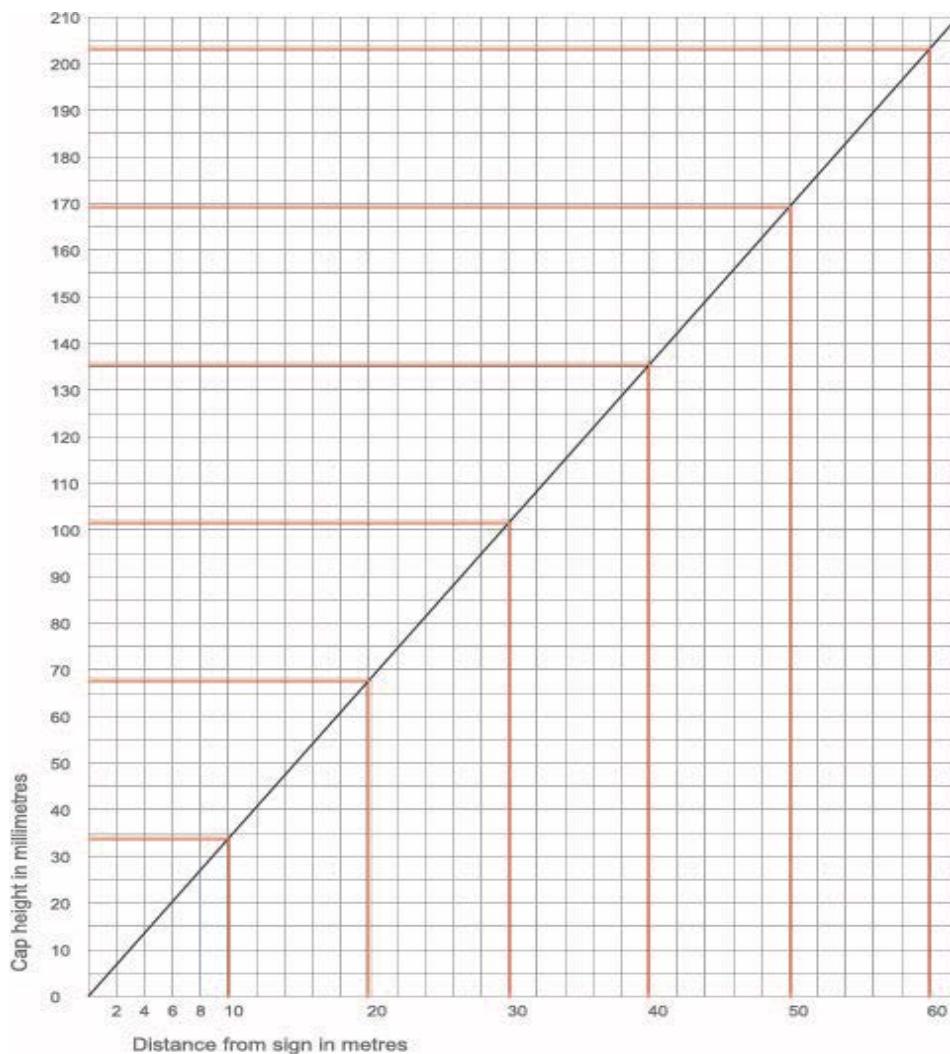
(b) Signage System design

- (i) Design for the wayfinding and signage system for the Project is comprised of identification, directional, information, operational, regulatory, and temporary signage.
- (ii) The City shall determine Station names for all Stations.
- (iii) Identification Signage
 - A. The key functions of the identification signage are to identify:
 - i. Stations within the built environment;
 - ii. Station entries;
 - iii. Station facilities;
 - iv. Passenger services and amenities;
 - v. Elevator access; and
 - vi. Accessible entries.
- (iv) Directional Signage
 - A. The key functions of the directional signage are to direct:

- i. Passengers from the Station entries to ticket machines and fare gates on to the Platform and to the exits;
 - ii. Passengers to connecting modes and infrastructure;
 - iii. Passengers to facilities within the Station; and
 - iv. Passengers to accessible access points.
- (v) Information Signage
- A. The key functions of the information signage are:
- i. Provide transit information;
 - ii. Notify Passengers of available services; and,
 - iii. Notify Passengers of delays or changes to scheduled services.
- (vi) Operational Signage
- A. The main purposes of the operational signage are:
- i. Identify doors, areas and access points for staff and facilities management;
 - ii. Identify ancillary room functions; and,
 - iii. Video surveillance signage.
- (vii) Regulatory Signage
- A. The key functions of the regulatory signage are:
- i. Identify potential hazards to Passengers and the public; and,
 - ii. Identify potential hazards to staff and Third Party Contractors.
- (viii) Temporary Signage
- A. The key function of temporary signage is to:
- i. Temporarily identify changes to services, Station facilities, Station closures or hours of operations;
 - ii. Temporarily identify hazards to Passengers and the public; and,
 - iii. Temporarily identify hazards to staff and Third Party Contractors.
- (ix) Sign Types shall be consistent with Confederation Line signage.
- (x) Sign Dimensions shall be consistent with Confederation Line signage.

- (xi) Project Co shall use the Confederation Line signage packages provided in Appendix C of this Part 4, which includes expectations for sign dimensions, sign and information hierarchy, sign types, sign content, visibility, contrast, layout, sign mass and sophistication.
 - (xii) Sign Quantities
 - A. Project Co shall be responsible for designing the wayfinding program including providing sufficient quantities of signs as deemed necessary to design and supply a clear, concise and consistent wayfinding sign system in order to meet the Project requirements.
 - (xiii) Sign Information
 - A. Project Co shall be responsible for updating and maintaining sign information content and messages to ensure that all signage is relevant and reflects relevant changes to the City transit System.
 - (xiv) For Stations subject to FLUDTA, the following requirements apply:
 - A. Signage design shall comply with the NCC commercial signage guidelines.
 - B. All text shall appear in both official languages.
 - C. Exterior signage shall not be permitted above the ground floor level.
 - D. Backlit signage, with the exception of Station entrance lanterns, billboard signage and digital signage shall not be permitted outside of the Station.
- (c) Design Elements and Considerations
- (i) The design and implementation of the Project wayfinding and signage system requires Project Co to incorporate the following key considerations and elements into the designs.
 - (ii) Line & Letter Spacing
 - A. Line spacing where a set of messages is displayed shall be at least 75% of the Cap height so messages can be quickly scanned and destinations identified.
 - (iii) Language
 - A. All signage for the Project shall feature messages in both English and French.
 - B. Where both languages appear on a single sign, Project Co shall follow one of the following two options:
 - i. English text on the left side and French text on the right; or
 - ii. English text on the upper portion of the sign with French text below.

- C. Where pairs of signs are used the sign displaying English text shall be placed at the beginning of the viewing sequence with the second sign in French located beyond it.
 - D. Where the two signs are required they shall be far enough apart to ensure the messages are differentiated and not read as a single message and close enough to one another allowing users to recognize that they represent the same message displayed in the two languages. A minimum gap of four character strokes shall be maintained between English and French messages. A minimum of two character strokes shall be permitted where a graphic device such as a vertical line or hyphen is used to visually separate the two messages.
 - E. Bilingual or unilingual paired signs shall employ the same size, fonts, letter heights, colours and general design principles for each language.
- (iv) Pictograms
- A. Pictograms shall be used to reinforce sign messages, aid quick recognition and clearly communicate information to all languages and cultures.
 - B. Pictograms shall be based on Confederation Line standards approved by the City. Any additional pictograms proposed by Project Co that are not based on the existing standards shall be presented to the City for acceptance.
- (v) Legibility & Viewing Distance
- A. All signage shall be legible and feature letters and graphic elements of the appropriate size for the identified viewing distances. The chart below provides the viewing distances for text of a particular height. These values are based on the viewer having good vision and reading the signs in daylight whilst stationary.



- B. It shall be noted that many factors negatively impact the legibility of sign text. These include angular distortion, speed of travel and low light levels. Factors such as these shall be considered when determining the height of text appearing on signs. Project Co shall increase text heights from those described in the chart as required to maintain sign legibility based on the impact of the above conditions.
- (vi) Mock ups of all sign types shall be provided by Project Co to assess the legibility of the proposed design and text heights. Mock ups shall be reviewed by user groups comprised of a cross section of the community and representing people with diverse abilities.
- (vii) Sign Placement
- A. Signage shall be placed in visible locations, free from obstructions. Special care shall be taken to ensure that signs are not obstructed by other signs, design elements or items such as security cameras.

- B. Project Co shall place signs within the accepted standard for a viewers' cone of vision, being 15° above and below the viewers' horizontal line of sight. Signs viewed outside a viewers' cone of vision are read peripherally and with much less detail. Project Co shall consider the viewers' cone of vision when selecting the height of the sign from floor level and the height of the typeface.
- C. The average persons' eye level when standing is 1500mm from floor level. When seated it is approximately 1000mm from floor level and when driving eye level is approximately 1200mm from floor level. Signage shall be placed depending on how it shall be viewed and taking into account differences in eye level and a sign's audience.
- D. Placement of signage shall be coordinated with the landscaping, architecture, interior design lighting and other equipment in order to standardize locations within a Station and across the System. Signage shall be applied consistently, assist users to know where to expect sign information and aid navigation.

(viii) Contrast and Colour

- A. Project Co shall ensure contrast between sign backgrounds and messages are at a level considered acceptable to maintain sign legibility and deliver a successful signage system.
- B. For environments with light levels between 10-70 foot candles Project Co shall provide signs with a contrast of 75% or higher between the background and message.
- C. For environments with higher light levels (70 foot candles and above) Project Co shall provide signs with a lower contrast level of 65-75%. A dark background shall be used to absorb light and prevent glare.

(ix) Halation

- A. When signs are backlit care shall be taken to reduce flare or halation. Halation makes backlit or reversed lettering difficult to read especially when travelling at speed or at night. Project Co shall ensure that signs are designed to minimize the effects of halation. Directional signage shall not feature designs which purposely use the effect of halation as a feature. This includes signage with halo lighting effects.
- B. Internally illuminated signage shall have reversed opaque or translucent backgrounds to reduce halation and increase legibility.
- C. Internally illuminated signs shall not feature light coloured illuminated backgrounds.

(x) Lighting

- A. Design and implementation of internal or external signage illumination shall be coordinated by Project Co with the City to ensure compatibility with the design intent for the overall lighting scheme.

(xi) Universal Design

- A. The principles of Universal Design shall be applied to designs for the wayfinding and signage system by Project Co. The signage system shall whenever possible seek to integrate accessible design features with the design as a whole. The goal is to deliver a wayfinding signage system that assists in providing an environment accessible to people with all levels of abilities. As a minimum, signage for the Stations shall be designed in accordance with the relevant accessibility codes referenced in this document. All directional signage shall be located in compliance with the stated codes.
- B. The application of tactile indicators shall be coordinated with key sign locations to assist with the recognition of tactile signage locations and aid navigation by the visually impaired.

(xii) CPTED

- A. The principles of CPTED shall be applied in order to ensure the design and placement of the wayfinding and signage system does not compromise the safety of Passengers or the general public. In general, signage shall enhance public safety by providing uninterrupted Site lines in critical areas, reduce areas where people or devices may be concealed and provide sufficient information to users to instil confidence and minimize confusion. All Station, security facilities and supporting transport services shall be easily differentiated and identified whilst being recognisable as part of an organised system.

(xiii) Vandalism

- A. All signage elements shall be designed and fabricated to dissuade and provide protection against vandalism and graffiti.
- B. Tough, scratch and impact resistant materials shall to be utilized to resist damage, maintain appearance, increase product life spans and reduce operational costs. Sacrificial and non-sacrificial anti-graffiti coatings shall be applied to signs where the risk of graffiti is deemed to be high.
- C. All accessible mechanical fixings shall be ‘security fixings’ with nonstandard drives. All accessible fixings shall be tamper proof.
- D. Damaged signs shall be repaired or replaced by Project Co in a timely manner and without negatively impacting Passengers, staff or the general public.

(xiv) The City Branding Integration

- A. Project Co shall be responsible for the integration of the City branding with their Station design solutions and utilizing the city graphic designs and solutions for wayfinding and signage system from the Confederation Line.

(xv) Local Conditions

A. All signage components designed and supplied by Project Co shall be fit for purpose, able to perform in the climatic conditions outlined in Schedule 15-2, Part 1, Article 4 – Design and Construction.

B. The effects of snow, ice and the effects of methods of snow dispersal on signage shall be addressed in the design.

(d) Fabrication Materials & Finishes

(i) Sign material selections and colours are subject to final brand review by the City.

(ii) Metalwork

A. All work shall be accurately and neatly constructed and securely fitted and fixed.

B. Project Co shall use types and grades of metals suited to their required function, finish and method of fabrication, in sections of adequate strength and stiffness for their purpose.

C. Where appropriate, prefabricate and preassemble items in the workshop before delivering items to Site.

D. Care shall be taken to ensure all visible metal surfaces are free from damage, scratching or other surface degradation.

E. Fabrication techniques, surface detailing and application of finishes shall be closely controlled to ensure continuity of appearance between individual items.

F. All visible metal edges shall be cut with machine tools. No visible edges of metal shall be cut with a guillotine or break press. No radius to edges unless specified.

(iii) Stainless Steel

A. All stainless steel used externally; in basement levels and non-air conditioned areas shall be marine alloy, AISI grade 316. In internal areas all stainless steel shall be grade AISI grade 304 unless otherwise specified.

B. All stainless steel surface finishes shall be factory or machine finishes. Stainless steel products with a standard mill or 2B finish shall not be hand finished or polished, by the contractor to match factory finishes.

C. All brushed or finished stainless steel shall be No.4 finish unless otherwise specified. Grain of finish is to run with long dimension of each sign unless otherwise specified.

D. All polished or mirror stainless steel shall be No.8 mirror finish, unless otherwise specified.

E. All surfaces shall be ground and polished to produce uniform, directionally textured, polished finishes free of cross scratches.

- F. All corners shall be 90° and mitred, with a hairline joint and with surface finishes meeting at mitre. No visible welds.
- (iv) Aluminium
- A. All aluminium shall be of an alloy suitable for purpose. For signage applications where sheet and plate is required, alloy 5005 shall be used.
- B. All welding shall be carried out in accordance with international standards, using techniques to avoid buckling and discolouration.
- C. All exposed welds shall be ground smooth and where aluminium is to be painted all surfaces shall be suitably sanded, primed, filled and smoothed prior to final paint treatment.
- (v) Mild Steel
- A. Steel components shall be of quality mild steel of a gauge and alloy appropriate for location and use.
- B. Method of welding used shall provide the maximum strength along joints, fill all gaps and run to a clean and regular finish. All welds shall be continuous along joints with no raw or exposed edges.
- C. Irregular welds shall be ground smooth with particular attention to visible areas.
- D. After fabrication and prior to pre-treatment and finishing processes, all rust, scale, burrs, weld slag and splatter shall be removed from the weld and surrounding areas.
- E. Steel work shall be free of grind and machine marks by way of linishing or sandblasting without causing damage to the designed form or creating surface irregularities.
- F. All mild steel framing and signage support Structure, located in external areas shall be hot dipped galvanised regardless of the application of paint finishes unless otherwise specified.
- (vi) Glass
- A. All glass used in the fabrication of signage shall be toughened safety glass.
- B. Where glass is used in conjunction with applied graphics for the purposes of visual display, all glass shall be low iron toughened safety glass.
- C. All edges shall be ground and polished smooth. All edges shall be square without chamfered or sharp edges.
- D. All glass installations located in direct contact with Passengers and staff shall be certified by a Professional Engineer.

- (vii) Acrylic & Polycarbonate
 - A. All acrylic used shall contain 90% or more Polymethyl methacrylate.
 - B. Where possible cast acrylic shall be used instead of extruded acrylic or polycarbonate products.
 - C. Cut edges shall be finished smooth and polished. No flame polished edges shall be provided.
- (viii) Fastenings
 - A. Fastenings, including anchors, lugs, screws, rivets, and the like shall be fit for purpose and capable of transmitting the loads and stresses imposed. All fastenings shall be sufficient to ensure the assembly is secure and rigid.
 - B. All fastenings and associated components such as sleeves shall be finished to match the sign body treatment and colour, unless otherwise approved.
 - C. All exposed screw heads shall be countersunk. All screw heads shall finish flush with the adjacent exposed surface.
 - D. Project Co shall ensure that all fixings are protected against corrosion and will not mark or stain existing finishes.
 - E. Fixings shall be compatible with the types of metal they are used to secure.
- (ix) Welding
 - A. Welded, brazed or soldered joints on exposed surfaces shall be ground, buffed or polished as applicable to the material and specified finishes. There shall be no buckling or visible surface colour variations in exposed metal finishes.
 - B. Welds and brazes on finished surfaces shall be indistinguishable from the parent metal.
- (x) Precision Cutting
 - A. All cut edges shall be smooth, ground and polished. No visible cut marks, burn marks, splatter or discolouration shall be accepted.
 - B. All start and end cuts for laser and waterjet cutting and shall be located outside the form to be cut. All cut edges shall be de-burred. All edges shall be square. No sharp edges.
- (xi) Metal Separation
 - A. Incompatible metals shall be separated to prevent galvanic reactions. Separation materials shall not be visible on exposed surfaces or cause discolouration to the surrounding finishes over time.

(xii) Graphic Films

- A. All corners and edges of finished letterforms, numerals, arrows, pictograms, logotypes and other graphic elements shall be sharp and true to the selected typeface or artwork, with accurate even curves and serifs where applicable.

(xiii) Screen Printing

- A. All screen-printed graphics shall be applied according using a screen of 120 threads per inch. Registration shall be accurate.
- B. Screen printing ink shall be Sericol Polyscreen 2 pac system or similar.

(xiv) Anti-Graffiti Coatings

- A. All applied coatings shall be compliant with the sustainability goals for the Project and be applied to the manufacturers' instructions by qualified personnel trained in the correct use and application and/or removal of these types of products.

(e) Electrical

(i) Internal Lighting

- A. Project Co shall ensure that all illumination is fit for purpose and provides even illumination. No shadows, visible wiring or hotspots shall be permitted.
- B. Project Co shall fabricate all signs with internal lighting in such a way as to prevent all light leaks
- C. All control gear shall be compatible with the lamps used and shall be located within the sign or concealed in a remote location. In all cases Project Co shall ensure that all control gear including transformers, drivers and ballasts are installed in an accessible and safe location which does not interfere with the functioning of the lighting or the sign itself.
- D. All wiring shall be encased in non-conductive, insulated, electrical conduit, fit for purpose.
- E. All ballasts and control gear shall be electronic. No solid core transformers or ballasts shall be used.
- F. All interior lighting fixtures located underneath skylights shall be full cutoff.

(ii) External Lighting

- A. Where additional illumination is required for the purposes signage illumination, light fixtures shall match in colour temperature, lumen output and intent.
- B. All exterior lighting fixtures shall be full cutoff, and to comply with City bylaws.

(iii) Activation of Signage Illumination

A. Activation for sign illumination shall be controlled by the Station BAS.

(iv) LED Displays

A. Project Co shall be responsible for the design and placement for all LED displays. Project Co shall be responsible for the design and supply of all shrouds and fixing systems required to maintain a consistent design language and integrate the displays with the designs for the wayfinding and signage system. Design of the shrouds and or fixing systems shall not negatively impact the performance of the base LED displays in any way.

B. Placement of LED displays as part of the Passenger information systems shall be the responsibility of Project Co. Placement of Passenger information displays shall not obscure or interfere with the operational performance of the wayfinding and signage system.

7.6 Conditions

(a) Site

(i) Site Conditions

A. No signage shall be fabricated or finished onsite.

APPENDIX A

Room Data Sheets

Building	New Walkley Yard Office Building						
Room Name:	Program Manager Office					Room Number:	NA

ARCHITECTURAL

Function:	Office for OC Transpo	Net Area:	14	m2	Number of Occupants:	1
Fire Rating:	N/A	Barrier Free:	Yes			

ROOM CHARACTERISTICS

Sound Control:	Standard	Special Conditions:	Ceiling
STC Rating:	45	Special Conditions	Floor
Other:	-	Special Wall Conditions	:

ROOM FINISHES

Floor:	CPT	Base:	RB	Wall:	PT		
Ceiling:	LAT	Millwork:					
Doors (Size):	900x2100	Type:		Fire Rating:		Hardware:	Access Control
O/H Doors (Size):		Type:	-	Fire Rating:	-	Hardware:	-
Windows:	-	Frame:	-	Fire Rating:	-	Glazing:	-
Wind Screens:	-	Frame:	-	Fire Rating:	-	Glazing:	-
Security Barriers:	-	Frame:	-	Fire Rating:	-	Glazing:	-

MILLWORK

Counter:	-	Matl:	-	Comment:	
Shelving:	-	Matl:	-	Comment:	-

FIXTURES: -

EQUIPMENT:

OTHER:

REMARKS: Adjacent to Contract Manager Office.
All OC Transpo communications systems shall be accessible from this room. Desk, credenza, book shelving, and four person meeting table

MECHANICAL

HVAC system:	Standard office	Air Supply:	Standard Office, Ceiling
Min. # of air changes/hr.:	-	Air Exhaust:	Ceiling
LAVS:	-	Number:	-
Water Closet:	-	Number:	-
Urinal:	-	Number:	-
Drinking Fountain:	-	Room Thermostat:	Yes
Floor Drain:		Drain Type:	-
Other:			

Comments:

ELECTRICAL

Receptacles:	Minimum four outlets at workstation			
Switches:	Low Voltage (Qty.):	-	Dimmer (Qty.):	-
	Other:	-		
Emergency Lighting Required:	All lighting on backup power (genset) and UPS			
Lighting Type:	T5 Fluorescent	Lighting Level (Lux):	200	-
Communications:				
Fire Alarm to OBC3.2.4:	-	P.A. System Required:	Coverage	Via phone system only
T.V. Outlet (Qty.):	-			
Telephone/Data Outlet (Qty.)	Standard			
Security Requirements:	Provide access control hardware			
A/V Systems:	-			
Comments:	-			

NOTES

Building	New Walkley Yard Office Building								
Room Name:	Contract Supervisor Office							Room Number:	NA

ARCHITECTURAL

Function:	Office for OC Transpo Crew	Net Area:	11	m2	Number of Occupants:	1
Supervisor						
Fire Rating:	N/A	Barrier Free:	Yes			

ROOM CHARACTERISTICS

Sound Control:	Standard	Special Conditions:	Ceiling	2750
STC Rating:	45	Special Conditions	Floor	
Other:	-	Special Wall Conditions	:	

ROOM FINISHES

Floor:	CPT	Base:	RB	Wall:	PT	
Ceiling:	LAT	Millwork:				
Doors (Size):	900x2100	Type:		Fire Rating:		Hardware: Access Control
O/H Doors (Size):		Type:	-	Fire Rating:	-	Hardware: -
Windows:	-	Frame:	-	Fire Rating:	-	Glazing: -
Wind Screens:	-	Frame:	-	Fire Rating:	-	Glazing: -
Security Barriers:	-	Frame:	-	Fire Rating:	-	Glazing: -

MILLWORK

Counter:	-	Matl:	-	Comment:	
Shelving:	-	Matl:	-	Comment:	-

FIXTURES: -180cm x 117cm white board

EQUIPMENT:

OTHER:

REMARKS: All OC Transpo communications systems shall be accessible from this room. Desk, credenza, and book shelving.

MECHANICAL

HVAC system:	Standard office	Air Supply:	Standard Office, Ceiling
Min. # of air changes/hr.:	-	Air Exhaust:	Ceiling
LAVS:	-	Number:	-
Water Closet:	-	Number:	-
Urinal:	-	Number:	-
Drinking Fountain:	-	Fixture:	-
Floor Drain:	-	Fixture:	-
Other:		Room Thermostat:	Yes
		Drain Type:	-

Comments:

ELECTRICAL

Receptacles:	Minimum four outlets at workstation			
Switches:	Low Voltage	-	Dimmer	-
	(Qty.):		(Qty.):	
Other:	-			
Emergency Lighting Required:	All lighting on backup power (genset) and UPS			
Lighting Type:	T5 Fluorescent	Lighting Level (Lux):	200	-
	Individually controlled task lighting to be provided at work station			
Communications:				
Fire Alarm to OBC3.2.4:	-	P.A. System	Coverage	Via phone system only
		Required:		
T.V. Outlet	Wall mounted			
(Qty.):				
Telephone/Data Outlet (Qty.)	Standard			
Security Requirements:	Provide access control hardware			
A/V Systems:	-			

Comments: -

NOTES

Building	New Walkley Yard Office Building										
Room Name:	Conference Room								Room Number:		NA

ARCHITECTURAL

Function:	Conference Room for OC	Net Area:	20	m2	Number of Occupants:	8
Transpo						
Fire Rating:	N/A	Barrier Free:	Yes			

ROOM CHARACTERISTICS

Sound Control:	Standard	Special Conditions:	Ceiling	2750
STC Rating:	45	Special Conditions	Floor	
Other:	-	Special Wall Conditions	:	

ROOM FINISHES

Floor:	CPT	Base:	RB	Wall:	PT	
Ceiling:	LAT	Millwork:				
Doors (Size):	900x2100	Type:		Fire Rating:		Hardware: Access Control
O/H (Size):	Doors	Type:	-	Fire Rating:	-	Hardware: -
Windows:	-	Frame:	-	Fire Rating:	-	Glazing: -
Wind Screens:	-	Frame:	-	Fire Rating:	-	Glazing: -
Security Barriers:	-	Frame:	-	Fire Rating:	-	Glazing: -

MILLWORK

Counter:	-	Matl:	-	Comment:	
Shelving:	-	Matl:	-	Comment:	-

FIXTURES: -180cm x 117cm white board; conference table, credenza for AV equipment

EQUIPMENT:

OTHER:

REMARKS:

MECHANICAL

HVAC system:	Standard office	Air Supply:	Standard Office, Ceiling
Min. # of air changes/hr.:	-	Air Exhaust:	Ceiling
LAVS:	-	Number:	-
Water Closet:	-	Number:	-
Urinal:	-	Number:	-
Drinking Fountain:	-	Fixture:	-
Floor Drain:	-	Fixture:	-
Other:	-	Room Thermostat:	Yes
		Drain Type:	-

Comments:

ELECTRICAL

Receptacles:	All walls and beneath center of conference table; integrate with table top			
Switches:	Low Voltage	-	Dimmer	-
(Qty.):			(Qty.):	
Other:	-			
Emergency Lighting Required:	All lighting on backup power (genset) and UPS			
Lighting Type:	T5 Fluorescent on dimmer	Lighting Level (Lux):	200	-
	Individually controlled task lighting to be provided at work station			
Communications:				
Fire Alarm to OBC3.2.4:	-	P.A. System	Coverage	Via phone system only
(Qty.):		Required:		
T.V. Outlet	-	(1) behind credenza (below monitor), provide in-wall conduit from credenza to monitor		
(Qty.):				
Telephone/Data Outlet (Qty.)		(1) Floor mounted under conference table; integrate in to table top		
Security Requirements:				
A/V Systems:		-165cm class 1080 LED flat screen monitor, wall mounted		

Building	New Walkley Yard Office Building						
Room Name:	Storage				Room Number:		NA

Comments: -

NOTES

ARCHITECTURAL

Function:	Storage area for OC Transpo Staff	Net Area:	25	m2	Number of Occupants:	-
Fire Rating:	None	Barrier Free:	Yes			

ROOM CHARACTERISTICS

Sound Control:	Standard	Special Conditions:	Ceiling	2750		
STC Rating:	45	Special Conditions:	Floor:			
Other:	-	Special Wall Conditions	Provide wall protection to 2m above finished floor, sufficient to resist damage from carts			

ROOM FINISHES

Floor:	ERC	Base:	FRP	Wall:	FRP to 2400mm AFF		
Ceiling:	PMC	Millwork:					
Doors (Size):	1800x2100	Type:		Fire Rating:	-	Hardware:	Access Control
O/H Doors (Size):		Type:	-	Fire Rating:	-	Hardware:	-
Windows:	-	Frame:	-	Fire Rating:	-	Glazing:	-
Wind Screens:	-	Frame:	-	Fire Rating:	-	Glazing:	-
Security Barriers:	-	Frame:	-	Fire Rating:	-	Glazing:	-

MILLWORK

Counter:	-	Matl:	Comment:	
Shelving:	Steel Adjustable	Matl:	Comment:	Minimum 60m adjustable shelving (4 tiers) 610mm deep; 300 kg per 1000mm load capacity

FIXTURES:

EQUIPMENT: **Heavy duty industrial shelving, min 500 kg/m²; 600mm deep, min. 100 lm; brace at floor and floor deck above**

OTHER: -

REMARKS:

MECHANICAL

HVAC system:	Typical office	Air Supply Exhaust:	-
Min. # of air changes/hr.:	-	Air Exhaust:	-
LAVS:	Number: -	Fixture:	-
Water Closet:	Number: -	Fixture:	-
Urinal:	Number: -	Fixture:	-
Drinking Fountain:	-	Room Thermostat:	-
Floor Drain:	-	Drain Type:	-
Other:	-		
Comments:	-		

ELECTRICAL

Receptacles:	One per each cart stall; one duplex on each wall minimum			
Switches:	Low Voltage (Qty.): -	Dimmer (Qty.):	-	-
Other:	-			
Emergency Lighting Required:	Exit level only			
Lighting Type:	T5 Fluorescent	Lighting Level (Lux):	400	-
Communications:	-			
Fire Alarm to OBC3.2.4:	-	P.A. System	Coverage	Yes
T.V. Outlet (Qty.):	-			
Telephone/Data Outlet (Qty.):	1			
Security Requirements:	Access Control			
A/V Systems:	-			
Comments:	-			

NOTES

RFP: Request for Quotation

OESC: Ontario Electrical Safe Code

Building	New Walkley Yard Office Building						
Room Name:	OC Transpo Server					Room Number:	NA

ARCHITECTURAL

Function:	OC Transpo Computer Equip.	Net Area:	12	m2	Number of Occupants:	1
Fire Rating:	1-hr	Barrier Free:	Yes			

ROOM CHARACTERISTICS

Sound Control:	Standard	Special Conditions:	Ceiling	2750
STC Rating:	55	Special Conditions	Floor	Antistatic raised access floor
Other:	-	Special Wall Conditions	:	

ROOM FINISHES

Floor:	RAF	Base:	RB	Wall:	PT/minimum 6m² comm. backboard
Ceiling:	LAT	Millwork:			
Doors (Size):	900x2100	Type:		Fire Rating:	20
O/H Doors (Size):		Type:	-	Fire Rating:	-
Windows:		Frame:	-	Fire Rating:	-
Wind Screens:	-	Frame:	-	Fire Rating:	-
Security Barriers:	-	Frame:	-	Fire Rating:	-
				Glazing:	-
				Glazing:	-
				Glazing:	-

MILLWORK

Counter:	-	Matl:	Comment:
Shelving:	-	Matl:	Comment:

FIXTURES: -

EQUIPMENT: -

OTHER: -

REMARKS: -

MECHANICAL

HVAC system:	3x Redundant Data Center Type	Air Supply:	Below floor (see comments)
Min. # of air changes/hr.:	-	Air Exhaust:	Ceiling
LAVS:	-	Number:	-
Water Closet:	-	Number:	-
Urinal:	-	Number:	-
Drinking Fountain:	-	Fixture:	-
Floor Drain:	-	Fixture:	-
Other:	Provide clean agent and pre-action fire sprinkler system.		

Comments: **Provide minimum 4-tons HVAC. HVAC system shall be delivered through the RAF, at minimum provide not less than 6 diffuser tiles. System shall be on emergency backup power (genset). Volume shall be controllable at each diffuser.**

ELECTRICAL

Receptacles:	Under floor, on emergency backup power		
Switches:	Low Voltage	-	Dimmer
(Qty.):			(Qty.):
Other:	-		
Emergency Lighting Required:	All lighting on backup power (genset) and UPS		
Lighting Type:	T5 Fluorescent	Lighting Level (Lux):	200
Communications:	Tie to OC Transpo 875 Belfast		
Fire Alarm to OBC3.2.4:	-	P.A. System	Coverage
		Required:	Yes
T.V. Outlet	-		
(Qty.):			
Telephone/Data Outlet (Qty.)	1		
Security Requirements:	Provide access control hardware		
A/V Systems:	-		
Comments:	Fire stop all conduit		

NOTES

RFP: Request for Quotation

OESC: Ontario Electrical Safe Code

Building	New Walkley Yard Office Building						
Room Name:	Transportation Quiet Room					Room Number:	NA

ARCHITECTURAL

Function:	Quite Room for OC Transpo Crew	Net Area:	32	m2	Number of Occupants:	6
Fire Rating:	N/A	Barrier Free:	Yes			

ROOM CHARACTERISTICS

Sound Control:	Standard	Special Conditions:	Ceiling	2750
STC Rating:	45	Special Conditions	Floor	
Other:	-	Special Wall Conditions	:	

ROOM FINISHES

Floor:	CPT	Base:	RB	Wall:	PT	
Ceiling:	LAT	Millwork:				
Doors (Size):	900x2100	Type:		Fire Rating:		Hardware: Latch
O/H Doors (Size):		Type:	-	Fire Rating:	-	Hardware: -
Windows:	-	Frame:	-	Fire Rating:	-	Glazing: -
Wind Screens:	-	Frame:	-	Fire Rating:	-	Glazing: -
Security Barriers:	-	Frame:	-	Fire Rating:	-	Glazing: -

MILLWORK

Counter:	-	Matl:	-	Comment:	
Shelving:	-	Matl:	-	Comment:	-

FIXTURES: -

EQUIPMENT:

OTHER:

REMARKS:

MECHANICAL

HVAC system:	Standard office	Air Supply:	Standard Office, Ceiling
Min. # of air changes/hr.:	-	Air Exhaust:	Ceiling
LAVS:	-	Number:	-
Water Closet:	-	Number:	-
Urinal:	-	Number:	-
Drinking Fountain:	-	Fixture:	-
Floor Drain:	-	Fixture:	-
Other:		Room Thermostat:	Yes
		Drain Type:	-

Comments:

ELECTRICAL

Receptacles:	Minimum four outlets at workstation			
Switches:	Low Voltage	-	Dimmer	Yes
	(Qty.):		(Qty.):	
Other:	-			
Emergency Lighting Required:	All lighting on backup power (genset) and UPS			
Lighting Type:	T5 Fluorescent	Lighting Level (Lux):	200	-
	Individually controlled task lighting to be provided at work station			
Communications:				
Fire Alarm to OBC3.2.4:	-	P.A.	System	Coverage
		Required:		Yes
T.V. Outlet	-			
(Qty.):				
Telephone/Data Outlet (Qty.)	Standard			
Security Requirements:	-			
A/V Systems:	-			

Comments: -

NOTES

Building	New Walkley Yard Office Building						
Room Name:	Supervisor Office					Room Number:	NA

ARCHITECTURAL

Function:	Office for OC Transpo	Net Area:	11	m2	Number of Occupants:	1
Fire Rating:	N/A	Barrier Free:	Yes			

ROOM CHARACTERISTICS

Sound Control:	Standard	Special Conditions:	Ceiling
STC Rating:	45	Special Conditions:	Floor
Other:	-	Special Wall Conditions	:

ROOM FINISHES

Floor:	CPT	Base:	RB	Wall:	PT	
Ceiling:	LAT	Millwork:				
Doors (Size):	900x2100	Type:		Fire Rating:		Hardware: Access Control
O/H (Size):	Doors	Type:	-	Fire Rating:	-	Hardware: -
Windows:	-	Frame:	-	Fire Rating:	-	Glazing: -
Wind Screens:	-	Frame:	-	Fire Rating:	-	Glazing: -
Security Barriers:	-	Frame:	-	Fire Rating:	-	Glazing: -

MILLWORK

Counter:	-	Matl:	-	Comment:	
Shelving:	-	Matl:	-	Comment:	-

FIXTURES: -

EQUIPMENT:

OTHER:

REMARKS: Adjacent and with window to Operator's Day Room; view of storage tracks

MECHANICAL

HVAC system:	Standard office	Air Supply:	Standard Office, Ceiling
Min. # of air changes/hr.:	-	Air Exhaust:	Ceiling
LAVS:	-	Number:	-
Water Closet:	-	Number:	-
Urinal:	-	Number:	-
Drinking Fountain:	-	Fixture:	-
Floor Drain:		Fixture:	-
Room Thermostat:		Fixture:	-
Other:		Drain Type:	-

Comments:

ELECTRICAL

Receptacles:	Minimum four outlets at workstation			
Switches:	Low Voltage	-	Dimmer	-
(Qty.):			(Qty.):	
Other:	-			
Emergency Lighting Required:	All lighting on backup power (genset) and UPS			
Lighting Type:	T5 Fluorescent	Lighting Level (Lux):	200	-
Communications:	Individually controlled task lighting to be provided at work station			
Fire Alarm to OBC3.2.4:	-	P.A. System Required:	Coverage	Via phone system only
T.V. Outlet (Qty.):	-			
Telephone/Data Outlet (Qty.)	Standard			

Security Requirements: **Provide access control hardware**

A/V Systems: -

Comments: -

NOTES

Building	New Walkley Yard Office Building						
Room Name:	Operator's Locker/Break/Day Room					Room Number:	N/A

ARCHITECTURAL

Function:	Waiting Room for Transportation Crews	Net Area:	75	m2	Number of Occupants:	16
Fire Rating:	N/A	Barrier Free:	Yes			

ROOM CHARACTERISTICS

Sound Control:	Standard	Special Ceiling Conditions:
STC Rating:	45	Special Floor Conditions
Other:	-	Special Wall Conditions :

ROOM FINISHES

Floor:	VCT	Base:	RB	Wall:	PT		
Ceiling:	LAT	Millwork:					
Doors (Size):	900x2100	Type:		Fire Rating:	Per code	Hardware:	Latch
O/H Doors (Size):		Type:	-	Fire Rating:	-	Hardware:	-
Windows:	Provide daylighting	Frame:	-	Fire Rating:	-	Glazing:	-
Wind Screens:	-	Frame:	-	Fire Rating:	-	Glazing:	-
Security Barriers:	-	Frame:	-	Fire Rating:	-	Glazing:	-

MILLWORK

Counter:	Kitchenette case work; Computer station	Matl:	HPL at computer; solid surface at kitchenette	Comment:
Shelving:	Single adjustable lowers two adjustable uppers	Matl:	HPL	Comment:

FIXTURES: Furnish painted metal lockers including those as required for accessibility. Provide benches where required for accessibility. Lockers shall be size in accordance with the City of Ottawa Standards for Interior Design and shall be provided in sufficient number at each location for opening day of service needs.

Provide casework with stainless steel kitchen sink with waste disposer, countertop space sufficient for coffee maker and microwave plus 100% linear open; full length overhead cabinets

EQUIPMENT: Provide (1) 1220mm LCD monitor and connection to digital broadcast media (cable TV); microwave, coffee maker, 480 litre frost free refrigerator-freezer

OTHER: Seating at table for not less than ten, with full room capacity of not less than 16. Provide minimum two computer workstations for crews, min. 900mm wide x 900mm deep work station (seated) with side vision screens (carrel set-up).

REMARKS: Network connectivity and power to be provided at workstations

MECHANICAL

HVAC system:	Standard office	Air Supply:	Standard Office, Ceiling
Min. # of air changes/hr.:	-	Air Exhaust:	Ceiling
LAVS:	-	Fixture:	-
Water Closet:	-	Fixture:	-
Urinal:	-	Fixture:	-
Drinking Fountain:	-	Room Thermostat:	Yes
Floor Drain:		Drain Type:	-
Other:			

Comments:

ELECTRICAL

Receptacles:	Standard office, at each comp. station, and at counter		
Switches:	Low Voltage	-	Dimmer
(Qty.):			(Qty.):
Other:	-		
Emergency Lighting Required:	All lighting on backup power (genset) and UPS		
Lighting Type:	T5 Fluorescent	Lighting Level (Lux):	200
Communications:			
Fire Alarm to OBC3.2.4:	-	P.A. System	Coverage
(Qty.):		Required:	Yes
T.V. Outlet	Wall mounted		
(Qty.):			
Telephone/Data Outlet (Qty.)	- Standard; 2 computer		

Security Requirements:

A/V Systems:

See above

Comments:

NOTES

Building	New Walkley Yard Office Building										
Room Name:	Superintendent's Open Office Area								Room Number:		NA

ARCHITECTURAL

Function:	Open Office Area for OC Transpo	Net Area:	60	m2	Number of Occupants:	6
Fire Rating:	N/A	Barrier Free:	Yes			

ROOM CHARACTERISTICS

Sound Control:	Standard	Special Conditions:	Ceiling
STC Rating:	45	Special Conditions:	Floor
Other:	-	Special Wall Conditions	:

ROOM FINISHES

Floor:	CPT	Base:	RB	Wall:	PT	
Ceiling:	LAT	Millwork:				
Doors (Size):	900x2100	Type:		Fire Rating:		Hardware: Latch
O/H Doors (Size):		Type:	-	Fire Rating:	-	Hardware: -
Windows:	-	Frame:	-	Fire Rating:	-	Glazing: -
Wind Screens:	-	Frame:	-	Fire Rating:	-	Glazing: -
Security Barriers:	-	Frame:	-	Fire Rating:	-	Glazing: -

MILLWORK

Counter:	-	Matl:	-	Comment:	
Shelving:	-	Matl:	-	Comment:	-

FIXTURES:

EQUIPMENT:

OTHER: Six (6) 7.5m2 cubicles

REMARKS:

MECHANICAL

HVAC system:	Standard office	Air Supply:	Standard Office, Ceiling
Min. # of air changes/hr.:	-	Air Exhaust:	Ceiling
LAVS:	-	Number:	-
Water Closet:	-	Number:	-
Urinal:	-	Number:	-
Drinking Fountain:	-	Fixture:	-
Floor Drain:		Fixture:	-
Other:		Room Thermostat:	Yes
		Drain Type:	-

Comments:

ELECTRICAL

Receptacles:	Minimum four outlets at workstation		
Switches:	Low Voltage	-	Dimmer
(Qty.):			(Qty.):
Other:	-		
Emergency Lighting Required:	All lighting on backup power (genset) and UPS		
Lighting Type:	T5 Fluorescent	Lighting Level (Lux):	200
	Individually controlled task lighting to be provided at work station		
Communications:			
Fire Alarm to OBC3.2.4:	-	P.A. System	Coverage
		Required:	Yes
T.V. Outlet	-		
(Qty.):			
Telephone/Data Outlet (Qty.)	Standard		
Security Requirements:	-		
A/V Systems:	-		
Comments:	-		

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APPENDIX A Room Data Sheets

**SCHEDULE 15-2
DESIGN AND CONSTRUCTION - TRILLIUM LINE REQUIREMENTS**

PART 5 – NEW WALKLEY YARD

ARTICLE 1 INTRODUCTION

1.1 General Requirements

- (a) Project Co shall follow the guidelines and performance criteria outlined in this Article for the design and construction of the New Walkley Yard.
- (i) The New Walkley Yard shall provide Revenue Vehicle storage, and facilities for Project Co to provide Maintenance and Rehabilitation Services of the System Infrastructure for the Expanded Trillium Line and the City for system operations.
- (ii) The New Walkley Yard shall accommodate the functional programs and system operation and Maintenance requirements defined in Schedule 15-2, Part 1, Article 3 – Operational Performance Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements and elsewhere in the Project Agreement.
- (iii) The New Walkley Yard configuration, including the yard and buildings, shall accommodate the following:
- A. a fleet comprising 6 existing Revenue Vehicles plus new Revenue Vehicles, potentially of mixed type and manufacturer, as described in Schedule 15-2, Part 8 - Vehicles;
- B. in addition to the existing and new fleet identified in “A” above, New Walkley Yard shall be built to accommodate one additional train with a length of approximately 80 metres, to accommodate future fleet expansion;
- C. meet the Operational Requirements outlined in Schedule 15-2, Part 1, Article 3 – Operational Performance Requirements;
- (iv) The New Walkley Yard shall incorporate the relevant requirements, guidelines, standards, codes, bylaws and other legislation that relate to the Project.
- (v) Emergency planning: Project Co shall be responsible for the preparation, submission and Maintenance (including revisions as necessary) of fire safety plan(s), for approval by Governmental Authorities, pursuant to Ontario Fire Code and OBC, where applicable.
- (vi) The New Walkley Yard shall be designed in accordance with CPTED. For further clarity, the design of the New Walkley Yard shall be included in Project Co's independently contracted CPTED review and report, required under Schedule 15-2, Part 4, Clause 1.3(b).
- (b) Site Summary

- (i) The Lands designated for the development of the New Walkley Yard is located west of Albion Road, just west of the Existing Walkley Yard. Refer to Schedule 33 - Lands for further information.
 - (ii) Project Co shall develop the New Walkley Yard Site to include but not be limited to: roadways, Trackwork, retaining walls, Site Utilities and lighting, staff and visitor parking lots, City required spaces, landscaping and pedestrian pathways, shipping and receiving areas, vehicle storage and Maintenance facilities, fuel storage and dispensing facilities, vehicle service facilities sufficient to meet the needs of daily service, security fencing, SWM, and New Walkley Yard buildings.
 - (iii) Project Co shall provide on Site roadways for the circulation of first responders, and Non-Revenue Vehicles consisting of MOW vehicles, delivery vehicles (parts, fuel, sand, etc.) and personal vehicles. Parking shall be provided for Project Co and City staff with accommodation of shift changes; no fewer than 26 City parking spaces (inclusive of City shift change spaces) shall be provided; accessible spaces shall be provided in addition to this baseline number.
 - (iv) Project Co shall design and construct pathways for operators and service personnel to the Revenue Vehicles and they shall be paved and Maintained and shall be adequately lighted to provide safe passage on foot; provide Track crossings, paved to TOR, to access each Yard Track.
 - (v) Project Co shall design and construct the New Walkley Yard to accommodate vendor truck traffic, including 16m trailers to the receiving area of the main shop building.
 - (vi) Project Co shall design and construct the Site to have security fencing along its perimeter and gates provided to completely secure the property when necessary. Site access gates off Albion Road shall be motorized with access control and shall include two-way communications for visitors to the administration building for gate operation.
 - (vii) Project Co shall design and construct the Site lighting to industry standards and as specified elsewhere in this document, but shall at a minimum provide adequate levels of illumination to assure safe operations and provide for security. Site lighting shall be designed to align with the sustainability goals and specifically Dark Skies standards.
 - (viii) Project Co shall modify, install, and Maintain SWM and pollution prevention features.
 - (ix) Project Co shall design and construct the primary vehicle access to be from Albion Road North.
 - (x) Project Co shall work with the City and other stakeholders to address neighbourhood requirements (e.g. noise and lighting requirements/ standards).
- (c) Project Co shall design and construct the New Walkley Yard facility to the following requirements:

- (i) The New Walkley Yard storage yard and buildings shall provide Revenue Vehicle storage and Maintenance, transit operations, training facilities, conference rooms, the New Walkley Yard server room and MOW facility to meet the requirements outlined in Schedule 15-3 – Maintenance and Rehabilitation Requirements.
- (ii) The Maintenance building shall be designed to accommodate no fewer than two service spots in the shop.
- (iii) Trackwork shall be designed to assure: maximum yard capacity, operational flexibility with regard to service and Maintenance needs as well as facilitating efficient revenue service. Single points of failure shall not be permitted in the Vehicle storage yard. Track shall be designed to have at least two independent points of access to the yard. The City recognizes that reverse moves may be required when employing the secondary point of yard ingress/egress.
- (iv) The New Walkley Yard and buildings shall also provide for daily service and inspection of Revenue Vehicles including at minimum a roll-over gage inspection pit, fixed fueling and sanding facilities—all under a lighted canopy. Project Co shall make provision for efficient daily interior cleaning of Revenue Vehicles.
- (v) The New Walkley Yard and buildings shall also provide for exterior cleaning of Revenue Vehicles. Washing shall be by automatic, drive-thru wash equipment. Wash equipment shall provide spot-free cleaning and shall be configured to remove on-vehicle water prior to exiting the facility to assure unacceptable levels of wash facility water are not comingled with stormwater. Energy efficiency and water reclamation measures shall be incorporated to align with the sustainability goals of the Project.
- (vi) The shop shall be designed with two Tracks for Maintenance of the Revenue Vehicles. Both Tracks shall be fitted with adjustable, dedicated exhaust extraction. One Track shall have a gage pit (full length preserving exiting when Revenue Vehicle is in place). Either side of the Track shall be fitted full-length with jacking pads to support mobile column lifts. A second Track shall be provided with a contiguous pit extending across the gage and far enough on either side to provide safe and efficient access to service lower chassis and body components. This pit shall have pedestal Track designed to maximize access to the inner and outer bays of the pit. Access to Revenue Vehicle roofs shall be provided along the entire length of one side of the Revenue Vehicle via a raised platform. Lighting and ventilation shall be provided in the pit to provide a safe work environment. Fall protection shall be provided in the shop where required. Crane coverage shall be provided as required for the safe and efficient movement of parts and subcomponents throughout the shop and storage areas. The shop shall be designed to, at minimum, provide for the removal and replacement of all Revenue Vehicle subassemblies including HVAC units, trucks, and prime mover power packs.
- (vii) Secure parts and materials storage shall be provided to assure the Revenue Vehicle fleet is Maintained to meet prescribed service needs. Storage space shall

be conditioned as required for the materials stored therein. Storage space shall be designed for the efficient delivery, storage, distribution, and removal of parts. A digital inventory control system shall be provided.

- (viii) Project Co shall provide durable building materials and systems meeting asset preservation and expiry date hand back requirements of Schedule 15-3 – Maintenance and Rehabilitation Requirements. Provide the minimum Design Life required in Schedule 15-2, Part 1, Article 4 – Design and Construction.
- (d) LEED® and Sustainable Construction
 - (i) Project Co shall design and construct the New Walkley Yard Maintenance and administration buildings to be LEED® Certified.
 - (ii) Project Co shall register the New Walkley Yard with the CaGBC and provide administration and documentation for all credits necessary for “Certified” status.
- (e) Accessibility:
 - (i) Where applicable, Project Co shall ensure the Site and facilities are designed to be universally accessible including satisfying the requirements of COADS, AODA, and applicable City Guidelines, OBC and CSA Standards.
- (f) Project Co shall design and construct the New Walkley Yard to the following general Operations philosophy:
 - (i) New Walkley Yard shall be designed for maximum safety and operating flexibility with direct access routes for Revenue Vehicles between the New Walkley Yard and the main line in both the north and southbound directions.
 - (ii) The New Walkley Yard facility shall minimize operational interference between Revenue Vehicles and Non-Revenue Vehicles.
 - (iii) The New Walkley Yard shall be operated by Project Co and provide a fully functioning transportation/transit service facility for the City, including facilities for City personnel.
 - (iv) The New Walkley Yard shall be designed such that the City can access their respective areas of the facility, including any operator Revenue Vehicle access area, without the need to wear personal protective equipment other than a safety vest.
 - (v) Project Co shall provide, preserve, and Maintain an access roadway (including a turnaround for a tractor with 16m trailer) at the terminus of Albion Road.
 - (vi) Maximum yard speed shall be 10km/hr.

1.2 Operator City Dedicated Facilities

- (a) Project Co shall design and build facilities complete with furniture, fixtures and equipment for occupancy by the City in accordance with the requirements of this Schedule and room data sheets in Appendix A of this Part 5. The City areas include but are not limited to:

- (i) administration offices; two for Program Manager and Contract Supervisor
 - (ii) Superintendent's open office area, six 7.5m² cubicles
 - (iii) Office storage ;
 - (iv) Operator dispatch facilities that are:
 - A. separately controlled;
 - B. located proximate to and providing convenient access to Revenue Vehicle Storage Tracks; and;
 - C. available to the City at all times as required to support system operations;
 - D. shall be climate controlled with phones, vehicle assignment display monitors, PA and an EAS.
 - E. The dispatcher area shall be located close to the Operator break room area.
 - (v) Operator sign-up, waiting, locker, lunch and assembly rooms; and
 - (vi) washrooms with a minimum of two shower rooms. Shower rooms may be unisex and do not need to be accessed directly from washrooms;
- (b) The City shall have dedicated and secure access to the City dedicated facilities.
- 1.3 Vehicle Storage**
- (a) The Revenue Vehicle Storage Tracks area shall be provided with storage area capacity of sufficient size to accommodate the requirements of Clause 1.1(a) (iii) of this Part 5 including protection on the Site for any future expansion identified.
 - (b) Stub ended Storage Tracks shall not be permitted.
 - (c) Track shall be designed to minimize switching under standard operations.
 - (d) Provide the number of paved cartways needed to support service requirements with respect to the Operations Service Plan.
 - (e) The paved cartways shall be located such as to minimize the distance within the yard that Revenue Vehicles are operated by the Operator and eliminate the need for crossing Tracks between Revenue Vehicles.
 - (f) Cartways shall be accessible at all times to the City and shall be Maintained free of ice and snow.
 - (g) Vehicles shall be stored on dedicated Storage Tracks. They shall not be stored on Tracks used for other Facilities.

1.4 Room Data Sheets

- (a) Project Co shall include within the New Walkley Yard, the rooms identified in the Room Data Sheets provided in Appendix A of this Part 5. These sheets contain minimum requirements for the design and construction of specified required rooms within the New Walkley Yard.

1.5 Yard Operations

- (a) The New Walkley Yard shall be considered to operate as a non-Cab signal territory with a separate S&TCS controlled by the YCC. All Train moves and routes within the New Walkley Yard limits shall be restricted to limited speed and governed by radio control authorization from the YCC. The YCC shall not control the wayside signals and powered switches that allows all Vehicles to enter or exit the mainline alignment. The entering and exiting of all Vehicles on to the mainline shall be controlled by the TOCC and BCC under the mainline S&TCS.
- (b) The switches within the New Walkley Yard shall be of the same type (dual control with hand or powered operation available) as used elsewhere on the Expanded Trillium Line and as specified herein. The switches shall be provided with switch heaters as specified herein. Both the switches and switch heaters shall be controllable from the YCC and the maintainers local control panel.
- (i) Project Co shall be allowed to use a maximum of two (2) double slip switches in the Yard, provided the switch machines and heaters for those slip switches are consistent with those used elsewhere on the Trillium Line.
- (c) Project Co shall design and implement a solution for a S&TCS in the New Walkley Yard MSF that provides:
- (i) Control and indication of all power switches within the New Walkley Yard limits from the YCC.
- (ii) Train presence detection through means of Track circuits, axle/wheel counters, or any other approved devices capable of the prevention of any powered switch from being thrown with a train or other rail vehicle sitting over the switch.
- (iii) Visual confirmation of the New Walkley Yard switch positions available to Trains and other rail vehicles via wayside indicators. The indicators shall be installed at a height of 1m above TOR and be highly visible under dark and poor weather conditions.
- (iv) A YCC control panel capable of the following:
- A. Control of the position of all power switches within the New Walkley Yard limits. Circuits shall prevent change of the switch position while a Train or other rail vehicle is over the switch;
- B. Indication display of the position of all power switches within the New Walkley Yard limits;
- C. Indication display of the Track occupancy of all Tracks within the New Walkley Yard;

- D. Indication display only of the wayside signals, switch positions, and Track occupancy of the yard entrance/exit interlockings;
 - E. Control of the switch heaters for all power switches within the New Walkley Yard limits;
 - F. Indication display of the status of the switch heaters for all power switches within the New Walkley Yard limits; and,
 - G. Indication of which panel has control over the yard, the YCC panel or the maintainers panel.
- (v) A maintainer local control panel located in the main signal equipment bungalow or room that can be used and accessed for maintenance and testing without accessing the YCC.
- (vi) Switches that lead exclusively to a maintenance bay and will not be travelled on by the Operators need not be automatically controlled.
- (d) Project Co shall design, provide, test, and determine the location and size of all signal equipment housings/bungalows and infrastructure required to hold all of the required signaling, switch control, and interface equipment. The equipment may be placed in a designated room within one of the buildings in the New Walkley Yard upon approval by the City.
- (e) Project Co shall design, provide, and test the cables and cable routing required to provide power, control, and indications of all the signaling, switch control, and interface equipment within the New Walkley Yard.

ARTICLE 2 NEW WALKLEY YARD – CIVIL DESIGN CRITERIA

2.1 Geotechnical / Foundation

- (a) Design and construction of all geotechnical and foundation work shall be in conformance with the requirements of Schedule 15-2, Part 2, Article 7 - Geotechnical Design Criteria and Requirements.

2.2 Site Work

- (a) Project Co shall design and construct all civil Site work to be in conformance with the requirements of Schedule 15-2, Part 2, Article 4 – Design and Construction.
- (b) Project Co shall design and construct pits, Tracks, and walkways at the fueling and service Facility to safely perform inspection of the Revenue Vehicle.
- (c) Project Co shall design and construct access for Emergency vehicles with a perimeter access roadway around the yard and emergency access throughout the yard.
- (d) Project Co shall design and construct pavement for Emergency access routes and exterior Operator walkways to be asphaltic concrete or Portland cement concrete to support the intended uses.
- (e) Project Co shall prepare a TIA in conformance with the requirements of Schedule 15-2, Part 7 - Traffic and Transit Management and Construction Access. Project Co shall design New Walkley Yard parking areas per the City of Ottawa Road Corridor Planning & Design Guidelines.
- (f) Grades
- (i) Yard Storage Tracks shall either be level or shall create a sag condition so that parked rolling stock cannot drift out onto yard lead or Mainline Track.
 - (ii) The maximum grade on yard Storage Tracks shall be 0.3%.
 - (iii) Acceptable maximum grade through yard turnout is less than 1%. Where grade is equal to or greater than 1%, reduce speed through yard turnout by 2 kph. Absolute maximum grade through yard turnout is 2%.
 - (iv) Tracks shall drain away from buildings.

2.3 Ottawa Rideau Valley Conservation Authority

- (a) PLAAAs shall be obtained for all design and construction activities on the New Walkley Yard including but not limited to the RVCA.

2.4 Site Contamination

- (a) Project Co shall manage any and all Contamination on Site and excavated materials in accordance with the Project Agreement and Schedule 17 – Environmental Obligations.

2.5 Drainage and Stormwater Management

- (a) Design and construction of all Drainage work on Site shall be in conformance with the requirements of Schedule 15-2, Part 2, Article 5 - Drainage and Stormwater Management Design Criteria, Conservation Authority requirements and Ontario Ministry of Environment and Climate Change guidelines.
- (b) Project Co shall provide appropriate SWM for the New Walkley Yard including water quantity and quality control to meet Ministry of Environment and Climate Change, and City of Ottawa requirements (Sewer Design Guidelines).
- (c) The Site is adjacent to a tributary of Sawmill Creek and will require approvals from provincial and federal agencies

ARTICLE 3 ARCHITECTURAL DESIGN CRITERIA

3.1 General Requirements

- (a) The architectural requirements of the New Walkley Yard shall comply with the criteria contained in this Article, and all relevant codes standards, regulations and guidelines below and those identified in this Part 5. In the event of conflicts between any codes, standards, regulations or guidelines, refer to Schedule 15-2, Part 1, Article 1 – Reference Documents and Submittals for order of precedence.
- (b) Project Co shall design all facilities to meet acoustical requirements and maximum sound levels specified in Schedule 17 – Environmental Obligations.

3.2 Design

- (a) The City's Urban Design and Planning requirements shall be reflected in the facility Site development and buildings in consideration of surrounding existing and future neighbourhood developments.
- (b) Materials shall comply with the asset preservation and Expiry Date requirements of Schedule 15-3 – Maintenance and Rehabilitation Requirements.
- (c) Provide the minimum Design Life required in Schedule 15-2, Part 1, Clause 4.3 – Design Requirements, Table 1-4.1 as determined per CSA S478-95 (R2007) Guidelines on Durability in Buildings.
- (d) All buildings shall have a BAS that shall report locally and to one centralized monitoring location.
- (e) Provide automated external defibrillators throughout the facility including the Operator's office area, the Operator's training area, City office areas and shop areas.
- (f) Accessibility
 - (i) It is a City priority to provide a universally accessible MSF facility. Where Project Co can so demonstrate that, by virtue of their industrial nature, certain shop areas should not be accessible, requirements for access and use by persons with differing levels of mobility, sight, hearing and sensory abilities shall be waved. However all areas shall be accessible to movement of emergency stretchers with attendants.
 - (ii) Project Co shall design the facilities to satisfy the requirements of all applicable codes, standards and barrier free requirements where applicable.
 - (iii) Facility design shall support ease of access and use by persons with differing levels of mobility, sight, hearing and sensory abilities.

3.3 Signage

- (a) General Requirements:

- (i) Shall comply with Schedule 15-2, Part 4, Article 7 – Wayfinding and Signage and signage requirements of applicable AODA, OBC, CSA, NBCC, TSB, TSSA, WSIB, WHMIS, OHSA and MTO standards, ASME A17.1/CSA 44, NFPA 130.
- (ii) Site identity signage shall include illuminated entry monument and reflective roadway and rail signage and wayfinding signage for visitors and delivery vehicles.
- (iii) Project Co shall provide reflective Site identity signage identifying address and facility for each building and as required identifying both Track numbers and door numbers above each rail door. Provide emergency contact information and hours of operation (as relates to public access) at main entry doors.
- (iv) Project Co shall provide interior signage identifying all departments and rooms: offices, workstations, break rooms, washrooms, shop functions etc. Provide holders for: meeting room agenda, staff directory, and daily events.
- (v) Project Co shall provide regulatory signage for exiting, accessibility, safety, and hazardous material and handling.
- (vi) Project Co shall provide a fire safety plan(s) for the facility as approved by AHJ.
- (vii) Project Co shall provide yard signage according to industry and Project Co requirements
- (viii) Project Co shall provide labeling of all exposed or accessible piping and ductwork

3.4 Building Code Analysis

- (a) Project Co shall perform a code analysis for the New Walkley Yard with respect to the OBC and obtain all required permits and approvals.
- (b) Provide a complete code analysis for the New Walkley Yard, in accordance with Schedule 10 – Review Procedure.

3.5 Landscape and Urban Design

- (a) Project Co shall create an urban relationship between the New Walkley Yard and Albion Road through either of the options articulated in Schedule 15-2, Part 6 – Urban Design, Landscape Architecture and Connectivity Requirements. In addition to the aforementioned requirement Project Co shall ensure that:
 - (i) Any Site perimeter fence along Albion Road shall be decorative, consistent with the building architecture and integrated into the landscape design New Walkley Yard.
- (b) Project Co shall provide all landscaping as required through the Site Plan Approval process.

ARTICLE 4 STRUCTURAL DESIGN CRITERIA

4.1 General Structural Design Criteria

- (a) Design and construction of all building structural work shall be in conformance with the requirements of Schedule 15-2, Part 4, Article 4 - Structural Design Criteria as applicable.
- (b) Design and construction of all Site structural work including Bridges and retaining walls shall be in conformance with the requirements of Schedule 15-2, Part 2, Article 7 Geotechnical Design Criteria and Requirements, and Schedule 15-2, Part 2, Article 4 Structural Design Criteria and Requirements.
- (c) Reference Documents
 - (i) Design and construction of structural work shall comply with the criteria contained in:
 - A. CISC-ICCA "Crane-Supporting Steel Structures: Design Guide"
 - B. ASME B30.2: "Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)"
 - C. ASME B30.17: "Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)"
 - D. ASME B30.11: "Monorails and Underhung Cranes"
- (d) Structural Loads
 - (i) Live Loads
 - A. Any equipment loads such as bridge crane, jib crane, fork lift etc. shall be considered as live load.
 - B. Structures supporting Revenue Vehicle or road vehicle loads, including ground-supported slabs, shall meet CHBDC standards for fatigue.
 - C. Structures supporting crane loads shall be designed for fatigue.
 - (ii) Environmental Loads:
 - A. Snow, wind, ice and seismic loads shall be as described in the relevant Reference Documents, using the importance category of "normal" with the building code and "other" within CHBDC.

ARTICLE 5 MECHANICAL DESIGN CRITERIA

5.1 General

- (a) Design of all mechanical systems shall incorporate energy efficiency and heat recovery initiatives for the New Walkley Yard buildings.
- (b) Reference Documents
 - (i) The Works shall comply with the criteria contained in this Article, and all standards, regulations, policies, Applicable Law, guidelines or practices applicable to the Project.
 - (ii) Mechanical systems design shall apply, but not be limited to, all applicable Reference Documents as referenced in this Part 5. In the event of a conflict between criteria, commitments or requirements contained within one document when compared with another, refer to Schedule 15-2, Part 1, Article 1 – Reference Documents and Submittals for order of precedence.
 - (iii) Project Co shall comply with all applicable codes, standards and regulations and with manufacturers' requirements and recommendations.
- (c) Testing, Adjusting and Balancing
 - (i) TAB shall be performed for all mechanical systems and shall be performed by an agency certified by AABC or NEBB.
 - (ii) Project Co shall complete commissioning activities in compliance with LEED® such that warranties are not violated or adversely compromised.
- (d) Vibration Requirements:
 - (i) All mechanical systems and equipment shall be designed and installed to eliminate the transmission of vibration and noise to any part of the building, including but not limited to offices, training rooms and conference rooms.
 - (ii) Project Co shall provide vibration isolators to mechanical equipment and components; and
 - (iii) Project Co shall provide seismic restraints for mechanical equipment or components including ductwork and piping.
- (e) Project Co shall provide meters for potable water and irrigation water to monitor usage.

5.2 HVAC

- (a) HVAC General
 - (i) Project Co shall design systems for the Maintenance Facility building(s) and associated office areas to meet personnel comfort conditions & provide personnel protection against operations which produce airborne particles and/or fumes.

- (ii) Project Co shall design systems as applicable to satisfy the requirements for ventilation, supply, exhaust, make-up air and cooling of all areas and equipment, and that of the various Maintenance and repair operations to be undertaken within the Maintenance facility building(s).
 - (iii) Project Co shall design systems for the New Walkley Yard facility to facilitate personnel comfort conditions and the manufacturer's recommendations for room ambient conditions required for sensitive computer based equipment. Minimum and maximum air temperatures shall be provided as detailed below:
 - A. Offices, administration areas: 22OC to 24OC, min. 25% RH (winter), max 50% RH (summer).
 - B. Server and communications rooms (aka equipment Room): 22 OC to 24 OC at 50% RH all year around.
 - C. Main electrical room: max. 35 OC.
 - D. DC room: max. 35 OC at 50% RH (summer).
 - E. Room and areas not listed above shall be maintained in accordance with ASHRAE Standard 90.1-2010.
 - (iv) Systems serving the New Walkley Yard server room(s) shall incorporate 2N redundancy.
 - (v) Where applicable, Project Co shall design systems in accordance with internal room design conditions and requirements as identified in the "room data sheets" in Appendix A of this Part 5.
 - (vi) External ambient design conditions shall be based on OBC data for Ottawa, ON.
 - (vii) Filtration efficiencies of HVAC equipment shall be selected based on the facility or room the equipment is serving, rooms containing computer based equipment and occupied rooms requiring higher filtration efficiencies.
 - (viii) Mechanical equipment and systems shall be designed so that the maximum noise transmitted by the systems does not exceed OHSA & ASHRAE Standards. Selection of equipment and systems design shall be such that the noise generated by the equipment or system shall not contribute in exceeding the required general area or room noise criteria as outlined in Schedule 15-2, Part 4, Article 5 – Mechanical Design Criteria.
- (b) HVAC Systems & Equipment
- (i) HVAC Equipment
 - A. Project Co shall select equipment containing no CFC refrigerant.

- B. Project Co shall select equipment utilizing refrigerant that meets applicable codes and standards and that will not contribute to ozone depletion and global climate change.
 - C. Project Co shall select equipment to provide the highest operating efficiencies available.
 - D. All equipment shall be isolated from the building and anchored for seismic restraint.
- (ii) HVAC System:
- A. Project Co shall design systems for high efficiency to meet or exceed ASHRAE's most stringent standards or requirements.
- (c) HVAC Controls
- (i) All building controllers, application controllers and all input/output devices shall use industry standard protocols.
 - (ii) HVAC controls plus the control and monitoring point settings shall be integrated within the overall New Walkley Yard BAS.

5.3 Plumbing and Drainage

- (a) Project Co shall provide complete design and construction of plumbing and drainage systems including separators for all facilities as required by and in accordance with all referenced codes, standards and regulations. Project Co shall incorporate equipment monitoring into the BAS system.

(b) Plumbing Fixtures

- (i) General Requirement
 - A. Urinal: waterless type urinals shall not be permitted.

5.4 Fire Protection

(a) Maintenance shops and associated offices:

- (i) Project Co shall provide fire protection systems as required by the applicable codes, regulations and standards.

(b) Yard:

- (i) Project Co shall provide accessible hydrants for fire protection of the open yard and Yard Track areas. Hydrants shall be located such that a fire in any area of the yard including Revenue Vehicle fires can be attacked using the hose length recommended by the AHJs.

5.5 Mechanical Systems for Shop and Yard

- (a) Project Co shall provide all necessary mechanical services required to facilitate operation, cleaning, Maintenance & repair of the complete facility & facility inventory, including but not limited to the buildings, yard, equipment, systems, Non-Revenue Vehicles and Revenue Vehicles. Specific requirements for Revenue Vehicle service equipment are set out in Schedule 15-2, Part 8 – Vehicles.
- (b) Project Co shall design systems to all applicable codes and standards.

ARTICLE 6 ELECTRICAL DESIGN CRITERIA

6.1 Introduction

- (a) This article presents the basic electrical design guidelines, codes, and standards references that shall be followed throughout the electrical design process of the New Walkley Yard.
- (b) Project Co shall design and construct all electrical work to be in conformance with the requirements of Schedule 15-2, Part 3 – Systems and Schedule 15-2, Part 4, Article 6 - Electrical Design Criteria as applicable.
- (c) Project Co shall provide complete design and construction of electrical and communication systems for all facilities as required by and in accordance with all referenced codes and standards and where required in the Project Agreement.

6.2 Reference Documents

- (a) Project Co shall ensure that the design and construction of the Works shall comply with the criteria contained in this Article, and all standards, regulations, policies, Applicable Law, guidelines or practices applicable to the Project, including but not limited to each of the following Reference Documents. In the event of a conflict between criteria, commitments or requirements contained within one document when compared with another, refer to Schedule 15-2, Part 1, Article 1 – Reference Documents and Submittals for order of precedence.
- (b) Refer to Schedule 15-2, Part 4, Article 6 – Electrical Design Criteria for design codes, standards and guidelines.

6.3 Basis for Design

- (a) The intent of this section is to outline the Facility's requirements for the buildings' electrical systems that are not addressed by the applicable codes and standards.
- (b) Project Co shall provide functional electrical systems that are adequately reliable, flexible, maintainable and expandable to suit the Facility's needs, while being economical to build, operate and Maintain over the term of the agreement.
- (c) The additional requirements outlined in this section shall supplement those required by the applicable legislation, codes, standards and requirements and are not to be used to reduce any such requirements.
- (d) The electrical systems shall be designed to be flexible and adaptable to support changes in the Facility with minimum disruption to the operations of the Facility.
- (e) All electrical equipment shall operate reliably within industry standards for levels of sound, vibration, electric field and magnetic field.
- (f) All electrical equipment shall be new, utilize proven technologies, and be of the most current design.

- (g) All electrical equipment shall be suitably protected from discharge of fluids from the sprinkler system as well as leakage from the sprinkler piping, drain lines, water lines, etc.
- (h) All electrical equipment shall be listed and approved for the specific purpose for which it is to be employed.
- (i) All electrical equipment shall be installed with seismic restraints adequate to withstand the maximum forces anticipated during a seismic event. The restraints shall protect the equipment from damage during the seismic event.
- (j) A comprehensive lightning protection system shall be provided to protect all elements of the Facility.
- (k) Lighting-level calculations shall be completed for all interior and exterior spaces occupied by staff.

6.4 Functional Requirements

- (a) Electrical Service
 - (i) The New Walkley Yard shall receive its service feeder from [REDACTED]. Project Co shall design an optimized distribution system capable to provide power throughout the area and facility at necessary voltages and in accordance with [REDACTED] specifications and distribution standards.
 - (ii) Project Co shall provide two incoming service feeders as required to support the facility. Project Co shall include fusible medium-voltage switch, transformers, 600/347 V low-voltage main-breaker switchgear, and tie-breaker.
 - (iii) Capacity of each of the service feeders shall be able to supply 100% of the demand plus 25% spare (future) loads. Project Co shall not route the two redundant feeders in a common trench or duct.
 - (iv) Project Co shall provide additional circuit breaker at 600-volt switchgear for emergency generator. Also include automatic transfer switch to prevent simultaneous closing of the emergency generator breaker and 600V main breakers.
 - (v) Project Co shall provide permanent emergency generator with a non-fused disconnect means prewired to 600-volt switchgear emergency generator breaker for quick generator connection as a backup power to critical UPS and selected emergency/standby loads. All power sources shall be as approved by the Governmental Authority and in conformance with the applicable code.
 - (vi) Project Co shall provide a redundant, three-phase, double-isolation UPS system. Project Co shall feed each UPS from a single circuit breaker from different busses on the 600-volt switchgear.
 - (vii) Project Co shall provide power distribution through 600-208/120 V three-phase transformers and 208/120 V switchboards.

- (viii) The ratings of power distribution equipment shall be sufficient to support the power requirements of the areas being serviced by the equipment plus a 25% spare capacity for future growth.
 - (ix) Low voltage switchgears directly connected to the medium/low voltage power transformers shall be equipped with electrically operated draw out power circuit breakers with adjustable electronic trip units for main, event generator, and feeder circuits.
 - (x) The power distribution system shall be designed and adjusted to allow for selective coordination between protective devices connected in series.
 - (xi) Project Co shall design the distribution system to provide electric shock and arc flash protection to:
 - A. Meet the latest requirements and guidelines of CSA Z462 and IEEE 1584.
 - B. Safe working distances for calculated fault locations based upon calculated arc flash boundary considering incident energy of 1.2 cal/cm².
 - C. Achieve arc flash hazard no higher than Category 2
 - (xii) The status of critical distribution equipment such as medium voltage circuit breakers, power transformers, low voltage power circuit breakers, resistance grounding system, digital meters, automatic transfer switches, generators and UPS shall be integrated with the BAS.
 - (xiii) The power factor of the Facility shall be actively managed with a dynamic power factor correction system such that the minimum power factor of the Facility shall be 0.95 lagging at all times.
 - (xiv) Power factor correction system shall be equipped with anti-resonance harmonic filters where required.
 - (xv) Electrical service design shall meet all [REDACTED] Service Requirements.
 - (xvi) Harmonic mitigating transformers and transient voltage surge suppressors shall be provided on feeders or panel boards supplying data processing equipment or communications equipment.
- (b) Project Co shall meter all Utility services to the Site.
- (c) Duct banks, Maintenance Holes and Handholes
- (i) Duct banks and maintenance holes shall be designed in accordance with the seismic criteria defined for this Project. Duct banks shall be designed to include 25% spare capacity after completion of installation to protect for future growth and expansion. Ducts shall be sloped to maintenance holes to provide adequate drainage. Concrete encasement shall be provided where required by applicable code. All ducts to be roped.

- (ii) Maintenance holes and/or handholes shall be sufficiently sized and provided where access to or installation of cable is necessary.
- (d) Electrical Rooms
 - (i) Electrical rooms shall have sufficient space to house all equipment. Adequate space shall consider minimum working clearances, conduit entry points and routing, equipment removal/replacement and ventilation requirements.
 - (ii) All electrical rooms shall be constructed to provide a 2-hr fire separation. The 2-hr fire rating shall be maintained for all services entering or leaving the electrical rooms.
 - (iii) Electrical rooms shall be provided with sufficient heating, ventilation and air conditioning to ensure that the environmental conditions of the electrical rooms are within the operating requirements of the equipment installed within these rooms at all times.
 - (iv) Design of the rooms that accommodate electrical equipment shall be the result of a Project Co analysis in terms of layout optimisation, equipment removal access, Maintenance clearances and equipment expansion to accommodate future equipment to accommodate the 25% load growth, equipment operation and trade access limitations.
- (e) Emergency and Standby Power Sources
 - (i) Redundant back-up generators connections shall be able to assume the entire load of the Facility during critical events including 25% spare capacity for future growth. Generator shall be size to assure no interruption to revenue service or to normal Revenue Vehicle servicing and administrative operations. On Site fuel supply, independent of fuel supply for Revenue Vehicles, shall provide 72 hours of emergency power under full load. Emergency generators shall comply with local noise and emissions requirement and the required approvals shall be obtained by the Project Co from Governmental Authorities.
 - (ii) TVSS shall be provided for each generator output.
 - (iii) Manual synchronization means beyond the automatic synchronization control for the two back-up generators shall be provided.
 - (iv) All UPS systems shall be of the online, double conversion type, and shall be equipped with automatic static bypass switches, as well as an external manual Maintenance bypass.
 - (v) Emergency power feeders shall be rated for two hours either through the use of fire-rated cables/wiring or embedment in concrete.
 - (vi) Non-life safety loads shall be shed automatically and instantaneously in the event of generator overload.
 - (vii) Generators, fire pumps and main life safety switchboards shall not be located below grade.

- (viii) Emergency generators shall be diesel generators compliant with the requirements of CSA C282.
 - (ix) Standby fixed mounted engine generators shall be installed outdoors; a completely enclosed weatherproof/sound attenuated housing to protect the generator from adverse weather conditions and reduce sound levels for surrounding residential neighbourhoods shall be provided. Generators shall be mounted on spring isolators with a floating floor, or equivalent means, to minimize the transmission of vibration. Enclosure shall have critical grade silencing suitable for residential installation. Project Co design shall follow NEMA/IEC enclosure/environmental protection standards.
 - (x) Stand-by power generators shall be located in an area easily accessible for Maintenance and refuelling.
 - (xi) Project Co shall provide 120V/20A GFCI outlets around back-up diesel generators from UPS to provide power in the event of a concurrent generator and Utility failure.
 - (xii) Automatic transfer switches serving life safety loads shall be equipped with means of bypass to both sources
 - (xiii) When second Utility power source is selected, emergency lighting, fire alarm and other emergency equipment loads shall be connected to a UPS or battery system as required for loads classified as “emergency level 1”.
 - (xiv) BAS – The BAS system within the New Walkley Yard shall provide supervisory control of the New Walkley Yard electrical and mechanical systems, and communications subsystems.
- (f) Grounding and Bonding
- (i) Project Co shall analyse and choose the most appropriate and OSCE/IEEE/TIA compliant grounding type.
 - (ii) An applicable OSCE/IEEE/TIA compliant grounding electrode system shall be provided. Test wells shall be provided to access the ground system for measurements.
 - (iii) The grounding system shall also be bonded to building columns and all major power distribution equipment. All non-current-carrying metal enclosures and all alternating current equipment shall be securely connected to the grounding system.
 - (iv) Project Co shall provide separate grounding system for New Walkley Yard equipment room's equipment and communication and data associated systems.
 - (v) Project Co shall avoid natural gas piping and pipe connected to an active cathodic protection system.
 - (vi) Lightning protection system analysis per NFPA 780/CSA B72 and design per IEEE 1100 shall be provided for the New Walkley Yard

6.5 Equipment and Materials

(a) General Requirements

- (i) Project Co shall select equipment, components, and materials that have been listed and labeled by the CSA, ULC or other acceptable testing agency, and marked for its intended use. Comply with the Canadian Electrical Code Parts I and II, and OESC.
- (ii) When not installed in conditioned spaces, equipment and materials shall operate as per Site conditions.
- (iii) Systems interfaces shall be designed in accordance with the requirements of the systems as defined in Schedule 15-2, Part 3 – Systems.
- (iv) Power supply design for the New Walkley Yard equipment room shall comply with, in addition to the codes and standards identified in this Part 5, the TIA-942 Standard.
- (v) TVSS shall be installed at each level of the New Walkley Yard equipment room distribution system and be properly sized to suppress transient energy that is likely to occur.
- (vi) UPS back-up time required for the systems shall be calculated, designed and adequately rated to provide required quality of uninterrupted power to all critical loads, including the City's office areas, in accordance with Schedule 15-3, Part 3 – Systems.

(b) Lighting

(i) Lighting Classification

- A. Project Co shall provide lighting design per Schedule 15-2, Part 4 – Stations.
- (ii) Emergency fixtures, exit lights and essential signs shall be independently wired from the emergency lighting panel. Emergency lighting shall be automatically energized upon failure of commercial power. Emergency lighting for stairs and passageways shall be designed to accommodate egress.
- (iii) Minimum illumination levels shall comply with the values indicated for similar areas or application in the IES Lighting Handbook and NECB.
- (iv) In addition to above requirements the average level of illumination shall be achieved for particular areas:

Area	Average Lux Level
Roof Access Platform	600
Shop Pits Area	1100
Shop Area	600

Warehouse & Parts Storage Area	600
New Walkley Yard Access Area	100
Track Switch Area	60
Vehicular Storage & Yard	50
Connecting Walkways	200
Yard	50
Warehouse and Parts Storage	600
Yard Service Area & Inspection Pit	600

- (v) Project Co shall integrate the New Walkley Yard lighting in the architectural design and aesthetics, minimize glare and lighting pollution;
- (vi) Project Co shall provide New Walkley Yard normal and emergency lighting from dedicated panels. Project Co shall comply with Governmental Authority requirements for egress and exit lighting.
- (vii) Project Co shall coordinate placement of the equipment and lighting in the New Walkley Yard equipment room so that lighting fixtures are placed in aisles between cabinets and racks instead over equipment rows.
- (viii) Project Co shall provide emergency lighting from UPS around back-up diesel generators to provide illumination in the event of a concurrent generator and Utility failure.
- (ix) BAS system shall monitor and control New Walkley Yard lighting system.
- (c) Fire Alarm
 - (i) Project Co shall apply latest standards governing the fire alarm design, Maintenance and Operation. Project Co shall coordinate the design with the requirements of the Schedule 15-2, Part 3 – Systems. In addition, Project Co shall comply with all the requirements of the Governmental Authority, City and AODA.
 - (ii) Project Co shall furnish, install, and connect an intelligent reporting, microprocessor controlled, addressable, fire alarm and detection system. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, control panels, auxiliary control devices, annunciators, power supplies, and wiring as specified herein.
 - (iii) The fire detection system shall be connected to and monitored by the City TOCC. Design shall comply with CAN/ULC-S561.

- (iv) The FACP shall contain a microprocessor based CPU. The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, control circuits, and notification appliance circuits, local and remote operator terminals, printers, annunciators, and other system controlled devices.
- (v) The FACP shall perform the following functions:
 - A. supervise and monitor all intelligent addressable detectors and monitor modules connected to the system for normal, trouble and alarm conditions;
 - B. supervise all initiating signaling and notification circuits throughout the facility by way of connection to addressable monitor and control modules;
 - C. detect the activation of any initiating device and the location of the alarm condition. Operate all notification appliances and auxiliary devices as programmed. In the event of CPU failure, all SLC loop modules shall fallback to degrade mode. Such degrade mode shall treat the corresponding SLC loop control modules and associated detection devices as conventional two-wire operation. Any activation of a detector in this mode shall automatically activate associated NAC;
 - D. visually and audibly annunciate any trouble, supervisory, security or alarm condition on operator's terminals, panel display, and annunciators.
- (vi) The system shall be an active/interrogative type system where each addressable device is repetitively scanned, causing a signal to be transmitted to the main FACP indicating that the device and its associated circuit wiring is functional. Loss of this signal at the main FACP shall result in a trouble indication for the particular input.
- (vii) The fire alarm system shall allow for loading and editing instructions and operating sequences as necessary. The system shall be capable of on-site programming to accommodate system expansion and facilitate changes in operation. All software operations shall be stored in a non-volatile programmable memory within the fire alarm control unit. Loss of primary and secondary power shall not erase the instructions stored in memory.
- (viii) The system shall provide a means to recall alarms and trouble conditions in chronological order for the purpose of recreating an event history. A separate alarm and trouble log shall be provided.
- (ix) Alarm signals arriving at the FACP shall not be lost following a primary power failure (or outage) until the alarm signal is processed and recorded.
- (x) Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded on NFPA Style 6 (Class A) Signaling Line Circuits (SLC).
- (xi) Initiation Device Circuits (IDC) shall be wired Class A (NFPA Style D) as part of an addressable device connected by the SLC Circuit.

- (xii) NAC shall be wired Class A (NFPA Style Z) as part of an addressable device connected by the SLC Circuit.
- (xiii) On Style 6 or 7 (Class A) configurations a single ground fault or open circuit on the system Signaling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.
- (xiv) When a fire alarm condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur:
 - A. Indication of alarm condition at the FACP and annunciator(s).
 - B. Identification of the device or zone that is the source of the alarm at the FACP.
 - C. Operation of audible and visible notification devices throughout the building until silenced at FACP.
 - D. Shutting down supply and return fans serving zone where alarm is initiated.
 - E. Closing smoke dampers on system serving zone where alarm is initiated.
 - F. Initiation of smoke control sequence through the HVAC system.
 - G. Notifying the local fire department.
- (xv) Upon activation of a supervisory device such as fire pump power failure or tamper switch, the system shall operate as follows:
 - A. Activate the system supervisory service audible signal and identify the source at the FACP and annunciator(s).
 - B. Pressing the "Supervisory Acknowledge Key" shall silence the supervisory audible signal while maintaining the Supervisory LED "on" indicating off-normal condition.
 - C. If the "Alarm Silence" button is pressed, all audible and visible alarm signals shall cease operation.
 - D. The "System Reset" button shall be used to return the system to its normal state.
- (xvi) A manual evacuation (drill) switch shall be provided to operate the notification appliances without causing other control circuits to be activated.
- (xvii) The FACP shall comply with ULC-S527, "Control Units for Fire Alarm Systems".
- (xviii) Fire alarm system shall be completed with addressable devices, manual pull stations, smoke detectors, heat detectors, multi-criteria detectors, horns, strobes or combination of notification appliances. In addition, the Fire alarm system shall be capable to monitor non addressable modules such as water flow, valve tamper and fire pump that are not otherwise equipped for addressable communication.

- (xix) Project Co shall install system components and all associated devices in accordance with applicable building code requirements, OESC, NFPA 72, CAN/ULC S524 and manufacturer's recommendations. Installation shall be done by factory-trained, CFAA fire alarm certified personnel or by personnel licensed or certified by the local authority
- (d) Conduits and Raceways
- (i) Shall comply with OESC, NFPA-70 and NFPA-130
 - (ii) Conduits installed in finished areas of new construction shall be concealed in walls, below or in slabs, or above suspended ceilings. Exposed conduits shall not be run on the exterior surface of buildings. Conduits shall not be run through structural members across pipe shafts or ventilation duct openings.
 - (iii) Conduits in concrete slabs shall be placed between the bottom and top reinforcing steel. Separate conduits to ensure proper concrete bond.
 - (iv) Conduits shall not be embedded in waterproofed or water bearing walls.
 - (v) Conduits penetrating exterior walls of any Structure (other than handholes, manholes, or pullboxes) below grade, at grade floors, or below grade floors shall be sealed to prevent moisture migration.
 - (vi) Grounding-type expansion fittings shall be installed in raceways every 60m or less of linear run or wherever structural joints are crossed to allow for expansion and contraction.
 - (vii) Project Co shall provide the raceway system and cable pulling for equipment described and identified by facility/systems and the City. Raceways shall be designed to include at least 25% spare capacity to protect for future growth and expansion. Provide power or conduit complete with pull wire as required.
 - (viii) Open raceways shall not be installed underneath sprinkler system.
- (e) Wiring and Cables
- (i) In addition to the requirements highlighted in Schedule 15-2, Part 4 – Stations, Project Co shall comply with NFPA-70 and NFPA-130
 - (ii) Design shall be compliant with CSA 22.2 No.75 and No.38 depending of the system served and Site condition.
 - (iii) Copper wires shall be used for servicing of the systems rated below 1000V.
- (f) Boxes and enclosures shall comply with NEMA 250, CSA 22.2 No.18 and No.40 and shall be rated NEMA 1 for conditioned Spaces and NEMA 4X for outdoor and unconditioned spaces.
- (g) Electrical Identification

- (i) Identification and tagging system shall follow approved City system proposed by Project Co.

ARTICLE 7 TRACKWORK

7.1 General Requirements

- (a) Project Co shall design and construct the Trackwork within the New Walkley Yard to comply with the criteria contained in this Article, Schedule 15-2, Part 2, Article 2 – Geometric Design Criteria for Track Alignment, and Schedule 15-2, Part 2, Article 3 – Trackwork.
- (b) The scope of the Trackwork within the New Walkley Yard shall include all work to provide a complete rail yard as specified herein. This shall include, but is not limited to, the design, supply, installation, and testing of New Walkley Yard Track including Yard Tracks, shop Tracks, Connecting Tracks, test Track, Spur Tracks and any and all related incidentals.
- (c) The limits of the Connecting Tracks shall begin at the point equivalent to the last long tie of the Mainline Track turnouts and end at the switches for the yard Track.
- (d) The Yard Track shall begin at the points of switches for the yard Storage Tracks and the yard shop Tracks.

7.2 Operational Requirements

- (a) Project Co shall design and construct the yard Storage Tracks to hold or store Trains in configuration for service with clearances as follows:
 - (i) clear of other Tracks and structures between clear points, defined as the location where Revenue Vehicle dynamic envelopes between two diverging Tracks from a given turnout are a minimum of 305mm apart;
 - (ii) clear of adjacent switches, roadway vehicular crossings and pedestrian crossings; and
 - (iii) clear of other parked Trains by a minimum of 1m.
- (b) Project Co shall design and construct the Track layout to:
 - (i) facilitate efficient, direct and rapid vehicle moves between Mainline Tracks, Storage Tracks, and Maintenance facilities; and
 - (ii) avoid the potential for single point failures to cripple yard operations.
 - (iii) provide all required functionality.

7.3 New Walkley Yard Track Structure Types

- (a) General
 - (i) Track structure types shall be consistent with the descriptions identified herein and Schedule 15-2, Part 2, Article 3 – Trackwork.
 - (ii) Embedded, direct fixation or ballasted Track shall be generally used at the New Walkley Yard, exterior to buildings, for the Revenue Vehicle storage yard, Connecting Track and other Site required Track.

- (iii) Paved or embedded Track shall be used in roadways and crossings with Site roadways, service aisles, cart paths and walkways.
 - (iv) Embedded Track shall be utilized in the shop buildings and aprons immediately outside of buildings.
 - (v) Post Track shall be utilized in pit areas of the shop building and inspection pit where under-vehicle access is required.
 - (vi) Direct fixation Track shall be utilized in wash Tracks.
 - (vii) Selection of Track segment types for areas identified in (i) and (ii), above, shall be driven by function, operational criticality, construction and life-cycle cost per the recommendations within AREMA Chapter 16 Economics of Railway Engineering & Operations.
 - (viii) Provide heated road/rail crossings within yard limits
- (b) New Walkley Yard Embedded Track
- (i) For the New Walkley Yard, Project Co may consider alternate forms of embedded Track from that described in Schedule 15-2, Part 2, Article 3 – Trackwork.
- (c) Paved Track shall have:
- (i) infill material placed to embed the rails to top-of-rail elevation;
 - (ii) gaps on the gauge side of the running rails for wheel flange ways; and,
 - (iii) ballasted Track structure type.
- (d) Post Track
- (i) Post Track shall include a rigid rail fastener system anchored to structural beams and/or columns.

7.4 New Walkley Yard Rail Configurations

- (a) General
- (i) Rail configurations shall be consistent with the descriptions identified in Schedule 15-2, Part 2, Article 3 - Trackwork.

7.5 Track Materials

- (a) General
- (i) Materials identified in Schedule 15-2, Part 2, Article 3 – Trackwork and in the following sections shall be used for all Track construction.

(b) End-of-Track Devices

- (i) Rail-mounted wheels stops shall be used at the stub-ends of shop Tracks to impede the travel of any rail bound Revenue Vehicle beyond the end of the Track(s).

7.6 Special Trackwork

(a) General

- (i) Special Trackwork shall comply with requirements identified herein and Schedule 15-2, Part 2, Article 3 – Trackwork.

(b) Turnouts

- (i) Acceptable minimum turnout radius within the yard Track shall be 30m. The absolute minimum turnout radius shall be 25m and shall be used only where absolutely necessary.

(c) Trap Switches

- (i) Trap switches shall be used to prevent non-registered Trains and Maintenance Vehicles from entering the mainline. The switch shall be normally pointed to the yard and set to allow entry to the mainline only if the movement authority is granted by the S&TCS.

ARTICLE 8 COMMUNICATION, CONTROL AND SECURITY SYSTEMS

8.1 General Requirements

- (a) Design and construction of all communication, control and security work shall be in conformance with the requirements of Schedule 15-2, Part 3 – Systems as applicable.
- (b) The communication systems for the New Walkley Yard shall provide support to Project Co operations and interface with the City.

8.2 Operational Description

- (a) CTS TOCC Interface – Project Co shall provide an interface including all cable, conduit and cable trays for the CTS as detailed in Schedule 15-2, Part 3 – Systems.
- (b) New Walkley Yard PA System – The New Walkley Yard shall be equipped with a PA system that shall allow personnel to make announcements throughout the MSF facilities, yard areas, and selected areas of the facilities or yard. The system shall operate within local regulations and applicable laws with respect to ambient noise.
- (c) CCTV – CCTV cameras shall be provided as detailed in Schedule 15-2, Part 3 – Systems. Cameras shall be deployed strategically throughout the New Walkley Yard to provide visual images of the New Walkley Yard to be viewed at the TOCC and BCC. The CCTV system shall use video analytics and/or intrusion detection systems to detect if people or objects have made unauthorized entry into the New Walkley Yard Tracks including the yard wye and road crossings into the facility. The CCTV system shall be capable of monitoring Train movements throughout the yard and within the Facility.
- (d) Telephone System – Project Co shall provide telephones as detailed in Schedule 15-2, Part 3 – Systems.
- (e) SCADA – The SCADA systems shall be as detailed in Schedule 15-2, Part 3 – Systems.
- (f) Voice and Data Radio Communications – The voice and data radio systems shall be as detailed in Schedule 15-2, Part 3 – Systems.
- (g) IAC – The IAC system shall control access and provide for detection of intrusion into entrance points of the New Walkley Yard including entrances along the perimeter fence as detailed in Clause 8.3(c) of this Part 5.

8.3 Performance Requirements

- (a) Revenue Vehicle Management
 - (i) Project Co shall be responsible for the monitoring and coordination of all Revenue Vehicle movements within the New Walkley Yard facility and from/to the yard and the mainline.

- A. This includes monitoring of all Yard Track switch movements, monitoring of Revenue Vehicles in yard, and up to the yard lead demark for turn over to mainline operations.
- (b) CCTV
- (i) Camera locations within the New Walkley Yard shall be located
 - A. to provide complete camera coverage of the New Walkley Yard exterior and perimeter;
 - B. at entrances and exits to New Walkley Yard buildings and access controlled locations;
 - C. at entrances to yard wye, access roads and pedestrian access through perimeter fence;
 - D. in areas where Maintenance activities require safety and security; and,
 - E. At the hand off areas where Operators will hand-off and hand-back the Vehicles.
 - (ii) CCTV coverage shall be provided at each switch or groups of switches to allow the yard controller to observe switch / interlocking areas and entrances.
 - (iii) The CCTV system shall have video analytics and/or intrusion detection systems to detect if there has been unauthorized entry into the New Walkley Yard Track areas within the perimeter fence.
 - (iv) The CCTV system shall document the condition of Revenue Vehicles at the inspection area upon entering and exiting the yard.
- (c) Intrusion Access Control System
- (i) The system shall provide controlled access and detect intrusion as follows:
 - A. External doors, entrances and exits of the New Walkley Yard;
 - B. Yard perimeter and access gates including the yard wye;
 - C. All rail Operations spaces; and,
 - D. All entrances to communications rooms, electrical/mechanical room, IT rooms.
- (d) Train-to-Wayside Wireless System
- (i) The Train-to-wayside wireless system shall provide all Revenue Vehicles with a wireless data connection at the New Walkley Yard for the data transfer of Train diagnostics, CCTV video review from the TOCC, CCTV video downloads from the TOCC, and Passenger counts.

- (ii) A LAN connection shall be provided between the wireless access points and the nearest communications room in order to connect to the CTS.

ARTICLE 9 VEHICLE SERVICE EQUIPMENT

9.1 Overview

- (a) Project Co shall provide all equipment, accessories, materials, etc., and building systems to meet the Maintenance and Rehabilitation Services requirements of the Project Agreement.

9.2 Baseline Requirements for Industrial Equipment

- (a) This section sets forth baseline requirements that apply to all Revenue Vehicle service equipment defined herein.

(b) General Requirements

- (i) Equipment shall be manufactured, installed and operated in accordance with all industrial and safety standards that apply to the Works, including but not limited to:

- A. CCOHS;
 - i. OHSA
- B. CSA;
 - i. CSA Standard C22.2 No 94
 - ii. CSA Standard C390-10
 - iii. CSA W47.1
 - iv. CSA W59
- C. CEAA;
- D. CGSB;
- E. CISC;
- F. CWB;
- G. NBCC;
- H. NFCC;
- I. NPCC;
- J. OBC; and,
- K. OESC (Ontario Regulation 164/99).

- (ii) Labeling

- A. Manufacturer shall securely attach in a prominent location, Lamacoid black text on white background labels, on each major item of equipment a noncorrosive, indelible nameplate showing manufacturer's name, address, model number, serial number, and pertinent Utility or operating data using industry standard size and font
 - B. All electrical equipment and materials shall be new and shall have attached labels attesting to CSA or ESA approval, in categories for which standards have been set by that agency and labeled as such in the manufacturer's plant.
- (c) Project Co shall determine which equipment, accessories, materials, etc. are needed to meet the Maintenance requirements of the Project Agreement and in what quantities. At a minimum, the following equipment shall be provided within the New Walkley Yard:
- (i) sand dispenser system;
 - (ii) diesel fuel storage, of not less than 37,584 L, and dispensing system;
 - (iii) pressure washing equipment for both vehicle cleaning and as required for parts cleaning in the shop;
 - (iv) mobile column lifts in sufficient number and configuration to service all vehicle types;
 - (v) DMU exhaust extraction;
 - (vi) fall protection (overhead and pit);
 - (vii) battery charger system;
 - (viii) cranes;
 - (ix) hoists;
 - (x) forklift trucks;
 - (xi) fluids distribution system;
 - (xii) compressed air system;
 - (xiii) parts storage; and,
 - (xiv) Diesel exhaust fluid storage.

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**SCHEDULE 15-2
DESIGN AND CONSTRUCTION**

**PART 6 DESIGN AND CONSTRUCTION REQUIREMENTS – URBAN DESIGN,
LANDSCAPE ARCHITECTURE AND CONNECTIVITY
REQUIREMENTS**

ARTICLE 1 INTRODUCTION

1.1 Introduction

- (a) The work under this Part 6 identifies the requirements for the integration of the Stations, sidewalks, MUPs, work on NCC lands and City lands that shall be developed to enhance the public realm.
- (b) The Site plans shall be developed in conjunction with the Stations, Civil and Guideway and Federal Land requirements to provide a comprehensive solution for the alignment.

1.2 Overview

- (a) The Project includes the design and construction of the site development for the proposed Stations, Park and Ride facilities, MUPs, PPUDO, bike rack and storage areas, sidewalks, and landscape restoration of lands affected by the construction of the Expanded Trillium Line.
- (b) Project Co shall complete the design and construction of the Site works for the alignment and Stations including all the plazas, pathways, MUPs, street furniture and planting.
- (c) Project Co shall obtain all the necessary approvals for the construction of the Site works. Refer to Schedule 17 - Environmental Obligations and Schedule 15-2, Part 2, Article 5 – Drainage and Stormwater Management Design Criteria for coordination with final Site works.
- (d) Project Co shall submit, in accordance with Schedule 10 – Review Procedure, the Site plans for:
 - (i) 13 Stations, and the New Walkley Yard;
 - (ii) Protection of, and enhancement to, the connectivity for the Stations, and the adjacent community;
 - (iii) Modification to, and additional development of, the Park and Ride facilities;
 - (iv) MUPs adjacent to the Track alignment, with connections to existing Facilities, as indicated within this Part 6;
 - (v) Development of Tree Mitigation Report(s) and Tree Compensation Drawing(s);

- (vi) Development of the mitigation plan for the SWM requirements;
- (vii) Miscellaneous mitigation works as identified within this Part 6;
- (viii) Design and construction of PPUDO and connecting sidewalks and MUPs to Stations and Bus Platforms;
- (ix) Design and construction of new bicycle racks and storage areas; and
- (x) Restoration of lands required for the construction of the Expanded Trillium Line, including the construction staging areas.

ARTICLE 2 DESIGN CRITERIA

2.1 Introduction

- (a) This article presents the design criteria for the landscape architecture and urban design that shall be integrated into the design of the Project, including the standards for streetscape elements, bicycle facilities, Park and Ride facilities, fencing, pedestrian and cycling access to the Stations, planting and tree compensation.

2.2 Reference Documents

(a) Order of Precedence

- (i) All Project urban design and landscape Works shall comply with the criteria contained within this Article and the Applicable Law, guidelines or practices applicable to the Project, including but not limited to the following Reference Documents. In the event of a conflict between the criteria, commitments or requirements contained within one document when compared with another, the more stringent shall apply. The order of precedence for this portion of the Project Agreement shall be as follows:
- A. The criteria in this Article;
 - B. OBC;
 - C. COADS;
 - D. AODA;
 - E. OTM (Books 1 through to 12, and 18);
 - F. City of Ottawa Construction Specifications, Drawings and Details;
 - G. Other relevant City Operation Policy, Procedures and Guidelines;
 - H. OPSS and OPSD;
 - I. TAC Guidelines for Understanding Use and Implementation of Accessible Pedestrian Signals; and,
 - J. Canadian Standards for Nursery Stock, most recent edition.

2.3 Scope of Work

- (a) The general scope of work shall include:

- (i) Public realm: Station entry plazas, Site furnishings, pedestrian lighting, sidewalks and MUP connections from the community to the Station Plaza entry, PPUDOs, bike facilities, plant material, and miscellaneous items to complete the Work;
- (ii) The MUPs along the alignment and providing community connections;
- (iii) Park and Rides: the parking lot configuration, pedestrian requirements, lighting, plant material and coordination with Site plan requirements;
- (iv) Any restoration and rehabilitation of the lands disturbed by the construction of the Project; and,
- (v) All other works identified within this Part 6.

2.4 Urban Design and Landscape Architectural Design

- (a) Project Co shall ensure that designs meet COADS and AODA standards for all Works surrounding bus waiting areas, sidewalks, entrances and pathways to the Station entry. Safe, efficient and accessible pedestrian circulation shall be given the highest priority in Station design.
- (b) Project Co shall ensure that there is a consistent use of standard landscape elements including fencing, paving, plant material and other items identified in this Article utilized throughout the alignment and proposed Stations.
- (c) Project Co shall ensure that urban development and landscape treatments compliment the adjacent land use. Pedestrian and cycling links shall be protected and connections to the adjacent communities provided.
- (d) Refer to Article 3 – Connectivity Requirements, of this Part 6 and Article 4 – Site Specific Desired Outcomes, of this Part 6 for additional requirements.
- (e) Project Co shall utilize native plant material wherever feasible.
- (f) Where appropriate, Project Co shall preserve and incorporate existing landforms and vegetation into urban design. Designs shall be achieved with the intent to minimize impacts to the surrounding environment.
- (g) Project Co shall ensure that the landscape design of each Station shall have standard and common finishes. All Stations shall express the local character and qualities of their communities and planning context and assist in wayfinding/Station identification. Station entrances shall be easily identifiable and be designed to discourage loitering and to maximize safety/observation.
- (h) Project Co shall design and construct the urban design elements and landscaping in accordance with CPTED principles.

- (i) Project Co shall design and construct all Emergency egress points to accommodate snow removal and clearing operations. Project Co shall provide a turnaround for the snow clearing equipment as per Schedule 15-2, Part 2, Article 1 – Introduction.

2.5 Park and Ride Facilities

- (a) Project Co shall ensure that the design and construction of Park and Ride facilities adhere to City standards, including the following:

- (i) There shall be a minimum of [REDACTED]% landscape treatment within the parking lot. This landscape treatment may contain a combination of paved walking surfaces, dry SWM facilities, street trees and sod. Wet ponds shall not be considered part of the 15% landscape requirements;
- (ii) The alignment of the stalls shall be parallel to the Station Platform, with the drive aisles perpendicular to the Station Platform and Station Plaza;
- (iii) The accessible parking spaces shall be designed according to COADS and located immediately adjacent to the Station entry;
- (iv) Refer to Schedule 15-2, Part 4, Article 2.6 – Functional Requirements for additional park and ride requirements;
- (v) There shall be a main drive aisle, with sidewalks on either side, perpendicular from the Station to the furthest limit of the parking lot. This main drive aisle shall have shade trees adjacent to the sidewalk, with a maximum of 7m on centre spacing.
- (vi) There shall be a continuous sidewalk connecting the Park and Ride facility to the Station Plaza. Where the pedestrian route crosses a traffic lane(s), a painted crosswalk demarcating the pedestrian route shall be provided.
- (vii) The parking lot shall be divided into parking cells, aligned with drive aisle access, and a maximum of 200 parking spaces per cell.
- (viii) The cells shall be defined with parking islands at the end of each row of parking spaces.
- (ix) In each cell, the islands closest to the Station shall have a minimum of two deciduous trees, with a minimum width of 3m, and a surface treatment capable of allowing the precipitation to infiltrate to the soil.
- (x) In each cell, the islands furthest from the Station shall have a minimum width of 2.4m, paved walking surface, and TWSI to current City standards.
- (xi) The pedestrian route between the islands shall be delineated on the roadway surface.

- (xii) The pedestrian sidewalk shall be immediately adjacent to the parking lot, and offset a minimum of 2.4m from any MUP. There shall be a landscape buffer between the sidewalk and MUP, and shall include shade trees, with a maximum of 7m on centre.
- (xiii) Supplemental lighting for the sidewalk shall be provided as required to provide lighting levels to meet the Schedule 15-2, Part 4, Article 6 - Electrical Design Criteria.

2.6 Landscape Plans

- (a) Project Co shall submit Landscape Plans in accordance with Schedule 10 – Review Procedure for the following:
 - (i) Station, Facilities and Site Specific Drawing Requirements:
 - A. Layout drawings, dimensioning all landscape items, including snow storage locations;
 - B. Grading drawings, indicating the drainage in accordance with the criteria of Schedule 15-2, Part 2, Article 5 – Drainage and Stormwater Management Design Criteria and shall include the finished elevations of all built elements from the edge of the Station façade to the original surface, edge of roadway curb, or limits of adjacent landscape not disturbed by the construction;
 - C. Fencing plans, indicating all fence locations, Maintenance and access gates, bridge fences, heights, and connections to existing and proposed features;
 - D. Planting plans;
 - E. Details indicating all construction requirements for the landscape items; and,
 - F. All coordination Site works, including civil, electrical, architectural, existing and proposed above and below services, and existing vegetation, Structures and miscellaneous works to provide a complete illustration of the proposed Site with the adjacent lands.
 - (ii) Proposed MUP and Connectivity Requirements:
 - A. Layout and grading, including cross-slopes for all proposed pathways, MUPs and sidewalks, bridges, Culverts, lighting and wayfinding signage, roadway crossings, beyond the individual Stations and connections into the existing pedestrian and cycling system.

- B. All coordination Site works, including civil, electrical, architectural, fencing, existing and proposed above and below services, stormwater management criteria, and existing vegetation, Structures and miscellaneous works to provide a complete illustration of the proposed Site with the adjacent lands.
- (iii) Tree Mitigation Report(s) and a Tree Compensation Plans(s)
- A. Project Co shall submit the complete package of Mitigation Report(s) and Tree Compensation Plan(s) for review prior to commencement of work. Segmentation of the works shall not be permitted.
- B. The City shall complete a tree survey of the alignment of the Airport Link. This tree survey can be utilized by Project Co to develop the Tree Mitigation Plan for the corridor.
- (iv) Tree Mitigation Plan(s) shall include:
- A. Survey of all existing trees, including species, caliper, and evaluation within the limits of construction;
- B. Survey of all existing trees, including species, caliper and evaluation within 6m of the limits of construction on City, Federal, or private lands;
- i. Project Co shall make all reasonable efforts to obtain the required property consents. Project Co shall notify the City if they are not successful in obtaining access, and the City will:
- 1 Obtain the consent; or,
- 2 Waive the requirement to survey trees outside of the limits of construction on City, Federal, or private lands.
- C. Identify all SAR Butternut trees, and SAR bat maternity roost trees, methodology of protection wherever feasible, where removal is required, provide mitigation and/or compensation as per Schedule 17 – Environmental Obligations and as identified in any SARA permitting requirements; and,
- D. Methodology for the review, and approval, of any trees identified for protection during the initial planning, and subsequently identified for potential removal due to construction conflicts.
- (v) Tree Compensation Plan(s) shall include:

- A. Limits of construction as per Schedule 15.2, Part 1, Article 4 – Design and Construction, and Tree Protection Fence(s) as required to protect all existing trees identified to remain.
 - B. Location, species, quantity and size of proposed trees for the compensation for all the existing tree removals. Project Co shall be required to provide a minimum of tree replacement at the equivalent to 0.25:1. Additional requirements, if necessary will be the responsibility of the City.
 - C. Identification of proposed butternut plantings, as per Schedule 17 – Environmental Obligations.
- (b) Restoration Drawings
- (i) Project Co shall provide restoration drawings for all lands affected by the construction of the Works, including temporary construction facilities.
 - (ii) The restoration drawings shall include all other lands affected by the construction, not identified above and shall identify:
 - A. Existing structures and facilities to be removed, including all permanent and temporary roads and facilities.
 - B. Grading and layout of all pathways, roadways, sidewalks, lighting, and miscellaneous Site works; and
 - C. Final landscape treatment, including seeding, sodding, plant material, and miscellaneous items to restore the Site.

2.7 Urban Design and Landscape Elements

- (a) Project Co shall design and construct sidewalks, pathways and plaza pavement in accordance with the following:
- (i) Each Station shall have an entry plaza, across the façade of all Passenger entry points to the Station, large enough to accommodate the peak flow identified.
 - (ii) The Station Plaza shall extend from the front face of the Station to the adjacent roadway, and encompass any existing sidewalks.
 - (iii) There shall be a minimum of 3m clear from the front façade of the Entry or Ticket Machines to any intersecting MUP.
 - (iv) A cast in place concrete paving shall be used to construct primary sidewalks and plaza spaces. Sidewalks and plazas shall meet the requirements of COADS, have a minimum width of 3m, unless specified elsewhere in this Part, and shall be

- capable of withstanding heavy duty commercial use including access by Emergency and Maintenance Vehicles as per City standards.
- (v) Contrasting pavers and textures delineating thresholds and pedestrian routes to meet the COADS, AODA and CAN/CSA B651 shall be provided at all Stations and bus platforms. This shall commence at the limit of the Station Entry Plaza and be continuous through to the Station and shall extend to any bus shelters located within, or adjacent to the Station Plaza. The pavers and textures shall be consistent with the materials utilized within the Station and bus platforms.
 - (vi) Sidewalks and MUPs shall be designed in accordance with the applicable existing and recreational networks of the surrounding community and shall adhere to City of Ottawa Construction Specifications, Drawings and Details for MUPs. Within Federal Lands, MUPs and pathways shall adhere to NCC standards. Design and selection of construction materials and layout alignment shall be consistent with specific Site context and associated landscape type.
 - (vii) Sidewalks and MUPs shall be reconstructed to their full width. Patching shall not be permitted.
 - (viii) All existing recreational pathways, MUPs and sidewalks shall remain open to public use during construction. Refer to Article 3 – Connectivity Requirements, of this Part 6.
 - (ix) The primary sidewalks and secondary pathways shall meet the requirements of the AODA and COADS, and shall not exceed a grade of 5% with a minimum landing distance of 6m at the bottom of each slope prior to a horizontal alignment shift. Cross slopes shall not exceed 2%. The primary sidewalks and secondary MUPs shall be designed to maintain positive drainage, as per Schedule 15-2, Part 2, Article 5 - Drainage and Stormwater Management Design Criteria.
 - (x) Depressed curbs shall be provided at all sidewalk roadway interfaces and shall be in proximity to bicycle parking areas to facilitate safe access from roadway to sidewalk.
 - (xi) Pedestrian crosswalks with vehicular traffic, including cycle lanes shall include TWSI as per City of Ottawa Construction Specifications, Drawings and Details.
 - (xii) PPUDOs shall be installed with a continuous pedestrian sidewalk to the Station as delineated in Article 4 – Site Specific Desired Outcomes of this Part 6.
 - (xiii) Paving materials shall be as follows:
 - A. Concrete Paving: shall be to 35 MPa, with a magnesium float finish, caulked expansion joints and saw cut control joints. There shall be no tooled edges; and,

- B. Project Co shall design and construct new work to provide smooth, safe and seamless transition of materials, where the construction of sidewalks, pathways, MUPs and Station Plazas adjoins existing installations.
- (xiv) Project Co shall delineate the intersections between the bus and LRT Passengers accessing the System from the cyclists and MUP users with the following:
- A. Where a cycle track or MUP intersects with a Station Plaza, the concrete paving of the entry Station Plaza shall extend across the cycling/MUP facility.
 - B. Where a bus stop occurs on a Roadway, the concrete paving from the bus waiting area shall extend across any MUP or segregated cycling facility. The minimum length of the concrete paving shall be 9.0m.
 - C. Three double soldier course bands of interlocking paving, minimum 600mm on centre spacing shall be installed as warning indicators on the cycle track or MUP in the asphalt paving.
- (b) Site Furnishing
- (i) Quantities of Site Furnishings shall be as per Article 4-2, Site Furnishings, of this Part 6.
 - (ii) Site furniture shall be in the family of complementary Site furnishings, benches, bicycle racks, waste receptacles, and lighting, from the Confederation Line, that provide an unobstructed view of the underside of the furniture, coordinated with the interior Station furniture, and sustainable in terms of its recycled content and long-term durability. Site furnishings shall be strategically placed along sidewalks, Station Plaza spaces and Platform areas to maximize their use and not encumber pedestrian movement. All furniture shall be fastened to the surface with non-corrosive fastenings to reduce vandalism and to protect for future replacement requirements. All furniture and landscape features shall be coordinated with light standards, CCTV and other elements to reduce vandalism. Site furnishes utilized on the Confederation Line include:
 - A. 3-Stream Recycling Container Car-180 by Canaan Site Furnishings;
 - B. Narrow U-stand, stainless steel Bicycle Rack MBR-500 DB, by Maglin; and
 - C. Ipe wood slats, powder coated cast aluminum sides, Bench, MLB 100-W-A, by Maglin; and
 - D. KicK – K4 Small Scale Luminaire, Light Standard, by Architectural Area Lighting.

- (iii) The Site furniture shall be located to provide clear access and visibility to any Site wayfinding signage, so that it does not obstruct views for CCTV and with sufficient offset to restrict unauthorized access.
 - (iv) Waste/recycle receptacle units shall be provided and shall be easily accessible for Maintenance and trash pick-up. Waste/recycle receptacles shall be installed outside of all Stations and at the bus Platform areas. A minimum of one waste/recycle receptacle unit shall be required per Station entrance and shall be located such that it does not obstruct pedestrian traffic flow.
 - (v) Benches shall be strategically placed at key gathering and waiting zones, be highly visible (CPTED) and clear of any pedestrian traffic. Benches shall be designed according to AODA and COADs standards.
 - (vi) New Bicycle Racks shall be provided in accordance with the quantities noted in this Article. Bicycle racks shall be located within the Station Plaza a maximum of 9m from the Station entry. A minimum of 80% of bicycle racks shall be sheltered. Clear access from the MUP to the bicycle parking shall be provided and additional area to accommodate dismounting and mounting of the bicycle beyond the width of the MUP. There shall be sufficient space to double the bicycle parking within the plaza or the adjacent turf, without the requirement for additional grading/retaining walls or elimination of streetscape elements. Expansion locations shall be identified on the Landscape Plans.
- (c) Access Control
- (i) Fencing barriers at all Stations shall be provided to prevent public access to the Tracks and Fare Paid Zones. Fences shall also serve as dividers separating pedestrians and cyclists at specific areas and prevent customers from crossing the bus roadways.
 - (ii) Landscape handrails shall be designed to meet the OBC and the AODA and shall be integrated with the design of the stairways and ramps to meet the above codes. All handrails and fastenings shall be stainless steel, exterior grade.
 - (iii) Bollards shall be provided to control vehicular and cycling activities adjacent to the Stations. Bollards shall be designed to facilitate replacement as required.
 - (iv) All bollards shall have reflective tape.
- (d) Fencing
- (i) The alignment shall be fenced to restrict access to the Track, and shall meet the following criteria:
 - A. General:

- i. Shall be within the Lands identified for the alignment and Stations;
 - ii. Shall be continuous along the alignment and Stations and connect to vertical walls and abutments at Stations and Bridges;
 - iii. Shall be a minimum of 1.8m high chain link fence except at Structures over the alignment;
 - iv. The height shall be measured from the publicly accessible side;
 - v. Shall be offset a minimum of 1.2m from any Structures or built elements that would assist in facilitating public access to the Track or Fare Paid Zones; and,
 - vi. Shall be offset a minimum of 600mm from the base of any landform.
- B. Station fencing:
- i. Shall encompass the Fare Paid Zone, as required, to restrict access to the entry points at all Stations.
 - ii. Shall encompass the bus Stations to accommodate for unrestricted Passenger flow between the Train and the bus; and,
 - iii. Shall have one set of two lockable gates, each a minimum 1.8m in width, situated between any bus Station and Train Station to accommodate Passenger movements during Train Station closure.
- C. NCC/Federal Lands:
- i. In addition to all requirements of this Clause 2.7(d)(i), all fencing, within, or adjacent to, NCC or Federal Lands, shall be black vinyl coated chain link fencing, with black powder coated posts.
- D. Track alignment fencing shall:
- i. extend continuously along the Track throughout the alignment;
 - ii. Project Co shall inspect the alignment, install new fencing as required and repair any damaged sections of the fence to meet the Requirements of this Article;
 - iii. be located within the Lands;
 - iv. have lockable service gates, as required for service and Emergency vehicle access, as per Schedule 15-2, Part 1, Article 2 – Physical Layout;

- v. each service gate shall be a minimum of 1.8m in width, with a lock box fixed to the adjacent fence fabric, for Emergency access; and,
- vi. service gates that have a 1.8m wide paved pathway from the nearest MUP, roadway or service access road. There shall be sufficient paved surface to accommodate the turnaround of snow clearing equipment Schedule 15-2, Part 2, Article 1 - Introduction.

E. Bridge Structure Fencing:

- i. Project Co shall provide Guideway protection fencing on all new and existing Bridge Structures that span the alignment and have pedestrian or cyclist movements. The minimum height from the adjacent pedestrian accessible spaces shall be 2.4m clear as measured from the walking surface or accessible ledge of parapet wall, for all proposed and existing Bridge Structures over the alignment;
 - 1 It shall be acceptable to include the height of a non-climbable parapet wall when measuring the required 2.4m height.
 - 2 Project Co shall provide a transition zone of fencing from the 2.4m height to the required Bridge guardrail height. The length of the transition zone shall be no less than 3.5m.
- ii. Shall be non-climbable;
- iii. Shall extend the full length of the Bridge structure and parapet walls where the Bridge spans only the alignment;
 - 1 Where Bridge Structures span the Guideway and other elements including roadways, parks, and streams, the full height fencing is required to extend across the Track limit to a distance of 6.0m beyond the most adjacent Track centre; and,
 - 2 From the location identified in Clause 1 above (6.0m beyond the most adjacent Track centre), Project Co shall provide a transition zone of fencing.
- iv. Shall be designed to be integrated within the structural requirements of the Bridge;
- v. Shall have vertical pickets, 100mm on centre, with 150mm extending above the top horizontal member, and 100mm below the bottom horizontal member;

- vi. Shall have a steel mesh, maximum 25mm openings, attached to the alignment side of the pickets, and extend from the bottom to top rail; and,
- vii. Shall have a black vinyl coated finish for all elements.
- viii. Project Co may propose alternative decorative designs for the vertical picket and rail design described above. Acceptance of any design not conforming to this section shall be at the sole discretion of the City.

F. Airport Station and elevated Guideway fencing:

- i. Project Co shall provide fencing on the elevated Structure adjacent to the operating airfield meeting OPSD-900.01 Chain Link Fence for Airside Installations; and,
- ii. For the purpose of this Project, the ground line identified in OPSD-900.01M shall equal the height of the Station Platform.

(e) Bridge Guardrails

- (i) Bridge Guardrails shall be designed to accommodate the requirements for raised cycling facilities at the back of roadway curb. Refer to Schedule 15-2, Part 2, Article 4 – Structural Design and Requirements;

(f) Site Lighting

- (i) All Station Plazas, sidewalks, Platforms and other areas external and immediately adjacent to Stations that are accessible to the public shall be lit with an LED light source to provide improved safety and security, and meet the requirements of Schedule 15-2, Part 4, Article 6 – Electrical Design Criteria.
- (ii) All pedestrian lighting shall be LED, downcast and have full cut-off to minimize light pollution. Additional shielding or cut-off fixture shall be provided adjacent to residential communities.
- (iii) All direct pathway connections from the adjacent street to the front entry Station Plaza shall be lit, and provide a continuous light level with the front entry Station Plaza, and as indicated in this Part.
- (iv) All pathway lights shall have a 4.3m height pole.

(g) Signage

- (i) All signage, including temporary construction staging, shall be bilingual.

- (ii) Refer to Schedule 15-2, Part 7 - Traffic and Transit Management and Construction Access for construction staging signage requirements.
 - (iii) Permanent bilingual wayfinding signage shall be provided throughout the corridor, and directing the community along the MUPs and sidewalks to the individual Stations.
 - (iv) At each Station, wayfinding signage shall be provided at the interface between the Station Plaza and MUP providing direction to the adjacent Station.
 - (v) Directional wayfinding signage shall also be provided at each MUP junction indicating the next Station in either direction.
 - (vi) Bilingual wayfinding signage shall indicate the following:
 - A. Station Name; and,
 - B. Approximate distance to Station.
 - (vii) Wayfinding signage graphics shall meet and match the existing signage on the pathway system. The content and location of the signage shall be approved by the City.
 - (viii) The location of the wayfinding signage shall take precedence over the location of street furniture, plant material or other items which may restrict clear access to the view the signage.
 - (ix) Project Co shall coordinate with the NCC for the wayfinding and regulatory signage located within federal lands.
 - (x) Project Co shall develop, design and install at least 10 interpretive panels along the Expanded Trillium Line MUPs or at the Expanded Trillium Line Stations which describes the heritage history and character of the former CPR rail line in accordance with Schedule 17 - Environmental Obligations. The interpretive panels, including their locations, shall be developed in consultation with the City's Heritage staff and federal stakeholders. A report detailing the research to support the text and graphics for interpretive panels including the design drawings shall be submitted to the City for review and approval in accordance with Schedule 10 - Review Procedure. The [REDACTED], shall form the basis of the research for the report.
- (h) Existing Plant Material
- (i) Existing plant material shall be protected where feasible and as per the Tree Mitigation Plan(s).

- (ii) Provide an Existing Tree Protection/Monitoring Plan, developed by a Licensed Arborist, which defines the methodology for the protection and Maintenance of the existing trees.
 - (iii) Protect plant material during construction as per City and NCC specifications and standards. Ensure protective fencing is inspected and repaired as required.
 - (iv) Any plant material required to be removed for the construction of the Project shall be replaced to the City standards for trees, and one to one replacement for shrubs and perennials.
 - (v) Any existing trees identified for protection, and proposed for removal during construction, shall be reviewed, and approved by the City prior to removal.
- (i) Proposed Planting
- (i) Planting outside of Stations shall be used to define spaces, provide shade and reduce wind speed on Platforms to help direct customers safely between public streets and Station entrances and assist in deterring pedestrian crossings through restricted access areas. Plant material shall be designed to be harmonious with the architecture and scale of the Station and coordinated with sight line locations for security cameras and Station lighting, in particular with respect to anticipated vegetation growth.
 - (ii) Planting shall adhere to CPTED requirements.
 - (iii) Street trees shall be integrated into the pedestrian plazas adjacent to the Stations to provide shade and comfort to the pedestrians. Where the trees are integrated within a paved plaza surface, a structural support system or a root control system below the paved surfaces shall be integrated into the overall design to provide a sufficient root growth to sustain growth.
 - (iv) Quality and source shall comply with the CNLA metric guide referring to size, development and rootball of plant material. Measure plants when branches are in their natural position. Use trees and shrubs of No.1 Grade. All plant material shall be hardy to the local urban conditions and native to the Ottawa area where possible. All plant material shall meet the requirements of “Canadian Standards for Nursery Stock.”
 - (v) Plant material shall be hardy to the urban conditions, winter Maintenance requirements and be designed to be low-Maintenance both in the short and long term. Plant material shall be salt tolerant when used in areas adjacent to bus facilities and in areas identified for snow storage. Local native species shall be selected wherever feasible. Supplemental watering to assist in establishment of the plant material shall be required. A long term potable water irrigation system shall not be permitted.

- (vi) The plant material palette shall include a variety of plant material to provide seasonal variety and colour.

Minimum Planting Criteria for Station and Guideway Landscapes

Plant Material	Size	Spacing
Deciduous Trees – large	70mm cal.	5.0ms
Deciduous Trees – medium	45mm cal.	4.0m
Coniferous Trees	1.5m ht	3.0m
Coniferous Shrubs	45cm spread	900mm
Deciduous Shrubs	45cm ht	900mm

(j) Topsoil

- (i) All in-situ topsoil stripped for construction requirements shall be removed off-Site unless there is sufficient room to stockpile topsoil at no greater height than 1.2m. Stockpiled topsoil shall only be used in areas of seeding adjacent to the alignment.
- (ii) All topsoil shall be fertile, friable, natural sandy loam containing not less than 4% of organic matter for sandy loams, with an acidity value ranging from pH 6.0 to pH 7.5 and capable of sustaining vigorous plant growth. It shall be free of stems or roots, stones and clods more than 50mm diameter or other extraneous matter. Topsoil shall be screened. Topsoil shall not be supplied in a frozen state.

(k) Sod

- (i) All turf areas within 9m of pedestrian pathways, entry plazas and paved public spaces, shall be sodded, unless otherwise specified in this Article.
- (ii) Nursery Sod: quality and source shall comply with standards outlined in ‘Canadian Standards for Nursery Stock’, most recent addition.
- (iii) Project Co shall scarify the existing subgrade a minimum of 150mm, and apply a minimum of 150mm of topsoil prior to installation of sod.

(l) Seed

- (i) The limits of construction and staging areas for some Stations and sections of the Track are expected to extend beyond the limits of sodding indicated above. Any disturbed areas extending beyond the limits identified for sod above shall be rehabilitated as per Schedule 15-2, Part 1, Article 4 – Design and Construction. A review of the adjacent land uses and Site development shall be completed for these locations and the most appropriate groundcover shall be selected.
- (ii) Seed: to meet the requirements of the City specifications, unless otherwise noted in this Article.

- (iii) Project Co shall scarify the existing subgrade 150mm, and apply a minimum of 150mm of topsoil prior to installation of seed.
- (m) Earth Borrow
 - (i) All in-situ non-contaminated overburden, and topsoil not appropriate for reuse as topsoil, stripped for the construction requirements, may be utilized as earth borrow backfill within the Lands;
 - (ii) All stripped overburden may be stockpiled; and,
 - (iii) Imported earth borrow shall consist of material as defined by OPSS 212.

2.8 Natural Channel Restoration

- (a) Project Co shall refer to Schedule 15-2, Part 2, Article 5 - Drainage and Stormwater Management Design Criteria, for the SWM requirements for the channel design.
- (b) Project Co shall design all watercourse embankments that are to be reinstated in accordance with the following:
 - (i) Maximum of 3:1 slopes;
 - (ii) Any slopes greater than 3:1 shall be constructed with a retaining wall made of natural materials, such as armour stone rock wall, wood revetments, root wads, or other measures. The retaining walls shall be made of natural materials, such as armour stone rock wall, wood revetments, root wads, or other measures. All built features shall meet the flow analysis and Design Criteria to ensure the slope stability, with the following minimums:
 - A. Use biodegradable materials to anchor the logs and root wads to the embankment.
 - (iii) Rip rap or gabion baskets shall not be permitted;
 - (iv) On all outside bends of the creek, Project Co shall reinforce the channel embankment with root wads. The reinforcement shall protect the embankment for the 2 year flows and be a minimum 0.75m height, or as per the detailed design analysis, completed as per Schedule 15-2, Part 2, Article 5 - Drainage and Stormwater Management Design Criteria;
 - (v) All slopes shall be vegetated with native species woody plant material;
 - (vi) Project Co shall ensure the stabilization of the final planting beds during the establishment of the plant material to control wash-outs and sediment movement into the watercourse;

- (vii) The vegetation shall be a blend of 90% trees and 10% shrubs, and shall be of an appropriate species for the location on the embankment. Project Co shall identify species that are tolerant for locations within the seasonal flooding, 10 year flood, 100 year flood and upland planting;
- (viii) The trees shall consist of a blend of the following:
 - A. 25% Coniferous Trees;
 - B. 70% Reforestation Trees; and,
 - C. 5% Caliper Deciduous Trees;
- (ix) The shrubs shall include:
 - A. 70% shrubs; and,
 - B. 30% live stakes.
- (x) Meet the following planting criteria:

Minimum Planting Criteria for Restoration Landscapes

Plant Material	Size	Spacing
Caliper Deciduous Trees	60mm cal.	5.0m
Reforestation Trees	20mm cal	3.0m
Coniferous Trees	900mm	2.4m
Deciduous Shrubs	45cm ht	600mm
Live Stake Planting (Deciduous)	90cm length	100mm

- A. Any live stakes shall consist of native species, rhizome spreaders, and be tolerant of the Site specific conditions at the creek edge.

2.9 LID SWM Landscapes

- (a) Refer to Schedule 15-2, Part 2, Article 5 - Drainage and Stormwater Management Design Criteria for the SWM requirements.
- (b) All surface drainage swales shall be landscaped to the following criteria:
 - (i) Flat-bottomed swales;
 - (ii) Varying side slopes, with a maximum slope of 3:1 and a minimum slope of 8:1;
 - (iii) Establish a ground cover that accommodates the periodic wetting;

- (iv) All bioswales adjacent to areas of vehicular traffic shall be protected by a raised concrete curb, with curb cuts to accommodate surface drainage; and,
- (v) All plant material utilized within the bioswales shall be salt tolerant.

2.10 Existing Tree Protection

- (a) Project Co shall submit a Tree Mitigation Report, in accordance with Schedule 10 – Review Procedure and Article 2.6 of this Part 6, to delineate existing trees impacted by the Work. These drawings shall be reviewed, and appropriate agency approval received, prior to commencement of Work.
- (b) All tree protection shall be installed prior to the commencement of any Works.
- (c) Project Co shall develop a construction plan that minimizes the removals and impacts on the adjacent trees to be protected.

2.11 Tree Compensation

- (a) Based upon the required removals to accommodate the construction requirements, Project Co shall complete the Tree Compensation Plan(s), and submit as consolidated package and in accordance with Schedule 10 – Review Procedure.
- (b) The Tree Mitigation Plan shall be prepared by a Licensed Arborist in conjunction with the Landscape Architect.
- (c) The Tree Compensation Plan(s) shall be based upon the following criteria:
 - (i) For every deciduous tree, between 100mm and 500mm caliper, Project Co shall replace with 2 - 70mm caliper trees; and,
 - (ii) For every coniferous tree, Project Co shall replace with 2 – 1.8m tree.
- (d) Project Co shall develop the Tree Compensation Plan(s) in conjunction with the overall planting plan for the Project, including Stations and Guideway to ensure sufficient compensation for the required removals.
- (e) The Tree Compensation Plan(s) shall conform to City standards and approved species list.
- (f) Existing trees (including crown, trunk and root system) in proximity or vulnerable to damage by the Work, shall be protected during all stages of Work. No material, construction equipment or vehicles shall be stored under the drip-line of trees at any time. Trees shall be protected and watered regularly as required by standard horticultural practice during the Construction Period.

2.12 Site Restoration

(a) Project Co shall complete the following:

- (i) Removal of all temporary and permanent roadway works, including granular bases;
- (ii) Scarification of compacted subgrade a minimum of 150mm prior to the placement of topsoil for planting, seeding or sodding; and,
- (iii) Regrading and shaping of the Site to reinstate the original contours and drainage patterns. In areas where the roadway will be removed, the regrading shall eliminate the engineered roadway grades and profile.

ARTICLE 3 CONNECTIVITY REQUIREMENTS

3.1 General Requirements

- (a) Existing pathways, sidewalks and MUPs within the City and NCC lands are critical community connections that shall be maintained throughout construction, unless specifically identified and agreed to for closure or removal.
- (b) Project Co shall develop a TTMP to identify any potential safety concerns for pedestrians and cyclists during construction and measures for protection, as per Schedule 15-2, Part 7, Article 7 – Traffic and Transit Management Plan.
- (c) Project Co shall implement any required measures to alleviate these potential safety concerns and ensure the community connections identified in this Part 6 and Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access, are maintained. Sidewalks and pathways shall be installed as required to provide connection between the adjacent communities to the Station and as indicated elsewhere in Schedule 15-2, Part 4 – Stations and this Part 6.

3.2 Connectivity Elements

- (a) Project Co shall ensure that design and selection of construction materials and layout alignment shall be consistent with specific Site context and associated landscape type.
- (b) Project Co shall design and construct these pathways and MUP's with a minimum width of 3.0m unless specified otherwise in this Article shall be a paved surface capable of commercial use, including access by Maintenance Vehicles and Emergency vehicles and shall not be used for calculating the requirements for loading or unloading of the buses.
- (c) Project Co shall design and construct routes utilized by cyclists, including MUP's, shall be continuous, dismount and walk solutions shall be approved and installed, at the discretion of the City.
- (d) Project Co shall include a TWSI, located at vehicular intersections, or where a sidewalk crosses a cycle track, for all pathways and MUP's.
- (e) Project Co shall provide a 200mm delineator strip between a cycle track and sidewalk, where there is insufficient width to provide a 0.9m landscape strip.
- (f) Project Co shall design and construct a sodded clearance strip on each side of a MUP, as per Article 2 - Design Criteria, of this Part 6, except in the following conditions;
 - (i) Where MUPs are located beneath a Bridge, provide 0.6m paved shoulder on each side of MUP;
 - (ii) Where MUP traverses an open paved plaza, provide pavement markings, change in paving colors or change in hard surface material to identify the route of the

- MUP. This shall include a minimum of four bands of interlocking pavers in a double soldier course, centred 0.6m prior to the MUP traversing the plaza;
- (iii) Where a MUP traverses the Station Plaza, there shall be a minimum of 3m offset from the Station entry; and,
 - (iv) Where a MUP is adjacent to an existing or a proposed vertical constructed surface or element such as a building, guardrail, retaining wall, fence, etc., a 0.6m “buffer” space shall be provided from the existing constructed surface in addition to the width of the MUP, with the same asphalt surfacing and base material.
- (g) Project Co shall design and construct the MUPs and sidewalks at Stations to ensure crossing locations to minimize the potential conflict between cyclists and pedestrians. This may include “T” intersections, small walls, planters or other design elements.
- (h) Project Co shall install bollards at all roadway intersections to restrict vehicular access to the MUP. These bollards shall be collapsible, to accommodate service vehicles.
- (i) Project Co shall provide reflective tape on all bollards.
- (j) Project Co shall design and construct depressed curbs at all sidewalk roadway interfaces and they shall be in proximity to bicycle parking areas to facilitate safe access from roadway to sidewalk.

3.3 Accommodation of Pedestrians and Cyclists During Construction

- (a) All trails, pathways and MUPs shall remain open throughout construction unless specifically identified. Where Project Co requires a temporary closure, less than seven days in duration, a temporary granular pathway may be installed. Where the trail, sidewalk, pathway or MUP is required to be closed for longer than seven days, Project Co shall provide an alternate route, with a minimum of a paved asphalt surface for the duration of the original closure.
- (b) Project Co shall provide an alternate route that minimizes any detours for the pedestrians and cyclists, and is a maximum of 20% additional length.
- (c) Proposed temporary closure or re-routing of pedestrian and cycling routes shall be submitted in accordance with Schedule 10 – Review Procedure, and shall conform to the TMPP and as required by City of Ottawa Special Provision D-005 and as documented in COADS. Project Co shall include a Pedestrian Access Plan/Construction Site Pedestrian Control Plan in the TTMP submissions per Schedule 15-2, Part 7, Article 7 - Traffic and Transit Management Plan.
- (d) Multiple subsequent closures of less than seven days, shall not be permitted, and an alternate route shall be provided and shall include:
 - (i) Smooth paved surface to provide Universal Design requirements;

- (ii) Curb cuts as required to provide barrier-free routes from pathways and sidewalks to roadway crossings;
 - (iii) A minimum clear width of 1.8m for sidewalks;
 - (iv) A minimum width of 3m for MUP; and,
 - (v) Temporary routes shall be lit to the same level as the original route.
- (e) All existing pedestrian walkways and cycling facilities shall be maintained to the City standards at all times, during the Construction Period. Project Co shall be responsible for all design, approvals, construction and Maintenance, including cleaning, of the pedestrian walkways and cycling facilities for the duration of time the detour is in service.
- (f) Project Co shall not close any MUP or sidewalk identified to remain open during construction, and the TTMP shall identify all measures to ensure the safety of pedestrians and cyclists. Project Co shall modify the TTMP as required to accommodate the pedestrian and cyclists.
- (g) The Site pedestrian control design shall include all temporary bilingual pedestrian signing, directional signing, Maintenance of sidewalk, relocation and any other delineation to provide safe environment for pedestrians and cyclists.

3.4 Roadway Crossings

- (a) General
 - (i) Project Co shall be responsible for liaising and coordinating with the City with regard to all modifications that may be required at municipal traffic signals both during and after completion of the design and construction. Proposed modifications shall be supported by traffic engineering analysis and meet the City traffic signal requirements and standards.
 - (ii) Project Co shall design and install pedestrian and cycling crosswalks at each signalized intersection.
 - (iii) Project Co shall complete a traffic study to finalize the configuration and review with the City with respect to the type of controlled crossing device to be implemented (pedestrian signal, full traffic signal, or PXO Type B, C or D). Project Co shall implement the type of controlled crossing device selected by the City at each intersection.
 - (iv) Project Co shall design and install PXO as indicated in Article 4 of this Part 6.
 - (v) Project Co shall coordinate the work of this article with Schedule 15-2, Part 2 - Civil and Guideway and Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access.

3.5 Pavement Marking and Signing

- (a) General
 - (i) Project Co shall provide all signing and Pavement marking in accordance with the criteria contained in this Article, the requirements of OPSS, the applicable Reference Documents and as per Schedule 15-2, Part 7, Article 1 - General Traffic and Transit Management Requirements.
 - (ii) All temporary signage shall be installed as per Schedule 15-2, Part 7, Article 1 – General Traffic and Transit Management Requirements.
- (b) Temporary Signing
 - (i) Project Co shall be responsible for the design, supply, installation, relocation, Maintenance, and removal of all temporary signage and pavement markings, including warning, guide, advisory and directional signs as per Schedule 15-2, Part 7, Article 1 – General Traffic and Transit Management Requirements.

3.6 Winter Maintenance

- (a) Project Co shall design the Station Plazas, pedestrian emergency egress, PPUDO, Park and Rides, pedestrian and MUP to accommodate winter Maintenance, including providing a route for equipment to manoeuvre along the corridor. This shall include locations to stockpile snow along the pathways as required, with sufficient space for equipment turn around including a minimum of 5m x 5m at all egress points at the building façades;
- (b) Project Co shall indicate the snow storage locations on the layout drawings and fencing drawings;
- (c) Any snow storage locations shall be located on unencumbered City lands and outside of any ROW;
- (d) Any allocated snow storage locations shall be offset from the existing and proposed Site features, bioswales and plant material; and,
- (e) Any snow storage locations shall ensure the drainage pattern is integrated within the overall SWM plan.

ARTICLE 4 SITE SPECIFIC DESIRED OUTCOMES

4.1 Station Specific Desired Outcomes

(a) Bayview Station

- (i) Realign existing MUP's to the north of the Station as required to maintain maximum gradient of 5% and tie into existing MUP network.
- (ii) Relocate north-south MUP, on the east side of the alignment to maintain a minimum width of 4m, excluding offset from any built structures and tie into existing MUP north and south of Station Platform. Rergrade between the MUP and the adjacent features to maintain a maximum of 3:1 for slopes.
- (iii) Integrate the secure fence with the perimeter wind screens around the Station, extending from the proposed limits of the Platform on the east side to the limits of the Platform on the west side to restrict access to the Station.
- (iv) Provide shrub planting on slopes at north east corner of Station and tree planting as per quantities in Clause 4.3 of this Part 6.
- (v) On the west side of the Station, extend the existing Station Plaza south to include the entry to the pedestrian Bridge, as per Schedule 15-2, Part 4, Clause 3.2 (f), and connection to the MUP west of the Station Entry with an approximate size of 200m².

(b) Gladstone Station

- (i) Provide Station Plaza between Gladstone Avenue and Station entrance with a minimum size of 500m², extending from the Fare Paid Zone to Gladstone Avenue to the south, and the MUP to the east.
- (ii) The Station Plaza design shall be developed as a pedestrian space, and to deter cycle movements.
- (iii) Project Co shall provide a bus shelter at the western limit of the Station Plaza.
- (iv) Provide all bicycle parking to the east of the plaza, adjacent to the MUP.
- (v) Realign the parking on the west side of the Station, within the city lands, to accommodate a 2m Emergency exit path from the Station Platform to Gladstone Avenue.
- (vi) Provide sufficient space at the north end of the Emergency exit path to accommodate Maintenance Vehicle turning requirements.

- (vii) Provide a minimum of 1m offset between Emergency exit and realigned parking, and install traffic barrier to restrict vehicles from accessing or blocking Emergency exit pathway.
- (viii) Reinstate planting disturbed by construction to match existing between Gladstone Station and existing Trillium MUP.
- (ix) Provide pedestrian and cyclist activated signalized crosswalk/crossride at MUP crossing of Gladstone Avenue.

(c) Carling Station

- (i) There are no specific requirements for this Station.

(d) [REDACTED]

- (i) Replace the existing underpass with a 9m wide underpass south of the Station that aligns with the existing east-west pathway.
- (ii) On the west side of the underpass:
 - A. Extend the paving on the west side to the full width of the underpass to the pathways connecting to Campus Avenue;
 - B. Provide a MUP leading north to connect to the existing Station entry; and,
 - C. Provide 4.5m wide stairs, with bike ramp, and a concrete sidewalk between the underpass and the raised concrete crosswalk to the south of the underpass.
- (iii) On the east side of the underpass, provide a concrete plaza to transition from the underpass to the existing pathway connection to the Station entry.
- (iv) Provide bicycle parking in equal quantities on both the east and west side of Station.
- (v) Provide new planting to match existing.

(e) Mooney's Bay Station

- (i) There are no specific requirements for this Station.

(f) Walkley Station

- (i) Provide Station Plaza at the Station entry with an unobstructed width of 9m, to allow Passenger access to paid fare entry location.

- (ii) Provide the bicycle parking at the Station Plaza, offset from the Passenger access route to the paid fare entry.
 - (iii) Reconfigure traffic lanes and widen sidewalk on the south side of Walkley Road to provide 3.6m wide sidewalk between Walkley Station and existing Transitway Station.
 - (iv) Provide crosswalk/crossride at off-ramp from Transitway and Airport Parkway to facilitate connection between Transitway Station and Walkley Station.
 - (v) Reconstruct and widen the existing pathway from Walkley Road into a lit MUP on the east side of the Station with a minimum width of 4m and extend the MUP to the parking lot south of the Station as required to meet AODA and COADS. Install trees a minimum of 6m on centre to provide shade along the MUP.
 - (vi) Provide access from the Emergency exit to the MUP, with sufficient space to accommodate snow and Maintenance vehicle access and turn around.
- (g) Greenboro Station
- (i) Provide a MUP connection from Bank Street to the Station entry plaza.
 - (ii) Provide Crossride/Crosswalk at Bank and Johnston Road.
- (h) South Keys Station
- (i) Provide a Station Plaza on the east side of Station entry that is framed by the traffic lanes to the north and the south, of approximately 700m², with approximately 93% concrete paving and 7% soft landscape;
 - (ii) The east Station Plaza shall provide a continuous barrier free access between the roadways and the plaza, with traffic bollards to control vehicular access to the plaza. Provide sufficient collapsible bollards to allow Maintenance vehicles access onto the plaza, from both the north and the south side of the Station Plaza;
 - (iii) Provide four trees in the east Station Plaza paving, and three trees within the planting beds;
 - (iv) Provide grocery cart storage, offset from the roadway, north of the Station entry, for a minimum of forty carts within the east Station Entry Plaza. The grocery cart storage shall be defined by a stainless steel guard, with a minimum of two rails, and a clear width of 2.55m and length of 4.5m;
 - (v) Provide a one way drive isle, 6m width, to accommodate a PPUDO, east of the east Station Plaza.

- (vi) Provide a roadway access, east of the PPUDO lane, aligned with the parking lot traffic lanes south of the Station Plaza;
 - (vii) Between the two aisles, create an island with a shrub planting and one tree, at each end;
 - (viii) Relocate the existing switchgear into the island between the two drive isles;
 - (ix) Extend the existing sidewalk to the east Station Plaza with crosswalks at all vehicular crossings from Daze Avenue;
 - (x) Reconfigure the parking lot east of the drive isle to extend the curb to the existing sidewalk to restrict vehicular traffic into the drive isle, and delete four parking spaces to accommodate vehicular turn movements;
 - (xi) Provide a Station Plaza on the west side of the Station entry that offsets the MUP a minimum of 3m to provide clear sight lines between the passengers and the MUP; and
 - (xii) The proposed Tunnel design, as per Schedule 15-2, Part 4, Clause 3.9 (e) (i), shall be developed to provide a minimum offset of 4m from the front face of the future Tunnel entry to the Roadway on the east side of the Station;
 - (xiii) Provide equal quantities of bicycle parking on both the east and west side of Station.
- (i) Leitrim Station
- (i) Provide a Station Plaza of approximately 450m², with approximately 90% paved areas, and 10% soft landscape.
 - (ii) Provide a secured perimeter enclosing the Train Station and bus Platform, with the lockable gates located between the bus Platform and the Train Station.
 - (iii) Align the MUP on the east side of the bus Station and the Train Station with a crossride/crosswalk at the bus access road to the bus Station. The MUP shall be in addition to the sidewalk requirements for the Park and Ride facility.
 - (iv) Provide a lit MUP along the north side of the Station and Park and Ride facility to Gilligan Road.
 - (v) Provide lit sidewalks and parking lot configuration, as per Article 2 – Design Criteria, of this Part 6.
 - (vi) Provide a crosswalk/crossride and lit MUP connection to Quinn Road.
- (j) Bowesville Station

- (i) Provide a lit 3m wide MUP from the intersection on Earl Armstrong Road on the east side of the entry road to Bowesville Station Entry Plaza;
 - (ii) Provide a signalized intersection including crosswalk/crossride facilities at the junction of Earl Armstrong Road and the MUP;
 - (iii) Provide a secured perimeter enclosing the Train Station and bus Platform, with the lockable gates located between the bus Station and the Train Station, and between the bus Station and the entry plaza;
 - (iv) The Station Plaza shall be of 800m² to accommodate the pedestrian and cycling requirements, bicycle parking, Site furniture and soft landscape elements with approximately 60% paved and 40% soft landscape;
 - (v) The Station Plaza shall connect to a pedestrian walkway, a minimum of 6m width, leading from the Park and Ride facility to the Station entry;
 - (vi) Where the MUP abuts the Station Plaza, there shall be three bands of interlocking paving;
 - (vii) Locate the stormwater facilities to the east and west of the Station, to frame the Station and bus Station to direct Passengers to the Fare Paid Zone entry gates;
 - (viii) Provide a sidewalk the intersection from the intersection on Earl Armstrong Road on the west side of entry road to the Station Plaza; and,
 - (ix) Reinstate the existing community gardens as required to accommodate the Earl Armstrong Road construction, and provide a gravel access road from the Park and Ride facility, with curb cut, to the garden, with sufficient space at the gardens to provide a turnaround.
- (k) Uplands Station
- (i) Reconfigure the existing parking lot to provide direct pedestrian access to Station from EY centre entrance, perpendicular to the Station, and with a minimum sidewalk width of 3.6m. The maximum reduction of parking spaces shall be 21.
 - (ii) Provide pedestrian lighting at the backside of the sidewalk connecting the EY Centre to the Station.
 - (iii) Provide crosswalk / crossride across existing drive aisles to south east of Station.
 - (iv) Provide plaza space to the south of the Station a minimum width of 9m and of sufficient size to accommodate bicycle parking, Site furniture and soft landscape elements as required below.

- (v) Provide a pedestrian sidewalk connection, a minimum of 4m between the bus stop and Uplands Station.
 - (vi) Provide a lit MUP from the Station to Uplands Road.
 - (vii) Reinstate the bioswales between the parking lot and the OC Transpo access road to meet the original plant species, spacing and size.
 - (viii) Provide traffic islands in the parking lot with two deciduous trees, species to match existing in parking lot.
- (l) Airport Station
- (i) Protect all existing plant material beyond the limits of the Station and Track structure. Reinstate all disturbed areas outside the overhead structures.
- (m) Limebank Station
- (i) Provide a Station Plaza of approximately 400m², with approximately 90% paved areas, and 10% soft landscape.
 - (ii) Provide a secured perimeter enclosing the Train Station.
 - (iii) Provide a pedestrian connection, a minimum of 6m wide between the eastbound bus stop area and the Station Plaza.
 - (iv) Provide a pedestrian connection, a minimum of 6m wide between the westbound bus stop area and the pedestrian crossing to the Station Plaza.
 - (v) Provide a pedestrian crossing of the east-west connector road at the west end of the bus stop area connecting to the Station plaza.
 - (vi) Provide a PPUDO with three spaces in each direction on Main Street: north of the Station.
 - (vii) Provide 1.8 m wide sidewalks from the Station at the intersection of Main Street and the east-west connector road to the PPUDO's on each side of Main Street.
 - (viii) Provide raised cycle tracks on the north and south side of the east-west connector road.
 - A. Cycle tracks shall transition from street side to behind the bus stops located adjacent to Limebank Station.
 - B. Cycling facility between the Trillium Line ROW and the east-west connector road shall be terminated just east of the Station entrance near the bicycle parking area.

- C. Project Co shall provide a 3.0 wide continuous MUP from the cycle track located on the north side of the east-west connector on the east side of Main Street north to Earl Armstrong Road.
- (ix) Project Co shall provide a 3.0m wide continuous sidewalk on the north side of the east-west connector road from Main Street to collector D.
 - A. Sidewalk shall be separated from the cycle track by a 2.0m wide landscape buffer for the entire length.
 - i. Landscape buffer shall not be required under the Limebank road Structure, however 0.6m separation shall be maintained between the two elements.
- (x) Project Co shall provide a 2.0 m landscape buffer between the Trillium Line ROW fencing and the cycling and pedestrian facilities located on the north and south side of the ROW fencing.

4.2 Site Furnishings

- (a) Project Co shall provide the minimum quantities of the following elements for each Station:

Station	PPUDO Parking Spaces	Bicycle Parking Spaces	Accessible Benches	Waste Receptacles
Limebank	6	40	2	2
Bowesville	6	40	8	2
Leitrim	4	20	4	1
South Keys	0	40	1	1
Walkley	0	20	2	1
Mooney's Bay	n/a	n/a	n/a	n/a
Carleton	0	14	2	0
Carling	n/a	n/a	n/a	n/a
Gladstone	0	20	2	2
Bayview	0	0	0	0
Uplands	0	10	4	1
Airport	0	0	0	0
New Walkley Yard	n/a	20	1	2

4.3 Site Plantings

- (a) Project Co shall provide the minimum quantities of plant material for each Station:

Station	Deciduous	Coniferous	Deciduous	Coniferous

	Trees	Trees	Shrubs	Shrubs
Limebank	20	5	120	30
Bowesville	250	30	400	0
Leitrim	38 + 102 (park+ride)	0	0	0
South Keys	0	0	0	0
Walkley	0	20	0	0
Mooney's Bay	n/a	n/a	n/a	n/a
Carleton	15	0	320	130
Carling	n/a	n/a	n/a	n/a
Gladstone	15	3	140	60
Bayview	21	0	210	90
Uplands	73	0	525	225
Airport	0	0	350	150

4.4 Site Specific Requirements

(a) South Keys Station to Leitrim Road

- (i) Provide a continuous MUP linking the Sawmill Creek Pathway system, on the west side of the alignment, to the main north-south MUP on the east side of the alignment including:
 - A. An underpass at the alignment, to accommodate a direct connection to the MUP to Millstream Way, and a Bridge over Hunt Club Road. See Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements for information;
 - B. Reconfiguration of the Sawmill Creek MUP to connect to the underpass and the Airport Parkway/Hunt Club Road West intersection, including all drainage, grading and retaining walls;
 - C. A MUP from the main north-south MUP to Millstream Way, including curb cuts on Mac Street; and,
 - D. The MUP connection between Millstream Way, north to the Sawmill Creek Pathway system shall have an asphalt paved surface.
- (ii) Provide a continuous MUP along the east side of the alignment from Hunt Club Road to Leitrim Station.
- (iii) Develop the service access road for the alignment to service as a MUP from Lester Road to the main north-south MUP. Install collapsible bollards at Lester Road to control vehicular movement on the service road and MUP.

- (iv) Provide an at-grade crossing at Lester Road, with a controlled crossing, as per Article 3 of this Part 6, and a minimum of 20m length of asphalt surfaced MUP;
 - (v) South of Millstream Way, the MUP surface shall be stonedust, unless the MUP has a shared use with service access road. Project Co shall provide a surface as required for the service requirements of the alignment
- (b) Leitrim Road to Bowesville Road
- (i) Provide a continuous stonedust surfaced MUP on the east side of the alignment, from Leitrim Road, east of the Leitrim Station, grade separated over Earl Armstrong Road, and south along the alignment to Bowesville Road;
 - (ii) Provide a MUP on the south side of Earl Armstrong Road;
 - (iii) Provide a connection from the MUP adjacent to the alignment to the MUP on the south side of Earl Armstrong Road;
 - (iv) The MUP south of Leitrim shall be constructed on the top of the embankment, minimizing any impact to the existing vegetation and grading;
 - (v) Provide a connection from the MUP to the Osgoode Trail, south of the alignment;
 - (vi) Provide a connection from the MUP adjacent to the alignment to the MUP within High Road ROW;
 - (vii) Maintain the existing gravel MUP north, from the end of High Road, within the existing ROW, to Bowesville Road;
 - (viii) Provide a PXO crossing at the MUP and Bowesville Road, with protected bike crossing locations; and,
 - (ix) Provide a 10m wide structure over the alignment at High Road with the following requirements:
 - A. Centre the MUP, with a stonedust surface, within the Bridge Structure, and extending to the limits of grading to align with the existing gravel walking pathway;
 - B. Provide a minimum of 300mm soil over the structure for a growing media, and seed with a native grass seed mix;
 - C. Reinstate the embankments adjacent to the Structure with a maximum of 3:1, minimum 300mm topsoil and a blend of native shrubs and trees to provide shade cover for small mammals and animals; and,
 - D. Provide a guardrail, as per Clause 2.7 (d) (i) E of this Part 6.

- (c) University Road Pedestrian Bridge over Rideau River (SN018750)
- (i) The University Road Pedestrian Bridge pathway connections shall be designed and constructed to provide universally accessible route from [REDACTED], over the Rideau River Bridge, and connecting to the Rideau River eastern pathway. The existing pathways and MUP's shall be relocated and modified as required to provide a smooth transition between the existing facilities and the proposed MUP.
- (ii) All handrails and guardrails required beyond the proposed Bridge Structure shall meet the materials, finishes and general design of the Bridge to provide a consistent design element throughout the site. Refer to Schedule 15-2, Part 2, Article 4 – Structural Design Criteria and Requirements for additional information.
- (iii) Provide a MUP on both the north, and south side of the proposed pedestrian Bridge, with the following criteria:
- A. Taper the MUP from the Bridge width of 5m, to 3m over a minimum distance of 6m;
 - B. Provide a minimum of 6m approach with a maximum slope of 2%, at the interface with the Bridge Structure;
 - C. Ramps and stairs shall not be permitted as part of the transition between the Bridge and the adjacent grade; and,
 - D. Minimize the impacts on both the north and south of the Rideau River by maximizing the grade of the MUP to meet AODA and COADS.
- (iv) [REDACTED] requirements:
- A. The MUP connection between the Bridge and Richcraft Hall shall be standard MUP width and meet the plaza grade;
 - B. The connection to the pathway along the river's edge, shall meet and match the width of the existing width; and,
 - C. Offset the pathway from the University Road on the east side of the Bridge a minimum of 1.2m.
- (v) Vincent Massey Park lands requirements;
- A. Maintain the original grade of the MUP for the Rideau River Eastern Pathway under the Rideau River rail Bridge;
 - B. Meet and match the original grade of the MUP to the west of the Bridge within 40m; and,

- C. Taper the MUP at the base of the natural stone wall, commencing approximately 20m west of the abutment to meet and match the width of the existing pathway.
- (vi) The grading from the MUP to the existing terrain shall vary, to ensure a naturalized slope, including:
 - A. Maximum of 20% slope;
 - B. A minimum of 600mm shoulder on either side of the MUP prior to commencement of the slope;
 - C. Protection of the critical root zone of the existing trees to be retained; and,
 - D. Maximum of 10% to accommodate the drainage from the Bridge to the Rideau River.
- (vii) Provide a natural stone retaining wall designed by a Professional Engineer, to be sufficient to withstand the river velocity and flow, and stepped to integrate within the overall grading plan, at the following locations:
 - A. On the north and south side of the Rideau River as required to maintain the current river edge;
 - B. Along the bottom of the Rideau River rail Bridge embankment to accommodate the MUP connection under the Rideau River rail Bridge; and,
 - C. Provide setbacks in the natural stone retaining wall to allow access to the beach.
- (viii) Provide a natural stone architectural finish on the Bridge abutments. Project Co shall provide three different natural stone options for review and selection by the City;
 - A. On the outer faces of all abutment walls.
- (ix) Project Co shall provide the following for the beach on the south side of the Rideau River:
 - A. Maintain the existing area of a minimum of 300m² of the existing riverwashed granite peagravel beach after completion of the works;
 - B. Provide a sample of the granite peagravel for review;
 - C. Grade the beach to provide a continuous slope from the natural stone retaining wall to the existing river bed;

- D. Reinstate as required with a minimum of 100mm depth stone;
- (x) Potential Maternal Bat Roosting Trees
 - A. There is a potential bat roosting tree that has been identified immediately south of the construction site for the Bridge to be protected throughout construction.
 - B. Provide a natural stone retaining wall as required to protect the maximum amount of the critical root zone for the tree.
- (xi) Project Co shall provide the following for electrical and lighting requirements:
 - A. Pedestrian Bridge lighting shall be provided per the requirements as in the Illuminating Engineering Society of North America Lighting Handbook. These requirements include a minimum average horizontal illuminance of 5 lux and a maximum uniformity ratio of 4:1;
 - B. The electrical feed shall be from the existing electrical circuits on [REDACTED] lands;
 - C. Provide a handhole and disconnect cabinet at the junction between the existing [REDACTED] electrical and the extension for the pedestrian Bridge;
 - D. Project Co shall provide integrated rail lighting along full length of pedestrian Bridge;
 - E. Pedestrian lighting shall be LED, 2700 Kelvin Color Temperature, and 6.07 watts/meter;
 - F. Lighting shall be downcast and have full cut-off to minimize light pollution, and ensure no light spill into the Rideau River; and,
 - G. Project Co shall provide conduits, with pull wire and handhole at the end of the construction, on the south side of the Rideau River, to accommodate for future electrical connection for the Confederation Heights connection.
- (xii) Project Co shall reinstate all the disturbed areas with the following:
 - A. North side of Rideau River shall be a combination of trees, integrated within the turf areas, with riparian planting along the embankment; and,
 - B. South side of the Rideau River shall be a naturalized landscape, with a meadow grass mix, riparian planting and trees.

ARTICLE 5 SITE SPECIFIC TEMPORARY REQUIREMENTS

5.1 Station Specific Temporary Requirements

- (a) Project Co shall design and construct the following at Bayview Station and MUP
 - (i) Project Co shall maintain the north-south MUP on the east side of the proposed Station to the main east-west pathway north of the alignment throughout construction.
 - (ii) Relocate the existing MUP on the east side of the proposed Station widening prior to the decommissioning of the existing MUP.
 - (iii) On the south side of Albert Street, an Alternate route shall be the shared construction access road, on the north side of 250 City Centre Avenue. Provide a direct connection to the MUP on the north side of Albert Street.
 - (iv) Provide flagperson on construction access road when road is utilized by construction vehicles to control movements.
- (b) Project Co shall design and construct the following at Gladstone Station and Trillium MUP
 - (i) Maintain the north-south MUP on the east side of the proposed alignment and Station, between Bayview and Gladstone Avenue.
 - (ii) This temporary paved pathway shall be a minimum of 3m, plus 1m clearance on either side and have sufficient configuration to ensure sight lines a minimum of 60m, and clear views from the adjacent lands to the pathway.
 - (iii) Provide MUP connections to Larch and Balsam Streets east of the realigned MUP.
 - (iv) Opaque screening/hoarding shall not be permitted.
 - (v) Provide direct connection to existing MUP on the south side of Gladstone Avenue.
- (c) Project Co shall design and construct the following at Carling Station
 - (i) Maintain the MUP throughout construction.
 - (ii) Flagpersons shall be utilized should Project Co require access across the MUP.
- (d) Project Co shall design and construct the following at Mooney's Bay Station
 - (i) Maintain MUP throughout construction.

- (e) Project Co shall design and construct the following at Walkley Station
 - (i) As per Clause 4.1 (f) (v) of this Part 6, the one existing pathway to the east of the proposed Station, from Walkley Road south to the development lands, shall be rebuilt to City standards for MUP. This pathway shall be permitted to be closed during construction.
- (f) Project Co shall design and construct the following at South Keys Station
 - (i) Project Co shall provide continuous access to the Transitway Station throughout construction. An at-grade crossing of the Transitway shall not be permitted.

5.2 Corridor Specific Requirements

- (a) Project Co shall design and construct the following at [REDACTED]
 - (i) A temporary pedestrian connection shall be maintained at the north underpass adjacent to the existing Station until the public opening of the new underpass. This pedestrian connection shall be within 100m north of the existing underpass location.
 - (ii) Clause 3.3(b) of this Part 6 shall not apply for the development of the alternate route, should the south underpass be required to be closed. Project Co shall provide a plan with the proposed route.
- (b) Project Co shall design and construct the following at the Brookfield Pathway/Sawmill Creek Pathway
 - (i) Brookfield and Sawmill Creek MUP have been identified for potential use by Project Co for construction access to the Expanded Trillium Line. These pathways shall be open for use by the community throughout construction, including the use of flagpersons to control movement through the corridor.
- (c) Alignment Corridor, Bowesville Station to Rideau River
 - (i) Where the alignment bisects a natural area, Project Co shall provide environmental passages developed to the following:
 - A. Project Co shall provide a swale under the alignment fence, with a maximum depth of 300mm, at 600m on centre spacing, to accommodate the passage of small mammals;
 - B. Ensure the swales do not direct additional surface drainage towards the alignment, to comply with TVA and Safety Certification Requirements.
 - C. Align the swale on either side of the alignment to facilitate the mammal crossings.

- (d) Project Co shall design and construct the following at the Osgoode Link Pathway
- (i) Project Co shall provide signage at the following entrances to the Osgoode Link Pathway stating that north/south connections on the pathway are not possible due to construction, when construction on the Trillium Line Extension blocks north-south connections on the Pathway:
 - A. Where the Osgoode Link Pathway crosses Rideau Road;
 - B. At the northernmost end of High Road; and,
 - C. Where the Osgoode Link Pathway connects to Leitrim Station.
 - (ii) Project Co shall develop a TTMP for an alternate cycling route due to the trail closure, along Rideau Road to Albion Road, and north, between Albion Road to Hunt Club Road.
 - (iii) Project Co shall provide all signage and pavement marking as required by the TTMP.
- (e) University Road Pedestrian Bridge over Rideau River (SN018750)
- (i) Project Co shall provide a TMPP for the temporary Rideau River Eastern Pathway closure.
 - (ii) The pathway shall remain operational during the peak use periods of July and August of each calendar year. Should Project Co require the use of the staging area and access to the pedestrian Bridge or Rideau River rail Bridge during this period, flagpersons shall be used.
 - (iii) The pathway closure may exceed 20% in overall length when compared to the original MUP.
 - (iv) Project Co shall allow full and continuous public access to Vincent Massey Park.
 - (v) On the west side of the pedestrian Bridge, the pathway closure signs shall commence prior to Heron Road, to redirect the pathway users along Heron Road, to the south side of Riverside Drive, and connecting back to the Rideau River eastern pathway closure at the signalized intersection of Data Centre Road.
 - (vi) On the east side of the Bridge, the pathway closure signs shall commence prior to the intersection of Data Centre Road, to redirect the pathway users to the south side of Riverside Drive.
 - (vii) Project Co shall complete a review of the existing conditions of the sidewalks and paths for the detour, and complete a repair as required to ensure a smooth and continuous surface.

- (viii) When the closure is in effect, the pathway shall be closed from the staging area for the construction to the east side of the Bronson Avenue Bridge.
- (ix) On [REDACTED] lands, the closure of pathway adjacent to the Rideau River shall be coordinated with the closure of the pedestrian underpass immediately north of University Drive. One of the two pathway connections shall be maintained throughout construction.
- (x) Pathway closure signage to be located to the west of Richcraft Hall, at University Drive, and east, at the pedestrian crossing at University Drive.

Location	Deciduous Trees	Coniferous Trees	Deciduous Shrubs	Coniferous Shrubs
South	26	0	400	0
North	4	0	0	50

APPENDIX A

Sample Road Modification Approval Report

PLANNING AND GROWTH MANAGEMENT

ROAD MODIFICATIONS APPROVAL (RMA) REPORTS UNDER DELEGATED AUTHORITY

INTERNAL ROUTING CHECKLIST

UNIT: Design Review and Implementation	FILE NUMBER: RMA-2015-DRI-001
SUBJECT: Modifications to St. Joseph Boulevard, 270 metres west of Tenth Line Road to accommodate a proposed sales center (developer- [REDACTED]).	
LOCATION: St. Joseph Boulevard, 270 metres west of Tenth Line Road.	

Preliminary/Technical Review and Approval

	Office	<i>Revised</i>		<i>Approval</i>	
		Yes	Date	Initials	Date
1.	Report Author			[REDACTED]	27-Feb-15
2.	Specialist			[REDACTED]	5-Mar-15

Councillor Concurrence

	Ward/Name	<i>Revised</i>		<i>Concurrence</i>	
		Yes	Date	Verified By	Date
1.	[REDACTED]			Via email	6-Mar-15

Final Review and Approval

	Office	<i>Revised</i>		<i>Approval</i>	
		Yes	Date	Initials	Date
1.	Financial Services			[REDACTED]	9-Mar-15
2.	Manager			[REDACTED]	9-Mar-15

CITY OF OTTAWA

**ROAD MODIFICATION
APPROVAL UNDER DELEGATED AUTHORITY**

DATE: 10 March 2015

RMA-2015-DRI-001

SUBJECT

- Modifications to St. Joseph Boulevard, 270 metres west of Tenth Line Road to accommodate a proposed sales center (developer- [REDACTED]).

LOCATION

- St. Joseph Boulevard, 270 metres west of Tenth Line Road, Ward 1, see Attachment 1.

PURPOSE

- The purpose of the proposed modifications is to accommodate traffic generated by a proposed sales center.

BACKGROUND

- The proposed sales center is bounded by undeveloped land to the north, residential lands to the east and west and St. Joseph Boulevard to the south.
- The proposed development is a sales center for a future [REDACTED] subdivision. The proposed subdivision will be located in the same general area as the sales center.
- The road modifications are for the sole purpose of the sales center and will be modified to accommodate the future subdivision.

EXISTING CONDITIONS

• **Road Cross-Sections**

St. Joseph Boulevard – 4-lane, urban, divided arterial road.

• **Street Lighting**

St. Joseph Boulevard – Both sides along center median.

• **Traffic Control**

The closest major intersection of St. Joseph Boulevard and Tenth Line Road is signalized.

• **Speed Limits**

St. Joseph Boulevard – posted at 60 kph.

• **Pedestrians**

There are asphalt sidewalks present on both sides of St. Joseph Boulevard. During an 8-hour period on Friday, 20 July 2012 at the intersection of St. Joseph Boulevard and Tenth Line

Road, 39 pedestrians crossed in the north-south direction on Tenth Line Road and 63 pedestrians crossed in the east-west direction on St. Joseph Boulevard.

- **Cycling**

There are no dedicated cycling lanes on St. Joseph Boulevard. During the same 8-hour survey mentioned above, 35 cyclists were observed travelling in the north-south direction and 24 cyclists travelling in the east-west direction.

- **Transit**

OC Transpo routes 120 and 136 (regular) serve St. Joseph Boulevard in this area.

- **Highest Hourly Volume**

During the same 8-hour survey mentioned above, between 4:00 pm and 5:00 pm, 421 eastbound and 395 westbound vehicles were recorded on St. Joseph Boulevard in proximity of the proposed development, respectively.

- **Heavy Vehicles**

St. Joseph Boulevard is designated as an unrestricted truck route. Heavy vehicles comprised 2.5% and 5.8% of the total traffic in the eastbound and westbound directions, respectively, during the same 8-hour survey mentioned above.

- **Collision History**

Collisions for the period from 1 January 2009 to 1 January 2014 (5 years):

St. Joseph Boulevard from Prestone Drive to Tenth Line Road: 2 collisions- 1 single vehicle and 1 sideswipe.

PROJECTED VOLUMES

- Not applicable.

PROPOSED ROAD MODIFICATIONS

- It must be emphasized that the following road modifications (see Attachment 2) are conceptual and intended only to illustrate the proposed function. The approval of any detailed design of the road modifications stemming from this report will be subject to the City's detailed design review process.
- The detailed design review process will include requirements for roadside safety provisions, center medians, utility relocations, street lighting and other needs as deemed appropriate by the City.
- Any required easements or property requirements identified to implement the project as a result of the approved design review process will be the responsibility of the applicant to secure at their cost, to the satisfaction of the City of Ottawa.

Proposed road modifications:

- Proposed access on St. Joseph Boulevard.
- Modifications to the center median on St. Joseph Boulevard to restrict left-turn movements out of the site.

MODIFICATION OUTCOMES – BENEFIT AND IMPACTS

- **Pedestrians**
No additional sidewalk infrastructure on St. Joseph Boulevard.
- **Cyclists**
No changes to the existing cycling infrastructure on St. Joseph Boulevard.
- **Transit**
No changes to the existing transit infrastructure on St. Joseph Boulevard.
- **Vehicles**
The modifications to the center median will prevent vehicles from turning left out of the sales center access.
- **Adjacent Land Uses**
No negative impacts are anticipated for the lands adjacent to the proposed road modifications.

PROJECTED IMPLEMENTATION DATES

- This is a privately funded project in which the property owner will establish the construction schedule.

TOTAL ESTIMATED CONSTRUCTION COSTS

- The total estimated cost for the proposed road modifications, which includes construction, engineering and contingencies, is \$80,000.

FINANCIAL COMMENTS

- There is no cost to the City for the proposed modifications listed in the previous sections estimated at \$80,000 (construction, engineering, and contingencies).
- [REDACTED] must provide financial guarantees acceptable to the City of Ottawa to cover the above-noted roadwork.
- [REDACTED] will be required to enter into a Road Modification Agreement with the City of Ottawa, which will include but not be limited to, [REDACTED] funding all costs associated with the design and construction of the above-noted road modifications.
- Total additional annual operating costs are estimated to be \$2,300 (surface operations at \$2,000, signs and pavement markings at \$300) and will be requested in the year following completion of construction.

COMPLIANCE WITH TRANSPORTATION MASTER PLAN

- The proposed roadway modifications comply with 7.3 (Maximize Road Network Efficiency) and 7.4 (Maximize Road Safety for All Users) of the Transportation Master Plan (2013).

CONSULTATIONS

- Via e-mail on 20 February 2015, [REDACTED] was given notice of the intention to advertise the proposed road modifications.
- The proposed road modifications were advertised on the City's website from 20 February 2015 until 6 March 2015 with a deadline for public input on 13 March 2015.

- Preliminary/technical approval was granted by the Program Manager of Design Review and Implementation on 5 March 2015.
- Via e-mail on 6 March 2015, [REDACTED] was given five business days to advise of his concurrence or non-concurrence with the Manager of Development Review (Suburban Services) having delegated authority to approve the proposed roadway modifications.
- Via e-mail on 6 March 2015, [REDACTED] provided his concurrence with the Manager of Development Review (Suburban Services) having delegated authority to approve the proposed roadway modifications.

RESULTS OF ADVERTISING

- No comments were received as a result of the online advertisement.

CURRENT STATUS

- Final approval was granted by the Manager of Development Review (Suburban Services) on 9 March 2015.

ATTACHMENTS

- Attachment 1 – Key Plan DRI-2015-001A
- Attachment 2 – Proposed Road Modifications DRI-2015-001B

Attachment 1

[REDACTED]

Attachment 2

[REDACTED]

APPENDIX B

Daily Traffic Management Site Record

- (a) Project Co shall create a Daily Traffic Management Site Record to document the status of the traffic control measures for the Project. The header of the document shall include but not be limited to headings for the Project Segment and number, date, day of week, location, time of the observations, name of observer and the signature of the observer. The Daily Traffic Management Site Record may be either a hard copy document or an electronic form in a format compatible with City systems.
- (b) Each day (weekdays and weekends, and statutory and civic holidays), Project Co shall carry out at least one site inspection with a focus on the efficacy of the Traffic and Transit Management Plan for the entire Project. The observations shall be recorded on the Daily Traffic Management Site Record, the original of which shall be retained by Project Co until the Project warranty period is complete.
- (c) In instances where traffic control measures change during the day (or night), such as but not limited to temporary lane closures, diversions, etc., Project Co shall carry out site inspection of all of the traffic controls relevant to the changes at the start of each change-over of the traffic control measures and record the inspection on the Daily Traffic Management Site Record.
- (d) Each day, Project Co shall review the information on the Daily Traffic Management Site Record, and assess the functionality of the traffic control measures, noting instances where the measures are not meeting the expectations of the TTMP and TTMP sub-plans, and identify the remedial action required such that the expectations for traffic control as set out in the TTMP and TTMP sub-plans shall be met.
- (e) Project Co shall take immediate action to effect the requisite remedial measures needed in order to attend to the noted matters. Project Co shall document in the Daily Traffic Management Site Record the issue, the remedy and the action taken.
- (f) Project Co shall continue to inspect a matter of traffic management concern until the issue is resolved.
- (g) Within 48 hours of the preparation of the Daily Traffic Management Site Record, copies of the Site Record shall be forwarded to the City, and to the Lead Traffic and Mobility.
- (h) Project Co shall produce a Monthly Summary of the Daily Traffic Management Site Records, noting the number of issues identified, the location and nature of the issues, the remedies for the issues, the actions taken and the results achieved. Trends in issues shall be identified, remedies for the trends ascertained, and remedial action implemented. All of this information shall be documented in a Monthly Summary of the Daily Traffic Management site Records, and a copy of the summary shall be brought to the weekly Traffic Management Committee meeting for review and discussion, with copy to the City and the Lead Traffic and Mobility.

- (i) The site visits and Daily Traffic Management Site Records, shall include, but not be limited to observations taken by a Project Co designated Traffic Control Supervisor, with respect to each of the following topics of traffic control information as relates to and in accordance with the current accepted TTMP and current accepted TTMP sub-plans. Note that where requirements of this section can be fulfilled by the provision of a video recording, the video can be referenced as proof that the requirements have been fulfilled:
- There are accepted TTMP and all of the TTMP sub-plans in place for the portion of the Project site under review;
 - All requirements, site locations, situations, conditions or other circumstances which are identified in the accepted TTMP and in each of the accepted TTMP sub-plans as potentially impacting traffic flow of any kind as may be related to/caused by the Project. Project Co shall prepare checklists of the identified items for consideration from the TTMP and from each of the TTMP sub-plans, and attach them to the Daily Traffic Management Site Record, thence to be reviewed on site and recorded as an integral part of the Daily Traffic Management Site Record;
 - Works listed in the Traffic and Transit Schedule of the TTMP are progressing in accordance with the start and finish dates set out therein for each work element;
 - Upon City request: Transit service travel time and frequency between existing or temporary BRT stations and/or stops;
 - Prohibitions to any part of the traveling public;
 - Upon City request: Diverted traffic volumes, speeds and travel times for all modes of travel on all roads effected by the Project;
 - Impacts on residential streets and associated temporary and permanent traffic calming measures;
 - Upon City request: Traffic detour follow-up study data for traffic volumes, speeds and travel times for all modes of travel using a detour route, as well as the queue lengths for vehicle traffic;
 - Third party works in the vicinity of the Project;
 - The placement of all traffic control devices;
 - Equipment or material which constitutes a hazard to traffic, pedestrians and cyclists;
 - Storage of equipment or materials external to identified storage areas;
 - Dirt and debris on paved and concrete surfaces;
 - Closure periods;

- Vehicle queues related to Construction activities, closure, detours, lane shifts and diversions, exceeding the length predicted by the analysis of the TCP for the work;
- Multiple construction zones such that traffic encounters multiple disruptions and/or discontinuity in lane geometrics;
- Construction activity and access points or traffic detour/diversion on private roads or lands;
- Construction activity and access points or traffic detour/diversion on public use lands or roadways controlled by an agency
- Access for transit users to all adjacent existing Transitway facilities, BRT lanes, and Transit Priority lanes and non-transitway routes;
- Open excavations adjacent to traffic lanes (including cyclist) during darkness or non-working days;
- Sight distance obstructions;
- Haul routes identified, and, clean and free of Construction dust and debris;
- Access by buses, pedestrians and cyclists to all existing bus stops;
- Passenger facilities are provided at relocated or temporary bus stops;
- Closures and minimization of traffic disruptions on Holidays and during Special Events;
- Detour routes, lane shifts and diversions paved, with pavement markings and signs in place;
- Milled surfaces, if present, are uniform in texture, not raveled, no standing water on the surface, and have been in place for less than three days;
- Detour routes, lane shifts and diversions drained such that there is no standing water or water flow across the roadway, busway, cycling and pedestrian facilities;
- Closure, detour, lane shift or diversion identified in Schedule 7 – Mobility Matters;
- All signs are bilingual English/ French;
- Temporary barriers at required locations, with appropriate flare offsets, end treatments, crash cushions, reflectors and anti-glare screens, and, provision for drainage, and removal of snow, ice and debris;
- Pavement drop-offs exposed to traffic, pedestrians and cyclists are to specifications per height, protection, ramping, etc.;
- All Work meets AODA requirements;
- Redundant pavement markings are eradicated as specified;

- Lane widths and clearance offset to specifications in reduced speed zones;
- Floodlighting adjusted so as not to interfere with driver's vision, nor directed toward residences or businesses;
- Streetlighting in accordance with Schedule 15-2, Part 2 – Civil and Guideway;
- All closures, detours, diversions, lane shifts, pathways and sidewalks being maintained and repaired to City and industry standards;
- School crossings appropriately addressed in order to maintain safe and efficient operation;
- Temporary closure and/or re-routing of pedestrian and cycling routes conform to Pedestrian Access Plan and Construction Site Pedestrian Control Plan
- Directional signing for pedestrians and cyclists;
- Sidewalk detours conforms to accepted TCP;
- Lighting provided for pedestrian and cyclist users is functional;
- OPS on duty for Work within 20m of traffic control signal:
- Alternate parking or designated usage zones provided to replace those impacted by Construction;
- Temporary traffic control signal installations;
- Date, time and content of the PVMS message changes;
- Date and time of lane closures;
- Successive intersections on either side of a closed intersection open to two-way traffic;
- Transit given priority on the road system via temporary busways or bus-only lanes;
- Transit priority measures operational at key intersections on detour routes;
- When BRT lane closures are in place during the permitted hours, an alternative is made available for transit;
- Interference or interruption of operations of BRT, Bus Only Lanes or BRT detours by Project transport vehicles;
- All traffic controls are operational before commencing Works affecting operation of BRT, Bus Only Lanes or BRT detour operations;
- Barrier free pedestrian and cycling access to active Stations and across all pedestrian bridges maintained at all times;
- Pedestrian and cycling access maintained across the local bus route lanes at all times;

- A new or relocated alternate route pathway, sidewalk or MUP leading to a station connection is provided in place of a closed pathway, sidewalk or MUP;
- Way-finding signage including maps showing routes and destinations is provided at all times for pathways, sidewalks and MUP closures and detours at all access points and intersections and on pathways or MUPs 50 m in advance of closure or relocation points;
- Generally, public traffic, transit, and construction traffic is managed in accordance with the TTMP;
- Pedestrian facilities are in accordance with the Pedestrian Access Plan and Construction Site Pedestrian Control Plan;
- All traffic control and protective devices identified in the approved TTMP are provided, installed and are being maintained;
- Traffic Control Supervisor on the Project site full time when Construction activities are underway;

APPENDIX D

Daily Lane Closure Report

- (a) Project Co shall create a Daily Lane Closure Report for each lane closure on the Project. The purpose is to document the status of all of the various lane closures for all modes of transportation throughout the Project. The Daily Lane Closure Report may be either a hard copy document or an electronic form in a format compatible with City systems.
- (a) The Daily Lane Closure Report shall be a field sheet format. The header of the document shall include but not be limited to headings for the Project Segment and number, date, day of week, location, time of the observations, name of observer, the signature of the observer, and whether the lane closure is a General Traffic Lane Closure, or a BRT Lane Closure.
- (b) Each day (weekdays and weekends, and statutory and civic holidays), Project Co shall carry out site inspections, in person or via electronic surveillance, with a focus on both the temporary and long term lane closures in effect for both general traffic and BRT vehicles throughout the entire Project. The data shall be recorded on the Daily Lane Closure Report, the original of which shall be retained by Project Co until the Project warranty period is complete.
- (c) In instances where lane closures change during the day (or night), Project Co shall carry out site confirmation of the lane closures relevant to the changes at the start and end of each change-over of the lane closures and record the inspection on a Daily Lane Closure Report. The observations shall be taken at a frequency so as to confirm with an accuracy of + - 5 minutes, the actual start and end times for each of the temporary lane closures.
- (d) Each day, Project Co shall review the information recorded on the Daily Lane Closure Reports, and assess the execution of the lane closures, noting instances where the timing of the lane closure implementation/removal is not meeting the expectations of the TTMP and TTMP sub-plans, and identify the remedial action required such that the expectations for lane closures as set out in the TTMP and TTMP sub-plans shall be met.
- (e) Project Co shall take immediate action to effect the requisite remedial measures needed in order to attend to the noted matters. Project Co shall document in the Daily Lane Closure Report the issue, the remedy and the action taken.
- (f) Project Co shall continue to inspect a matter of traffic management concern until the issue is resolved.
- (g) Each day, copies of the current Daily Lane Closure Report shall be forwarded by Project Co to the City, and to the Lead Traffic and Mobility.
- (h) Project Co shall produce a Monthly Summary of the Daily Lane Closure Reports, noting the number of issues identified, the location and nature of the issues, the remedies for the issues, the actions taken and the results achieved. Trends in issues shall be identified,

remedies for the trends ascertained, and remedial action implemented. All of this information shall be documented in the Monthly Summary of the Daily Lane Closure Reports, and a copy of the summary shall be brought to the weekly Traffic Management Committee meeting for review and discussion, with copy to the City and the Lead Traffic and Mobility.

- (i) The Daily Lane Closure Reports shall include, but not be limited to, observations taken during personal site visits and/or via electronic/camera surveillance, carried out by a Project Co designated Traffic Control Supervisor, with respect to each of the following topics of lane closure information as relates to and in accordance with the current accepted TTMP and current accepted TTMP sub-plans.
- Lane closure required (Yes/no);
 - Planned lane closure (yes/no);
 - Scheduled lane closure time (Military Time – 24 hr clock);
 - Scheduled lane opening time (Military Time);
 - Actual lane closure time (Military Time);
 - Actual lane opening time (Military Time);
 - Period of the day (peak, off-peak, night, weekend, holiday);
 - Lane description:
 - A. Street name;
 - B. Direction of traffic flow
 - C. Name of upstream cross street
 - D. Name of downstream cross street;
 - E. Number of lanes closed;
 - F. No of blocks lane(s) is closed; and
 - G. Lanes closed – Right turn, Through and right turn, Right through, Left through, through and left turn, left turn
 - Comments/other observations;
 - Equivalent lane closure hours for current observation;
 - Location Map to scale showing relevant lane configuration with closed lane(s) shown as hatched area;
 - Checked by (print name then signature); and
 - Signed off by (print name then signature).

APPENDIX E
OMCIAA Traffic Control Permit

OMCIAA Standard Operating Procedure

SOP Name: Traffic Control

SOP#: SAF1017SOP

Revision:	Description:	Author:	Date Issued:	Approved by:
Revision 1.0	Traffic Control	[REDACTED]	Oct 25/2010	WHSC Committee
Revision 2.0	WHSC Review	NA	May 1, 2014	WHSC Committee
Revision 3.0	19T	19T	19T	19T

1. Foreword	N/A
2. Purpose	This procedure exists to define the requirements to be followed by employees and contractors working on or in close proximity to a roadway or a vehicle corridor on Airport Authority property.
3. Scope	This Standard Operating Procedure (SOP) applies to all Airport Authority personnel and to contractors working on Airport Authority property.
4. Definition	<p>Advance Warning Area The Advanced Warning Area is the first area of warning to drivers that there's work ahead. Traffic cones and warning signs must be displayed at least 50m before the Work Area begins so that drivers can prepare to slow down. If the Work Area is immediately after a curve in the road, traffic cones must be placed 60m in advance for additional advance warning of work around the bend ahead.</p> <p>Approach Area The Approach Area is much closer to where the work is actually taking place. The Approach Area must be clearly marked, notifying of lanes changes / closures, speed reductions, passing restrictions, etc. If the Work Area is immediately after a curve in the road, the Approach Area shall be marked at least 40m in advance for additional warning of work around the bend ahead.</p> <p>Transition Area The Transition Area is where traffic is channeled from the normal path to the new path and must be clearly marked as such. The Transition Area must be kept free of any materials, vehicles, equipment, etc. and must be obvious to drivers. Having a flag-person at the Transition Area is preferred. If a complete lane closure is required, 2 traffic control persons are required to direct the traffic flow from each direction.</p> <p>Work Area The Work Area is the area where the work is actually taking place. Materials, vehicles and equipment can be stored in this area as well. The area could be further shielded with barriers if deemed necessary. This should be determined at the Pre-Start meeting.</p>

	<p><i>Termination Area</i></p> <p>The Termination Area is after the Work Area ends and extends from the tail-end of where the work is taking place to where traffic can safely resume to the normal path. This should be at least 40m beyond the work area.</p>
5. Hazard or Occurrence	N/A
6. Responsibilities	<p><i>Vice Presidents, Directors, Managers and Supervisors</i></p> <p>Those who supervise shall ensure a safe and healthy workplace for employees; ensure that all employees are appropriately trained and equipped in order to carry out required tasks.</p> <p><i>Project Managers</i></p> <p>Project Managers shall ensure that contractors of the project they are managing are adhering to the requirements within this procedure.</p> <p><i>Work Permit Process Coordinators</i></p> <p>The coordinator/s of the work permit process shall ensure permit applicants are made aware of the requirements within this procedure, as necessary.</p> <p><i>Employees & Contractors</i></p> <p>Employees and contractors shall comply with the requirements as detailed in this procedure</p>
7. Procedures	<p>This procedure is intended as a practical working reference and must be used in conjunction with the Canada Labor Code, Part II and the regulations supporting this part as well as task-related standard operating procedures and /or the jurisdictional legislation applicable to your organization. The requirements are as follows:</p> <ol style="list-style-type: none"> 1. Pre-start meeting – perform workplace assessment, identify risks, mitigate hazards, define Advance Warning Area, Approach Area, Transition Area, Work Area and Termination Area. 2. Perform task/s during off-peak daylight hours (low volume traffic) – alternatively, tasks may be performed during peak daylight hours (high volume traffic); this would be dependent upon criticality and operational impact. 3. Buddy system – one individual performing the task at the work area (i.e. in an elevating device); and one individual observing; the observer shall be located off road and between the Approach Area and the Transition Area. If a complete lane closure is required, 2 traffic control persons are required to direct the traffic flow from each direction. 4. Should an elevating device be used, the placement of the device must be directly adjacent to the work being performed and within the Work Area.

	<ol style="list-style-type: none"> 5. There must be a vehicle parked in front of the Work Area; this vehicle must be in the direction of oncoming traffic with flashers on; if the vehicle is equipped with a beacon, this too shall be operational. 6. Signage & pylons – warning signage “work ahead” must be visible at the Advance Warning Area, at least 50m prior to the start of the work area with directional arrows and pylons indicating vehicles to merge to adjacent lane. If the Work Area is immediately after a curve in the road, the pylons shall be placed at least 60m in advance. As well, while 50m is suggested, the most appropriate risk mitigating distance shall be determined in the pre-start meeting. This shall be discussed and agreed upon prior to any work being performed (i.e. work overhead, immediately after a curve in the road, etc.); pylons shall be placed in a fashion to detour vehicles and pedestrian traffic away from the Work Area. These pylons should start at the Advance Warning Area. 7. Should an elevating device be used, the operator must adhere to applicable safe operating procedures and associated training must be current. 8. Personal Protective Equipment (PPE) – applicable PPE shall be discussed and agreed upon in the Pre-start Meeting. Essential PPE includes: <ul style="list-style-type: none"> ✓ Reflective safety vests ✓ Safety helmet ✓ Steel-toe footwear Additional PPE is task dependent and may include: <ul style="list-style-type: none"> ✓ Fall protection gear / bucket operator ✓ Hard hat / safety gloves / safety glasses, etc. ✓ Confined space equipment 9. Please refer to Figures 1, 2, 3 and 4 on the following pages, which represent the intended approach to be taken for 4-lane traffic control, 2-lane traffic control and complete lane closure traffic control as well as alternative signage to be used (project dependent). <p>Additional precautions are project dependent and shall be addressed and agreed upon at the Pre-start Meeting.</p>
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Figure 1 – 4 lane traffic control (single lane work, keeping the other lane open)

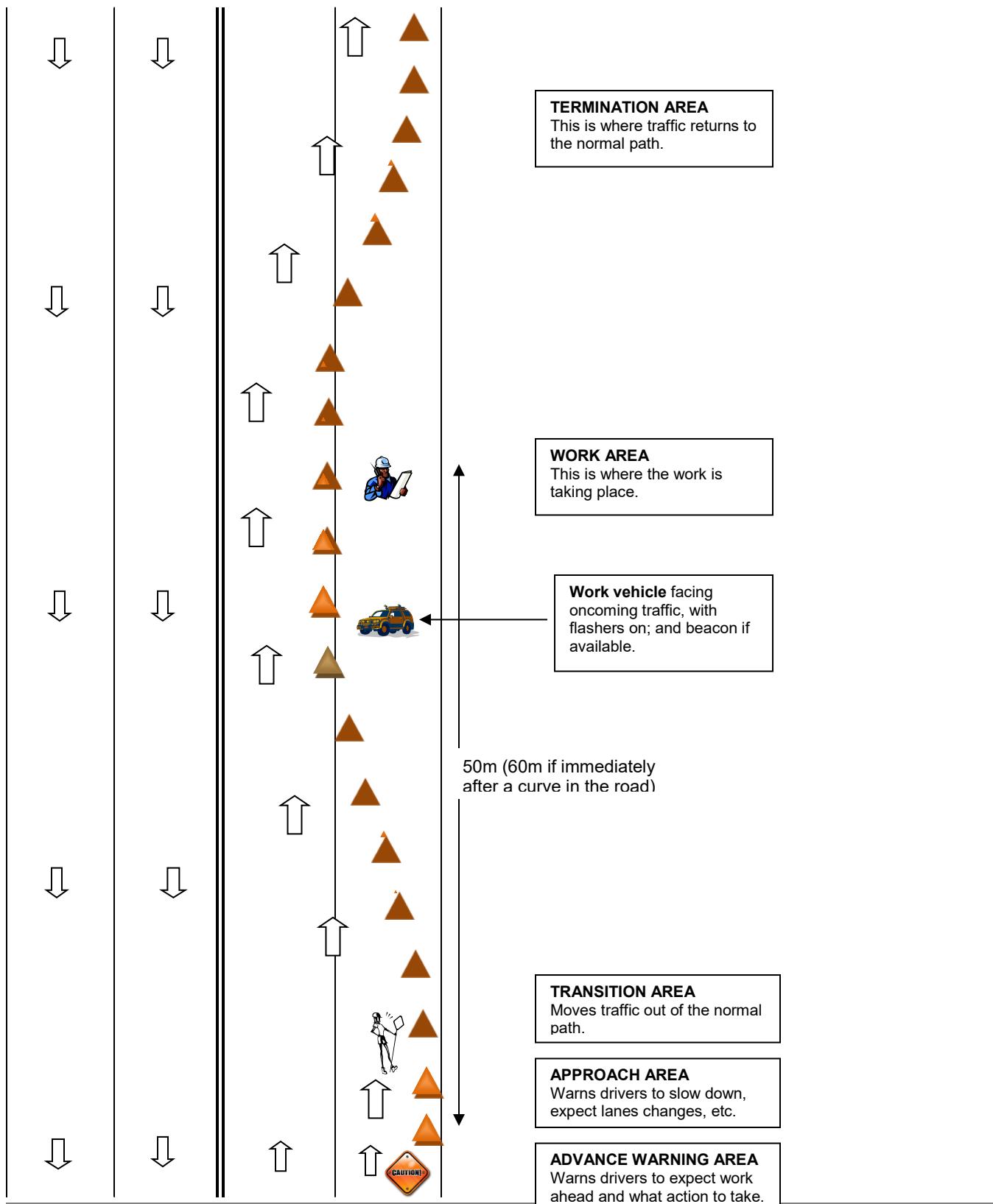


Figure 2 – 2 lane traffic control (roadside work, keeping both lanes open)

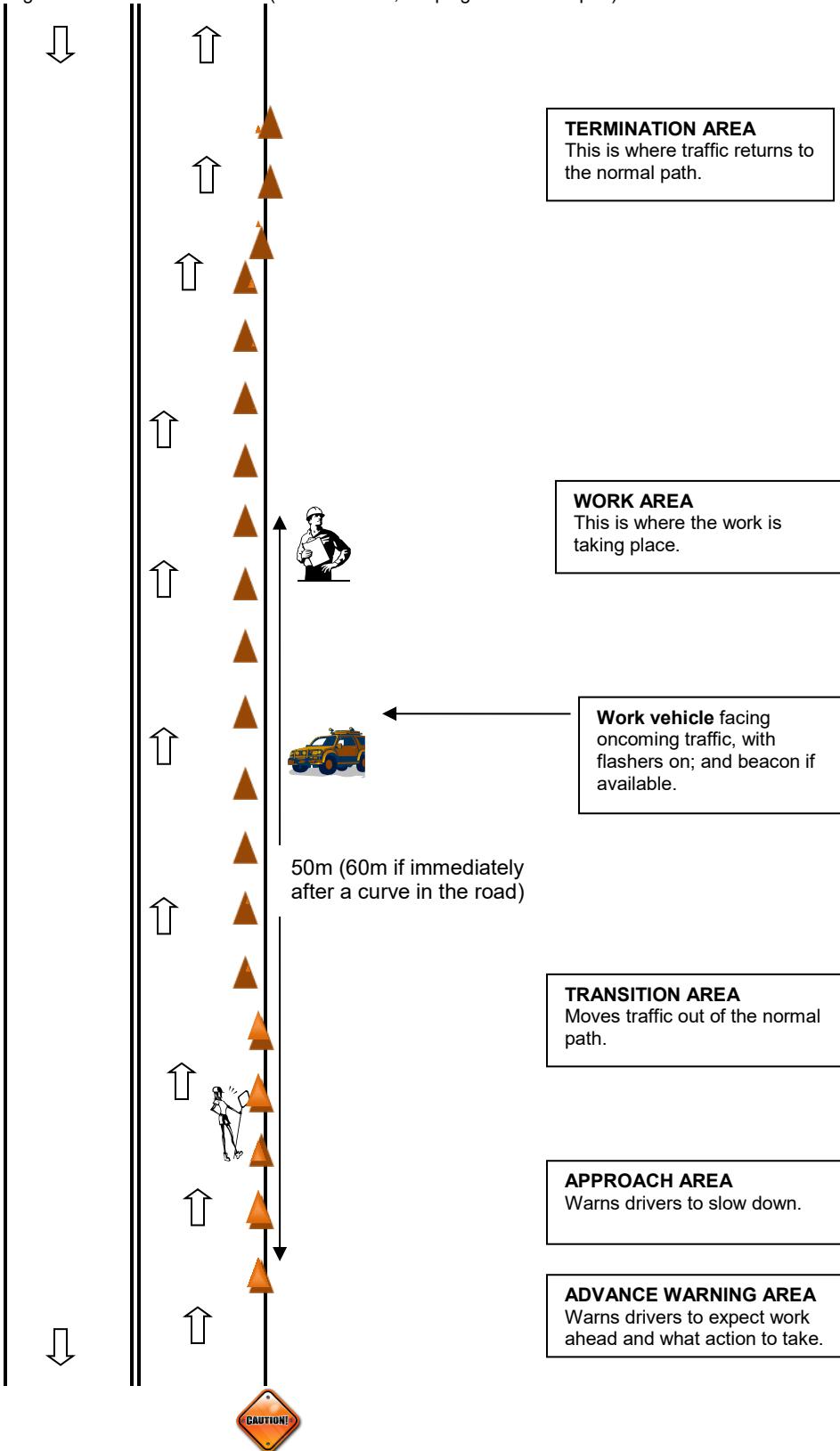


Figure 3 – 2 lane traffic control (1 complete lane closure - 2 traffic control persons required)

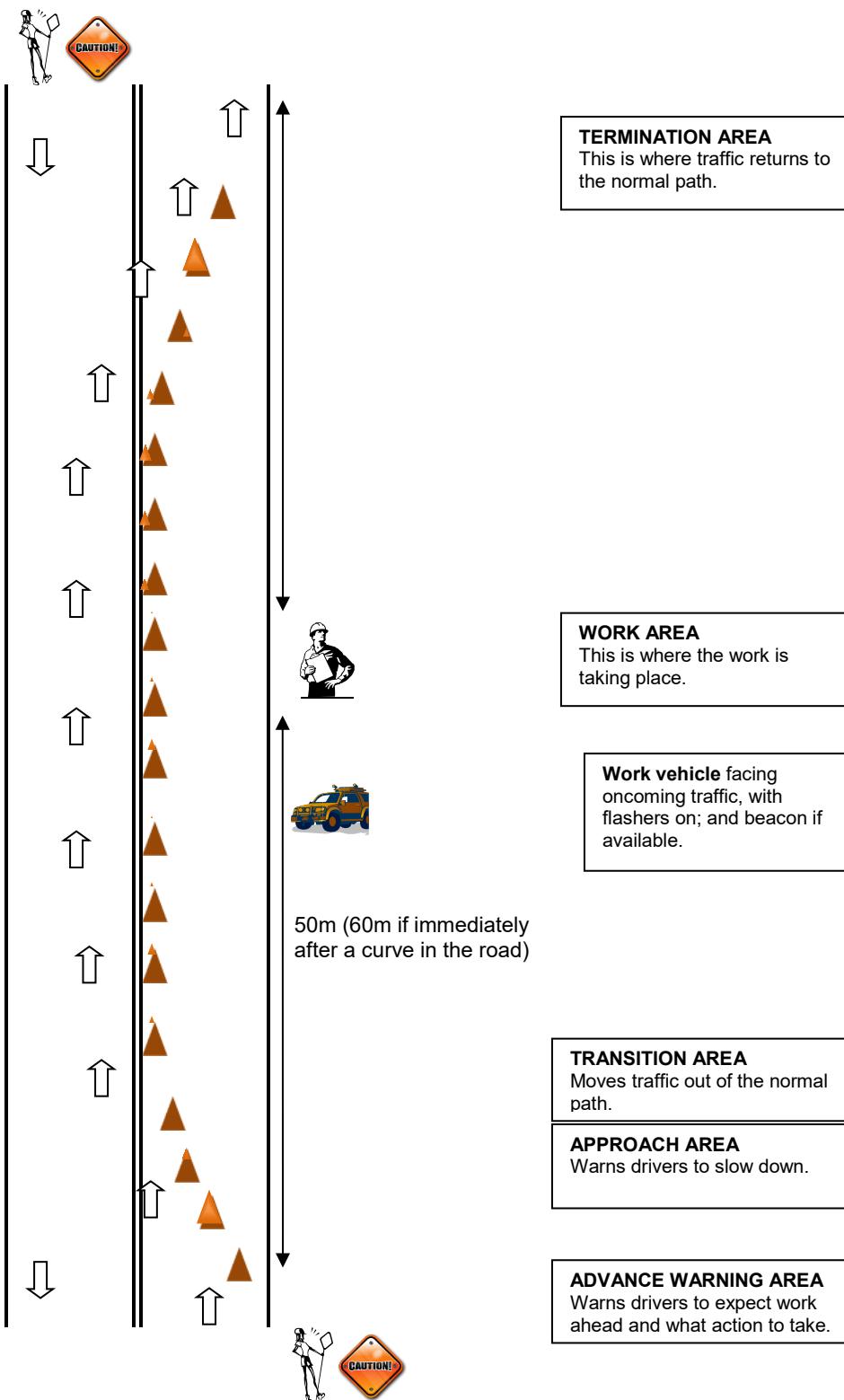
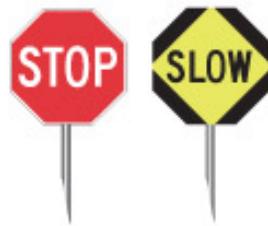


Figure 4 – Examples of alternative signs (project dependent)





TRAFFIC PROTECTION PLAN SITE SKETCH

Drawn by: _____

Supervisor: _____ Print _____ Sign _____

Date:



INSTRUCTIONS FOR TRAFFIC CONTROL PERSON(S)

Traffic control person (s) (TCP) shall wear a hard hat, safety boots, shirt, pants, and reflective safety vest with tear away sides, shoulders and front, at all times while directing traffic.

Hand signals shall be used in conjunction with a slow/stop sign to control traffic.

Stand on the right side of the lane you will be directing, facing across the roadway so that you can see traffic from both ways and the other TCP (if 2nd TCP is required for the task).

Ensure you have placed yourself in an area that will allow you to escape from any erratic driving or accident.

TCPs working without radios must signal each other when they are going to change direction of traffic flow.

When you have learned that emergency vehicles are approaching, traffic must be stopped both ways to allow for a clear path for any emergency vehicle to pass.

TCP shall not engage in any other work while controlling traffic.

If any vehicles refuse to stop or are driving in a reckless manner, the TCP shall make every attempt to take down the license plate number, a description of the vehicle and report it to your on site Supervisor or directly to the Security Operations Centre (SOC) at 613-248-2111.

All TCP's should have with them a small note book and pencil for any note taking.

If you are confronted by any driver or pedestrian contact your Supervisor or SOC and ask for assistance. Never threaten physical violence or give verbal abuse to anyone.

Traffic Control Person(s):

Supervisor:

TCP #1: _____
Print name

Print name: _____

TCP #2: _____
(if applicable) Print name

Signature: _____

Signature: _____
TCP #1

Date: _____

Signature: _____
TCP #2 (if applicable)

Date:

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**SCHEDULE 15-2
DESIGN AND CONSTRUCTION**

**PART 7
DESIGN AND CONSTRUCTION REQUIREMENTS – TRAFFIC AND TRANSIT
MANAGEMENT AND CONSTRUCTION ACCESS**

**ARTICLE 1 GENERAL TRAFFIC AND TRANSIT MANAGEMENT
REQUIREMENTS**

1.1 Order of Precedence

- (a) Project Co's Traffic and Transit Management Plan and traffic control operations shall comply with the criteria contained in this Part 7, and all standards, regulations, policies, Applicable Law, guidelines or practices applicable to the Project, including but not limited to each of the following Reference Documents. In the event of a conflict between the criteria, commitments or requirements contained within one document when compared with another, the more stringent shall apply:
 - (i) OC Transpo Transitway and Station Design Guidelines;
 - (ii) City of Ottawa Transportation Master Plan;
 - (iii) City of Ottawa Road Corridor Planning & Design Guidelines, Urban & Village Collectors / Rural Arterials & Collectors;
 - (iv) Region of Ottawa-Carleton Regional Road Corridor Design Guidelines, July 2000, Region of Ottawa-Carleton;
 - (v) City of Ottawa Right of way Lighting Policy;
 - (vi) City of Ottawa Pedestrian Plan;
 - (vii) City of Ottawa Cycling Plan;
 - (viii) City of Ottawa Traffic and Parking By-Laws;
 - (ix) The City of Ottawa, Department of Public Works and Environmental Services, Infrastructure Services Branch, Standard tender documents for Unit Price Contracts (Volume No.1- Construction Specifications; Volume No. 2 - Materials Specifications & Standard Detail Drawings);
 - (x) City of Ottawa Area Traffic Management Principles and Guidelines;
 - (xi) City of Ottawa Emergency Management Plan;

- (xii) City of Ottawa Maintenance and Quality Standards for Roads, Sidewalks and Pathways
- (xiii) Geometric Design Guide for Canadian Roads (TAC);
- (xiv) Urban Supplement to the Geometric Design Guidelines for Canadian Roadways (TAC);
- (xv) Guidelines for the Design of Roadway Lighting (TAC);
- (xvi) Turning Vehicle Templates (TAC);
- (xvii) Geometric Design Standards for Ontario Highways (MTO);
- (xviii) City of Ottawa Transportation Impact Assessment Guidelines;
- (xix) City of Ottawa Delivery Standards for CADD Drawing Files;
- (xx) Roadside Safety Manual (MTO);
- (xxi) Ontario Traffic Manuals;
- (xxii) Ontario Provincial Standards Specifications and Standard Drawings (OPSS and OPSD);
- (xxiii) Accessibility for Ontarians with Disabilities Act (AODA);
- (xxiv) Ottawa Accessibility Design Standards;
- (xxv) City of Ottawa Operation Policy, Procedures and Guidelines;
- (xxvi) City Operating Policy and Procedures;
- (xxvii) City of Ottawa Park and Pathway Development Manual;
- (xxviii) Multi-Modal Level of Service (MMLOS) Guidelines;
- (xxix) NCHRP Report 280 Work Zone Practices – Table 3: General Guidelines on Vehicle Capacity Through Work Zones;
- (xxx) Other relevant MTO Policy, Procedures and Guidelines;
- (xxxi) Bikeways Design Manual;
- (xxxii) Guidelines for Reducing Speed Limits in Construction Work Zones;
- (xxxiii) NCC Standard Sign System Manual; and,
- (xxxiv) OC Transpo, Interaction Zone Design Guidelines for Bus Stops and Bike Lanes.

1.2 General Requirements

- (a) Project Co shall manage the traffic and transit impacts of the Project and shall develop a TTMP for the Project and work to meet the requirements of this Part 7.
- (b) Project Co shall develop and submit a traffic and transit management strategy and TTMP in accordance with Schedule 10 – Review Procedure that is acceptable to the City. Project Co shall cooperate with the City and OC Transpo with respect to the development of the traffic management strategy.
- (c) Further to the requirements of Schedule 15-2, Part 1, Article 10 – Construction Safety Management, Project Co shall identify in each Site Specific Safety Plan, the safety concerns and mitigation measures associated with each Work Site as pertains to the health and safety of the traveling public, from the perspectives of pedestrians, cyclists, general vehicle traffic, transit traffic and transit customers. Project Co shall include a copy of each relevant Site Specific Safety Plan as an Annex to the TCP submission in accordance with Schedule 10 – Review Procedure. Project Co shall keep the Site Specific Safety Plan and the TCP current to the changes on Site, and resubmit the TCP accordingly. Project Co shall not proceed with any Work on Site without an accepted TCP which is current to the present-day Site Conditions.
- (d) Project Co shall work closely and in a reasonable manner with the City and OC Transpo, Stakeholders, other City service providers, and the Governmental Authorities so that transit service is maintained during the performance of the construction in terms of travel time and frequency.
- (e) Construction shall be scheduled so that the duration and extent of the proposed Work and traffic control measures minimize the impact to all modes of transportation and adjacent land owners, and shall not prohibit any part of the traveling public prior to receiving the required authorization to do so.
- (f) Project Co shall collect, record, document, and file with the City, the travel times between Existing Trillium Line and Transitway Stations and stops for all bus routes and Facilities, prior to the commencement of any Work activity which would alter bus travel times. Project Co is advised to coordinate their collection of this data in advance with OC Transpo, as OC Transpo may be able to facilitate the collection of the data using their bus tracking system. This information shall be used by Project Co as the baseline travel times for comparison/evaluation of alternate/temporary bus routes. Baseline data shall be validated by the City to ensure that it is representative of normal operations and not affected by other road works.
- (g) All traffic data used for analysis for traffic management purposes shall be based on the most current data and shall be no older than two years. The information to be collected shall include, but not be limited to, all of the hourly traffic volumes and AADTs for all modes of travel on all Roadways, bus Facilities, bike facilities and pedestrian facilities which will be affected by the Project, including any potential detour routes. Project Co shall be responsible for obtaining or collecting all traffic data necessary for its traffic

analysis, if traffic data less than two years old is not relevant to the traffic management analysis due to temporary conditions that existed at the time the data was collected. Project Co shall confirm with the City that the data is appropriate prior to conducting an analysis using said data.

- (h) Project Co shall undertake a traffic management study, if road capacity and LOS is reduced, to determine the impact of the construction on other routes and to determine appropriate mitigation measures. The traffic management study shall involve area wide traffic modeling to determine impacts to all modes of transportation including adjacent corridors impacted by the construction. The study shall include Project Co's forecast for, but not limited to, routes, diverted traffic volumes, speeds, and travel times for all modes of travel on all routes subject to the study. The traffic management study shall be submitted as a part of the TTMP document in accordance with Schedule 10 – Review Procedure.
- (i) The traffic management strategy shall address the impact on residential streets of any diverted traffic through appropriate temporary and permanent traffic calming measures in accordance with City of Ottawa Area Traffic Management Principles and Guidelines, and in consultation with the City along any detoured bus routes.
- (j) The OTM supersedes all reference in this Project Agreement to the Ministry of Transportation MUTCD. The supply and placement of all necessary temporary TCDs shall be performed under the sole direction of Project Co and in accordance with Project Co's submitted/reviewed TTMP and associated TCP, prior to commencing any construction on or adjacent to a City street or provincial highway/freeway. The TCP shall be developed in accordance with guidelines established by the most recent version of the OTM, the OHSA, and this Part 7 which details the required contents and submission of the TTMP and associated TCPs.
- (k) Vehicular and pedestrian/cyclist traffic control within the Project shall remain the sole responsibility of Project Co as the City delegates this authority to Project Co in accordance with the submitted/reviewed TTMP. Notwithstanding the foregoing, Project Co shall, at its own expense, remove any equipment or material, which in the City's opinion, constitute a Hazard to traffic, pedestrians, and cyclists.
- (l) Project Co shall be fully and solely responsible to ensure the development and implementation of a submitted/reviewed TTMP as required in this Part 7. The TTMP, its sub-plans, and all required TCDs shall be designed/installed, monitored, operated/Maintained, and removed, utilizing only competent persons and workers as defined under the OHSA. Project Co shall be responsible for coordination of this Work with the City.
- (m) Project Co shall not store any equipment or materials on a federal, provincial, or municipal road or the Roadway shoulders and, Transitway, Park and Rides, or boulevards, unless the storage areas are identified in the TCP and appropriate TCDs have been implemented to protect the equipment or materials. The City shall review and approve any storage of equipment and/or materials within the Lands. Project Co shall be

permitted to use temporary closed lanes as a construction laydown and staging area where temporary lane closures are permitted and approved by the City. Construction shall be scheduled so that the duration and extent of the proposed Work and traffic control measures minimize the impact on the traveling public. Project Co shall remove all dirt and debris from all paved or concrete surfaces outside of the staging area at the close of each workday, and shall be responsible for any repairs or Maintenance associated with the construction activity, to City standards.

- (n) The permitted periods for closures outlined in this Part 7 shall be the basis for the development of the TTMP. Variations to the applicable Permitted Periods for Closures, at specific locations, may be permitted for such specific locations, but only if substantiated through a plan by Project Co that addresses, at a minimum, traffic requirements, analyses, and Stakeholder consultation, where applicable, and such plan is submitted to and accepted by the City in accordance with Schedule 10 – Review Procedure.
- (o) All vehicle, transit, transit customer activity, pedestrian, and cycling data used for analysis for traffic management purposes shall be based on the most current data, and no older than two years with growth factors acceptable to the City. Project Co shall be responsible for obtaining any vehicle, pedestrian, and cycling data necessary for its traffic management analysis where the City does not already have the data or cannot provide the data within Project Co's required timelines.
- (p) Implementation and removal of any closure, full closures, detour routes, Lane Shifts, and diversions and/or other changes in traffic patterns shall not be permitted outside of the applicable Permitted Periods for Closures as defined in this Part 7 and elsewhere in this Project Agreement. The City may, acting in a reasonable manner, temporarily adjust the applicable permitted periods for any closure in circumstances considered appropriate by the City including but not limited to, holidays, as further addressed in Clause 1.4 - Holidays and Special Events of this Part 7, incidents, and Maintenance.
- (q) The City may direct Project Co, on 7 Business Days advance notice, to eliminate or modify any or all closures and restore free-flow traffic for a 24-hour period on the day of any event other than a holiday, as per this Part 7.
- (r) Project Co shall temporarily cease any relevant construction activities that are affecting traffic and make all the necessary travel lanes available to traffic as quickly as possible, if the City determines that vehicular queues related to closure, full closures, detour routes, Lane Shifts and/or diversions are excessive. For example, where the extent of vehicular queues affect traffic operations such as at intersections or interchanges or the ability of vehicles on a highway mainline to exit at upstream interchange ramps.
- (s) At any time during the Project, the City Representative may, acting in a reasonable manner, temporarily adjust the applicable Permitted Periods for Closures identified in this Part 7, including but not limited to holidays (as further addressed in this Clause), incidents and Maintenance.

- (t) Any proposed Project Co initiated closure, full closures, detour routes, Lane Shifts, and diversions, not included in Project Co's accepted TCP, shall be submitted to the City in an updated TCP in accordance with Schedule 10 - Review Procedure. Project Co shall not proceed with implementation of the closure, full closure, detour, Lane Shift, or diversion without an accepted TCP. Project Co shall not commence any Work on Site without an applicable current accepted TCP.
- (u) All Transitway, bus lanes, municipal Roadway, cycle, and pedestrian facility permanent modifications not specifically described or depicted in the EA for the Project, or specifically referenced or shown in the Project Agreement, require Council approval prior to their construction. Project Co shall provide to the City a RMA report for the proposed modifications in accordance with requirements of the City's Transportation Impact Assessment Guidelines. A sample RMA report has been provided in Appendix A of this Part 7. The RMA shall be submitted to the City in accordance with Schedule 10 - Review Procedure. Project Co shall attend committee and Council meetings with the City, and provide assistance to the City in preparing a presentation for committee and Council, and assisting the City in answering any questions which arise at the meetings. Given that modifications vary in size and complexity, and that committee and Council agendas may become full, Project Co shall confirm with the City regarding the lead time required to have each particular item prepared and placed on a committee agenda for consideration, thence, forwarded to Council agenda for approval and final disposition, and allow for this time in their scheduling of the Works.
- (v) Multiple construction zones that impact each other along existing provincial highways, existing municipal Roadways, existing Transitway, and other affected federal Roadways or routes between them, such that traffic encounters multiple disruptions and/or discontinuity in the lane geometries, shall not be permitted.
- (w) Access to/from construction zones along existing provincial highways, existing Transitway, and existing Major Municipal Roads shall not be permitted outside of the applicable Permitted Periods for Closures, unless separate acceleration and deceleration lanes are provided to/from such construction zones. Acceleration and deceleration lanes shall be designed in accordance with the Reference Documents and Applicable Codes and design standards taking into account all construction vehicle/equipment types.
- (x) Construction vehicles/equipment shall only use accesses to/from construction zones in the same direction of traffic thereby diverging/merging with the flow of traffic, in order to avoid crossing opposing traffic. The City reserves the right to close any access to/from any construction zone that it deems to be unsafe or which constitutes a Hazard to the public.
- (y) There shall be no open excavation adjacent to a lane carrying traffic including cyclists at any time, except where a barrier designed to restrain errant vehicles or cyclists is located between the traffic and the excavation.
- (z) Project Co shall remove materials and construction vehicles/equipment which, in the opinion of the City, constitute a Hazard or sight distance obstruction.

- (aa) Project Co shall be responsible for identifying to the City in advance all Roadways being utilized for haul routes. Project Co shall be responsible for ensuring haul routes are kept clean and free of construction dust and debris. Project Co shall submit a plan for the cleaning of haul routes in accordance with Schedule 10 – Review Procedure. Haul routes shall comply with City's by-laws for goods movement and use of truck routes.
- (bb) The City shall be granted access to the Work zone to install portable cameras or other devices required for monitoring, audit, public communication, data collection, or other purposes.
- (cc) Project Co shall be responsible for providing, installing, and Maintaining all TCDs and protective devices identified in the approved TTMP.
- (dd) Seasonal Load Restriction Period
 - (i) Project Co shall abide by the City's SLR period. If Project Co's schedule requires that an ODV exceeding the half-load limit be used on a non-full load truck route during the SLR period, Project Co shall conduct non-destructive Pavement deflection testing (such as falling weight deflectometer) during the summer prior to the SLR period, and again during the SLR period, and submit the results to the City a minimum of five calendar days prior to the required vehicle movement. The City will not issue an ODV permit during the SLR period without receipt of this data demonstrating that the road can accommodate vehicle loads exceeding the half-load limit.

1.3 Accommodation of Transit Services

- (a) Project Co shall be responsible for liaising and coordinating with all applicable municipal transit agencies for any modifications to bus routes and/or bus stops that may be required due to closures, full closures, detour routes, Lane Shifts, and diversions and/or other changes in traffic patterns.
- (b) Project Co shall maintain access for transit customers to all adjacent existing and temporary Transitway and transit facilities, bus lanes, Transit Priority Lanes, and non-Transitway routes through detours or otherwise as detailed elsewhere in this Part 7 and elsewhere in this Project Agreement, unless exceptions have been approved.
- (c) Project Co shall provide the City and OC Transpo at least 35 calendar days' notice to coordinate adjustments required to their facilities as a result of construction. Access by buses, pedestrians, and cyclists to all existing bus stops or Platforms located within the Work zone shall be maintained at all times, except where otherwise stated in this Part 7, elsewhere in this Project Agreement, or agreed upon by the City and OC Transpo. Where access cannot be maintained and temporary facilities are required, these facilities shall be comparable to the existing facilities in form/function, to the satisfaction of OC Transpo.
- (d) Proposed modifications to bus routes and/or bus stops shall be submitted in accordance with Schedule 10 – Review Procedure.

- (e) Any relocation of bus stops or shelters shall be preceded with signage prepared and posted by Project Co at the existing bus stops, Station, or Platforms indicating the location of the relocated bus stops, Station or Platforms with advance notification to the public of at least 30 calendar days, subsequent to the review and acceptance of the relocation proposal by the applicable authority. Any relocation of bus stops shall include the provision of appropriate customer or operational facilities or infrastructure including but not limited to: Platforms, shelters, lighting, benches, operator washroom facilities, supervisor facilities, bus lay-up stalls, Station/route/regulatory/wayfinding signage, bike racks, and safety and security systems (i.e. emergency phones and CCTV cameras/stanchions), to City and OC Transpo standards and specifications. Project Co shall be responsible for liaising and coordinating with all applicable municipal transit agencies.
- (f) Project Co shall contact OC Transpo Transit Planning Staff at least 5 Business Days prior to starting construction, where the TTMP has indicated that the proposed Work will interfere with bus or pedestrian access to/from a transit stop, in order to coordinate the temporary relocation of the affected transit stop(s) as may be required.
- (i) Project Co shall contact OC Transpo Transit Planning Staff at least 20 Business Days prior to the relocation or removal of a bus shelter.
- (ii) A temporary concrete shelter pad shall be required for the relocation of a bus shelter if the planned duration of Work is longer than 30 calendar days, unless otherwise indicated by OC Transpo staff.

1.4 Holidays and Special Events

- (a) Project Co shall comply with the following requirements when scheduling hours of Work or Project Co initiated closures during the holidays identified in Tables 7-1.1 and 7-1.2:
- (i) Project Co shall not commence the implementation of any closures on any of the holidays, after 12:00 hrs on Fridays or a day proceeding a holiday weekend, and before 12:00 hrs on a day following a holiday or on the first Business Day following a holiday weekend.

TABLE 7-1.1 – ONTARIO STATUTORY HOLIDAYS

New Year's Day	Civic Holiday
Family Day	Labour Day
Good Friday	Thanksgiving Day
Victoria Day	Christmas Day
Canada Day	Boxing Day

TABLE 7-1.2 – OTHER HOLIDAYS

Easter Monday	Remembrance Day
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- (b) Project Co shall minimize traffic disruptions on existing provincial highways, existing Major Municipal Roads, existing or detoured Transitway, bus detour routes, federal roads, existing Minor Municipal Roads, and other affected municipal and federal Roadways during special events. Project Co shall be responsible for obtaining a listing of planned special events on an as required basis from the City of Ottawa Events Central Office, the Traffic Management Special Events office, and the NCC, recognizing that the special events calendar is updated by the City and the NCC on a regular basis.

1.5 Detour Route, Lane Shift, Diversion, Closure, and Construction Requirements

(a) General

- (i) Project Co shall not implement any closure, detour, Lane Shift, or diversion without an applicable current accepted TTMP and TTMP sub-plans.
- (ii) Project Co shall pave all detour routes, Lane Shifts, and diversions and have appropriate Pavement markings and signs placed in accordance with the OTM, King's Highway Guide Signing Policy Manual (MTO Roadways), and City of Ottawa Operation Policies, Procedures and Transitway and Station Design Guidelines.
- (iii) Project Co shall be responsible for all Pavement markings and non-regulatory signage on all detour routes, in preparation for the detour and during detour operations.
- (iv) Project Co shall ensure that the Pavement structure and condition of any new, existing, or temporary Roadway, bus lanes, bus detour route, cycling facility, and pedestrian facility used for all detour routes, Lane Shifts, and diversions, including detour routes prescribed by the City, is designed and constructed for its intended purpose in accordance with the requirements set out in Schedule 15-2, Part 2, Clause 6.10 - Pavement, and does not adversely impact the safety and intended function of such detour routes, Lane Shifts, and diversions for all road users of the facilities.
- (v) Project Co shall schedule construction activities such that no milled surface shall remain for more than five calendar days or over weekends. Each milled surface shall have a uniform texture, not be raveled, and not allow standing water on the surface.

- (vi) Project Co shall prepare an engineered design for each detour route, Lane Shift and diversion that shall conform to the Design Criteria requirements in the Reference Documents identified in Clause 1.1 of this Part 7.
- (vii) Project Co shall provide detour routes, Lane Shifts, and diversions with Drainage facilities to prevent standing water and flow of water across the Roadway, bus lanes, cycling facilities, and pedestrian facilities, including bus stops and Platforms.
- (viii) Project Co shall replace all on-street catch basins with curb inlet catch basins, in accordance with City Standards, on transit detour routes where buses will be travelling in the curbside lane.
- (ix) Implementation and removal of any closure, full closures, detour routes, Lane Shifts, and diversions and/or other changes in traffic patterns shall not be permitted outside of the applicable Permitted Periods for Closures.
- (x) Lane closure duration shall be limited to the time required to execute the necessary construction activities. Project Co shall not close a lane for purposes other than actual construction Work, such as but not limited to material and equipment storage, and staff parking, unless approved by the City.
- (xi) Project Co shall maintain access to all adjacent properties through all partial closures, full closures, detour routes, Lane Shifts, and diversions.
- (xii) Detour routes, Lane Shifts, and diversion requirements and any modifications thereto, shall be submitted in accordance with Schedule 10 – Review Procedure. The Work Submittal shall in addition include modifications to the various TTMP sub-plans as applicable.
- (xiii) All Project related closures associated with traffic of any kind shall be the responsibility of Project Co, as well as any associated requirements for traffic control (such as, but not limited to, signage, temporary Pavement markings, line painting, TCD, barriers, flag persons, point duty police, etc.). Closures and their ancillary requirements shall be submitted in accordance with Schedule 10 – Review Procedure.
- (xiv) Project Co shall prepare and submit Record Drawings to the City in accordance with the requirements of Schedule 15-2, Part 1, Article 15 – Record Drawings where new traffic signals, temporary traffic signals or modifications are being made to existing traffic signals, within 30 calendar days of signal activation.
- (xv) All closures, detour routes, Lane Shifts, and diversions shall be identified and included in Schedule 7 – Mobility Matters.
- (xvi) Project Co shall have independent Road Safety Audits and Road Safety Design Reviews completed for any temporary or permanent Roadway, Roadway detour,

Transitway, or Transitway detour, in accordance with the criteria set out in Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals, and Lay-Bys.

- (xvii) Project Co shall reinstate to original condition, unless otherwise indicated elsewhere in the documents, and at Project Co expense, all Lands, Roadways, MUPs and assets affected by the implementation of the Trillium Line Extension

(b) Traffic Control Devices

- (i) Project Co shall supply, install, and Maintain PVMS as required to supplement the TCP and shall use the same to provide advance notification and advance warning of traffic pattern changes and other operational changes for traffic and/or transit. Sign locations and messages shall be as shown in the TTMP which shall be submitted to the City in accordance with Schedule 10 – Review Procedure. The City retains the right to require Project Co to provide additional PVMS in support of the TCP.

- (ii) Project Co shall provide PVMS(s) to provide advance notification and advance warning of incidents as deemed necessary by the Emergency Traffic Plan. Sign messages and the duration that the PVMS is deployed and displayed shall be submitted to the City for acceptance prior to being implemented, and the TTMP shall be updated to record the messages which were used.

- (iii) PVMS signs shall meet the following requirements:

- A. Be capable of displaying a sequence of up to 6 panels;
- B. Each display panel shall be capable of displaying up to three lines;
- C. Each line of text shall accommodate up to 12 characters; and,
- D. Messages shall be legible from 50 to 300m.

- (iv) Project Co shall utilize bilingual messages on all PVMS signs and message boards.

(c) Traffic Counting Equipment

- (i) Project Co shall be responsible for the replacement of any counting loops or any other traffic counting equipment negatively impacted or damaged by the construction Work.

(d) Temporary Barrier Requirements

- (i) Project Co shall supply and install temporary barriers based on the requirements of the OTM, OHSA, and the Roadside Safety Manual.

- (ii) Project Co shall show the temporary barriers in the TCP which shall be submitted in accordance with Schedule 10 – Review Procedure.
 - (iii) Temporary barriers used for closures, full closures, detour routes, Lane Shifts, and diversions, including those along the Transitway, shall meet the OPSS and have appropriate flare offsets, end treatments, and crash cushions. Temporary barriers shall have reflectors installed. Project Co shall make adequate provision for Drainage and removal of snow, ice, and debris where temporary barriers are used.
 - (iv) Project Co shall install anti-glare screens, on or adjacent to barriers, in order to avoid driver distraction and headlight glare in locations adjacent to existing provincial highways, existing Major Municipal Roads, existing Transitway, existing Minor Municipal Roads and other affected municipal, provincial and federal Roadways. Anti-glare screen requirements shall also be applicable during construction in these areas, and driver protection shall be provided. Project Co shall submit the documentation and product samples proposed for anti-glare screens in accordance with Schedule 10 – Review Procedure.
- (e) Signage
- (i) Project Co shall be responsible for the design supply, installation, relocation, Maintenance, and removal of all temporary signage and Pavement markings, including warning, guide, advisory, and directional signs in accordance with this Part 7, Schedule 15-2, Part 2 - Civil and Guideway, and City Special Provision D-005.
 - (ii) Project Co shall provide all temporary signage in accordance with the City, OTM and MTO standards. The location, size and type of each sign shall be indicated on the TCP.
 - (iii) Project Co shall supply and install bilingual signs, with translations accepted by the City.
 - (iv) There shall be no temporary signage placed between the bullnose of an off-ramp and the bullnose of a downstream on-ramp with the exceptions noted below:
 - A. Wa-33LR Object Marker Sign;
 - B. Wa-132 Ramp Speed km/h Sign;
 - C. Wa-109 Chevron;
 - D. Post-mounted Delineators;
 - E. Wa-175 Truck Overturning Sign & Wa-32t km/h tab Sign; and,
 - F. G.f-104 Ground Mounted Exit Sign.

- (v) Project Co shall prepare and submit as a part of the TTMP sub-plans a temporary signing plan and a temporary signing table a minimum of 30 calendar days prior to the implementation of the plan. The temporary signing table shall include, but, not be limited to information detailing sign location (station of final location, removal location, and on which side of the road to be installed in relation to the direction of travel), height to bottom of sign, lateral offset to post #1, support type with dimensions, alpha-numeric sign code with dimensions, and the message/description.
- (vi) Project Co shall be responsible during construction to identify to the City any requirements to remove, install, or modify any necessary regulatory signage due to the requirements of the TCP sub-plan. Project Co shall notify the City 14 calendar days prior to requiring any modifications of signage. Project Co and the City shall provide and install regulatory signage in accordance with their respective responsibilities per this Part 7, Schedule 15-2, Part 2 - Civil and Guideway, and City of Ottawa Special Provision D-005
- (vii) Project Co shall be responsible to install and remove all necessary construction signage for any proposed detour routes. Project Co shall notify the City a minimum of 14 calendar days in advance of the requirement for the detour.
 - A. Six months advance notice shall be required when an extended Existing Trillium Line detour is required.
 - B. 20 Business Days shall be required where a detour requires bus shelter relocation.
- (viii) After the completion of construction, the City will provide and install all required regulatory signage.
- (ix) Project information signage will be provided by the City. Project Co shall install Project information signage at locations designated by the City.
- (x) Project Co shall be responsible for contacting the appropriate City representative to confirm, in writing, the official municipal road names as well as Civic Address Signs (911 Identification Numbers and signing) requirements, and incorporate such signs in the permanent and temporary Pavement and signing design drawings. The location, size, and type of each sign shall be also indicated on Project Co's TCP.
 - A. Project Co shall ensure that the above noted signs are in place at all times.
 - B. Temporary relocation due to construction operations shall be permitted but the address numbers shall be in the proximity of the entrance and be made visible throughout the duration of construction.
 - C. Project Co shall replace any damaged signs immediately.

- (xi) The temporary signing plan and temporary signing table shall be submitted to the City in accordance with Schedule 10 - Review Procedure 30 calendar days prior to implementation of the plan.
- (f) Temporary Lighting During Construction
- (i) Project Co shall be responsible for all temporary street light relocation.
 - (ii) All existing lighting in each staging phase shall be maintained in operational order to applicable standards during construction on the relevant construction phase until such time as replacement temporary or permanent lighting is energized.
 - (iii) Temporary illumination shall be provided to applicable standards for the roads to accommodate traffic detours and diversions in accordance with City of Ottawa's Right of Way Lighting Policy Guidelines and standards, the OPSS 601.
 - (iv) Project Co shall ensure existing street light levels are maintained at all times. Where existing lighting needs to be removed as part of the Work, Project Co shall install replacement temporary lighting until such time as the new permanent lighting is energized.
- (g) Pavement Drop-Offs
- (i) Project Co shall perform all construction activities so as to minimize any drop-offs (abrupt changes in Roadway elevation) left exposed to traffic, pedestrians and cyclists during non-working hours. Work shall be performed in accordance with Schedule 15-2, Part 2 - Civil and Guideway. Drop-offs left exposed to traffic, pedestrians, and cyclists during non-working hours shall be delineated as follows:
 - A. Drop-offs up to 40mm may remain exposed with appropriate TCDs alerting motorists of the condition. However, no drop-offs shall be allowed between adjacent lanes of traffic;
 - B. Drop-offs greater than 40mm that are in the Roadway or shoulder shall be delineated with appropriate TCDs and further delineated as described in Clauses C and D below;
 - C. Drop-offs greater than 40mm shall be protected based on the OHSA/CCOHS requirements;
 - D. Ramping shall be provided for vehicular traffic at a slope of 10:1 if the elevation difference, where unavoidable.
 - i. The provisions for temporary ramping shall also meet the requirements of OPSS 313.

- ii. Project Co shall ensure that adequate and positive Drainage is maintained along and across the Roadway at all times and during all construction stages.
 - iii. Temporary ramp downs of the longitudinal joint shall not be permitted between travel lanes in the same direction. Transverse and longitudinal ramp downs shall not form part of the permanent Pavement, and shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane.
- E. All transverse edge drops located on roads utilized by transit shall be ramped at a slope of 10:1.
- (ii) All areas of excavation near areas of traffic and their proposed safety measures shall be shown in the TTMP.
 - (iii) All Work shall meet AODA requirements at all times.
- (h) Pavement markings, symbols and devices
- (i) Project Co shall be responsible for the execution of all Pavement markings and symbols in accordance with this Part 7, and Schedule 15-2, Part 2 - Civil and Guideway.
 - (ii) Project Co shall be responsible for the installation, application, Maintenance, and removal of all temporary Pavement markings, symbols, Roadway Pavement markers, channelizing devices, barricades, reflective devices, etc., in accordance with the OTM, and all of which shall be specified and detailed in the TTMP which shall be submitted to the City in accordance with Schedule 10 – Review Procedure.
 - (iii) Project Co shall eradicate all redundant temporary or permanent Pavement markings that are not required for the intended traffic pattern when traffic lanes will be redefined for a duration of more than an Intermittent Period.
 - A. Eradication of Pavement markings shall be in accordance with City of Ottawa Special Provision D-005, such that removal of Pavement markings, when necessary, shall be by means of asphalt grinding, sandblasting, soda blasting, or some other form of mechanical removal and not by the use of black paint.
 - B. On arterial roads the City may specify that soda blasting be the means of Pavement marking eradication, in the event that clear Pavement marking visibility is seen to be essential to the safe operation of the Roadway.
 - (iv) Temporary Pavement markings materials shall be in accordance with OPSS 710, and shall be specified and detailed in the TTMP.

- (v) Project Co shall apply all temporary Pavement markings in accordance with OPSS 710, the accepted Signing and Pavement markings drawings, and the closure, detour route, Lane Shift, and diversion drawings as submitted to the City in accordance with Schedule 10 – Review Procedure.
- (i) Speed limits and safe passage through Project Site
 - (i) The City reserves the right to determine speed limits through the Project Site. Unless specified in this Part 7 or agreed to in writing by the City, the existing regulatory speed limits shall be maintained.
 - (ii) Speed limits on all existing provincial highways, existing Major Municipal Roads, existing Transitway, Minor Municipal Roads, and other affected municipal, provincial, and federal Roadways shall remain unchanged outside of construction zones. Project Co shall prepare the necessary designation of MTO construction zone forms, (PH-M-101), if Work occurs on a provincial highway, and submit them to the Governmental Authority.
 - (iii) Construction activities on all existing provincial highways, existing Major Municipal Roads, existing Transitway, Minor Municipal Roads, and other affected municipal and federal Roadways shall maintain the following lane widths at all times during construction activities, unless specified elsewhere in this Part 7 or in Schedule 15-2, Part 2 – Civil and Guideway:

Table 7-1.3

	Speed Limit = 50 km/h or less		Speed Limit = greater than 50 km/h	
	Not Shared	Shared Lane*	Not Shared	Shared Lane*
General Traffic	3.0 m	3.75 m	3.2 m	3.75 m
Truck Route	3.2 m	3.75 m	3.5 m	3.75 m
Transit Operating in Lane	3.65 m	4.0 m	3.65 m	4.0 m
Lateral Offsets between Traffic and Temporary Barriers	0.25 m		0.50 m	

* Shared lanes are all right-most traffic lanes that are not adjacent to an on-road cycling facility.

** Where bus only lanes are constructed and physically separated from other roadways (i.e. Transitway), a 1m wide Maintenance strip shall be provided on the outside of each lane, in addition to the standard minimum lane width

- (iv) Floodlighting used to illuminate areas of the Work during construction shall be adjusted so as to not interfere with the vision of drivers on the affected or opposing lane, and also so as to not be directed towards residences or businesses

- near the construction zone. Project Co shall design floodlighting in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-bys.
- (v) All street lighting design and performance shall be in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-bys.
- (j) Maintenance of closures, detours, diversions, Lane Shifts, pathways, and sidewalks
- (i) Project Co shall keep existing Roadways open to traffic, and Project Co shall be responsible for providing and Maintaining a road through the Work for the duration of the Work, whether along an existing Roadway, including the road under construction, or on detours, diversions, or Lane Shifts.
- (ii) Project Co shall Maintain and repair closures, detours, diversions, Lane Shifts, pathways and sidewalks and their appurtenances, which are built as permanent infrastructure, as per the Maintenance provisions set out in this Part 7 for temporary infrastructure until such time as they are turned over to the City and accepted by the City.
- (iii) Project Co shall be responsible for all aspects of Maintenance and repair for all temporary closures, detours, diversions, Lane Shifts, pathways, and sidewalks and their appurtenances throughout their duration of use.
- (iv) Project Co shall execute the Maintenance services on temporary infrastructure, including Platforms, pathways, and sidewalks throughout its duration of use:
- A. in accordance with Applicable Law and Good Industry Practice;
- B. in accordance with the accepted TTMP;
- C. to ensure that the condition of the Project Co temporary infrastructure is sufficient to meet the design, construction, and operational requirements for the intended use; and
- D. in coordination with the City, so as to permit the City to operate City infrastructure, while minimizing any adverse impact on third parties.
- (v) Project Co shall convene a meeting with the City, including but not limited to, City Road Services Department and City Traffic Services Department, in order to coordinate Maintenance activities at the interface between existing City infrastructure and the Project Co temporary or permanent infrastructure, prior to putting a piece of temporary or permanent transportation infrastructure into service. Project Co shall take minutes of the meeting and distribute the documented proceedings and conclusions to the participants.
- (vi) On the first Monday after Thanksgiving each year, Project Co shall convene a meeting with the City, including but not limited to, City Road Services Department and City Traffic Services Department, to discuss “winter readiness”,

so that all parties know their respective roles prior to a sudden onset of winter weather. Project Co shall take minutes of the meeting and distribute the documented proceedings and conclusions to the participants.

- A. The City shall be responsible for winter Maintenance on all public roads, including bus detour routes, as per the City of Ottawa Maintenance and Quality Standards for Roads, Sidewalks and Pathways. Project Co shall be responsible for winter Maintenance at locations where construction conditions do not allow for the City to provide this Maintenance without changing their means/methods;
- B. Project Co shall be responsible for the winter Maintenance of any construction Roadways or accesses to construction Sites.
- C. Project Co shall provide to the City a map indicating the Project Co contact person for each construction Site.

1.6 Accommodation of Pedestrians and Cyclists During Construction

- (a) Project Co shall not close or relocate any pedestrian walkway without a TTMP that has been accepted by the City. The TTMP and TCP sub-plans shall identify any pedestrian walkway closure, relocation, and alternate route in accordance with Schedule 10 - Review Procedure, complete with a detailed explanation of why the pedestrian walkway is required to be closed or relocated and the signs which shall be installed as a part of the closure or relocation.
- (b) All pedestrian and cyclist accommodations during construction shall be in accordance with Schedule 15-2, Part 6 – Urban Design, Landscape Architecture and Connectivity Requirements.
- (c) Project Co shall identify all school crossings within a detour route, Lane Shift or diversion, and determine appropriate measures to maintain safe and efficient operation of the crossings as may be affected by increased vehicle traffic on the detour, Lane Shift, or diversion.
- (d) Project Co shall ensure that pedestrian access at and approaching intersections is maintained at all times at least on one side to accommodate the north-south and east-west crossings, and extending to the adjacent intersections.
- (e) Project Co shall ensure that pedestrian access at least on one side across any Bridge structures is maintained at all times, and extend to the nearest intersection.
- (f) Project Co shall install a TC-68 “Bike Lane Closed” at a location where cyclists can safely merge with traffic, and provide the following signage should it be necessary to close a bike lane or cycle track:
 - (i) For lane widths greater than 4m: a WC-19 and WC-19S “Car and Bike Share the Road”; and

- (ii) For lane widths 4m or less: a WC- 24 and WC-24T “Shared Use Lane Single File”.
- (g) Project Co shall post advanced on-Site notification for any closures or relocation of pedestrian and cycling routes at least 15 Business Days prior to the closure, subsequent to the review and acceptance of the proposed closure by the Governmental Authority. Signage shall indicate the dates and duration of any closure as well as a map of alternative routes available.
- (h) Project Co shall undertake a safety study for situations where a construction access must cross a sidewalk, pathway, MUP or cycling facility, in order to evaluate the potential conflict between pedestrian/cyclist versus construction traffic, and develop appropriate safety measures in order to maintain a safe and efficient crossing at all times. Project Co shall incorporate the safety study and measures into the TTMP, TCPs and the Site Pedestrian Control Plan.
 - (i) Detour routes for pedestrians and cyclists shall be designed in accordance with City standards including but not limited to those set out below;
 - (i) The detour route shall be illuminated to at least the level of lighting either direct or indirect, which was in existence on the original sidewalk, pathway, cycling facility, or MUP;
 - (ii) The vertical and horizontal separation from vehicle traffic shall be as per the original sidewalk.

1.7 Working within Vicinity of a Traffic Control Signal

- (a) Project Co shall notify and be responsible for all costs associated with OPS being on duty to control traffic, when Project Co is required to work within 30m of a traffic control signal, and there is a need to control traffic within this area that would contradict the traffic control display. Advanced notice of 48 hours shall be provided to OPS. No traffic control person shall be permitted to direct traffic in this area, nor may they direct traffic from more than one direction at any time. Project Co shall notify the City of this situation prior to OPS contact.
 - (i) Project Co shall provide OPS if the visibility of the signal display will be blocked by equipment, lanes are skewed through the intersection or traffic control persons are required within 30m of a signalized intersection.

1.8 Parking and Designated Use Zones

- (a) Parking regulations on City streets in the vicinity of the construction zone will be enforced and shall be subject to the City’s Parking By-Law.
- (b) Project Co shall designate safe parking areas suitably located so as to facilitate practical Site inspections related to traffic monitoring and, attendance at Project meetings, in the TTMP. These areas shall be for the use of the City for the duration of the construction.

Each parking area shall accommodate a minimum of two vehicles and be reserved for City staff.

- (c) Project Co shall be responsible for identifying in their TCPs any locations where existing parking or designated usage zones will be impacted by its construction activities. Project Co shall develop and submit in conjunction with their TCP submittals, a plan to provide alternative parking location(s) and usage zones, in accordance with Schedule 10 – Review Procedure, for review and acceptance a minimum of 30 calendar days in advance of impacting any parking locations.

1.9 Temporary Traffic Control Signals

- (a) All traffic signal design and performance requirements shall be in accordance with Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals, and Lay-bys.
- (b) Where required to complete the Work, the City will supply temporary traffic control signals, for existing and new locations identified in Project Co's approved TTMP. Following the completion and acceptance of civil and traffic signal designs, Project Co shall contact the City's designated traffic control signal contact person at least 30 calendar days in advance to arrange for a mutually acceptable date and time to have City forces available to perform the installation, relocation modification, and connection of the traffic control signal.
- (c) Project Co shall complete the related civil Work at least 14 calendar days prior to the date when City forces are available in order for appropriate inspections to occur. Prior to the crew arriving on Site, Project Co shall provide adequate space and time for the Work to be completed.
- (d) Where there is active ongoing construction Work and Project Co personnel are present within an intersection where there are existing traffic control signals to be temporarily modified, or new temporary traffic control signals to be installed, then Project Co shall arrange and pay for OPS paid-duty officers to provide point duty within an intersection while the City modifies or installs the traffic control signals.
- (e) At an intersection where there are existing traffic control signals to be modified temporarily, or there are temporary traffic control signals to be installed, and only City forces will be working at the intersection, then the City will arrange for the OPS services and charge the costs back to Project Co as part of the costs for the signal modifications/installation where Project Co personnel are not present.

1.10 Record Keeping of Traffic Control Devices/Collisions

- (a) Project Co shall maintain accurate records of the traffic controls that are in place within Project Co's construction Work areas.

- (b) Project Co shall maintain an accurate daily record of the inspection of the traffic accommodations, and provide copies of the information to the City immediately upon request. The daily record shall include the following:
- (i) A semi-weekly video (hand held, dash-cam, etc.) in both or all directions as applicable, such that all portions of the Work are recorded in sufficient detail to accurately see and distinguish/read all of the TCD in place on Site;
 - (ii) Condition and placement including changes, additions, and removals of all TCDs;
 - (iii) Confirmation of compliance with the TTMP and its sub-plans;
 - (iv) All traffic collisions;
 - (v) The dates, times, and content of all messages on all PVMS;
 - (vi) The date and time of lane closures; and
 - (vii) All other information required for accurate reconciliation of the lane closures adjustments pursuant to Schedule 7 - Mobility Matters.

1.11 Traffic Systems Management Provisions

- (a) Project Co shall be responsible for costs related to City forces to supply and install traffic camera monitoring systems for the Project corridors and Stations, and also any temporary facilities/infrastructure operated during construction. The City shall procure the equipment and provide labour, however, for clarity, Project Co shall reimburse the City for these costs. Project Co shall be responsible for providing power and system connectivity to the specific locations selected by the City. Traffic cameras shall be required within the Project corridors, Stations, and temporary facilities/infrastructure, at the City's discretion, for the purposes of observing traffic flow, with the capability of zooming in for more specific detail where required to monitor a specific incident. The cameras shall be linked into the City of Ottawa Traffic Control Centre for monitoring purposes. Cameras shall comply with City of Ottawa specifications.
- (b) Project Co shall develop and execute a monitoring plan, as per the TTMP, that utilizes new and existing City traffic camera systems that provides full coverage of the Project corridors, Stations, and temporary facilities/infrastructure. Project Co's plan shall include strategically located cameras to achieve this goal. The City will provide Project Co with an inventory of existing City traffic camera coverage within the Project corridors.
- (c) New traffic camera locations shall include, but not be limited to, the following signalized intersections: Bronson Avenue at Holmwood Avenue and Somerset Street at Bayview Road.
- (d) Project Co shall consult with the City to prepare an inventory of the location of existing traffic cameras and ITS devices that will be impacted by road construction. Project Co

shall provide the City with 30 calendar days' notice prior to the impact on the devices and shall work with the City to relocate the devices.

- (i) Project Co shall be responsible for providing a new location and Utility hook ups where required.
- (ii) The City shall be responsible for equipment relocation and connections.

1.12 Communications

- (a) Project Co shall ensure that all communications and stakeholder engagements in relation to the TTMP are in accordance with Schedule 18 – Communications and Stakeholder Engagement Obligations and as further detailed in Clause 1.12 of this Part 7
- (b) Project Co shall be responsible for providing road closure and detour information to the City for the purposes of public notification.
- (c) Project Co shall schedule and attend TTMP meetings and workshops with the City in order to obtain TTMP approvals and with key Stakeholders prior to implementation. The frequency of the meetings shall vary at the City's discretion. Project Co shall record and distribute minutes for these meetings to the City within five Business Days of the meeting, including but not limited to attendance sheets, agenda, record copy of material presented, comments received, issues raised, and the follow up action proposed by Project Co to resolve each issue. Resolution of the issues shall be raised and recorded by Project Co at the regularly scheduled TTMP meetings.
- (d) Project Co shall attend any public meetings that are held prior to detour implementation, and shall be responsible for addressing issues raised at the public meetings in the forum of the technical TTMP meetings.
- (e) Project Co shall provide the City with a process as part of the Communication and Stakeholder Engagement Plan detailed in Schedule 18 – Communications and Stakeholder Engagement Obligations, and a contact person to whom the City can rely on to respond to any stakeholder relations obligations pertaining to traffic management. Issues and the resolutions thereto shall be raised and recorded by Project Co at the regularly scheduled Traffic Management Committee meetings.
- (f) Project Co shall assist the City and attend stakeholder events and stakeholder outreach meetings in relation to the TTMP in accordance with Schedule 18, Part 4 Communications and Stakeholder Engagement Activities. At these events and meetings, Project Co shall explain in terms easily communicated to the public, the process of how the specific segment of the Project will be built, with a focus on an overview of the proposed traffic closures and detours/alternate routes for pedestrians, cyclists, and vehicles, and how the related traffic/transit management staging is proposed to be performed.

- (g) Project Co shall provide design illustrations, display boards, and narratives to the City for the traffic related information such as, traffic volumes, traffic detours/alternate routes, traffic Emergency/contingency plans, collision data, truck routes, construction traffic routes, etc. All material provided shall be dated and include a contact name and contact coordinates (Project Co & City jointly). All materials shall be provided in quantity for distribution in both hard copy and electronically, in both official languages.
- (h) Project Co shall provide timely e-mail content for the City's distribution regarding traffic/transit updates, including major cycling route impacts.
- (i) Project Co shall provide to the City, content for weekly traffic/transit information/forecast updates, for release to the City's website.
- (j) Project Co shall provide a quarterly newsletter reflecting key traffic milestones and forecast traffic events to the City for release to the public.
- (k) Project Co shall provide timely content for social media updates to the City for release on the City's social media accounts so as to inform followers as to quick updates about on-the-ground traffic control implementation.
- (l) Project Co's Director of Communications and Stakeholder Engagement shall be the spokesperson whom the City will contact to address all Project related complaints pertaining to traffic/transit management issues which are reported to the City, unless an alternative spokesperson has been agreed to by the City. The spokesperson shall provide pertinent and timely information to the City in response to the complaint.

ARTICLE 2 EXISTING MUNICIPAL ROADWAYS

2.1 General Requirements – Municipal Roadways

- (a) Project Co shall not perform any Work on municipal Roadways during the following Peak Periods unless noted as an exception in this Part 7:
 - (i) Monday to Friday inclusive: 06:30 to 09:30 hrs and 15:00 to 18:30 hrs
- (b) Project Co shall not close the reserved transit/Transit priority lanes from 06:00 to 18:30 hrs, Monday to Friday.
- (c) Project Co shall be permitted to partially close portions of Municipal arterial and collector Roadways due to construction activities while always maintaining local traffic access, based on the principle of maintaining at least one lane per direction (or two lanes per direction for segments with three existing lanes in each direction) and sufficient lane widths to accommodate bus travel.
- (d) Project Co shall schedule intersection disruptions during Off Peak Periods, Night Periods or Weekend Periods only. During those periods, there shall be at least one lane of traffic per street permitted at all times. Flagging shall be required if a single lane of traffic is in operation during construction activities. No active Work shall be performed in an intersection during Peak Periods.
- (e) Project Co shall develop a sequencing plan to minimize the length of the municipal Roadway that is closed at any one time.

2.2 Conditions of Work on Municipal Roadways

- (a) Project Co shall provide at least 28 Business Days advance notice in the form of an e-mail to the designated City representative for all closures, detours, and diversions.
- (b) Project Co shall only be permitted to close any existing municipal Roadways for purposes of carrying out Work under this Project after all other safe and reasonable methods of construction have been investigated by Project Co and deemed not to be feasible or practicable.
- (c) Project Co shall maintain two-way traffic at successive intersections on either side of a closed intersection at times of the closure.
- (d) Project Co shall maintain a pedestrian sidewalk to the City design standards at all times during the construction. Project Co shall be responsible for all design, approvals, construction, and Maintenance of the sidewalk for the duration of time the detour is in service.
- (e) Project Co shall not use accesses to/from construction zones, shoulder closures, and the loading and unloading of materials and construction vehicles/equipment to/from the

travelled portion of existing municipal Roadways during Peak Periods on any weekday. Exceptions to this shall be made for the delivery of concrete.

- (f) Project Co shall accommodate all turning movements at intersections at all times, unless specified elsewhere in this Schedule 15-2 – Design and Construction Requirements. This includes all protected auxiliary turn lanes.
- (g) Project Co shall make all travel lanes available during non-work times unless construction Work has rendered them temporarily unsuitable for traffic use, or unless a closure was approved by the City.

2.3 Permits from the City of Ottawa

- (a) Project Co shall follow the approach, with regards to obtaining the relevant permits and approvals, outlined in the City of Ottawa Permits, Business Licenses and Applications – ROW.
- (b) Road Cut Permit
 - (i) Project Co shall obtain a Road Cut Permit prior to the start of Work on any municipal Roadway. The requirements of the Road Cut Permit are outlined in City of Ottawa By-Law — Road Activity By-Law No. 2003-445.
 - (ii) Project Co shall ensure that an application for a Road Cut Permit contains a reference to the Project and shall include the TCP sub-plan (as submitted to and accepted by the City in accordance with Schedule 10 – Review Procedure) with their application. If as a result of the Road Cut Permit approval process the TCP is revised, Project Co shall submit the revised TCP to the City in accordance with Schedule 10 - Review Procedure for re-acceptance and shall update and resubmit the TCP sub-plans to reflect the changes found in the approved Road Cut Permit version of the TCP.
- (c) Road Close Permit
 - (i) Project Co is required to obtain Road Close Permits prior to closing municipal Roadways as specified elsewhere. Project Co shall submit the road closure request forms no later than 4 weeks prior to each closure event.
 - (ii) Project Co shall ensure that an application for Road Close Permit contains a reference to the Project and shall include in their application, the relevant portion of the TTMP as submitted to and accepted by the City in accordance with Schedule 10 – Review Procedure. If as a result of the Road Closed Permit approval process the TCP is revised, Project Co shall submit the revised TCP to the City in accordance with Schedule 10 – Review Procedure for re-acceptance. It shall include the updated TCP and sub-plans to reflect the changes found in the approved Road Close Permit version of the TCP.
- (d) Private Approach Permit

- (i) Project Co shall obtain a Private Approach Permit for any Site access from a municipal Roadway.
- (ii) Project Co shall ensure that an application for a Private Approach Permit contains a reference to the Project and shall include in their application, the relevant portion of the TTMP as submitted to and accepted by the City in accordance with Schedule 10 – Review Procedure. If as a result of the Private Approach Permit approval process the TTMP is revised, Project Co shall submit the revised TTMP to the City in accordance with Schedule 10 – Review Procedure for re-acceptance. It shall include the updated TTMP and sub-plans to reflect the changes found in the approved Private Approach Permit version of the TTMP.

(e) OC Transpo Permits

- (i) Project Co shall not carry out any Work on the Existing Trillium Line, the Transitway, or any bus facilities, without completing the Transitway Access Permits and receiving approval from the City, OC Transpo, and Capital Rail.
- (ii) When an application for an OC Transpo Permit is made for the Project or any portion thereof, Project Co shall ensure that an application for an OC Transpo Permit contains a reference to the Project and shall include in their application, the TCP as submitted to and accepted by the City in accordance with Schedule 10 – Review Procedure. If as a result of the OC Transpo approval process the TCP is revised, Project Co shall submit the revised TCP to the City in accordance with Schedule 10 - Review Procedure for re-acceptance, and shall update and resubmit the TTMP and sub-plans to reflect the changes found in the approved OC Transpo version of the TCP.

- A. The TCP shall be approved by the City at least 14 calendar days prior to any detour or construction activity that has operational impacts on transit service. If the action is an extended detour or requires a shelter relocation, notification shall be provided as otherwise specified in this Part 7.
- B. The submission of a TCP does not constitute advance notice, which does not include timelines for potential revisions to the TCP.

(f) Noise Bylaw Exemption

- (i) Project Co shall apply and obtain an exemption to the City Noise Bylaw if required for evening/night Work. Note: a Noise Bylaw exemption is not required for Work conducted Monday through Saturday between 7:00 and 22:00 hrs and Sunday between 9:00 and 22:00 hrs.

2.4 Hunt Club Road (Arterial)

- (a) Project Co's TTMP and sub-plans shall consider the requirement to maintain traffic and transit operations in this area, providing for the Airport Parkway and South East

Transitway ramps throughout construction, or providing an acceptable alternative. Transit movements between ramps shall be protected for at all times.

- (b) Within the Hunt Club Road corridor, the following constraints shall be followed:

- (i) No lane reductions on weekdays between 06:00 and 19:00 hrs;
- (ii) No lane reductions on weekends between 10:00 and 18:00 hrs; and
- (iii) Maintain a minimum of one lane in each direction during all other times.

2.5 Airport Parkway (Arterial)

- (a) Project Co's TTMP and sub-plans shall consider the requirement to maintain two-way traffic operations at all times. Project Co shall stage the Work through the Work area by constructing Roadway widening and localized detouring that maintains uninterrupted two-way traffic.
- (b) Within the Airport Parkway corridor, the following constraints shall be followed:
- (i) No lane reductions on weekdays between 06:00 and 19:00 hrs; and,
 - (ii) Maintain a minimum of one lane in each direction during all other times.
- (c) The Airport Parkway is the transportation route that is used for dignitaries visiting Ottawa. The OPS and RCMP may restrict public access to the Airport Parkway during these events. Project Co shall immediately cease all activities and evacuate the Work Site as directed by the OPS and RCMP.
- (d) Project Co shall be permitted to perform full mainline closures for installation of Bridge girders, prefabricated Bridge components, falsework, and overhead electrical wiring installations. The installation over the traveled portion of the Airport Parkway shall require the stoppage of traffic across the full width of the affected traffic lanes. Closure of all lanes shall only be performed as follows:
- (i) OPS shall be employed to perform the full closures;
 - (ii) The closure shall take place between 02:00 and 05:00 hrs; and
 - (iii) The duration of nightly closures is restricted to fifteen minutes per any 1 hour period or until the end of the traffic queue passes.
- (e) No lane reductions on the Airport Parkway shall be permitted to occur a minimum of three hours prior to, during, or three hours following, an event at the [REDACTED]. Project Co shall coordinate with the [REDACTED] to determine at the scheduled events and adjust their construction schedule accordingly;

- (f) Project Co shall maintain uninterrupted transit access to the Airport Parkway bus stops at all times.

2.6 Uplands Drive (Collector)

- (a) Within the Uplands Drive corridor, the following constraints shall be followed:
- (i) No lane reductions on weekdays between 06:00 and 19:00 hrs;
 - (ii) No lane reductions on Uplands Drive shall be permitted to occur a minimum of three hours prior to, during, or three hours following, an event at the [REDACTED]. Project Co shall coordinate with the [REDACTED] to determine at the scheduled events and adjust their construction schedule accordingly;
 - (iii) Project Co shall not restrict or reduce lanes for access/egress Roadways into and out of the EY Centre during any event. Project Co shall coordinate with the [REDACTED] to obtain the events listing/schedule;
 - (iv) Project Co shall maintain uninterrupted transit access to the [REDACTED] and Uplands Drive bus stops at all times; and,
 - (v) No lane reductions of Uplands Drive shall be permitted at any time if the interchange ramps at Airport Parkway and Hunt Club Road are closed, or if Airport Parkway is closed at any point south of Hunt Club Road.

2.7 Lester Road (Arterial)

- (a) Within the Lester Road corridor, the following constraints shall be followed:
- (i) No lane reductions on weekdays between 06:00 and 19:00 hrs; and,
 - (ii) Traffic management plans shall maintain two-way traffic operations at all times. Project Co shall stage the Work through the Work area by constructing Roadway widening and localized detouring that maintains two-way traffic.
- (b) Full mainline closures shall be permitted for installation of Bridge girders, prefabricated Bridge components, falsework, and overhead electrical wiring installations. The installation over the traveled portion of Lester Road shall require the stoppage of traffic across the full width of the affected traffic lanes. Closure of both lanes shall only be performed as follows:
- (i) OPS shall be employed to perform the full closures;
 - (ii) The closure shall take place between 02:00 and 05:00 hrs; and
 - (iii) The duration of nightly closures is restricted to 15 minutes per any one hour period or until the end of the traffic queue passes.

- (c) No lane reductions on Lester Road shall be permitted to occur a minimum of three hours prior to, during, or three hours following, an event at the [REDACTED]. Project Co shall coordinate with the [REDACTED] to determine at the scheduled events and adjust their construction schedule accordingly;
- (d) Project Co shall maintain uninterrupted transit access to the Lester Road bus stops at all times.
- (e) Project Co's TTMP and TCP sub-plan shall specifically identify provisions for ensuring that the at-grade rail crossing regulatory requirements are met throughout all stages of the Work to the satisfaction of the City and OC Transpo.

2.8 Leitrim Road (Arterial)

- (a) Leitrim Road is an arterial Roadway which serves traffic and transit in an east to west direction immediately south of the OMClAA. This is an important transportation route in the weekday Peak Periods. Leitrim Road also provides access to the existing Leitrim Station and transit facilities via Gilligan Road.
- (b) The following constraints shall be followed within the Leitrim Road corridor:
 - (i) No lane reductions on weekdays between 06:00 and 19:00 hrs.
 - (ii) Project Co shall maintain one lane of traffic in each direction throughout the duration of construction.
 - (iii) Project Co shall maintain access at all times to private homes and business fronting on the south side of the existing Leitrim Road between Gilligan Drive and the LRT Elevated Guideway.
 - (iv) The City has major watermains within this section of Leitrim Road. Project Co shall ensure the City has uninterrupted access to this infrastructure at all times for monitoring and Maintenance purposes.
- (c) Full mainline closures shall be permitted for installation of Bridge girders, prefabricated Bridge components, falsework, and overhead electrical wiring installations. The installation over the traveled portion of Leitrim Road shall require the stoppage of traffic across the full width of the affected traffic lanes. Closure of both lanes shall only be performed as follows:
 - (i) OPS shall be employed to perform the full closures;
 - (ii) The closure shall take place between 02:00 and 05:00 hrs; and,
 - (iii) The duration of nightly closures is restricted to 15 minutes per any one hour period or until the end of the traffic queue passes.

2.9 Albion Road (Arterial)

- (a) Project Co's TTMP sub-plans shall address the requirement to maintain traffic and transit operations in this area, or providing an acceptable alternative.
- (b) The following constraints shall be followed within the Albion Road corridor:
 - (i) No lane reductions on weekdays between 06:00 and 20:00 hrs;
 - (ii) Maintain a minimum of one lane in each direction during all other times; and,

2.10 Gilligan Road (Local)

- (a) Construction on Gilligan Road shall not be performed during the following Peak Periods unless noted as an exception in this Part 7:
 - (i) Monday to Friday inclusive: 06:00 to 09:30 hrs and 15:00 to 20:00 hrs
- (b) Project Co shall maintain uninterrupted access to and from the Leitrim Park and Ride and transit Station at all times during construction activities that may restrict access to Gilligan Road from Leitrim Road.
- (c) Project Co shall maintain private access to lands fronting on Gilligan Road at all times.
- (d) Project Co shall maintain pedestrian and cycling access to the Park and Ride lot from the MUP which connects to Quinn Road at all times.
- (e) Project Co shall maintain access to the Leitrim Park and Ride stormwater facility and maintenance Roadways at all times.

2.11 Bronson Avenue (Arterial)

- (a) Project Co's TTMP sub-plans shall address the requirement to maintain traffic and transit operations in this area, or provide an acceptable alternative.
- (b) The following constraints shall be followed within the Bronson Avenue corridor:
 - (i) No lane reductions on weekdays between 06:00 and 19:00 hrs;
 - (ii) No lane reductions on Saturdays between 06:00 and 19:00 hrs; and
 - (iii) Maintain a minimum of one lane in each direction during all other times.

2.12 Earl Armstrong Road (Arterial)

- (a) Earl Armstrong Road is an arterial Roadway which serves traffic and transit in an east to west direction south of the OMCIAA. This is an important transportation route in the weekday Peak Periods. The following constraints shall be followed within the Earl Armstrong Road corridor:

- (i) No lane reductions on weekdays between 06:00 and 19:00 hrs;
 - (ii) Project Co shall maintain one lane of traffic in each direction throughout the duration of construction; and,
- (b) The full closure of Earl Armstrong Road, between Bowesville Road and High Road, shall be permitted in order to construct the new Bridge, if a road over rail option is selected.
- (i) Prior to the full closure of Earl Armstrong Road, Project Co shall develop a detour plan to be approved by the City.
- (c) If a rail over road option is selected, then full mainline closures shall be permitted for installation of Bridge girders, prefabricated Bridge components, falsework, and overhead electrical wiring installations. The installation over the traveled portion of Earl Armstrong Road shall require the stoppage of traffic across the full width of the affected traffic lanes. Closure of both lanes shall only be performed as follows:
- (i) OPS shall be employed to perform the full closures;
 - (ii) The closure shall take place between 02:00 and 05:00 hrs; and,
 - (iii) The duration of nightly closures is restricted to 15 minutes per any one hour period or until the end of the traffic queue passes.

2.13 Bowesville Road (Collector)

- (a) Project Co's TTMP sub-plans shall address the requirement to maintain traffic and transit operations in this area, or provide an acceptable alternative.
- (b) The following constraints shall be followed within the Bowesville Road corridor:
- (i) No lane reductions on weekdays between 06:00 and 20:00 hrs;
 - (ii) Project Co shall maintain a minimum of one lane in each direction during all other times; and,
- (c) If a rail over road option is selected, then full mainline closures shall be permitted for installation of Bridge girders, prefabricated Bridge components, falsework, and overhead electrical wiring installations. The installation over the traveled portion of Bowesville Road shall require the stoppage of traffic across the full width of the affected traffic lanes. Closure of both lanes shall only be performed as follows
- (i) OPS shall be employed to perform the full closures;
 - (ii) The closure shall take place between 02:00 and 05:00 hrs; and,
 - (iii) The duration of nightly closures is restricted to 15 minutes per any one hour period or until the end of the traffic queue passes.

(d) The full closure of Bowesville Road, between Earl Armstrong Road and Ficko Crescent, shall be permitted in order to construct the new Bridge, if a road over rail option is selected.

(i) Prior to the full closure of Bowesville Road, Project Co shall develop a detour plan to be approved by the City.

2.14 Limebank Road (Arterial)

(a) Project Co's TTMP sub-plans shall address the requirement to maintain traffic and transit operations in this area, or provide an acceptable alternative.

(b) The following constraints shall be followed within the Limebank Road corridor:

(i) No lane reductions on weekdays between 06:00 and 20:00 hrs;

(ii) Project Co shall maintain a minimum of one lane in each direction during all other times; and,

(iii) Project Co shall maintain existing street light levels at all times. Where existing lighting needs to be removed as part of the Work, Project Co shall install replacement temporary lighting until such time as the new permanent lighting is energized.

(c) If a rail over road option is selected, then full mainline closures shall be permitted for installation of Bridge girders, prefabricated Bridge components, falsework, and overhead electrical wiring installations. The installation over the traveled portion of Limebank Road shall require the stoppage of traffic across the full width of the affected traffic lanes. Closure of both lanes shall only be performed as follows:

(i) OPS shall be employed to perform the full closures;

(ii) The closure shall take place between 02:00 and 05:00 hrs; and

(iii) The duration of nightly closures is restricted to 15 minutes per any one hour period or until the end of the traffic queue passes.

(d) If a road over rail option is selected, Project Co shall be permitted to close Limebank Road in order to construct the grade separation of Limebank Road over the Trillium Line alignment. Project Co shall provide a traffic detour route within the Lands on the west side the closed portion of Limebank Road to accommodate all modes of transportation to be detoured, including vehicles, pedestrians and cyclists.

(i) Project Co shall conduct a traffic management study, to be submitted for review under Schedule 10 – Review Procedure, in order to determine the required facilities and intersection controls necessary to operate the Roadway detour such that it meets the City level of service standards.

- (ii) Project Co shall design and construct these facilities prior to the closure of Limebank Road. These facilities shall remain in operation until Limebank Road has reopened, and the facilities shall be removed / reinstated to pre-existing condition once they are no longer required (with the exception of new permanent infrastructure that has been used as a portion of the detour, which would not need to be removed or reinstated).

ARTICLE 3 EXISTING TRANSITWAY SYSTEM

3.1 General Requirements

- (a) The requirements in this Article 3 shall apply to the following Transitway sections of the Project:
- (i) Southeast Transitway (Billings Bridge Station to South Keys Station, including the bus turnaround loop south of Hunt Club Road); and
 - (ii) Leitrim Park & Ride Station and Facility.
- (b) Project Co shall maintain all bus services by utilizing staging, lane closures or detouring of transit services and other traffic away from the various Sites under construction. Project Co shall include the Transitway detouring and staging in the TTMP to the satisfaction of the City and in accordance with the provisions of this Part 7, Schedule 7 - Mobility Matters, Schedule 17 – Environmental Obligations, and Schedule 15-2, Part 1, Article 5 – Implementation Constraints and Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals and Lay-bys.
- (c) Project Co shall reimburse the City for any additional operational or maintenance costs incurred by the City occasioned as a result of any City changes required to City operations, due to changes or revisions to the TTMP made by Project Co after the TTMP has been reviewed and accepted by the City.
- (d) Project Co shall apply the following key Transit performance principles to the TTMP:
- (i) Safety of all users of the Work shall be the paramount principle;
 - (ii) Maintain existing local and rapid transit services as closely as possible to the frequency of service of the 2018 Post-LRT Stage 1 Transit Service Plan. Project Co shall be responsible for contacting the City prior to the service change dates identified in Table 7-3.1 to identify any changes to the transit service plans and how they may impact the frequency of service for transit;

Table 7-3.1–Tentative Transit Route Schedule Change Dates

Year	April	June	September	December
2018	22	24	2	23
2019	21	23	1	22
2020	19	21	6	20
2021	18	20	5	19
2022	17	26	4	25
2023	23	25	3	24

- (iii) Maximize the continued transit services use of the existing Transitway and Stations during construction;
 - (iv) Minimize the travel time variability on transit routes;
 - (v) Minimize additional transit customer travel times including walking distances to and from bus stops, Stations, and Platforms;
 - (vi) Minimize additional transfers points for transit customers;
 - (vii) Minimize additional OC Transpo resources required (buses, kms travelled, lay-bys, disruption of services, service changes, temporary Fitups);
 - (viii) Minimize redundancies;
 - (ix) Minimize disruption to other road users;
 - (x) Minimize and mitigate impact on adjacent lands and occupants thereof; and
 - (xi) Minimize additional bus traffic in residential areas.
- (e) Project Co shall develop Transitway staging and detour plans subject to the requirements in this Part 7. Project Co's Transitway staging and detour plans shall be submitted in accordance with Schedule 10 – Review Procedure and subject to evaluation and acceptance by the City.
- (f) Project Co may schedule Work within the existing Transitway utilizing one lane closures during Off Peak Periods and Night Periods as detailed elsewhere in this Article 3. Project Co shall be responsible for obtaining the required City approvals and permits to undertake this Work. A suitable alternative location shall be required if the closure of one lane impacts a bus stop or Platform.
- (g) Project Co shall provide 35 calendar days' notice to the City for construction access to any component of the existing Transitway. Notice shall be provided in the form of a document explaining the request for construction access to the relevant component of the existing Transitway, submitted by Project Co to the City in accordance with Schedule 10 – Review Procedure, and, the simultaneous transmission of an electronic message sent to the City's Lead Traffic and Mobility and the designated OC Transpo representative, informing them that the request Notice has been submitted.
- (h) Project Co shall be responsible for minimizing the overall duration required for the closure of any parts of the existing Transitway.
- (i) Project Co's TTMP Transitway staging and detour plans shall be founded upon the following key principles and constraints:

- (i) Safety of all users shall be the primary principle;
 - (ii) Transit shall be given priority on the road system to the greatest extent possible (e.g. temporary bus-only lanes shall be provided);
 - (iii) Transit priority measures shall be implemented at key intersections on transit detour routes to reduce transit delays;
 - (iv) Construction Work shall be staged and phased to minimize disruption to public transit and general traffic throughout design, construction and implementation;
 - (v) Project Co's approved Transitway staging and detour plans for any segment of the existing Transitway shall be Commissioned and operational to the satisfaction of the City prior to full closure of any portion of the Transitway.
 - (vi) Project Co's Transitway staging and detour plans shall be developed to ensure continuity of transit route origins and destinations and Station locations for all transit services that utilize either portion of the Transitway or Stations in the context of access for buses and pedestrians and network coverage;
 - (vii) Project Co shall not close any component of the Transitway prior to Commissioning the detour route for the corresponding Transitway closure, and when Transitway lane closures are in place during the permitted hours, an alternative shall be made available for transit;
- (j) Project Co shall provide at least six months advance notice to the City for all lane closures and diversions impacting the existing Transitway.
- (k) Project Co shall coordinate with OC Transpo to ensure that all TTMP and TCP submissions and updates to those submissions reflect the most current OC Transpo transit operations.
- (l) Project Co shall coordinate the proposed closure, and timing of the closure, of each segment or segments, with the City including OC Transpo, and to the satisfaction of the City and OC Transpo, such that OC Transpo may adequately administer the closure.
- (m) Project Co shall design and construct all Transitway staging plans and detour routes according to the Reference Documents listed in Clause 1.1 of this Part 7.
- (n) Project Co shall design and construct all permanent and temporary bus stops during all the construction staging, including safe and secure pedestrian access to and from bus stops, and all shelters and COADS requirements that meet the requirements of the City and OC Transpo's standard drawings.

3.2 Construction On or Adjacent To the Existing Transitway

- (a) Project Co shall provide 35 calendar days' notice to the City for access to the Transitway. Project Co shall obtain all required approvals and permits from the City and OC Transpo.

Project Co shall complete the required submissions in accordance with Schedule 10 – Review Procedure and subject to evaluation and acceptance by the City, prior to submitting permit applications.

- (b) All required traffic control and protection systems identified in the approved TTMP shall be installed, operated, Maintained, and removed by Project Co to the satisfaction of the City.
- (c) Project Co shall perform the required traffic control for lane closure(s) identified in the approved TTMP to the satisfaction of the City and OC Transpo, where construction requires Transitway lane closure(s).
 - (i) Project Co shall provide the temporary Station/stop and the temporary Station/stop facilities in kind, such as shelters or benches, as well as the accesses to/from the Station/stop, operational features such as bike racks, lighting, etc., and including traffic camera/OC Transpo security camera coverage of the temporary Station/stop and its surroundings, where construction shall require any change to, or relocation of an existing Transitway Station or bus stop, to the satisfaction of the City. This shall include staff washrooms equipped with key access system to the satisfaction of the City.
 - (ii) Project Co shall include all alterations to existing Stations or bus stops, and all temporary Station or bus stop designs in the TTMP submission to the City in accordance with Schedule 10 - Review Procedure.
- (d) Project Co shall provide 15 Business Days' notice to the City prior to the day on which any changes to existing signage or new sign placement required for construction shall be required.
- (e) Loading or unloading of materials or construction equipment that will adversely affect the existing Transitway, bus only lanes, or Transitway detour traffic, shall not be performed during the following periods:
 - (i) On Transitway bus only lanes or Transitway detour:
 - A. 06:00 to 18:30 hrs
 - (ii) Adjacent to Transitway:
 - A. 06:00 to 09:30 hrs
 - B. 15:00 to 18:30 hrs
 - (iii) Where loading or unloading of materials is done by means of lifting overhead, overhead protection shall be provided to all impacted pathways, sidewalks, and Platforms.

- (f) Project Co shall not store any equipment or materials on the travelled portion of the Transitway, bus only lanes, or Transitway detour, or its shoulders or boulevards, unless the equipment or materials are protected by traffic control and protection systems previously approved by the City and OC Transpo.
- (g) Project Co shall ensure that vehicles transporting materials to, from, or on the Transitway or bus only lanes do not interfere with or interrupt Transitway or bus only lanes operations. Where the transportation of materials to or from construction Sites cannot be accomplished without interfering or interrupting Transitway operations, a separate dedicated construction access shall be established at Project Co's cost.
- (h) Project Co shall require construction vehicles to enter and/or exit in the same direction as buses so that vehicles merge with the bus traffic without crossing traffic lanes, unless specified otherwise.
- (i) Project Co shall ensure that vehicles shall at all times use the access point on the Transitway or bus only lanes operations that is closest to the Works Site.
- (j) Project Co shall ensure that all traffic controls are operational before commencing Works affecting Transitway, bus only lanes or Transitway detour operations.
- (k) Project Co shall contact the OC Transpo Control Centre 30 minutes prior to setup each day that they are working in or adjacent to a Transitway lane.

3.3 Pedestrian and Cycling Access to the Transitway During Construction

- (a) Project Co shall maintain barrier free pedestrian and cycling access, associated with active and temporary Stations and across all pedestrian Bridges at all times.
- (b) Project Co shall maintain pedestrian and cycling access across the local route lanes at all times.
- (c) Project Co shall provide a new alternate route pathway, sidewalk, or MUP of equivalent length, or within 20% additional length, to current City standards in the event that a pathway, sidewalk or MUP leading to a Station connection is to be closed or relocated due to construction, unless prescribed otherwise by the City.
- (d) Any disruption of a pathway, sidewalk, or MUP that impacts the accessibility to a Transitway Station shall be done in accordance with the provisions of Schedule 15-2, Part 6 - Urban Design, Landscape Architecture and Connectivity Requirements

3.4 Transitway Lane Closures

- (a) The requirements in this Article 3 shall be applicable to the following Transitway sections of the relevant phase of the Project:
 - (i) Southeast Transitway – Billings Bridge Station to South Keys Station, including the bus turnaround loop south of Hunt Club Road; and

- (ii) Leitrim Park & Ride Station and Facility.
- (b) Project Co shall apply all applicable requirements in this Part 7.
- (c) Project Co shall be required to include the Transitway staging in the TTMP and sub-plans, demonstrating how traffic and transit will be maintained throughout construction.
- (d) Permitted temporary single-lane closure periods for Transitway Segments shall be as follows:
 - (i) Southeast Transitway – Billings Bridge Station to South Keys Station, including the bus turnaround loop south of Hunt Club Road; and,
 - (ii) Leitrim Park & Ride Station and Facility.

Table 7-3.2

Closure	Monday to Friday	Saturday	Holiday or Sunday
One lane closure	18:30 - 06:00 hrs 9:30 - 15:00 hrs	00:01 - 24:00 hrs	00:01 - 24:00 hrs

- (e) Permitted temporary full closure periods for the following Transitway Segments shall only be permitted for two continuous periods during the Project. The closures shall only be permitted for the following purposes: demolition of the rail bridge over the Transitway and erecting the new [REDACTED] Grade Separation at Ellwood Diamond Structure, and shall be as follows:
 - (i) Southeast Transitway – Billings Bridge Station to Walkley Station.

Table 7-3.3

Closure	Monday	Tuesday to Thursday	Friday	Saturday	Holiday or Sunday
Full closure*	0:00 – 5:00 hrs	Not permitted	22:00 – 23:59 hrs	0:00 – 23:59 hrs	0:00 – 23:59 hrs

*The full closure of the Transitway shall only be permitted twice, within the hours identified In Table 7-3.3 above.

3.5 Circulation Roadway Closures within Transitway Stations

- (a) Project Co shall ensure the continuance of all of the operational functions of the existing Transitway Stations throughout the construction and commissioning period. Project Co

shall develop TCPs identifying all changes to operational functions and submit to the City in accordance with Schedule 10 – Review Procedure for areas where construction requires lane closures to bus circulation Roadways, Platforms, or bus lay-by areas within Transitway Stations. Project Co shall provide 35 calendar days' notice prior to the day on which the closures will be required.

- (i) Project Co shall perform all modifications required for the temporary bus terminal with no interruption to the regular bus service.
 - (ii) Where changes to the operational function of a Transitway Station results in a routing for buses that causes additional travel time to be incurred, six months' notice shall be provided.
- (b) Project Co shall ensure the continuance of all operational functions of detoured transit services throughout construction and commissioning periods.
- (c) Project Co shall coordinate all closures with the City. The following conditions shall apply:
- (i) Monday to Friday inclusive:
 - A. 06:00 to 09:30 hrs and 15:00 to 18:30 hrs: Bus circulation Roadways shall be fully operational; and,
 - B. 09:30 to 15:00 hrs and 18:30 to 06:00 hrs: One-way bus circulation Roadways may be reduced to one lane. Two-way bus circulation Roadways may be reduced to one lane only in each direction, providing that all appropriate approvals and plans are in place.
 - (ii) Saturday, Sunday and holiday:
 - A. 00:01 to 24:00 hrs: One-way bus circulation Roadways may be reduced to one lane. Two-way bus circulation Roadways may be reduced to one lane only in each direction.

- (d) Project Co shall simulate the operation of the Station, including but not limited to VISSIM modeling, to demonstrate to the City and OC Transpo that any modified Stations will function in an acceptable manner. This information shall be included in the TTMP submissions in accordance with Schedule 10 - Review Procedure. Project Co shall monitor and make adjustments to the Station if the switchover is not performing in accordance with that forecast in the TTMP and sub-plans as reviewed and accepted by the City.

3.6 South-East Transitway - Walkley Station to South Keys Station

- (a) Project Co shall maintain full transit operation and services to the Greenboro Transitway Station at all times. Project Co shall replace in kind any part of Greenboro Transitway Station impacted by construction.

- (b) Project Co shall maintain full transit operation and services to the South Keys Station at all times. During construction of the new pedestrian underpass, the Work shall be completed in such a manner that maintains pedestrian and bus access to the full northbound and southbound Platforms.
- (c) Project Co shall be permitted one weekend (Saturday and Sunday) in order to install decking. Project Co shall be required to develop staging drawings that shall be included in the TCP to detail the detour requirements and Platform serviceability during this Work. The design speed for the buses within the detour may be reduced to a 40 km/hr design speed. The restrictions for lane closures outlined in Article 3.5 of this Part 7 apply.
- (d) Project Co shall be permitted one weekend (Saturday and Sunday) in order to remove the decking and reinstate the Transitway. Project Co shall be required to develop staging drawings that shall be included in the TCP to detail the detour requirements and Platform serviceability during this Work. The design speed for the buses within the detour may be reduced to 40 km/hr. The restrictions for lane closures outlined in Article 3.5 of this Part 7 apply.

3.7 Leitrim Park & Ride Station and Facilities

- (a) Project Co shall ensure that OC Transpo's transit operations and services are maintained for Leitrim Park & Ride at all times. Project Co shall provide the following prior to decommissioning any component of the existing Leitrim Station:
 - i) Maintain the existing facilities in operation or provide new/temporary facilities to the City and OC Transpo standards and specifications, including but not limited to: Platforms, shelters, lighting, benches, bus lay-up stalls, Station and route signage, bike racks, and safety and security systems (i.e. emergency phones and CCTV cameras);
 - ii) Dedicated bus access roads to and from Gilligan Road to the Leitrim Station facilities. Where required, Project Co shall provide detours to the City and OC Transpo standards and specifications;
 - iii) Project Co shall ensure MUP access to the Park & Ride facilities is maintained utilizing existing MUPs and new or temporary MUPs as required to maintain connectivity. MUPs shall meet all standards as outlined in Schedule 15-2, Part 6 – Urban Design, Landscape Architecture and Connectivity Requirements;
 - iv) Project Co shall be responsible to ensure the bus turnaround is available to facilitate Leitrim Station operations at all times. Project Co shall use the OC Transpo/City of Ottawa Transitway and Station Design Guidelines to design the bus turnaround; and,
 - v) The existing Leitrim Park & Ride lot has capacity for approximately 290 vehicles. Project Co shall be responsible for ensuring that there are a minimum of 150 vehicle stalls during the construction of the expanded Park & Ride lot. The

reduction in capacity shall only be permissible during the construction of the lot modifications and expansion. The existing capacity of 290 vehicle stalls shall be maintained at all other times. A dedicated access road to the parking, Site lighting, communications, and safety and security systems (i.e. emergency phones and CCTV cameras) shall be maintained in accordance with the requirements of OC Transpo/City of Ottawa Transitway and Station Design Guidelines.

ARTICLE 4 EXISTING AIRPORT ROADWAYS

4.1 General Requirements

- (a) The closure of any existing OMCIAA roads for purposes of performing Work for this Project shall only be considered after all other safe and reasonable methods of construction have been investigated and deemed not to be feasible or practicable. Application for closure of any existing OMCIAA roads shall be submitted in accordance with Schedule 10 – Review Procedure.
- (i) Successive intersections on either side of a closed intersection shall be open to two-way traffic at times of the closure.

4.2 Lane Closures on Airport Roadways

- (a) Project Co shall not perform construction during the following peak periods unless noted as an exception in this Part 7:
- (i) Monday to Friday inclusive: 06:30 to 09:30 hrs and 15:00 to 18:30 hrs.

4.3 Restrictions on Construction Operations on OMCIAA Roadways

- (a) Project Co shall liaise with the City and the OMCIAA which has governance over the subject OMCIAA Roadways, and arrange all Work utilizing OMCIAA Roadways for access to the Work Sites to the written satisfaction of OMCIAA. Project Co shall include in its submission of the TTMP and TTMP sub-plans in accordance with Schedule 10 – Review Procedure, all of the documentation and drawings relevant to traffic management prepared in accordance with this Article, as accepted by the OMCIAA.
- (b) Project Co shall not proceed with any Work affecting OMCIAA Roadways without an accepted TTMP and TTMP sub-plans applicable to said Work.
- (c) Project Co shall maintain one lane of traffic in each direction on Paul Benoit Driveway, Silverstar Private and Tracker Private between 05:00 and 22:00 hrs.
- (d) Nightly closures of the Paul Benoit Driveway-Silverstar Private-Tracker Private connection shall be minimized and shall be subject to the approval of the City and the OMCIAA.
- (e) Project Co shall maintain full access/egress to/from the loading dock at all times, except during the shutdown period noted below:
- (i) Project Co shall be permitted one nine-month period where access/egress to/from the loading dock may be completely restricted;
- (ii) During the shutdown period, Project Co shall permit site access to the OMCIAA or their designate to the loading dock for the purpose of servicing OMCIAA equipment, such as, but not limited to, the re-fuelling of generators, subject to 48

- hours' notice, coordination and in accordance with Project Co's Site Safety Plan; and
- (iii) During the shutdown period, Project Co shall maintain their Site such that a route to and from the loading dock is provided for at all times, in the case of an Emergency response to the loading dock area or an Emergency egress from the loading dock area.
- (f) Project Co shall maintain access to all parking lots at all times.
- (i) To maintain access to parking lot E1, Project Co shall provide a connection from parking lot E1 to Kiowa Private.
- (g) Project Co shall ensure that there is a pedestrian access point maintained beneath the elevated Guideway at all times, providing access between the terminal building and all affected parking lots.
- (h) OMCIA Roadways may be reduced to one lane of traffic in each direction using partial lane closures in accordance with the OTM for short duration Work during Off-Peak Hours and/or as detailed in this Part 7.
- (i) All short duration Works shall be re-opened to two-lane, two-way traffic prior to the peak periods each working day.
- (j) Drainage along OMCIA Roadways shall be maintained at all times.
- (k) Project Co shall abide by the OMCIAA Traffic Control SOP for any work on OMCIA roadways. The OMCIAA Traffic Control SOP is provided in Appendix E of this Part 7.
- (l) Project Co shall not be permitted to use Airport Parkway Private for construction or for access to construction Sites.

4.4 Protection of Public Traffic

- (a) Project Co shall follow the requirements below when working on a traveled way:
- (i) Place equipment in position to present minimum interference and Hazard to traveling public;
- (ii) Keep equipment units as close together as working conditions permit and preferably on same side of traveled way; and
- (iii) Not leave equipment on traveled way overnight.
- (b) Project Co shall not close any lanes of OMCIA Roadways without approval of the City and the OMCIAA. Before re-routing traffic, erect suitable signs and devices in accordance with instructions contained in the OTM.

- (c) Project Co shall keep traveled way graded, free of pot holes, and of sufficient width for required number of lanes of traffic as per Table 7-1.3 in this Part 7.
- (d) Project Co shall provide and Maintain road access and egress to properties fronting along the Work area and in other areas as indicated, unless other means of road access exist that meet approval of the City and the OMCIAA.

4.5 Informational and Warning Devices

- (a) Project Co shall provide and Maintain signs, flashing warning lights, temporary signals, and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Works which requires road user response.
- (b) Project Co shall supply and erect signs, delineators, barricades, and miscellaneous warning devices as specified in the OTM. All signs shall be bilingual.
- (c) Project Co shall place signs and other devices in locations recommended in the OTM.
- (d) Project Co shall arrange and attend a meeting with the City and the OMCIAA at least five Business Days prior to commencement of Work to review the list of signs and other devices required for Project. Project Co shall revise the list if the situation on Site changes, to the approval of the City and Governmental Authority, and, resubmit the TTMP and applicable TTMP sub-plans in accordance with Schedule 10- Review Procedure.
- (e) Project Co shall continually Maintain TCDs in use by:
 - (i) Checking signs daily for legibility, damage, suitability, and location. Clean, repair, or replace to ensure clarity and reflectance; and
 - (ii) Removing or covering signs which do not apply to conditions existing from day to day.

4.6 Control of Public Traffic

- (a) Project Co shall provide flag persons in the following situations:
 - (i) When public traffic is required to pass working vehicles or equipment which block all or part of the traveled Roadway;
 - (ii) When it is necessary to institute a one-way traffic system through the Work area or other blockage where traffic volumes are heavy, approach speeds are high, and traffic signal system is not in use. Flag persons shall be provided (one at each access point to the Site) during peak periods when one-way traffic is operational;
 - (iii) When personnel or equipment are employed on the traveled way over brow of hills, around sharp curves, or at other locations where oncoming traffic would not otherwise have adequate warning;

- (iv) Where temporary protection is required while other TCDs are being erected or taken down;
 - (v) For Emergency protection when other TCDs are not readily available; and
 - (vi) In situations where complete protection for personnel, working equipment, and public traffic is not provided by other TCDs.
- (b) Project Co shall keep the City informed of all ongoing Work related discussions with Governmental Authority, and shall maintain all applicable TTMP and TTMP sub-plans current with respect to the Work as accepted by OMCIAA.

4.7 Bus Transit, Taxi, Ride Sharing, Commercial and Public Traffic

- (a) Project Co shall not interrupt bus transit, taxi, ride sharing, commercial, and public traffic services to and from the Airport Lands at any time.

4.8 Accommodation of Pedestrians and Cyclists

- (a) Project Co shall maintain pedestrian and cycling access and egress to the existing sidewalks, pedestrian pathways, and MUPs as outlined in Schedule 15-2, Part 6 – Urban Design, Landscape Architecture and Connectivity Requirements.

4.9 Information Signs

- (a) Project Co shall provide bilingual information signs as follows:
- (i) The locations of all signage shall be shown on the Project Co's TCP. The text to appear on the signs shall be approved by the City and OMCIAA prior to fabrication of the signs.
- (b) Signs to remain in place for the duration of the construction in the area affected by the Work.

4.10 Portable Variable Message Signs

- (a) If PVMS are required on OMCIAA Roadways, they shall be supplied, installed, and Maintained as per Article 1.5 of this Part 7.

ARTICLE 5 EXISTING [REDACTED] ROADWAYS

5.1 General Requirements

- (a) Project Co shall only consider the closure of any existing [REDACTED] Roadways for purposes of performing Work after all other safe and reasonable methods of construction have been investigated and deemed not to be feasible or practicable. Application for closure of any existing [REDACTED] Roadways shall be submitted in accordance with Schedule 10 – Review Procedure.
- (i) Successive intersections on either side of any full Roadway closure shall be open to two-way traffic at times of the closure.

5.2 Permitted Periods of Closures on [REDACTED] Roadways

- (a) Project Co shall not perform construction during the following Peak Periods unless noted as an exception in this Part 7:
- (i) Monday to Friday inclusive: 06:30 to 09:30 hrs and 15:00 to 18:30 hrs.

5.3 Restrictions on Construction Operations on [REDACTED] Roadways

- (a) Project Co shall liaise with the City, and the Governmental Authority which has governance over the subject [REDACTED] Roadways and arrange all Work utilizing [REDACTED] Roadways for access to the Works Sites to the written satisfaction of said Governmental Authority, and, Project Co shall include in their TTMP and TTMP sub-plans in accordance with Schedule 10 – Review Procedure, all of the documentation and drawings relevant to traffic management prepared in accordance with this Article, as accepted by the Governmental Authority..
- (b) Project Co shall not proceed with any Work affecting [REDACTED] Roadways without an accepted TTMP and TTMP sub-plans applicable to the Work.
- (c) [REDACTED] Roadways may be reduced to one lane of traffic in each direction using partial lane closures in accordance with the OTM for short duration Work during off-peak hours and/or as detailed in this Part 7.
- (d) All short duration Works shall be re-opened to two-lane, two-way traffic prior to the Peak Periods each working day.
- (e) Drainage along [REDACTED] Roadways shall be maintained at all times.

5.4 Protection of Public Traffic

- (i) Project Co shall follow the requirements below when working on a traveled way:
- A. Place equipment in position to present minimum interference and Hazard to traveling public;

- B. Keep equipment units as close together as working conditions permit and preferably on same side of traveled way; and
 - C. Not leave equipment on traveled way overnight.
- (ii) Project Co shall not close any lanes of [REDACTED] Roadways without approval of the City and the Governmental Authority. Before re-routing traffic, Project Co shall erect suitable signs and devices in accordance with the OTM.
 - (iii) Project Co shall keep traveled way graded, free of pot holes, and of sufficient width for required number of lanes of traffic, as per Table 7-1.3 in this Part 7.
 - (iv) Project Co shall provide and Maintain road access and egress to properties fronting along the Work area and in other areas as indicated, unless other means of road access exist that meet approval of the City and the applicable Governmental Authority.

5.5 Informational and Warning Devices

- (i) Project Co shall provide and Maintain signs, flashing warning lights, temporary signals, and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- (ii) Project Co shall supply and erect signs, delineators, barricades, and miscellaneous warning devices as specified in the OTM. All signs shall be bilingual.
- (iii) Project Co shall place signs and other devices in locations recommended in the OTM.
- (iv) Project Co shall arrange and attend a meeting with the City and the Governmental Authority at least five Business Days prior to commencement of Work to review the list of signs and other devices required for Project. Project Co shall revise the list if the situation on Site changes, to the approval of the City and Governmental Authority, and, resubmit the TTMP and applicable TTMP sub-plans in accordance with Schedule 10 - Review Procedure.
- (v) Project Co shall continually Maintain TCD in use by:
 - A. Checking signs daily for legibility, damage, suitability, and location. Clean, repair, or replace to ensure clarity and reflectance; and,
 - B. Removing or covering signs which do not apply to conditions existing from day to day.

5.6 Control of Public Traffic

- (i) Project Co shall provide flag persons in the following situations:

- A. When public traffic is required to pass working vehicles or equipment which block all or part of the traveled Roadway;
 - B. When it is necessary to institute a one-way traffic system through the Work area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use, flag persons shall be provided (one at each access point to the Site) when one-way traffic is operational;
 - C. When personnel or equipment are employed on the traveled way over brow of hills, around sharp curves, or at other locations where oncoming traffic would not otherwise have adequate warning;
 - D. Where temporary protection is required while other TCDs are being erected or taken down;
 - E. For emergency protection when other TCDs are not readily available; and
 - F. In situations where complete protection for personnel, working equipment, and public traffic is not provided by other TCDs.
- (ii) Project Co shall keep the City informed of all ongoing Work related discussions with the Governmental Authority, and shall maintain all applicable TTMP and TTMP sub-plans current with respect to the Work as accepted by [REDACTED].

5.7 Transit Service, Detours, and Station

- (a) Project Co shall maintain bus services to and from [REDACTED] on [REDACTED] Roadways to access the University Station, bus stops, and bus lay-up areas. Project Co shall provide uninterrupted access to the bus routes and the Station and stops for buses and Passengers at all times. In the event that Project Co must impact a bus stop, Platform or lay-up area, Project Co shall be responsible for planning and accommodating alternative space within the campus, in consultation with [REDACTED] and OC Transpo.

5.8 Accommodation of Pedestrians and Cyclists

- (a) Project Co shall maintain pedestrian and cycling access and egress to the existing sidewalks, pedestrian pathways, and MUP as outlined in Schedule 15-2, Part 6 – Urban Design, Landscape Architecture and Connectivity Requirements.

5.9 Ground Mounted Signs

- (a) Project Co shall provide bilingual information signs as follows:
- (i) The locations of all signage shall be shown on the Project Co's TCP. The text to appear on the signs shall be approved by the City and [REDACTED] prior to fabrication of the signs.

- (b) Signs to remain in place for the duration of the construction in the area affected by the Work.

5.10 Portable Variable Message Signs

- (a) If PVMS are required on [REDACTED] Roadways, they shall be supplied, installed and Maintained as per Article 1.5 of this Part 7.

ARTICLE 6 TRILLIUM LINE TRANSIT SERVICES

6.1 General Requirements

- (a) The requirements in this Article are applicable to the following Expanded Trillium Line sections of the relevant phase of the Project:
 - (i) Existing Trillium Line - Bayview Station to Greenboro Station; and
 - (ii) Future Trillium Line Extension – Greenboro Station to Bowesville Station.
- (b) Project Co shall apply all applicable requirements in this Part 7.
- (c) Project Co shall reimburse the City for any additional operational or maintenance costs incurred by the City occasioned as a result of any City changes required to City operations, due to changes or revisions to the TTMP by Project Co after the TTMP has been reviewed and accepted by the City
- (d) Project Co shall provide 30 calendar days' notice to the City for access to the Existing Trillium Line. Project Co shall obtain all required approvals and permits from the City and OC Transpo. Prior to submitting Permit applications, Project Co shall complete the required Works Submittals in accordance with Schedule 10 – Review Procedure and subject to evaluation and acceptance by the City.
- (e) Project Co shall provide at least a six months advance notice to the City for any Work impacting the Existing Trillium Line.
- (f) Project Co's TTMP for the Existing Trillium Line shall be founded upon the following key principles and constraints:
 - (i) Construction Work shall be staged and phased to minimize disruption to the Existing Trillium Line, public transit, and general traffic throughout design and construction;
 - (ii) Minimize the travel time variability on replacement transit routes;
 - (iii) Minimize additional transit customer travel times, including walking distances to/from Existing Trillium Line Stations/Platforms;
 - (iv) Minimize additional transfer points for transit customers;
 - (v) Minimize additional bus traffic in residential areas;
 - (vi) When the Existing Trillium Line is in service, Project Co's access to corridor shall be scheduled during the daily non service period from 0:00 to 0:500 to the greatest extent possible; and

- (vii) Project Co shall coordinate and grant access to the Existing Trillium Line corridor by third parties to maintain their existing infrastructure.
- (g) Project Co shall be responsible for minimizing the overall duration required for the closure of the Existing Trillium Line.

6.2 Construction On or Adjacent to the Expanded Trillium Line

- (a) Loading or unloading of materials shall not be performed during hours when the Existing Trillium Line is in service, including but not limited to crane swing over the Existing Trillium Line corridor.
 - (i) Any encroachment over the Existing Trillium Line corridor by a crane or load of materials taking place during hours when the Existing Trillium Line is not in service, shall be coordinated by Project Co with the City and shall be subject to any Crane Swing Agreement entered into between Project Co and the City.
- (b) Project Co shall not store any equipment or materials within ten metres of the Existing Trillium Line Tracks, when the Existing Trillium Line is in service.
- (c) Project Co shall ensure that vehicles transporting materials to, from, or on the Existing Trillium Line do not interfere with or interrupt Existing Trillium Line operations.
- (d) Project Co shall require construction vehicles to enter and/or exit the Existing Trillium Line at designated points and with prior authorization from the City.
- (e) Project Co shall ensure that vehicles at all times use the approved access points that are closest to the Work Site.
- (f) Project Co shall ensure that all safety systems (including flag person) from the City are operational before commencing Works affecting Existing Trillium Line operations.
- (g) Future Trillium Line Extension: A portion of this corridor has an operational rail service for freight deliveries to the NRC Facility located along Lester Road. The remainder of the corridor south of the NRC spur to Bowesville Station currently has no rail services. Project Co shall be responsible for ensuring the NRC delivery service is maintained.
- (h) The NRC spur line access to and from the Existing Walkley Yard shall remain active at all times. If a closure is required, 30 days prior authorization shall be required from the City.
- (i) Future Trillium Line Extension: Project Co shall maintain the access road to the City's water plant facilities located adjacent to the corridor between Lester Road and Leitrim Road at all times.
- (j) Project Co shall prepare a TTMP that addresses intended hours of Work, Maintenance of local access points, Maintenance of Existing Trillium Line access for Emergency vehicles, access road closures, and impacts to Existing Trillium Line service.

6.3 Permits & Approvals

- (a) Project Co shall be responsible to obtain all permits, licenses, certificates, and approvals such as locates for Utilities (gas, water, electrical, sewers, etc.), railway Utilities such as Signals and Communications, Tracks, Stations, adjacent roads, overpasses, underpasses, Tunnels, rock cuts, and others prior to starting any Work.

ARTICLE 7 TRAFFIC AND TRANSIT MANAGEMENT PLAN

7.1 General Requirements

- (a) Project Co shall submit an initial TTMP to the City in accordance with Schedule 10 – Review Procedure no later than 60 calendar days following Financial Close, and at least 30 calendar days in advance of the start of any construction activity, and in accordance with the requirements of this Part 7. Following the acceptance of the initial TTMP by the City, Project Co shall submit all subsequent proposed changes to the TTMP to the City in accordance with Schedule 10 – Review Procedure. As a minimum the initial TTMP shall be updated and submitted on an annual basis in accordance with Schedule 10 – Review Procedure. The initial TTMP is required to demonstrate Project Co's:
 - (i) general plan for achieving specific TTMP and TTMP sub-plan requirements for all construction elements having significant traffic impacts, as well as all transit detours, in coordination with Project Co's planned Project Schedule; and,
 - (ii) specific plan for managing traffic during the Initial Works.
- (b) The TTMP shall outline how public traffic, transit, transit customers, pedestrians, and cyclists as well as the traffic generated by construction activities, are to be managed. It shall include all aspects of traffic management as set out in this Part 7, as well as any traffic management related matters which may arise as a result of the execution of any aspect of the Work.
- (c) The TTMP and all updates thereto shall be consistent with and comply with all of the requirements set forth in this Part 7 and all other relevant provisions of this Project Agreement, the OTM, and City of Ottawa Operation Policies, Procedures and Guidelines.
- (d) The final submission of the TTMP or TTMP sub-plans shall be stamped by Project Co's designated Traffic Engineer, and signed off by Project Co's designated Traffic Manager, both of whom shall be as identified in Article 7.3 – Project Co Responsibilities, of this Part 7.
- (e) The TTMP and all updates thereto shall include a traffic and transit schedule which shall be adapted from the Works Schedule. The traffic and transit schedule shall show start and finish dates for all the information pertinent to traffic management for the Project, such as but not limited to, segment and Station closures, detours and diversions, and relevant submissions.
- (f) The TTMP shall show proof of constructability in terms of schedule (traffic and transit schedule versus Project schedule), and, in terms of on Site construction activities and physical Work area requirements versus spatial accommodations for TTMP and TTMP sub-plan traffic management requirements.
- (g) Project Co's TTMP shall consider all impacts relating to the construction both direct and indirect, that pertain to the existing operations of the City, and the street network within

and include impacts on all road users, pedestrians, cyclists, transit customers, transit vehicles, and private vehicles of all types.

- (h) Project Co's TTMP shall reference and interface with Project Co's Traffic QMP as described in Schedule 11 – Integrated Management System, Project Co's Emergency Traffic Plan as described in this Part 7, the OTM, and City of Ottawa Operation Policy and Procedures.
- (i) Project Co's updates to the TTMP shall be prepared and submitted in accordance with Schedule 10 – Review Procedure for any and all Project activities which may result in changes to the traffic management strategies set out in the TTMP. The initial TTMP shall be updated and submitted on an annual basis in accordance with Schedule 10 – Review Procedure.
- (j) Project Co shall not conduct any construction activity that affects traffic without a signed and sealed TTMP that is current to the activities on Site, and has been accepted by the City.
- (k) Project Co's TTMP shall comply with the definitions and guidelines provided in the OTM and City of Ottawa Operation Policy, Procedures and Guidelines.
- (l) Project Co's TTMP shall include the Pedestrian Access Plan as outlined in Schedule 15-2, Part 1, Article 5 – Implementation Constraints, the construction Site Pedestrian Control Plan as required by City of Ottawa Special Provision D-005, the specific requirements as identified in Schedule 15-2, Part 6 – Urban Design, Landscape Architecture and Connectivity Requirements and as documented in COADS.
- (m) Project Co shall prepare detailed TCPs complete with traffic control layout drawings and fully integrated with the approved Works Schedule, outlining the provision of all forms of traffic control required throughout the duration of the Project. The plans shall be consistent with the TTMP and submitted in accordance with Schedule 10 – Review Procedure.
- (n) Project Co shall prepare drawings that address stage-specific activities and requirements for each stage of the Work that affects traffic. These drawings shall accompany the TTMP submissions in accordance with Schedule 10 – Review Procedure.
- (o) Any lane closure shall be approved in writing by the Governmental Authority and the City, and, that closure and the Governmental Authority shall be identified in the approved TTMP.
- (p) Project Co shall not perform any Work on Site without a TTMP and TTMP sub-plans which are current to the activities on Site, and, are accepted by the City.
- (q) The TTMP shall provide detailed drawings for Project-related designated truck access and egress points, the applicable haul and heavy vehicle routes through the City, and applicable staging areas. The drawings shall be consistent with the TTMP and submitted

in accordance with Schedule 10 – Review Procedure. As a minimum the designated truck route drawings shall be updated and submitted on an annual basis in accordance with Schedule 10 – Review Procedure. The City may, at its discretion, require that Project Co Lands, where contiguous with an active construction Site, be utilized for haul and heavy vehicle routes in order to reach the City’s truck route network in a manner acceptable to the City.

- (r) The following TTMP sub-plans for Project Co’s TTMP are required and shall be submitted in accordance with Schedule 10 – Review Procedure. The TTMP sub-plans shall be:
- (i) Traffic Control Plan;
 - (ii) Emergency Traffic Plan;
 - (iii) Traffic Incident Management Plan;
 - (iv) Traffic Management Implementation Plan;
 - (v) Transit Management Plan;
 - (vi) Traffic Advisory Temporary Signage Plan;
 - (vii) Traffic Risk Assessment Plan;
 - (viii) Traffic and Transit Management Communications Plan;
 - (ix) Traffic and Transit Management Monitoring Plan;
 - (x) Lane Closure Measurement and Verification Plan; and,
 - (xi) Property Access and Business Continuity Plan.

7.2 Traffic and Transit Management Sub-Plans

- (a) Traffic Control Plans
- (i) Project Co shall prepare and submit Project specific TCPs in accordance with Schedule 10 – Review Procedure. The TCPs shall be prepared in accordance with the OTM, City of Ottawa Policies, Procedures and Guidelines and other Reference Documents for all activities that affect traffic operations, and shall include the following:
- A. start and completion dates of Work;
 - B. hours of Work and also indicate if there is a requirement to Work during peak hours;

- C. Work zone locations and direction and distance to nearest landmarks;
- D. size of the Work zone;
- E. lanes affected by the Works;
- F. lane configuration in the Work zone;
- G. confirmation of whether accesses or intersections will be affected by the Work zone or by TCD;
- H. traffic volume capacity during the Project;
- I. proposed delays or closure times;
- J. show that local traffic access is maintained;
- K. scale drawing(s) in CADD identifying:
 - i. the location of the Work zone using landmarks and LKI where applicable;
 - ii. accesses or intersections affected by the Work zone or by TCDs;
 - iii. traveled lanes affected;
 - iv. resultant lane configuration including widths;
 - v. location of restricted width lanes;
 - vi. required lane closures;
 - vii. lane use requirements;
 - viii. posted speeds;
 - ix. requirements for road closure;
 - x. on-street parking spaces and parking meters/paystation affected by the Work;
 - xi. replacement strategy for affected on-street parking spaces;
 - xii. requirement for temporary no stopping signs;
 - xiii. handicap, bus, taxi, loading, hotel, diplomat, tour bus, or other zones affected by the Work, and the replacement strategy for each zone;

- xiv. any bus routes and bus stops affected by Work activity;
 - xv. traffic and transit routing and detour requirements;
 - xvi. location of hazardous areas created by road geometry or local geography;
 - xvii. the location of vehicle storage areas if delays are anticipated;
 - xviii. any local roads used for a detour route;
 - xix. the design speed and the design vehicle for each road used as a detour route;
 - xx. any traffic signal changes required by the detour route or Project Works;
 - xxi. any signing impacted by the Work;
 - xxii. location of construction accesses and safety provisions applied in instances where a construction access crosses a sidewalk, pathway, MUP, or cycling facility; and
 - xxiii. pedestrian and cyclist facilities, which shall be in conformance with the requirements of the Pedestrian Access Plan as required in Schedule 15-2, Part 1, Article 5 - Implementation Constraints, the Construction Site Pedestrian Control Plan as required by City of Ottawa Special Provision D-005, and the requirements set out elsewhere in this Part 7.
- L. Should Project Co adopt a traffic control layout exactly as shown in OTM Book 7 with no changes, Project Co shall provide a reference to the OTM Book 7 layout. For any deviations to OTM Book 7, Project Co shall submit a custom traffic control layout as described in (ii) below.
- M. include scale custom traffic control layouts showing the placement of all TCD and Traffic Control Persons;
- N. be sealed by a Professional Engineer; and
- O. include a summary description of the public notification undertaken wherein the subject matter of this specific TCP is mentioned.
- (ii) Custom traffic control layouts shall:
- A. be in CADD format and submitted to the City in PDF format;
 - B. show schematically the placement of all TCDs;

- C. place all TCDs in accordance with the standards contained in the OTM;
 - D. follow symbol conventions for identifying TCDs as per the OTM;
 - E. show on the drawings the locations and details of all signs, PVMS, Pavement markings, barriers, and protective Works;
 - F. have all dimensions and explanatory notes on the drawing;
 - G. show traffic operations at all phases of the Project; and,
 - H. be signed and sealed custom traffic control layouts.
- (iii) Project Co shall document any proposed Project Co-initiated closures, full closures, detour routes, Lane Shifts, and diversions in the TCP. The TCP shall be updated and amended as required such that it is current at all times with respect to the existing and proposed traffic control measures in the field.
- (iv) Project Co shall conduct traffic analysis including modelling on the TCP for each construction stage of the design and construction within each phase where traffic operations are affected. The traffic analysis shall determine the effect of each TCP on the capacity and operation, including the resulting vehicle delays, queue lengths, and traffic signal timing. The traffic analysis shall be conducted for the representative hour(s) and day(s) that each TCP is in operation. The analysis and the results and recommendations shall be provided to the City in accordance with Schedule 10 – Review Procedure.
- (v) Project Co shall be responsible for including construction generated traffic in the TCP and any associated analysis such as but not limited to the potential for conflict between construction generated traffic and pedestrian and cyclist movements.
- (vi) Project Co shall continuously measure the effectiveness of TCPs and, if those measurements indicate a TCP is non-compliant with the OTM, accepted TCPs and other Reference Documents, Project Co shall immediately adjust the TCP to bring it into compliance.
- (vii) Auxiliary lane lengths at existing signalized intersections shall not be reduced unless analysis confirms operation is acceptable to the City.
- (viii) Project Co shall implement the accepted TCPs and accepted revisions thereto.
- (b) Emergency Traffic Plan
- (i) Project Co shall prepare and submit an Emergency Traffic Plan in accordance with Schedule 10 – Review Procedure. The Emergency Traffic Plan shall specify how Project Co shall facilitate access for Emergency vehicles to and through affected Sites. Project Co shall consult with local municipalities and ESP in

developing the Emergency Traffic Plan, and liaise closely with them throughout the design and construction as it evaluates and updates the plan on an annual basis, or, whenever there is a change in the Site conditions which materially alters the ability to execute the accepted Emergency Traffic Plan.

- (ii) Project Co shall provide specific scenarios for Emergency vehicle access to and through the Site for each of the cases identified in the Traffic Incident Management Plan and the Traffic Risk Assessment Plan.
 - (iii) Project Co shall implement the accepted Emergency Traffic Plan and accepted revisions thereto.
 - (iv) Project Co shall update the plan such that the information therein is kept current with the upcoming and ongoing construction activities. Project Co shall submit the updated plan for review/acceptance in accordance with Schedule 10 – Review Procedure.
 - (v) Project Co shall not commence any Work on Site without an applicable current accepted Emergency Traffic Plan.
- (c) Traffic Incident Management Plan
- (i) Project Co shall prepare and submit a TIMP in accordance with Schedule 10 – Review Procedure. It shall be in accordance with the City of Ottawa Emergency Management Plan. The TIMP shall include a process flow chart which includes but is not limited to - occurrence of the incident, nature and timing of notifications to partner agencies, names and coordinates of contacts, actions to address the incident, post incident review of process, and revisions thereto to the TIMP as appropriate. The primary objectives are to support the City in facilitating incident response and moving traffic safely and expeditiously around the incident. The plan shall specify how Project Co will provide access for Emergency vehicles and assistance to ESP, and how Project Co shall work with the City's Traffic Incident Management Group in responding to the incident.
 - (ii) A traffic incident includes, but is not limited to, any of the following occurrences on or adjacent to a construction Site or detour route:
 - A. motor vehicle accidents;
 - B. pedestrian and cycling accidents;
 - C. Emergency road repairs;
 - D. Emergency Utility repairs;
 - E. Emergency road closures for fire, gas leak, etc.;
 - F. disabled vehicles; and

- G. debris on the road.
- (iii) Project Co's TIMP shall:
- A. Work closely and effectively deal with major incidents with partner agencies including City, OPS, OC Transpo, STO, RCMP, OPP, MTO, City of Gatineau, Sureté du Québec, and the Ministry of Transportation of Québec;
- i. These efforts shall include the provision of temporary TCDs and/or OPS in the vicinity of Project Co's construction Sites or detour routes as requested by the City's Traffic Incident Management Group.
- B. Coordinate with the City of Ottawa Office of Emergency Management the communications to the public regarding the impacts to the road network of the incident, via the City, media, and VMSs, and in accordance with established communication protocols; and
- C. Define a process to review incidents and propose modifications to the Project that shall reduce the severity and frequency of incidents.
- (iv) Project Co shall document all incidents, including but not limited to, date location, details of the incident, comments of the incident reporter, actions taken, partner agency and agency representatives contacted, follow-up action recommended to be taken and by whom, signed and dated. A copy of the document shall be given to the City within 48 hours of the occurrence of the incident.
- (v) Project Co shall implement the accepted TIMP and accepted revisions thereto.
- (vi) Project Co shall update the plan such that the information therein is kept current with the upcoming and ongoing construction activities. Project Co shall submit the updated plan for review/acceptance in accordance with Schedule 10 – Review Procedure.
- (vii) Project Co shall not commence any Work on Site without an applicable current accepted TIMP.
- (d) Traffic Management Implementation Plan
- (i) Project Co shall prepare and submit a TMIP in accordance with Schedule 10 – Review Procedure. The TMIP shall identify the Traffic Control Supervisor, Traffic Engineer, and Traffic Manager, along with the qualifications and experience of those named individuals demonstrating they meet the qualifications and experience identified in this Part 7.

- (ii) The TMIP shall define processes to ensure that the TTMP and each of the individual TTMP sub-plans are developed and implemented efficiently and appropriately, and that they are kept up-to-date with necessary modifications during the Project. In addition, the processes shall be set out in flow charts, one for the TTMP and one for each of the sub-plans, with an accompanying explanation provided to describe the activities represented by each box in each of the flow charts.
 - (iii) Project Co shall implement the accepted TMIP and accepted revisions thereto.
 - (iv) Project Co shall update the plan such that the information therein is kept current with the upcoming and ongoing construction activities. Project Co shall submit the updated plan for review/acceptance in accordance with Schedule 10 – Review Procedure.
 - (v) Project Co shall not commence any Work on Site without an applicable current accepted TMIP.
- (e) Transit Management Plan
- (i) Project Co shall develop a Transit Management Plan that is integrated with the TTMP.
 - (ii) Project Co shall prepare and submit the Transit Management Plan in accordance with Schedule 10 – Review Procedure. It shall outline how the quality of transit services shall be maintained during all phases of construction. The Transit Management Plan shall contain the following information with respect to how Project Co intends to maintain transit service routes and comply with the requirements:
 - A. Accommodation of transit service routes as detailed in this Part 7;
 - B. Accommodation of the requirements in Article 3 – Existing Transitway System of this Part 7;
 - C. Overall strategy and approach that Project Co intends to implement to maintain the quality of transit service routes throughout the construction period and minimize disruption to the Passengers;
 - D. Identify Project Co's scheduled construction activities, closures, detour routes, Lane Shifts, and diversions that have an impact on the existing transit service;
 - E. Overall strategy for administering the Transit Management Plan with the City that as a minimum demonstrates how Project Co will manage the notice requirements, reviews and approvals, permits, and commissioning that shall be completed prior to implementing lane closures, diversions, or detours; and,

- F. Minimize the travel time for the pedestrians to access the existing Transit facilities.
- (iii) Project Co shall implement the accepted Transit Management Plan and accepted revisions thereto.
- (iv) Project Co shall update the plan such that the information therein is kept current with the upcoming and ongoing construction activities. Project Co shall submit the updated plan for review/acceptance in accordance with Schedule 10 – Review Procedure.
- (v) Project Co shall not commence any Work on Site without an applicable current accepted Transit Management Plan.
- (f) Traffic Advisory Temporary Signage Plan
- (i) Project Co shall prepare and submit a Traffic Advisory Temporary Signage Plan in accordance with Schedule 10 – Review Procedure. The primary objective of the plan is to notify the City and other Stakeholders in advance of scheduled construction activities, closures, full closures, detour routes, Lane Shifts, and diversions.
- (ii) The Traffic Advisory Temporary Signage Plan shall be prepared in accordance with the requirements set out in Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals, and Lay-bys.
- (iii) Project Co shall update the plan such that the information therein is kept current with the upcoming and ongoing construction activities. Project Co shall submit the updated plan for review/acceptance in accordance with Schedule 10 – Review Procedure.
- (iv) Project Co shall implement the accepted Traffic Advisory Temporary Signage Plan and accepted revisions thereto.
- (v) Project Co shall not commence any Work on Site without an applicable current accepted Traffic Advisory Temporary Signage Plan.
- (g) Traffic Risk Assessment Plan
- (i) Project Co shall prepare and submit a Traffic Risk Assessment Plan in accordance with Schedule 10- Review Procedure. Project Co shall identify all risks which may have an impact on traffic and state the measures to be implemented to manage, reduce, or eliminate the risks.
- (ii) Project Co shall perform an independent assessment to identify any risks that could have an impact on traffic management or special conditions that shall be addressed through Project Co's Traffic Risk Assessment Plan.

- (iii) Project Co shall update the plan such that the information therein is kept current with the upcoming and ongoing construction activities. Project Co shall submit the updated plan for review/acceptance in accordance with Schedule 10 – Review Procedure.
 - (iv) Project Co shall implement the accepted Traffic Risk Assessment Plan and accepted revisions thereto.
 - (v) Project Co shall not commence any Work on Site without an applicable current accepted Traffic Risk Assessment Plan.
- (h) Traffic and Transit Management Communications Plan
- (i) Project Co shall prepare and submit a Traffic and Transit Management Communications Plan in accordance with Schedule 10 – Review Procedure. It shall describe clearly how Project Co shall communicate to the City and other Stakeholders about all matters relating to traffic flow, including specifically, how it shall provide timely notice of construction related delays, closures, detours, traffic incidents, and emergencies.
 - (ii) Project Co shall craft the Traffic and Transit Management Communications Plan to show how Project Co shall incorporate and carry out each of the requirements set out in Clause 1.12 of this Part 7.
 - (iii) Project Co shall implement the Traffic and Transit Management Communications Plan to apply throughout the Project Term.
 - (iv) Project Co shall ensure that the plan is maintained current as related to the activities on Site. Project Co shall submit the updated plan for review/acceptance in accordance with Schedule 10 – Review Procedure.
 - (v) Project Co shall not commence any Work or Site preparations for same without an accepted Traffic and Transit Management Communications Plan.
 - (vi) Project Co shall consult with the City to identify the major user groups affected by the Project. Major user groups may include, but are not limited to, the following:
 - A. emergency and police services;
 - B. transit operating companies;
 - C. motorists;
 - D. cyclists;
 - E. pedestrians;

- F. transport and tour bus companies;
 - G. taxi and limousine companies;
 - H. MTO;
 - I. NCC;
 - J. NRC;
 - K. OMClAA;
 - L. [REDACTED];
 - M. property owners and businesses;
 - N. community organizers; and
 - O. Special Event organizers.
- (vii) Project Co shall develop and document a process which shall be integrated with the City's communication procedures for traffic management (such as the City Traffic Report and Public Service Announcements) to keep major user groups informed of planned traffic pattern changes, including, but not limited to the following: hauling and truck routes, transit impacts, detours, Lane Shifts, lane closures, sidewalk/MUP closures, access restrictions, schedule changes, and other traffic control procedures. Procedures for disseminating information related to unplanned traffic pattern changes shall be addressed in the Traffic Incident Management Plan. Project Co shall ensure that this process is acceptable to the Governmental Authorities.
- (viii) All public inquiries or complaints that Project Co receives shall be documented and handled immediately in the field and forwarded simultaneously to the City, 24 hours a day, seven days of a week.
- (i) Traffic and Transit Management Monitoring Plan
- (i) Project Co shall prepare and submit a Traffic and Transit Management Monitoring Plan in accordance with Schedule 10 – Review Procedure. Project Co shall demonstrate how they will ascertain whether or not the TTMP Plan and the TTMP sub-plans are working as forecast. In cases where the forecasts are not being met, Project Co shall describe the means to adjust the plans such that the forecasts are met or exceeded.
 - (ii) Within each TTMP sub-plan submission, Project Co shall identify performance indicators tailored to the specifics of the sub-plan including but not limited to traffic volumes, travel times, and peak hour queue lengths. Upon acceptance of the sub-plan by the City, Project Co shall use those indicators on an ongoing basis

to assess the effectiveness of the subject sub-plan. Project Co shall review the parameters of performance indication, and adjust the indicators accordingly in the event that a sub-plan undergoes an update due to changes in Project as a result of any and all Project activities which may result in changes to the traffic management strategies set out in the TTMP.

- (iii) Project Co shall identify in their TTMP and their TTMP sub-plans, the acceptable level of performance achievable for each of the performance indicators, based on the calculations used in support of the accepted TTMP and TTMP sub-plans.
- (iv) The performance of the TTMP or TTMP sub-plan shall be deemed to be acceptable from each of a) a general traffic perspective, b) a transit perspective, c) a cycling perspective, and d) a pedestrian perspective, if the level of performance measured in the field during the execution of the TTMP traffic management measures meets or exceeds the level forecast in the TTMP for each of the respective perspectives. If the performance of any one or more of the perspectives is less than that forecast in the TTMP, then Project Co shall immediately formulate mitigation measures to bring the performance of that perspective up to the forecast standard.
- (v) Project Co shall perform field monitoring in advance of and during each stage or closure.
- (vi) Project Co shall be responsible for all means, methods and techniques used to undertake the monitoring services and shall provide all aspects necessary for the performance of the monitoring services, including labour, supervision, management, plant, equipment, tools, and materials.
- (vii) The field monitoring shall include as a minimum, Peak Period traffic volumes, travel time surveys, queue and delays and intersection operational performance within the impacted Roadway network. The monitoring plan shall include travel time and delay data specific to transit vehicles, if impacts to transit routes are anticipated.
- (viii) Field monitoring shall occur five Business Days after stage, detour implementation, or closure implementation, and every 20 Business Days thereafter for the duration of the Work. The frequency of monitoring post-implementation may be increased at the request of the City should issues be noted as a result of the field monitoring or the daily Site reviews.
- (ix) Within five Business Days of conducting the field monitoring, Project Co shall evaluate the data and submit a report summarizing the monitoring results and evaluating the performance of the stage, detour implementation, or closure implementation compared to Project Co's current TTMP and TTMP sub-plan.
- (x) Where applicable, the data collected shall include, but not be limited to:

- A. General Traffic
 - i. Traffic volumes – Peak Periods and AM and PM peak hour, at major intersections and other locations representative of the Roadway network impacted by the execution of the Project;
 - ii. Travel times – AM and PM peak hour along major Roadways or Project Segments, and other streets representative of the Roadway network impacted by the execution of the Project; and,
 - iii. AM and PM queue lengths for traffic movements at signalized intersections and other intersections representative of the Roadway network impacted by the execution of the Project;
 - B. Transit
 - i. Travel times - AM and PM peak hour travel times, as determined from OC Transpo GPS data, to be provided to Project Co upon request
 - C. Cyclists
 - i. Volumes – AM and PM Peak Periods; and,
 - ii. Condition of surface of cycling lanes and MUPs.
 - D. Pedestrians
 - i. Volumes – AM and PM Peak Periods; and,
 - ii. Surface condition of sidewalks.
- (xi) Project Co shall ensure that the plan is maintained current as related to the activities on Site. Project Co shall submit the updated plan for review/acceptance in accordance with Schedule 10 – Review Procedure.
- (xii) Project Co shall create and execute a Daily Traffic Management Site Record as set out in Appendix B of this Part 7.
- (xiii) Project Co shall create and execute a Daily Traffic Monitoring Report as set out in Appendix C of this Part 7.
- (xiv) Project Co shall create and execute a Daily Lane Closure Report as set out in Appendix D of this Part 7.
- (j) Lane Closure Measurement and Verification Plan

- (i) Project Co shall prepare and implement a Lane Closure Measurement and Verification Plan prior to implementation of any planned lane closures. The Lane Closure Measurement and Verification Plan shall describe how Project Co will evaluate their performance on lane closure progress in relation to the lane closure plan it has submitted based on the requirements in Schedule 7 – Mobility Matters. This plan shall also describe the verification process through which the City can audit Project Co's lane closure performance.
- (k) Property Access and Business Continuity Plan
- (i) Project Co shall prepare and submit a Property Access and Business Continuity Plan, in accordance with Schedule 10 - Review Procedure. The goal of the plan is to support the business community in the construction Work zone and to maintain existing or equivalent vehicle and pedestrian access to all buildings and properties. This plan shall address elements of ensuring accessibility to business (for customers as well as deliveries) as well as promotion of the businesses in the affected corridors to assist them during the construction period.
- (ii) The Property Access and Business Continuity Plan shall address the following elements:
- A. Maintaining effective access for all relevant modes currently available to all properties, including but not limited to, vehicles, deliveries, pedestrians, and cyclists;
 - B. To the extent possible, maintain visual sight lines and facilitate Maintenance of a clean and attractive environment despite construction;
 - C. A strategy for implementing temporary replacement of parking which is unavailable during construction. This strategy shall address provision of temporary parking lots and changes to on-street parking regimes; and
 - D. City and Project Co responsibilities for communication and stakeholder engagement shall be as defined in Schedule 18 – Communications and Stakeholder Engagement Obligations.
- (iii) The plan shall demonstrate how Project Co shall achieve the following property access requirements;
- A. Maintain front door pedestrian access to all properties;
 - B. When front door pedestrian access cannot be maintained, provide a minimum of 60 calendar days' notice to the affected property owner and tenants;
 - C. Maintain existing or provide equivalent vehicle access (i.e. maintain existing driveway location and width, maintain rear laneway width and configuration);

- D. Identify when OPS traffic assistance shall be provided in accordance with City requirements;
 - E. Minimize delay for vehicles and pedestrians accessing retail stores; and
 - F. Provide Traffic Control Personnel where appropriate to maintain safe and adequate vehicle and pedestrian access.
- (iv) The Plan shall demonstrate how Project Co shall achieve the following wayfinding and visibility requirements:
- A. Maximize the visibility of business frontages, including front doors;
 - B. Maintain locations and visibility of current business signage;
 - C. Where locations and/or visibility of current business signage cannot be maintained, relocate or design, supply, and install new signs at locations which continue to provide high visibility and clear sightlines. These shall be conducted in consultation with the affected businesses;
 - D. Design, supply, and install additional signs to direct pedestrians and vehicles to business access routes; and
 - E. Maintain all signage as described above throughout the construction period.
- (v) The plan shall demonstrate how Project Co shall achieve the following communications requirements;
- A. Conduct ongoing community liaison during construction;
 - B. Provide adequate and specific notice to affected property owners and tenants for each stage of construction, including anticipated impacts and durations;
 - C. Provide sufficient notice and description of impacts to allow businesses to take actions to offset and/or mitigate business loss;
 - D. Maintain records of all notices;
 - E. Provide prompt, formal written responses to complaints and provide document specific follow-up actions; and
 - F. Provide contacts for construction or a Community Liaison staff member outside normal business hours.
- (vi) Project Co shall support the City in accordance with Schedule 18 – Communications and Stakeholder Engagement Obligations, to engage with

property owners and tenants throughout the corridor and BIAs throughout the Project, to inform them of upcoming changes in construction activity, facilitate mitigation of any construction-related access or parking issues between the properties and Project Co, and assist in ensuring that Project Co maintains access for each relevant mode and keeps the street clean to the extent possible.

- (vii) Project Co shall update the plan such that the information therein is kept current with the upcoming and ongoing construction activities. Project Co shall submit the updated plan for review/acceptance in accordance with Schedule 10 – Review Procedure.
- (viii) Project Co shall implement the accepted Property Access and Business Continuity Plan and accepted revisions thereto.
- (ix) Project Co shall not commence any Work on Site without an applicable current accepted Property Access and Business Continuity Plan.

7.3 Project Co Responsibilities

- (a) Project Co shall accept full responsibility for quality control and quality assurance of all activities affecting the TTMP. The TTMP quality control process shall be included in the TTMP. Project Co shall ensure that all personnel identified in the TTMP are suitably qualified and licensed.
- (b) Traffic Manager
 - (i) Project Co shall designate a Traffic Manager who shall be responsible for the following:
 - A. development, implementation, and management of the TTMP;
 - B. ensuring the City is kept informed of all upcoming traffic activities and any revisions to the TTMP;
 - C. ensuring that appropriate modifications are made to the TTMP if the specified traffic control measures are not achieving the requirements;
 - D. coordinating with persons carrying out Work in areas adjacent to the Project;
 - E. co-chairing with the City the Traffic Management Committee;
 - F. ensuring the timing and organized delivery of public and Stakeholders communication information;
 - G. participating as Project Co's representative in coordinating with the City's Traffic Demand Management program and the Traffic Incident Management Group; and

- H. sign-off of each and every TTMP and TTMP sub-plan prior to their submission to the City.
 - I. review and sign off the Lane Closure Analysis Report required in Schedule 7 – Mobility Matters; and,
 - J. Attend the Mobility Matters Review Meetings described in Schedule 7 – Mobility Matters.
- (ii) The Traffic Manager shall be a Professional Engineer with the following qualifications:
- A. 20 years of experience overall in the traffic engineering field;
 - B. 10 years of experience specifically related to traffic management and construction staging during construction; and
 - C. Experience in design/build type projects where Roadways and/or Highways were constructed within an existing urban area.
- (c) Traffic Engineer
- (i) Project Co shall designate a Traffic Engineer who is a Professional Engineer and has Project Co's authority to review, and shall seal, the TTMP and associated sub-plans and take responsibility for ensuring that all traffic engineering issues and requirements are taken into account.
 - (ii) The Traffic Engineer shall attend the Project's regularly scheduled Traffic Management Committee meetings and be Project Co's representative at the City's Traffic Control Centre when required.
 - (iii) The Traffic Engineer shall oversee and direct record keeping, reporting, and accounting of temporary and permanent traffic signal installations and ensure that all traffic signal notification timelines (as detailed in Schedule 15-2, Part 2 – Civil and Guideway, and this Part 7) are met.
 - (iv) The Traffic Engineer shall have the following qualifications:
 - A. 15 years of experience overall in the traffic engineering field;
 - B. 10 years of experience specifically related to traffic modeling, intersection design, and construction staging, and traffic signal infrastructure;
 - C. Experience in design/build type projects where Roadways and/or highways were constructed within an existing urban area.
- (d) Traffic Control Supervisors

- (i) Project Co shall designate Traffic Control Supervisors, each of whom shall have Project Co's authority to respond to traffic control requirements, and each of whom shall personally perform all the duties of the Traffic Control Supervisor, in accordance with this Part 7.
- (ii) A Traffic Control Supervisor shall be on the Site full-time when construction activities are underway.
- (iii) The duties of the Traffic Control Supervisor shall include but not be limited to the following:
 - A. Directing all traffic control operations for construction;
 - B. The Traffic Control Supervisor shall have direct line authority over all of Project Co's Traffic Control Personnel and procedures on the Site;
 - C. Liaising with the City, OC Transpo, as required;
 - D. Recording the actual duration of lane closures, full closures, detours and Lane Shifts, and unauthorized traffic delays and forwarding this information, on a daily basis to the City's Lead Traffic and Mobility for information and appropriate action;
 - E. Monitoring queue lengths in active construction zones and implementing appropriate measures when such queues affect the operation and safety of existing provincial Roadways, existing Transitway, existing Major and Minor Municipal Roads, and other federal and municipal Roadways and providing the City with documentation outlining the date, location, queue lengths, and measures taken;
 - F. Monitoring, and recording on a daily basis, the transit travel times through construction zones and detour routes, at a frequency and duration sufficient to identify operational performance issues. Coordinate with OC Transpo ahead of time to establish "geofence" points in the system before measurements are to take place in order to facilitate the collection of accurate date, route, time, and location data. Document and evaluate the transit travel times versus the forecast times established in the TTMP submissions. Identify operational performance issues and the Project Co recommended mitigation measures immediately to the City. Provide a copy of the record, issues, and mitigation measures to the City daily. Prepare and submit to the City on a monthly basis, a monthly summary report of the daily reports. Report the operational performance issues and their resolution at the next Traffic Management Committee meeting and record the same in the notes of the meeting;
 - G. Respond to traffic related incidents resulting from construction and traffic management activities. All major incidents shall be documented within 48

hours of the incident and provided to the City per Clause 7.2 (c) (iv) of this Part 7

- H. Documenting traffic control measures and activities in accordance with this Part 7 and producing a Daily Traffic Monitoring Report and Daily Lane Closure Report as set out in Appendices C and D of this Part 7, respectively;
- I. Documenting site instructions and items noted on daily (site) reports which pertain to or affect traffic control, and updating the Traffic Control Plans immediately to reflect the changes on Site, and then promptly submitting the revised plans to the City in accordance with Schedule 10 - Review Procedure, as updates to the TTMP and applicable TTMP sub-plans;
- J. Overseeing all requirements that contribute to the safety, convenience, and orderly movement of vehicular, cycling, and pedestrian traffic;
- K. Attending the Project's regularly scheduled traffic management meetings; and
- L. Traffic control supervision shall be provided by Traffic Control Supervisors on the Site on a 24 hour per day basis when construction activities are underway. During non-work periods, the Traffic Control Supervisor or accepted alternate shall be on the Site within 30 minutes of being notified. The Traffic Control Supervisors shall have appropriate personnel and equipment available on call, at all times.

(e) Traffic Control Personnel

- (i) All Traffic Control Personnel shall be qualified in accordance with the OHSA/CCOHS and the regulations thereunder.

(f) Traffic Management Committee

- (i) Project Co shall be responsible for forming a Traffic Management Committee that shall be comprised of Project Co, City, OC Transpo, and representatives of Governmental Authorities that shall meet on a weekly basis. The purpose of this committee shall be to coordinate, plan, and take action with respect to current and future traffic and transit impacts that may be caused by the design and construction Works.

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**SCHEDULE 15-2
DESIGN AND CONSTRUCTION**

**PART 8
DESIGN AND CONSTRUCTION REQUIREMENTS – VEHICLES**

ARTICLE 1 INTRODUCTION

1.1 Definitions

- (a) In this Specification, unless the context otherwise requires:
- (i) Acceptance Test: Test performed on a Vehicle using production items to determine whether or not the item complies with specified requirements for the purpose of confirming that production items are at least equal to the qualified item.
 - (ii) Accepted: Found suitable to the City, subject to successful completion of all testing.
 - (iii) Anticlimber: Fingers at the ends of Vehicles that are designed to engage adjacent Vehicles
 - (iv) Automatic Coupler: A coupler which when mechanically engaged also engages electrical and pneumatic trainlines between Vehicles.
 - (v) AW0: Weight of a fully functional, ready to run Vehicle.
 - (vi) AW1: AW0 plus the weight of Passengers when all seats are occupied
 - (vii) AW2: AW1 plus the weight of standing Passengers at 4 pass/m²
 - (viii) AW3: AW1 plus the weight of standing Passengers at 6 pass/m²
 - (ix) Body Section: Portion of a Vehicle that provides Passenger seating and includes articulation points on each end.
 - (x) Bogie: The assembly containing motors, drive train, Vehicle suspension and brakes which swivels beneath each end of a Vehicle and supports its mass on the rails.
 - (xi) Braking, Dynamic: Electrical braking in which the power generated by the traction motors, when driven as generators providing retardation effort, is either dissipated as heat by brake resistor grids (Rheostatic) or returned to the Vehicle to power loads.
 - (xii) Braking, Emergency: Irrevocable braking to a full stop at the maximum design brake rate.
 - (xiii) Braking, Full Service: A brake application which obtains the maximum controlled, non-emergency brake rate consistent with the design of the propulsion and friction brake systems.

- (xiv) Collision Posts: Members of the end structure projecting upward from the underside of the underframe to provide protection to the interior of the Vehicle against penetration during a collision.
- (xv) Component: One replaceable part of the Vehicle.
- (xvi) Conditional Acceptance: Found suitable to the City, subject to successful completion of all testing. Open items may exist, each of which shall be tracked by a Field Modification Instruction. Open design issues may exist, subject to acceptance by the City on a case-by-case basis
- (xvii) Console: Control panel in the Operators cab from which the Operator monitors and controls Train operation.
- (xviii) Consist: The quantity and specific identity of Vehicles that make up a Train.
- (xix) Contractual Deliverable Requirement List (CDRL): CDRLs identify a portion of the items that are required to be submitted by Project Co, to confirm compliance with Project Agreement obligations. CDRLs will be used by Project Co to show the City how the design achieves compliance with the agreed Technical Requirements.
- (xx) Corner Post: Vehicle structural member that extends vertically from the floor structure to the roof structure, located at the end sill surfaces with the side surface of the Vehicle.
- (xxi) Coupler: A device for mechanically coupling Transit Vehicles together. This term is also applied to connectors, as in electric coupler and pneumatic coupler which couple electric and pneumatic trainlines together between Transit Vehicles.
- (xxii) Deadman Control: A spring loaded device that detects cognizance of the Operator.
- (xxiii) Device: An element of a component, consisting of parts and structure, which performs specific functions necessary to the operation of the component (bearings, batteries, connectors, and similar elements).
- (xxiv) Draft Gear: The energy absorbing mechanism that attaches the coupler or drawbar to the anchorage.
- (xxv) Draft screens: Screens located on either side of doors extending into Passenger compartment to form a vestibule and protect Passengers in adjacent seats.
- (xxvi) Failure, Component or System: A state of a component or system that requires replacement or adjustment to return to normal operation.
- (xxvii) Fault Monitoring: Automatic monitoring of Train control logic for errors during service from any of the subsystems including brakes, traction, doors, air conditioning, etc.
- (xxviii) Floor Height: The vertical distance measured between the upper surfaces of the rail and Vehicle floor including floor covering.

- (xxix) FMI (Field Modification Instruction): A formal document, subject to acceptance by the City, which defines/describes modifications and serves as a record of vehicle configuration.
- (xxx) Handrails: Safety appliances installed anywhere on the Vehicle, to assist in movement or provide a hand-hold during Train motion.
- (xxxi) Leading Cab: The controlling cab in a Train.
- (xxxii) Load Weigh: A signal derived from the load on the secondary suspension, used to regulate tractive effort and braking in proportion to Vehicle load.
- (xxxiii) Master Controller: The device to control power and braking from an operator's cab.
- (xxxiv) Mock-Up: A full scale model used to demonstrate preliminary design and/or specification compliance.
- (xxxv) Operator's Cab: The compartment located at the end Vehicle and equipped to provide proper facilities to enable operation of the Train.
- (xxxvi) Profile Grade: A straight line representing an established grade line, in relation to the horizontal.
- (xxxvii) Prototype: A unit built to test a new design and which performs essentially the same as a production unit.
- (xxxviii) Qualification Test: Test performed using a preproduction or production item to determine whether or not the item complies with specified performance requirements.
- (xxxix) Roll: Rotational motion of a Transit Vehicle body about a longitudinal axis.
- (xli) Slide, Wheel: The condition existing when the rotational speed of the wheel is slower than that for pure rolling contact between the tread and the running rail.
- (xli) Speed, Max Operating: The steady state speed attainable by the Vehicle.
- (xlii) Spin, Wheel: During positive tractive effort, the condition existing when the rotational speed of the wheel is faster than that for pure rolling contact between the tread and the running rail.
- (xliii) Subsystem: A subsystem comprised of elements interconnected within a system to perform a specific function.
- (xliv) Systems Safety Management: Program management which ensures the accomplishment of systems safety tasks including identification of the systems safety requirements; planning, organizing, and controlling those efforts which are directed towards achieving the safety goals.
- (xlv) Ultimate Strength: The limit of the ability of a structural member to resist fracture or collapse.

(xlvi) Zero Speed: Vehicle velocity of less than 3 km/h.

1.2 Introduction

- (a) Project Co shall provide seven Trains of minimum capacity of 420 Passengers per Train for the Trillium Line Extension. Vehicles shall be fully assembled and tested prior to delivery, and delivery shall not take place prior to Conditional Acceptance by Project Co. The City reserves the right to restrict delivery if substantial non-compliances exist in the New Revenue Vehicle design or construction.
- (b) Project Co shall ensure that the capacity of each Train is based on the following:
- A. A peak standee density of 3.3 Passengers/m².
- (c) Project Co shall provide a Service Proven Vehicle, with limited redesign required to comply with the requirements of this Part 8. Project Co may propose alternatives to the requirements herein to more closely reflect the proposed New Vehicle, subject to acceptance by the City. Alternatives will be reviewed on a case by case basis, and the City reserves the right to accept or reject any proposed alternative at its sole discretion.
- (d) The New Revenue Vehicles need not be fully compatible with the six 40m Alstom Lint vehicles currently in service, but shall be structurally compatible in case of collisions and mechanically compatible for coupling under pushing and towing requirements. For reference, the coupler height of the existing vehicles is 1,060mm above TOR.
- (e) Diesel-electric vehicle technology is the preferred solution. Alternative arrangements that are equivalent to diesel-electric in terms of reliability, maintainability and safety may be proposed for consideration by the City. Validation of equivalence shall be required before another arrangement may be considered.
- (f) Project Co shall provide level boarding with a Platform height of 574mm with a maximum horizontal gap of 75mm. Level boarding shall be defined as Revenue Vehicle threshold height at ±16mm from Platform height for all wheel diameters and passenger loading, up to and including AW1 with standing Passengers at 3.3/m².
- (g) Project Co shall ensure that the Revenue Vehicles are designed and constructed to satisfy Transport Canada rules and regulations including but not limited to the CTA Code of Practice, Passenger Rail Car Accessibility and Terms and Conditions of Carriage by Rail of Persons with Disabilities. The Revenue Vehicles shall also comply with the Capital Railway Inspection and Safety Rules.

1.3 General Requirements

- (a) Project Co shall satisfy the following high level overview of the general New Revenue Vehicle requirements:

Item	Requirement
Length*	Compatible with 77,000mm Platforms

Max Distance between Centerline of End Doors*	65,000mm
Height (max)	4,310mm (static)
Width(max)	Compatible with a Platform edge 1,574mm from track centre-line
Operational Speed	120km/h
Structural Strength	P-II of EN12663-1:2010
Crash Energy Management	EN15227:2011 or FRA Tier I Alternative Compliance
Coupler Style	Sharfenberg Type 10 Latch, or equivalent
ADA/AODA Compliant Level Boarding	Revenue Vehicle threshold height at ±16mm from Platform height for all wheel diameters and passenger loading, up to and including AW1 with standing Passengers at 3.3/m ² .
Accessibility	Entire low floor section between doors shall be ADA/AODA compliant
Emissions	Euro III-B or Interim Tier 4
Vehicle Life	30 years

1.4 Expanded Trillium Line Alignment

- (a) Project Co shall ensure that the New Revenue Vehicle is compatible with and designed to operate safely and reliably over the Expanded Trillium Line alignment. Project Co shall ensure that the Revenue Vehicles are compatible with interfaces of the System, including but not limited to:
 - (i) Track Gauge: 1435mm;
 - (ii) Minimum radius curve in workshop: 100m;
 - (iii) Minimum radius curve on main line: 125m;
 - (iv) Guideway maintained to Transport Canada Class IV requirements;
 - (v) AREMA compliant Special Trackwork; and,
 - (vi) Maximum grade: 4% (5% shall be permitted for lengths less than 250m).

1.5 Environmental Conditions

- (a) Project Co shall design and construct the New Revenue Vehicles to operate in -40°C to +40°C.
- (b) Project Co shall design and construct the New Revenue Vehicle to be capable of operation at the performance levels stated in this Part 8 under the following environmental conditions:

- (i) Thermal shock temperature change 58°C;
 - (ii) Humidity 10 to 100%;
 - (iii) Continuous rain fall rate 60mm/hr;
 - (iv) Continuous snowfall rate 55mm/hr;
 - (v) Freezing rain accretion 5mm/hr;
 - (vi) Maximum daily freezing rain accretion 30mm; and
 - (vii) Fording
 - A. Water 75mm above TOR; and
 - B. Snow 40cm above TOR.
- (c) Project Co shall design and construct the New Revenue Vehicle to be resistant to water intrusion under any combination of wind, rain or snow and any Vehicle speed. A slope with a grade of no greater than 1:12 may be provided to drain water locally at doorways.

1.6 Performance Requirements

- (a) Project Co shall design and construct the New Revenue Vehicles to be capable of operating at a speed of 120 km/h. The maximum Revenue Service speed shall be easily adjustable through the DDU and initially set at 85km/hr. Project Co shall adjust the speed limit as and when requested by the City. The setting scheme shall require a password or similar arrangement to ensure all New Revenue Vehicles are set to the same maximum
- (b) Project Co shall design and construct the New Revenue Vehicle for maximum availability, be capable of operating reliably for a minimum of 165,000km per year and provide a minimum service life of 30 years.
- (c) The New Revenue Vehicles shall have the following minimum performance with AW2 loading:
 - (i) Average acceleration rate from 0 to 50 km/h shall be no less than 0.68 m/s², and 0.32 m/s² from 50 to 80 km/h;
 - (ii) Service braking shall be no less than 0.95 m/s²; and,
 - (iii) New Revenue Vehicles shall have a guaranteed emergency brake rate of no less than 1.1 m/s².

1.7 Vehicle Weight Definition

- (a) Project Co shall consider options for weight reduction during the design phase to maximize the energy efficiency of the System.

- (b) Project Co shall design and construct the New Revenue Vehicles to balance weight per powered axle.
- (c) Project Co shall design and construct the New Revenue Vehicle so that the maximum axle load with 500kg/m² interior loading shall be no greater than 19 tonnes.

1.8 Noise, Shock and Vibration Requirements

- (a) Project Co shall design and construct the New Revenue Vehicle so that the interior noise levels shall be no greater than 70 dBA in the seated area and cab area
- (b) Project Co shall conduct all measurements of exterior noise levels with the Train on or operating on level, tangent Track in a free-field environment, such as outdoors, away from any reflecting surfaces. Noise external to the New Revenue Vehicle, shall not exceed:
 - (i) 75dBA, when measured 25m from a stationary Vehicle; and,
 - (ii) 79dBA, when measured 25m from a Train traveling at 85 km/h and braking.
- (c) Project Co shall design and construct the New Revenue Vehicle so that shock and vibration limits are in accordance with and tested to IEC 61373. In addition, the Vehicle shall be designed to withstand the shock loads imparted by existing and proposed Expanded Trillium Line Special Trackwork, including AREMA design railway crossing diamonds, railbound-manganese bolted turnout frogs and/or bolted heel blocks.

1.9 Electrical Equipment Environmental Conditions

- (a) Project Co shall design and construct the New Revenue Vehicle so that all Vehicle electronic equipment shall function reliably under power quality conditions detailed in EN 50155, unless otherwise specified. Documentation of similar Vehicles that comply with these requirements may be proposed for review by the City.

1.10 Clearance Requirements

- (a) Project Co shall provide clearance diagrams and dynamic envelopes for the New Revenue Vehicles.
- (b) Project Co shall ensure that the dynamic envelopes of the Revenue Vehicles and the infrastructure are fully integrated.

1.11 Towing

- (a) Project Co shall design and construct the New Revenue Vehicle so that at AW3, maximum ambient temperature, maximum allowed variation in Bogie wheel diameters any Train shall be able to tow an equal length, equal weight, dead Train between any two Stations. No over temperature shut down shall occur and no part of the propulsion system shall exceed the manufacturer's limits for a 30 year life.
- (b) Project Co shall design and construct the New Revenue Vehicle so that at AW0, maximum ambient temperature, maximum allowed variation in Bogie wheel diameters any Train shall be

able to tow an equal length dead Train the entire length of the line. The speed through Stations shall be limited to 16km/h. No over temperature shut down shall occur and no part of the propulsion system shall exceed the manufacturer's limits for a 30 year life.

1.12 Safety

(a) Project Co shall design and construct fire Safety in accordance with the following:

- (i) Unless similar documents exist from the New Revenue Vehicle family, Fire Safety shall be achieved through adherence to the following requirements or equivalent specifications:
- A. All non-metallic components used on the Vehicle shall be smoke, flame and toxicity tested to NFPA 130, 49 CFR part 238 and BSS 7239, or Bombardier standard SMP 800-C;
 - B. Project Co shall retain a list of materials (flammability matrix) used in the Vehicles showing location of material, weight (density and total weight), heat value per kg and per Vehicle, flame spread, flashpoint, smoke generation, and toxicity. Project Co shall retain and manage test results for each component for the operating life of the Vehicle;
 - C. All heat sources on the Vehicle shall be protected with redundant levels of protection so that circuits are open before unsafe temperatures exist;
 - D. Smoke detectors and fire detectors shall be located throughout the Vehicle, including within the fresh air intake, engine compartments and water heaters (if provided). Upon activation, the detectors shall energize a signal in the fire alarm system. The location of the fire shall be sent to the alarm system. Fire suppression in the diesel engine compartment may be provided in lieu of heat detectors;
 - E. Fresh air dampers shall automatically close upon detection of smoke;
 - F. Protection from smoke and fire originating under the Vehicle floor shall be proven through testing documenting successful completion of a 30 minute floor fire test in accordance with ASTM E119, NFPA 130, and 49 CFR part 238; and,
 - G. An interior and exterior manual door release shall be provided for each side door.

(b) Project Co shall design and construct Safety analyses in accordance with the following:

- (i) FMECA
- A. Unless a similar document exists from a comparable new Vehicle in service, Project Co shall perform a FMECA to identify weaknesses in system-wide hardware and software design, and to analyze the modes and effects of failures whenever these details are not established by historical records of equipment operation. The FMECA shall provide input to system designs and to the safety analyses for theoretical circuit behaviour, random component failures, electrical

interference, systematic component failures, and software errors in software-based logic. The FMECA shall be updated throughout the system design development and throughout the operational life of the system.

(ii) Hazard Analysis

- A. Unless similar documents exist from the new Vehicle family, a preliminary hazard analysis, a systems hazard analysis and a sub-system hazard analysis shall be prepared and submitted for review by the City.
- B. Project Co shall identify failure-induced and normal operating (non-failure condition) hazards falling into severity Categories I, II and III (as defined in MIL-STD-882).

(c) Project Co shall design and construct Emergency tools and equipment in accordance with the following:

- (i) Emergency tools shall be provided in all New Revenue Vehicles. The Emergency tools shall be located in equipment cabinets that are readily identifiable (visible) and accessible.
- (ii) Tool cabinets shall be suitably enclosed, entirely recessed and shall be readily accessible by either Passengers or crew without the use of tools.
- (iii) The Emergency tools and equipment shall include:
 - A. Fire extinguishers shall be located in each Passenger area and each cab. Extinguishers shall meet the requirement of Part XIII, of the On-Board Trains Occupational Safety and Health Regulations; and,
 - B. Wrecking tools suitable to the vehicle's fabrication.

(d) Project Co shall ensure that first aid supplies and equipment shall be available and accessible to Passengers, Train crew and ESP and shall consist of the following:

- (i) A stretcher, first aid supplies and a trauma kit. The trauma kits shall contain twice the first aid supplies prescribed in Part XII of the On-Board Trains Occupational Safety and Health Regulations and shall include four flashlights, one armband, five pairs of latex gloves, five pocket masks, 10 one-way valve resuscitation mouth to mouth protectors, and one megaphone.

(e) Project Co shall design and construct the New Revenue Vehicles so that 16 Emergency egress/Emergency rescue windows shall be provided per Train along with two additional Emergency windows located in each cab area. The number of Emergency egress/Emergency rescue windows may be reduced during design review after consultation with Transport Canada.

- (i) Windows shall be compliant to APTA-SS-PS-003-98 – Standard for Emergency Evacuation Units for Passenger Rail Cars.

- (ii) Procedures for removal of the glazing in case of Emergency shall be indicated by pictographs mounted in conspicuous and clearly visible locations. Hammers shall not be provided.
- (f) Project Co shall design and construct the New Revenue Vehicles so that roof Emergency access shall be provided in accordance with APTA-RP-C&S-001-98 – Recommended Practices for Passenger Equipment Roof Emergency Access. Each body section shall contain such a location, suitably marked.

1.13 Carbody

- (a) Project Co shall design and construct the carbody in accordance with the following general requirements:
 - (i) The New Revenue Vehicle shall meet the structural and crashworthiness requirements of all the related standards and requirements outlined in this Part 8.
 - (ii) The carbody shall have a 40 year expected life. The carbody material shall have inherent corrosion protection. The proposed material for the body shell, structural beams and underframe shall be submitted for approval by the City.
 - (iii) The carbody shall be designed to achieve crash energy management per EN 15227 and/or FRA Tier I Alternative Compliance consistent with [REDACTED].
 - (iv) The structural integrity shall be to EN 12663, P-II, or equivalent and protect the Operator and Passengers.
 - (v) Carshell Design features
 - A. A pilot beam shall be mounted onto each head face. The minimum load capability of the pilot beam shall be 300 kN at center and 250 kN laterally.
 - B. The body sides of New Revenue Vehicle shall be flat or include a designed curve. Deviations shall not exceed 2.5mm over 1m. Alternatively, surface quality may be reviewed visually and approved by the City.
 - C. Bellows between carbody sections shall be double walled. The outer wall shall be flush with the exterior sidewalls.
 - D. Roof drainage shall be managed and controlled. Water shall not flow over the sides of the New Revenue Vehicle or onto the Station Platform.
 - (vi) Thermal and Acoustical Insulation
 - A. All external surfaces shall have no less than 50mm of thermal insulation. Alternative levels of insulation will only be considered if the heating and cooling requirements can be met with the alternative level of insulation.
 - B. Condensation shall not occur on any interior or exterior surface under any temperature or humidity level, to the maximum extent possible. Where

condensation is unavoidable, parts where condensation may form shall be equipped with a drain.

- C. Acoustical insulation shall be utilized as required to meet the noise requirements outlined in this Part 8.
- (vii) Carshell structural features shall include:
 - A. A coupling speed up to 5km/h with no resulting damage to coupler or anchorage. Replaceable energy absorption components of the coupler shall be excluded from this requirement;
 - B. Provisions for Vehicle towing;
 - C. Component mounting to the carshell shall confirm to APTA SS-C&S-006-98, Std for Attachment Strength of Interior Fittings for Passenger Railroad Equipment (or EN12663 class P-II); and,
 - D. Sufficient jacking pads to allow New Revenue Vehicle jacking during Maintenance and in the case of derailment.

1.14 Crash Energy Management

- (a) Project Co shall ensure that all New Revenue Vehicles shall be fitted with CEM systems.
- (b) Project Co shall prove compliance with EN 15227 and/or FRA Tier I Alternative Compliance.
- (c) Project Co shall conduct and submit a crash energy absorption analysis of the New Revenue Vehicle to assess the energy absorbing properties of the structure and the structural compatibility with the existing Vehicles. The analysis shall be subject to review and comment by the City as well as Transport Canada.

1.15 Fuel Tank Arrangement

- (a) Each New Revenue Vehicle shall have a fuel tank that stores no less than 2600 liters of fuel.

1.16 Coupler and Draft Gear

- (a) Project Co shall design and construct the coupler and draft gear in accordance with the following requirements:
 - (i) The New Revenue Vehicle shall include couplers on each end. Couplers shall be arranged to perform automatic coupling and resetting after uncoupling.
 - (ii) The couplers shall be Type 10 latch, as manufactured by Sharfenberg or equivalent. The centerline of the coupler shall be 1060mm above Top of Rail.
 - A. The coupler shall provide for mechanical coupling with the existing Vehicles.

- (iii) The coupler shall be equipped with an energy absorption device and a shear off device that contains the coupler while allowing front end deformation under crash conditions.
- (iv) The coupler shall:
 - A. Be a service proven design;
 - B. Use an automatic centering device that allows for coupling on curve;
 - C. Be equipped with a weather protective device to protect couplers from rain, ice and snow;
 - D. Include manual coupling/uncoupling lever(s);
 - E. Be equipped with heaters for coupler faces. Additional heaters shall be provided if they are required to ensure reliable operation in Ottawa climatic conditions; and,
 - F. Couplers shall be capable of retreating rearward in a crash to allow complete collapse of all 3 crash energy management zones.

1.17 Cab Equipment and Controls

- (a) Full width cabs shall provide a spacious, ergonomic, Operator friendly environment. Project Co shall design and construct the cab to be separated from the Passenger area by a full partition and a lockable cab door. The cab shall provide the New Revenue Vehicle with an aesthetically pleasing, modern look. Large windows on all four sides of the cab shall provide excellent visibility to the Operator. Cabs shall be provided on each end of the Vehicle.
- (b) Project Co shall design and construct the Operator's seat to be fully adjustable, heated and shall accommodate 5th percentile females and 95th percentile males. A foot rest shall be provided.
- (c) Project Co shall ensure that all controls necessary to operate the New Revenue Vehicle, including low voltage circuit breakers, cut-out and bypass switches, are located in the cab. All controls shall be proposed by Project Co for review by the City.
- (d) Project Co shall provide a mock-up of the proposed cab arrangement and layout.
 - (i) The arrangement and accessibility of the controls and comfort/visibility provided by the Operator's seat shall be reviewed and approved by the City during the mock up review. Ease of entering and exiting the cab as well as seating comfort behind the console shall be demonstrated.
 - (ii) Alternative approaches to mock ups, such as a review of existing models of the proposed Vehicle, may be proposed for consideration by the City, however, the City reserves the right to customize the cab layout as necessary to improve the interface and provide a seamless Operator experience with the existing and New Vehicles.
- (e) Project Co shall design and construct the cab to be provided with:

- (i) A Hinged cab door, arranged to allow quick emergency egress into the Passenger compartment (panic bar);
 - A. The cab door glazing shall be “one-way” or transparent to the Operator and opaque on the passenger side.
 - B. The door shall be fitted with a keyed lock. The tumbler shall match the Existing Vehicle Fleet so that a single key opens all cars in the fleet.
 - (ii) A full width contoured front windshield;
 - A. Designed to minimize glare and interior reflection.
 - B. Laminated safety glass, FRA Type 1 or UIC 651, clear.
 - C. Windshield shall be electrically heated with a watt density of no less than 0.08 watts/cm². The entire windscreen shall be heated.
 - (iii) Cab side windows;
 - A. Horizontal sliding or hinged panel on both sides of cab. Open adjustment shall be incremental
 - B. Tint visible light transmission shall be proposed by Project Co for approval by the City.
 - C. Latch easily operated by Operator.
 - D. Glazing to be dual-pane laminated safety glass.
 - (iv) Side windows; and
 - A. Fixed horizontal panels on both sides.
 - B. Maximized in size to contribute to the modern feel of the New Revenue Vehicle.
 - C. Glazing to be dual-pane laminated safety glass.
- (f) Project Co shall design and construct cab controls in accordance with the following:
- (i) Cab controls shall include all of the following at a minimum.
 - A. Clock configured such that all Revenue Vehicles show the same time;
 - B. Door status of the entire Train, as well as the status of each individual door shall be provided, either on the DDU or alternate location;
 - C. Sander switch shall be a momentary push button, not an on/off switch;
 - D. The indicator panel shall be provided with a backlight or alternative approach to provide clear visibility in bright sunlight;

- E. Gooseneck for interior and exterior announcements;
 - F. Push to talk microphone for voice radio functions;
 - G. The headlight dimmer shall utilize a pushbutton;
 - H. Seals on all safety-critical cutout and bypass switches;
 - I. Coupler controls;
 - J. Silent alarm pushbutton;
 - K. Master controller;
 - L. Transfer switch/direction switch;
 - M. Alerter pushbutton;
 - N. Cab video display screens;
 - O. Dimming adjustment for all displays and LED indicators;
 - P. Communication control panel;
 - Q. Passenger door controls shall:
 - i. Be a momentary recessed push buttons that preclude accidental activation. (collar type pushbutton); and
 - ii. Illuminated when activated (Color coded as follows: open =green, close = red, enable = yellow);
 - R. A low voltage voltmeter with a range as applicable for battery voltage;
 - S. An odometer;
 - T. Ventilation, cooling and heating controls;
 - U. Cab heater, with direction adjustability and an outlet for the Operator's feet and cab side windows; and,
 - V. A recessed folding coat hook.
- (g) Project Co shall include the following additional cab features:
- (i) Emergency tool cabinets and fixtures as described in the Safety section of this Specification;
 - (ii) Full width (no less than 450mm) permanently fixed jump seat shall be provided in the cab. The arrangement shall provide back and bottom cushions;

- (iii) A cup holder and storage locker shall be provided for the Operator. Arrangement of these components subject to agreement by the City. The locker shall provide a volume of no less than 7,000cc;
 - (iv) Cab video display screen(s);
 - (v) A DDU display screen;
 - (vi) Full width Sun visors that provide UV protection; and,
 - (vii) Irretrievable Emergency brake switch.
- (h) Project Co shall design and construct vigilance device/alerter in accordance with the following:
- (i) An alerter system shall be provided in the cab which shall ensure the continuous attentiveness of the Operator by monitoring selected cab activities. Activities may be proposed by Project Co for review and approval by the City.
 - A. The system shall initiate a penalty brake application if the Operator fails to institute a change of state in a monitored input or depress the alerter push button within a set time period.
 - i. Prior to a penalty application the system shall first illuminate a visual display for four seconds, then sound an audible alarm and illuminate a visual display for six seconds.
 - ii. The light alarm shall be perceivable from the Operator's seat at all times. Once activated, the alarm shall remain on until one of the monitored inputs has changed state. If no change of state occurs in any monitored input within 10 seconds, the alerter system shall initiate a penalty brake application.
 - iii. Foot pedals may be also be included as a vigilance device, provided that a change of state of the pushbutton is required and a constant force on the pedal is not an indication of Operator alertness.
 - B. The alerter timer shall be made inactive and the timing reset to zero whenever any of the following conditions occur:
 - i. Train speed less than 10 km/h
 - ii. The brakes are applied
 - iii. The cab is inactive.
- (i) Project Co shall ensure that cab exterior appointments shall include, but not be limited to the following:
- (i) Windshield wipers:

- A. Windshield wipers shall be full width and arranged to park outside of the Operator's field of view.
 - B. Wiper blade shall be heated, or an alternative method shall be proposed to prevent freezing of blades.
 - C. Electrically operated (operable in the Lead cab only);
 - D. Speed control which includes off, low, high and adjustable Intermittent
- (ii) Windshield washers with no less than 15 litres of washer fluid capacity.
 - (iii) 100dBA Horn with snow deflecting cone.
 - (iv) 85dBA Bell – type EBE, or alternative proposed for acceptance by the City
 - (v) Lighting in accordance with this Part 8.

1.18 Passenger Doors and Controls

- (a) Project Co shall design and construct each Passenger body section to include no less than two dual-leaf doorways per side. Doorways shall provide a clear opening width of no less than 1300 mm and height of no less than 2150 mm.
- (b) Project Co shall design and construct the New Revenue Vehicle to be equipped with threshold extensions (if required) to achieve ADA/AODA compliance as required in Clause 1.2(f) of this Part 8.
- (c) Project Co shall design and construct the door system to be the bi-parting sliding leaf type using high reliability Overhead electric operators. Doors shall be arranged to ensure that the Platform may not be fouled under any circumstances.
- (d) Project Co shall design and construct the following door operator design features
 - (i) The operator shall be a service proven design with a history of reliability without the need for Maintenance and adjustment. The door mechanism shall be suitable for operation in cold temperatures as well as snow and ice storms. The operator shall be sufficiently powered to open with 3mm of freezing rain developed on the door panels and seals.
 - (ii) The door operator shall be a simple, safe design employing interlocking relay logic to prevent unintended operation. The door operator shall also be interlocked with the no-motion relay.
 - (iii) Door panels shall be closed and locked out of service with a mechanical lock which is independent from the motor and mechanically prevents panel movement. The lock shall cut out door motion, provide a close and locked indication to the door summary loop and energize a door out of service sign on both interior and exterior locations.

- (iv) Door control operators shall provide the ability to adjust open and close time intervals using the PTU. Timing shall be set to match the existing Vehicles.
 - (v) The door closing force shall not exceed the limits specified in APTA SS-M-18-10 or equivalent specification. Pressure sensitive obstruction detection or motor current monitoring shall automatically open the doors when an obstruction is encountered. The obstruction detection system shall stop the affected panel from closing when an obstruction is detected, fully reopen and recycle.
 - (vi) The maximum force needed to open the doors manually shall not exceed 75N.
- (e) Project Co shall design and construct the following door panel design features
- (i) The door panels shall be designed to blend seamlessly with the New Revenue Vehicle exterior. Panel design shall meet the following requirements:
 - A. Be fitted with dual-pane laminated safety glass windows. Window to be aligned with Passenger side windows and tinted to match; and
 - B. Be provided with interior and exterior Passenger pushbuttons in compliance with AODA and ADA to allow individual door control when enabled.
- (f) Project Co shall design and construct door controls in accordance with the following:
- (i) Doors shall be operable via pushbuttons in the cab (open, close, door release enable, door release disable), trainline signals and local door open pushbuttons, depending on the mode set up within the consist.
 - (ii) A Door release feature shall release door control and illuminate a “Door Open” LED pushbutton at each active door, in the interior and exterior of the New Revenue Vehicle allowing Passengers to open individual doors by pressing the “Door Open” button. A pictogram shall indicate the function of the pushbutton switch. Pushbuttons out of service will not display energized LEDs.
 - A. Light barriers shall be fitted on each doorway. Six seconds after the last Passenger has passed the light barrier, the door shall commence closing. The timing of the device shall be adjustable.
 - (iii) Crew switches shall have the capability to cycle the doors. Interior and exterior crew switches shall be installed on the inside and outside of all doors.
 - A. Crew switches shall be housed behind a lockable door.
- (g) Project Co shall include the following Passenger door safety features:
- (i) Door control on each car shall be interlocked with the no motion detection system on that car.
 - (ii) Door operator design shall include a safety device to ensure doors recycle after contact with a 19mm round object or 9.5mm thick by 75mm wide object inserted at any height.

- (iii) Doors closed and locked status shall be interlocked with propulsion to prevent movement when a door is open.
- (iv) All doors shall have a mechanical Emergency release mechanism inside and outside the Vehicle. Actuation of any door release shall activate the nearest PEI.
- (v) Door operators shall have a cut-out that locks the door and completes the door closed summary loop.
- (vi) Each doorway system shall have an audio and interior/exterior visual warning while open and during closing. The City will provide the sound requirements for the opening, closing and obstacle detection sounds.
- (vii) Marker lights and brake lights shall flash whenever doors are open.

1.19 Heating, Ventilation and Air Conditioning

- (a) Project Co shall design and construct the HVAC equipment to provide safe, reliable climate control in accordance with the climatic and environmental conditions outlined in this Part 8. The system shall utilize microprocessor controls to automatically control interior temperatures (both in the cab and Passenger area) and prevent snow or ice or water from accumulating on the New Revenue Vehicle floor or the thresholds. The system shall incorporate a layover mode to maintain moderate interior temperatures when New Revenue Vehicles are not in Revenue Service.
- (b) Project Co shall design and construction the HVAC system in accordance with the following:
 - (i) The system shall be designed to prevent condensation forming on the windows at any time during Revenue Service when cooling is available. A reheat mode shall be incorporated to achieve this requirement.
 - (ii) The HVAC units shall be roof-mounted, fully unitized packages with a height that meets the roof equipment height limits.
 - (iii) Watertight and leak-proof seals shall be provided between carbody and HVAC unit return and supply air interfaces.
 - (iv) The refrigerant circuit shall be hermetically sealed system charged with non-ozone depleting refrigerant. Refrigerant shall comply with all applicable Canadian standards and laws.
 - (v) 12 m³/hr of fresh air per Passenger at AW2 shall be provided. Fresh air dampers, or equivalent, shall allow a quicker warm-up or cool down during initial start-up by limiting fresh air.
 - (vi) The HVAC heating system shall be arranged to operate in stages. The system shall use duct sensors to keep supply air within 8°C of return air temperature.
 - (vii) Temperature stratification shall be limited to 3°C within any vertical or horizontal plane.

- (viii) Over-temperature safety protection shall be:
- A. Self-resettable thermostats that disable control voltage to the heater contactors; and,
 - B. Fusible link(s), or equivalent, to protect the system in the event of a failure of the over-temperature thermostat.
- (ix) The system shall be designed to maintain interior conditions between 19°C and 22°C with 1% design conditions for cooling and 99% design conditions for heating as defined in ASHRAE fundamentals handbook. Design conditions include AW2 passenger loads and worst case solar loads and fresh air loads, as well as all equipment heat loads.
- (c) Project Co shall design and construct the HVAC controls in accordance with the following:
- (i) The HVAC controller shall allow software adjustments and modification to settings, including a ±2°C setpoint adjustment for all switching points. Setpoint accuracy shall be ±1.0°C.
 - (ii) Setpoints shall be easily adjustable. Project Co shall adjust the setpoint as directed by the City
- (d) Project Co shall design and construct the following additional HVAC features:
- (i) Emergency shutdown switch for HVAC system (per car and consist control) shall be located in the cab.
 - (ii) Emergency fresh air damper close switch (per car and consist control) shall be located in the cab.
 - (iii) A layover mode to maintain interior temperatures between 4°C and 8°C. (Dampers shall be closed during layover).
 - (iv) A positive interior pressure shall be maintained at all times and at all New Revenue Vehicle speeds.
- (e) Project Co shall design and construct the floor heat system in accordance with the following:
- (i) No less than 15 kW of floor heat shall be provided per body section. The heat shall enter the New Revenue Vehicle through baseboard heat registers throughout the Vehicle.
 - (ii) The entire heater shall be fabricated from stainless steel or anodized aluminum, including enclosure and grilles.
 - (iii) The grilles/heater guards shall be designed to prevent Passenger exposure to unsafe surface temperatures (greater than 52°C) and electrical connections.
 - (iv) Threshold heaters shall also be provided as part of the floor heat system. These heaters shall be sized to keep snow and ice from accumulating at the doorway or affecting the

operation of the door system. Thresholds shall be arranged to allow drainage of melted snow and ice.

(f) Project Co shall design and construct the cab system in accordance with the following:

- (i) The HVAC equipment within the Operator's cab shall consist of:
 - A. An electrically heated windshield;
 - B. Overhead air diffusers with volume and directional adjustability; and
 - C. Thermostatically controlled cab heater(s) with the following features:
 - i. OFF-LOW-HIGH rotary switch for air speed/volume control of both cab heaters;
 - ii. Manual adjustment to direct airflow to floor, cab side windows, or both;
 - iii. Heater noise level in HIGH speed not to exceed 72dBA;
 - iv. Cab heater surface temperatures shall not exceed 52°C; and,
 - v. Over-temperature protection shall include:
 - 1 An over-temperature thermostat which shall automatically cycle the heater contactors upon excessive temperatures; and
 - 2 Failure of the over-temp thermostat shall cause a manually resettable shunt trip breaker to open power to the heaters. Manual reset switch shall be easily accessible to the Operator.

1.20 Lighting

- (a) Project Co shall design and construct the lighting system to consist of all interior lighting, exterior lighting, and indicators. The design shall provide lighting with a minimal degradation of color or luminosity over time. Safe levels of lighting shall be provided in the event of Emergency conditions.
- (b) Project Co shall design and construct the Lighting system to:
 - (i) Be LED based, operating entirely from the New Revenue Vehicle low voltage system;
 - (ii) Have two luminosity levels for the main interior lighting: normal and Emergency;
 - (iii) Be configured so that lighting throughout the Train can be controlled from the lead Vehicle; and,
 - (iv) Provide lighting levels in Passenger compartments and at doors compatible with AODA/ADA requirements.
- (c) Project Co shall design and construct the interior lighting in accordance with the following:

- (i) The main lighting fixtures shall use LED cluster modules operating from the low voltage distribution network.
 - (ii) The interior Emergency lighting shall use LED modules operating from the New Revenue Vehicle battery.
 - (iii) LLEPM shall be provided along the aisle and vestibules leading to the doorways (for wayfinding in case of an Emergency), utilizing a HPPL material strip embedded into the floor (or LED lighting).
 - (iv) An interior LED indicator light shall be provided over each door to indicate that the door is not closed and locked.
 - (v) An LED backlit sign shall be provided over each side door to indicate when the door is locked out of service.
- (d) Project Co shall design and construct the cab area lighting in accordance with the following:
- (i) LED indicator and instrument lighting shall be provided.
 - (ii) Overhead lighting shall be provided using dimmable and directionally adjustable lights.
 - (iii) LED cab equipment compartment lighting shall be provided.
 - (iv) Overhead and equipment compartment lighting shall be included in the Emergency lighting system.
- (e) Project Co shall design and construct the cab exterior lighting in accordance with the following:
- (i) The following exterior lighting shall be LED type, visible in all natural and artificial lighting conditions:
 - A. marker lights;
 - B. tail lights;
 - C. Brake cutout lights;
 - D. Exterior fault lights;
 - E. Door open LED indicator light at each door; and,
 - F. Additional indicator lights as necessary.
 - (ii) Headlights shall have high and low beam functionality.
 - (iii) A third, forward facing headlight shall be provided at the center line of the New Revenue Vehicle, above the cab to distinguish the Vehicle from other types of vehicles.
 - (iv) Headlights shall conform to Transport Canada requirements (200,000 candela) and shall be aligned to centreline in the horizontal plane and adjusted to strike the rail at 244m.

- (v) Headlights, tail lights and brake lights intensity shall meet all requirements of Canadian Motor Vehicle Safety Regulations, Technical Standard 108.
- (f) Project Co shall design and construct the lighting controls in accordance with the following:
 - (i) All lighting controls switches and circuit breakers shall be located in the cab area. Alternative locations may be acceptable provided that the Operator can access breakers with a key turn without the need for any other tools.
 - (ii) Passenger compartment lighting control shall be a trainline control function from the control panel on the lead car.
 - (iii) Cab lighting shall be controlled through a switch with dimmer control.
 - (iv) Equipment locker lighting shall be controlled by a switch on the control panel and a limit switch actuated by the locker door.
 - (v) A dimmer switch shall be provided to control the intensity of indicator panel back lighting.
 - (vi) Control of headlights, tail lights, brake lights, and marker lights shall be interlocked with the direction trainlines and coupler loop switches so that head lights, tail lights, brake lights and marker lights shall only be active at ends of the Train in accordance with Train direction.
- (g) Project Co shall ensure the following performance is achieved:
 - (i) The cab and Passenger area lighting intensity shall meet as a minimum, the requirements of EN 13272 or equivalent.
 - A. Lighting levels shall be proposed by the Project Co and shall provide adequate lighting levels for day time and night time conditions while minimizing glare.
 - (ii) Emergency lighting shall be available for 60 minutes after loss of the low voltage power supply and shall meet or exceed the minimum illumination requirements of APTA SS-E-013-99, Rev. 1.
 - (iii) LLEPM shall meet APTA standard SS-PS-004-99 Rev. 2.
 - (iv) Amber marker lights shall be activated on the front of the lead car when the master controller is in the forward position.
 - (v) Marker Lights, tail lights and brake lights shall operate as follows:
 - A. Red marker lights and tail lights shall be activated on the last car at all times;
 - B. Brake lights shall be active on the last car when the Train brakes are applied;
 - C. Red marker lights and red tail lights shall be active on the front of the Train when no direction is selected; and,

- D. Marker lights and brake lights shall flash when the Train is stopped and the doors are open. Marker and brake lights shall also flash when the Master Controller is in the reverse position.
- (vi) Interior Passenger and cab lighting shall time out in 20 minutes after the New Revenue Vehicle is turned off.
- (vii) Exterior New Revenue Vehicle door status lights shall be visible from both the longitudinal and transverse directions.
- (h) Project Co shall design and construct the auxiliary power in accordance with the following:
- (i) Auxiliary power units shall include:
- A. 3 phase 60Hz AC power units to supply power for HVAC, blower motors, compressors, fans, etc.; and.
- B. LVPS to provide low voltage DC power for control systems, and battery charging, lighting, etc.
- (i) Project Co shall design and construct the battery in accordance with the following:
- (i) No less than two battery sets shall be provided per New Revenue Vehicle.
- (ii) Batteries shall be rated at a minimum of 80 Ah at 110V.
- (iii) The battery shall be protected by a fuse and a positive and negative side disconnect switch and over voltage protection.
- (iv) The batteries shall be heated.
- (v) The battery compartment shall be ventilated sufficiently to prevent build-up of explosive levels of hydrogen gas.
- (vi) The batteries shall be sized to power the following loads for 90 minutes:
- A. Train radio;
- B. Interior Emergency and interior cab lighting;
- C. Exterior marker lighting; and,
- D. PEI, PA, speakers and announcement signs.
- (vii) The batteries shall be sized to power the following loads for 30 minutes:
- A. Passenger doors (single cycle);
- B. CCTV;
- C. TCMS;

- D. Windshield wipers;
 - E. Fire protection systems; and,
 - F. Instrument lighting.
- (j) Project Co shall design and construct the AC and low voltage distribution in accordance with the following:
- (i) All AC and low voltage DC circuits shall be circuit breaker protected.
 - (ii) Low Voltage DC and AC Circuit breakers shall be located in locked enclosures in the cab. Alternative locations may be acceptable provided that the Operator can access breakers with a key turn without the need for any other tools.
 - (iii) All AC and DC circuit breakers shall meet the requirements of IEEE Std C37-13 and IEEE Std C37-14 respectively. Alternate arrangements that comply with the following IEC standards will be accepted: IEC 61373, IEC 60898-1, IEC 60898-2, IEC 60947-2 and IEC 61009.
 - (iv) The low voltage DC system shall be grounded in a manner which prevents differences in potential between cars caused by traction return currents from interfering with trainline signals.
 - (v) Galvanically isolated, ground fault protected single phase 120VAC 60Hz power shall be provided to cab and Passenger compartment outlets as needed for cleaning and for New Revenue Vehicle Maintenance Activity.

1.21 Propulsion Control

- (a) Project Co shall design and construct the propulsion control to:
- (i) Be based upon networked and trainlined tractive effort and braking effort commands with load-weigh compensation to provide consistent acceleration and braking rates regardless of Passenger loading;
 - (ii) Detect and correct spins and slides in coordination with the friction brake and traction control system;
 - (iii) Request sanding control to apply sand in front of both wheels of the leading axle when wheel spin or slide exceeds a pre-set level;
 - (iv) Monitor direction, propulsion and braking control and friction brake status trainlines and inhibit or shutdown propulsion in case of conflicts;
 - (v) Provide fault recording and diagnostics for system troubleshooting and report faults to the DDU.

1.22 Bogies

- (a) Project Co shall design and construct each New Revenue Vehicle to be supported by four wheeled Bogies.
- (b) Project Co shall design and construct the Bogie components in accordance with the following:
 - (i) Shall be either cast steel or fabricated/welded steel construction. Components may be made from cast iron if service proven components have a record of satisfactory operation in climates similar to Ottawa. Cast iron, if proposed shall be:
 - A. Ductile spheroidal graphite cast iron EN-GJS-400-18LT-LT
 - B. Designed for temperatures to as low as -40°C.
 - (ii) The secondary suspension shall be controlled by a levelling valve to fulfill AODA/ADA level boarding requirements.
 - (iii) Secondary suspension shall include dual check valves to ensure even deflation in case of a failure.
 - (iv) Secondary lateral and vertical dampers shall be used.
 - (v) Wheel profiles shall be identical to those provided on the existing Vehicles. Alternative proposals may be considered by the City, so long as rail wear is consistent between the New and Existing Vehicle Fleets.
 - (vi) Allowable wheel wear shall be no more than 30mm on the radius. A location for shimming shall be provided.
 - A. Project Co shall provide a description of the method used to shim the Revenue Vehicles and the expected time required to perform the task.
 - (vii) A flange lubrication system shall be provided.
 - (viii) Axles shall be designed in accordance with AAR M-101, APTA RP-M-001-98, or UIC 515-3, or equivalent.
- (c) Project Co shall design and construct the Bogie motion control in accordance with the following
 - (i) Primary suspension strokes shall never be exhausted under any condition of dynamic operation, New Revenue Vehicle weight, weight variation and suspension creep.
 - (ii) Primary and secondary vertical and lateral stops shall be fabricated from replaceable elastomeric bumpers.
 - (iii) Equalization shall be such that with the car on level Track under an AW0 load, lifting or dropping any wheel up to 38mm shall not change the load on any other wheel of the car by more than 60%.

- (iv) Raising or lowering any wheel up to 50mm shall not result in loss of contact between any of the other wheels on the car and the rail.
- (d) Project Co shall conduct stress analysis in accordance with the following:
 - (i) For the service proven New Revenue Vehicle, stress analysis and FEA results from a previous contract shall be submitted for review and consideration by the City.
- (e) Project Co shall ensure the following design ride quality:
 - (i) A ride quality test shall be performed. The ride quality provided shall be equivalent to or superior to the City's existing vehicles.
 - (ii) The methodology used to evaluate ride quality shall be ISO 2631 (latest edition), in the frequency range of 0.5 to 80Hz. Limits are valid for three axes.

1.23 Brakes

- (a) Project Co shall design and construct the brakes in accordance with the following
 - (i) The New Revenue Vehicle shall be equipped with a dynamic brake system as well as a friction brake system.
 - (ii) The braking system shall be designed to operate on the Expanded Trillium Line alignment, which includes 11 stations and a round trip time of 62 minutes. Project Co shall provide proof that the system has the capacity to manage this duty cycle under all conditions.
 - (iii) Brake cycle design compliance shall be based on the head way and dwell times as described in Schedule 15-2, Part 1, Article 3 – Operational Performance Requirements, with AW3 passenger loading
 - (iv) Alternative solutions may be proposed for consideration by the City.
 - (v) Disc Brakes and Calipers
 - A. A disc brake system shall be provided for all axles of all Bogies.
 - B. Disc rotors shall have a wear limit indicator.
 - (vi) Friction Brake Control Unit
 - A. The disc brakes of each Bogie shall be controlled by a FBCU for that Bogie.
 - B. The FBCU shall be physically independent or integrated with propulsion logic provided that the level of Safety, Reliability and Availability is the same as with an independent unit.
 - C. The FBCU shall:
 - i. Read and interpret trainline requests and load-weigh transducers;

- ii. Communicate over a direct link with the propulsion system for that Bogie;
 - iii. Read the dynamic braking effort signal from the propulsion system and command the friction brakes to provide the difference between braking request and the braking effort supplied by propulsion;
 - iv. Take over if the TCU cannot control a New Revenue Vehicle slide within a pre-set time;
 - v. Request the sanding system to apply sand during low adhesion;
 - vi. Include a means to initiate safety self-checks of the brake system and default to a restrictive state in case of failure;
 - vii. provide roll back protection when the New Revenue Vehicle is starting from a dead stop, in coordination with the propulsion system;
 - 1 The roll back prevention function of the FBCU shall be coordinated with propulsion to prevent any rollback on the absolute maximum grade for the Expanded Trillium Line, or 4%, whichever is greater.
 - viii. Provide fault recording and diagnostics for system troubleshooting;
 - ix. Provide a brake application and inhibit Train propulsion when air pressure falls below a level required to provide a friction only AW3 Emergency brake stop;
 - x. Control braking to provide the total trainline braking request in case of failure of the propulsion system to provide electric braking or in case of communications failure with the propulsion system;
 - xi. Default to safe operating mode if a failure of the load weigh sensor occurs on the Bogie; and,
 - xii. Distinguish between speed sensor failures and New Revenue Vehicle slides.
- (vii) Sanding System
- A. A sanding system shall be provided that shall deposit sand at the wheel rail interface of the lead axle of each New Revenue Vehicle in the Train.
 - B. The air system powering the sander shall store sufficient compressed air that it is capable of 20 seconds of sand application without running the air compressor.
 - C. Sand boxes and nozzles shall be heated and have a volume of no less than 20 litres.

- D. Sanders shall be activated during spinning or sliding events and continuously down to zero speed during any emergency brake application.
- E. A momentary switch shall be provided on the console to manually activate sanding.

1.24 Communications and Passenger Information System

- (a) Project Co shall design and construct all equipment needed for wireless communication between Revenue Vehicles and TOCC. Project Co shall arrange interfaces for this data to facilitate the communication by Project Co's equipment.
- (b) Project Co shall design and construct the system in accordance with the following system functional requirements
 - (i) Provide synchronized audio and visual Passenger information announcements and shall include, at a minimum destination, Station stops, time, Emergency announcements.
 - (ii) Coordinate Emergency announcements on the New Revenue Vehicle with station announcements so that station and Vehicle announcements do not compete.
 - (iii) Provide a Passenger Emergency intercom system.
 - (iv) Provide reliable voice communications with the TOCC.
 - (v) Provide a CCTV video monitoring and recording system.
 - (vi) Provide fault recording and diagnostics for system troubleshooting.
 - (vii) Include a silent alarm reporting function.
 - (viii) Train Voice Radio
 - A. The Revenue Vehicle's PA system shall provide, as required, power, analog and digital interfaces and connections to the P25 radio system.
 - B. The radio, antenna and any other equipment needed to integrate the radio into the Revenue Vehicles shall be provided, installed and tested by Project Co.
 - C. The radio system shall be as detailed in Clause 5.4(b) of Schedule 15-2, Part 3 - Systems.
 - (ix) Public Address System
 - A. The PA system shall accept input from the Operator's cab microphone, patched through TOCC announcements, and the automatic announcement system.
 - i. TOCC and cab input shall take priority over automatic announcements.
 - B. The PA system shall automatically compensate for ambient noise.

- C. The PA control shall emit an activation chime different from the door chime before any announcement.
 - D. The PA system shall have both internal and external speakers. External speakers will not be active unless selected.
 - E. Automatic selection of the correct side for external speaker activation based on location of the Station Platform shall be provided.
- (x) Cab to Cab and Passenger Emergency Intercoms
- A. PEI units shall be installed at all accessible areas in the car and at the cab walls.
 - B. PEI and cab-to-cab intercom systems shall have a session hold function with ability to transfer between PEI and cab-to-cab sessions.
 - C. Once activated, the PEI stations shall require no further intervention by the Passenger to communicate with the Train. PEI stations shall meet ADA and AODA requirements and be provided in each accessible area in the New Revenue Vehicle
 - D. A view from the CCTV camera with the best view of the first PEI activated and a longitudinal view of that car shall be automatically transmitted to the CCTV display in the active cab once zero speed is reached. Queuing of multiple PEI or cab-to-cab intercom calls shall be possible.
 - E. The PEI system shall permit a Passenger speaking at a distance of 50cm from the PEI unit in a normal tone of voice with ambient noise levels up to 85dBA to be heard. Total harmonic distortion through the system from microphone to cab handset shall be less than 2%.
 - F. The Passenger interface and functionality of the PEI shall be consistent with the City's LRV fleet.
- (xi) Radio and Intercom Control Panel
- A. The Communications System control panel radio handset shall by default connect to the Train voice radio.
 - B. Pushbuttons shall be provided to connect the handset to the cab-to-cab intercom and PEI systems.
 - C. Controls shall be provided to adjust the volume of the radio, and intercom speakers and handset volume above a pre-set minimum level.
- (xii) Automatic Announcement System
- A. The automatic announcements shall provide pre-recorded simultaneous voice and visual announcements over the Train PA system and the transverse announcement signs located in each body section of all Revenue Vehicles.

- B. Station and connection announcements shall be provided as the Train enters each Station. Pre-recorded announcements shall be determined during design review.
 - C. Pre-recorded special announcements may be selected from the Communications Systems control panel at any time and override any other messages.
 - D. The cab system may make direct announcements at any time over the PA system using the gooseneck microphone and a control switch.
 - E. The system shall have the capability of transmitting TOCC announcements.
 - F. Station announcements shall be triggered based on Revenue Vehicle's location.
 - G. All automatic announcements shall be made in English and French.
 - H. Project Co shall provide the equipment and software necessary to create content for use on the system.
 - I. Project Co shall propose a design that provides integration of the Confederation Line and Expanded Trillium Line announcement systems, for approval by the City.
 - J. The current Existing Trillium Line fleet uses a Passenger information system provided by [REDACTED]. If an alternate system is proposed that meets these functional requirements, Project Co shall supply a hardware and software package to enable editing and updates to the onboard messages. City approval shall be required on alternative solutions.
- (xiii) Announcement Signs
- A. LED Passenger announcement signs shall be visible throughout all of the Revenue Vehicles, so that Passengers may read a sign from any seated or standing location.
 - B. The announcement signs shall be controlled by the automatic announcement system from the lead Revenue Vehicle in the Train over the Train communications network.
 - C. Signs shall display longer messages by sequencing rather than scrolling.
 - D. The system shall have the ability to display 30 characters with a character height compliant to ADA/AODA for all Passengers on the Revenue Vehicle.
 - E. Signs shall display time of day (military time) when not displaying a message.
- (xiv) LCD Displays:
- A. One LCD display shall be provided per vestibule in New Revenue Vehicles. The display shall be used to indicate each Station stop, highlighting current station and upcoming stations.

- B. The LCD display system shall also display information about connections, service delays, elevators out of service, indicate and highlight next stop, and provide the time of day.
 - C. The LCD display system shall display time countdown messages for upcoming Stations and provide time countdown messages for the destination Station.
 - D. The LCD display system shall only be powered when the interior lighting trainline control is active and the Passenger area temperature is above 10 °C.
 - E. The LCD display system shall have a minimum of 16GB of solid state drive data storage.
 - F. Project Co shall provide a software editing package to enable the City to make changes to the system as required.
 - G. The LCD displays shall:
 - i. Be housed in tamper proof enclosures;
 - ii. Be equipped with an Ethernet port to receive content from the media controller;
 - iii. Be ruggedized to withstand the shock and vibration of a rail transit environment;
 - iv. Be no more than 88mm deep;
 - v. Have a viewing area diagonal of 17 inches or greater;
 - vi. Have a high reliability, long service life, LED back light;
 - vii. Have intensity sensing and compensation for brightness and contrast;
 - viii. Have adjustable resolution up to minimum of 1280/720 pixels; and,
 - ix. Be capable of operating between -20 °C and + 70 °C.
 - H. The size and layout of the display shall be proposed by Project Co for review and approval by the City.
 - I. Thin film transistor displays may also be proposed for acceptance by the City.
- (xv) Passenger information control panel
- A. An Operator's Passenger information control panel shall be provided to allow the Operator to select pre-recorded announcements over the PA and to select destinations in case of the automatic system's failure.
 - B. The Operator's Passenger information control panel shall also display failure of PA sign or PEI equipment in any New Revenue Vehicles in a Train.

- C. The Passenger information control panel shall be either an independent unit or a sub-screen of the DDU.

(xvi) Destination Signs

- A. One external electronic destination sign shall be provided and installed at the cab end of each New Revenue Vehicle and one on each side of each body section of the Vehicle.
- B. The destination sign control shall automatically display the correct destination of the Train based on Train travel direction and location.
- C. When a Train enters a terminal location the destination signs shall reverse direction as soon as the Train comes to a stop unless this action is overridden. The “Out of Service” message shall also be able to be selected.
- D. Destination signs shall only display English.

(xvii) Security Alarm System

- A. A pushbutton switch shall be provided in the cab compartment of Revenue Vehicles to activate the silent alarm.
- B. Pushbutton location shall be determined during review of the cab mock-up.
- C. Activation of the silent alarm shall:
 - i. Cause an alarm message to be sent over the Train radio system to the TOCC. This alarm message shall include the Revenue Vehicle number where the alarm was activated; and,
 - ii. Cause a tag message to be sent to the NVR of the Revenue Vehicle where the alarm was initiated to prevent overwriting of the video data.

(xviii) CCTV and Network Video Recorder System

- A. Interior cameras within the Passenger compartment shall provide full coverage of the interior areas of the Revenue Vehicles. Cameras views shall cover the entire Passenger area such that there are no blind spots.
- B. Cab forward facing and cab interior facing (Operator’s seat and console) cameras shall be provided.
- C. The network cameras shall be directly networked to the NVR.
- D. The system shall be arranged to comply with Ottawa’s Transit Network Access and Privacy Policy.

- E. The Platform mounted cameras that capture the Platform edge view of all doors shall be displayed on the cab monitor(s). The views shall display in the cab when the cab is active and the Revenue Vehicle is stationary.
 - i. Alternatively, Revenue Vehicle side mounted cameras may be used to monitor all doors on the trainset. One camera per body section shall be provided.
- F. When the Revenue Vehicle comes to a stop, the display shall show the views from the Platform cameras that capture the doorways of the Revenue Vehicle or consist of vehicles. When a Passenger intercom button is pushed, the camera that captures the particular PEI shall be displayed.
- G. The Operator shall have the ability to toggle between camera views or display all views when the Train is stopped. The PEI call shall take precedence over any other views.
- H. Cameras shall stream video adjustable up to 30 frames per second. Triggering the silent alarm shall set recording to 30 frames per second for an amount of time defined by the City.
- I. Cameras and NVR shall be powered from the low voltage DC power with necessary DC to DC isolation converters.
- J. A means shall be provided to determine if the camera has been tampered with or vandalized, or if the camera has failed.
- K. Means shall be provided for the City to access real time video data in the event of an emergency.
- L. Project Co shall provide a CCTV system that communicates and downloads all images to the wayside system. Project Co shall provide the on-board equipment required for communication to the wayside.

(xix) NVR

- A. The Revenue Vehicles NVR shall be networked into the communications network to provide video feeds to the Operator, displayed on the CCTV cab video display.
- B. Each NVR shall have storage capacity sufficient to store 30 days of video data from the attached cameras without overwriting. The storage device shall be shock and vibration hardened for rail transit duty.
- C. The NVR system shall safeguard and maintain authenticity of the video images using security techniques such as digital image watermarking or encryption and shall be able to demonstrate a chain of custody for data that will be used as evidence in a court of law. When a tag is activated, the NVR shall prevent the video data from being overwritten for 60 days.

- D. Activation of the silent alarm shall insert a tag in the files of all recording units in the Train.
 - E. Activation of any PEI shall activate the camera that captures the PEI location and initiate recording of the communication.
 - F. Data collected by the NVR shall be automatically downloaded each time the Revenue Vehicle enters the New Walkley Yard.
 - G. The NVR system shall be coordinated with the wayside system for communication and downloading. Project Co shall provide and install the equipment required for wireless communication.
- (xx) Cab Video Display
- A. The cab video display shall be energized only in the active cab of Revenue Vehicles.
 - B. The cab video display shall not display any images until the Train reaches zero speed. The video shall remain active for 10 seconds after departure.
 - C. Upon Station arrival, the cab video shall automatically activate a view of the Platform doors in order to enable the Operator to monitor Platform edge safety. The monitor shall be independent of other cab displays.
- (xi) APC System
- A. The APC system provided by Project Co shall be an Infodev EDI solution in order to match the Existing Vehicle Fleet and provide seamless data integration.
 - i. It shall be capable of counting Passengers at each doorway with a minimum accuracy of Alstom Lint % as tested by the City, together with precise stop activity location/time points.
 - ii. Door dimensions shall be confirmed with the APC supplier during design review in order to provide correct sensor sizing.
 - iii. Project Co shall ensure that the APC sensors are mounted at all Passenger doorways at the precise location for maximum accuracy, with the assistance of the APC system supplier.
 - iv. Sensor bars shall be painted according to interior paint code.
 - v. The Current installed equipment includes Infodev GW-400B computer module and DA-400 sensors. Project Co's proposed solution shall be provided to the City for review and approval.
 - vi. Project Co shall supply the required power, I/O signals (door switch activity), and direct Ethernet connections from each APC unit to a provided cellular router unit (Digi WR44RR).

- vii. The APC system shall have non-volatile memory capacity to store Passenger data for all doors for eight days assuming 20 round trips per day.
- viii. The data collected by the APC shall be recorded and remotely available in real-time, or at each Station, as a minimum.
- ix. Data collected by the APC shall be automatically downloaded each time the Vehicle enters the New Walkley Yard.
- x. The APC system shall have a diagnostic and fault recording system and shall report failures to the DDU.
- xi. Diagnostics shall be remotely available over the communications network.

(xxii) Onboard Cellular Modem

- A. An onboard cellular modem shall be provided to provide GPS locations to the onboard NVR and onboard APC equipment and to enable remote access to the NVR and APC.
- B. For information, the existing Vehicles are provided with a Digi Transport LTE modem with antennas for GPS and cellular connections.

1.25 Interior Appointments

(a) Project Co shall design and construct the interior appointments in accordance with the following:

- (i) Seats
 - A. The seating shall be arranged with a combination of transverse and longitudinal seating throughout the length of the New Revenue Vehicle and to accommodate ADA/AODA required floor space.
 - B. Flip seats shall be provided adjacent to all vestibules to provide clear floor space to accommodate wheelchairs, baby carriages, bicycles and the other Passenger requirements. Flip seats shall be arranged to revert to the stowed position with less than 20N of force. Lowering the flip seats into position shall require not more than 40N.
 - C. All seats adjacent to windscreens as well as accessible areas shall be designated "Priority seating" and shall be fitted with signage depicting the International Symbol for Accessibility (ISA), along with language indicating priority seating for elderly/persons with disabilities. Signage shall be located on the side wall above all seats designated for this purpose as well as at the accessible areas.
 - D. Seats shall be contoured with rail transit grade cushion and a vandal resistant material.

- E. Seats shall have a minimum width of 420mm.
 - F. Fabric, cushioning and all aesthetics shall be subject to review and approval by the city
 - G. Seats shall be arranged knee to back transverse with a minimum pitch of 750mm. Face to face seats shall only be utilized at Emergency windows and with the approval of the City.
 - H. An Accessible location shall be provided directly adjacent to each vestibule.
- (ii) Stanchions, Handrails and Grab Bars
- A. Hand holds, grab bars and stanchions shall be arranged such that all standees have an accessible support.
 - B. Stanchions shall be placed to not interfere with Passenger flow during boarding / alighting. Stanchions shall be powder coated yellow RAL Classic 1023.
 - C. Handholds shall be provided in the accessibility seating areas.
- (iii) Miscellaneous Interior Equipment
- A. Draft screens shall be fitted on each side of each doorway. Design of screen shall be subject to approval by the City
 - B. The floor panels shall be of phenolic composite construction. They shall be at least 19mm thick and comprised of upper and lower fiberglass fabric reinforced skins, impregnated with a phenolic thermosetting resin.
 - i. Alternative arrangements may be proposed for consideration by the City.
 - C. The floor covering shall include the following:
 - i. High friction material in both wet and dry conditions; and,
 - ii. Smooth surface (non-ribbed or dotted).
- D. Miscellaneous interior appointments shall include:
- i. Advertising card frames for ceiling corners, side walls, and end walls;
 - ii. Locked convenience outlets for car Maintenance (110 VAC);
 - iii. Signage placed adjacent to the accessible space and denote priority seating for persons with disabilities;
 - iv. Additional interior graphics/signs/instructions in Canadian English and French in consultation with the City; and,

- v. Emergency and car number information in Braille. General interior signage shall be submitted for review by the City.

1.26 Exterior Design

- (a) Project Co shall design and construct the exterior of the New Revenue Vehicle to be sleek, modern and attractive. All electrical and mechanical equipment shall be concealed behind easily replaceable roof shrouds, Bogie skirts or cab side skirts.
- (b) Project Co shall design and construct the exterior of the car in accordance with the following:
- (i) Exterior
- A. Exterior Appointments shall include:
- i. Tinted, dual-pane, laminated safety glass Passenger side windows;
 - ii. Exterior speakers next to each Passenger side door;
 - iii. Sand filling provisions; and,
 - iv. General exterior signage shall be submitted for review by the City.
- B. Exterior Painting
- i. The underframe and the roof shall be dark gray (RAL 7012) and the Bogies black (RAL 7021).
 - ii. The exterior base color shall be traffic red (RAL 3020).
 - iii. The painting scheme and branding details shall be subject to review and approval by the City.
- (ii) Snowplough
- A. A removable, body mounted snowplough with vertical height adjustment shall be provided at each cab end. The plough shall be subject to review and approval by the City.
- i. It shall be at least 75mm and not more than 150mm above TOR.
 - ii. It shall be properly coated for corrosion resistance.
 - iii. The plough shall be fitted with easily replaceable, sacrificial blade. The blade shall extend 50mm below the plough structure. The blade shall be constructed with a durable fibre reinforced elastomeric material.

1.27 Train Control

- (a) Project Co shall select a Train Control System that meets the Headway and system capacity as described elsewhere in this Project Agreement.
- (b) Project Co shall provide, install and test the on board Train Control equipment and ensure it is properly integrated into the Revenue Vehicle controls.
- (c) The Train Control system requirements are detailed in Article 10 of Schedule 15-2, Part 3 - Systems.

1.28 Event Recorder

- (a) Project Co shall design and construct the event recorder in accordance with the following general objectives:
 - (i) The event recorder shall be crashworthy, meeting the construction requirements of IEEE 1482-1999.
 - (ii) Project Co shall propose a list of signals in compliance with IEEE 1482-1999 to be recorded for review and approval by the City. At a minimum, the following signals shall be included:
 - A. Train speed;
 - B. Direction of motion;
 - C. Time;
 - D. Distance (GPS);
 - E. Throttle position;
 - F. Automatic air brakes/ emergency brakes;
 - G. Operation of dynamic/independent brake;
 - H. Position on/off Switch for headlights;
 - I. Position on/off Switch for auxiliary lights;
 - J. Horn control handle activation;
 - K. Magnetic track brake, if applicable.
 - L. Status of vigilance device;
 - M. Slip/ slide Control;
 - N. All Train Control signaling; and,

- O. Operation of the hydraulic retarder, if applicable.
 - (iii) The event recorder shall record all Safety Critical data and allow retrieval after accidents or unsafe events.
 - (iv) Project Co shall propose the data retrieval protocol and the health check process.
 - (v) Project Co shall propose the size of the data storage and detail the level of data that can be saved before any over-writing occurs, for review and acceptance by the City.
- (b) The event recorder shall be powered from the battery backed up low voltage bus through a dedicated magnetic push to reset circuit breaker which cannot be turned off.
- (c) The event recorder shall have voice recording capability. PEI communication shall also be recorded. Voice recording requirement applies to Revenue Vehicles.
- (i) Alternatively, the PEI recordings may be stored on the NVR.

1.29 Drawings and Documentation

- (a) Project Co shall provide all documentation that is required to confirm compliance with this Part 8 for review to the City in accordance with Schedule 10 – Review Procedure. This shall include vendor submittals and the following as a minimum:
- (i) Passenger capacity calculations/approach;
 - (ii) Applicability of design for climatic conditions (such as heating capacity, snow plow, threshold heaters, temperature rating of components);
 - (iii) Overall New Revenue Vehicle dimensions and Vehicle dynamic envelope;
 - (iv) Basic design parameters – acceleration, deceleration, top speed;
 - (v) ADA/AODA compliance details, including level boarding;
 - (vi) Carbody details;
 - (vii) Diesel engine details – cooling, exhaust, emissions;
 - (viii) Propulsion details;
 - (ix) Bogie details;
 - (x) RAMS data for proposed New Revenue Vehicle;
 - (xi) Communication system details;
 - (xii) Brake system details;
 - (xiii) Passenger door system details;

- (xiv) Auxiliary/LVPS/battery system details;
- (xv) HVAC and heating system details;
- (xvi) HVAC heating and cooling calculations;
- (xvii) Friction brake and propulsion thermal calculations;
- (xviii) Wheel profile and interface with rail;
- (xix) New Revenue Vehicle dynamics modeling results;
- (xx) New Revenue Vehicle electrical modeling results;
- (xxi) Cab layout/ergonomics;
- (xxii) Passenger seating/stanchions/level of comfort;
- (xxiii) Provisions for on-board equipment (Train Control, Radio, Wireless Link);
- (xxiv) Emergency lighting and signage;
- (xxv) Waiver requests;
- (xxvi) FEA results & stress analyses;
- (xxvii) Crashworthiness analyses;
- (xxviii) Climate room test results;
- (xxix) Noise test results;
- (xxx) Flange lubrication/wayside squeal suppression;
- (xxxi) Load leveling functional description;
- (xxxii) Diagnostics and monitoring functional description;
- (xxxiii) Operator's display functional description;
- (xxxiv) Spin/Slide control functional description;
- (xxxv) Cab mock up, or alternative proposal to demonstrate layout, functionality and ergonomic performance of the cab;
- (xxxvi) New Revenue Vehicle electrical schematics;
- (xxxvii) Qualification test procedures and reports
- (xxxviii) Train to Wayside Emissions Safety Analysis;

- (xxxix) FEA models and load cases;
 - (xl) Battery load calculations; and,
 - (xli) Battery load Shed Schedule.
- (b) All test procedures shall be provided to the City with the Final Design Review. Test reports shall be submitted as available. This shall include vendor testing.
- (c) Project Co shall notify the City of all tests taking place. The City reserves the right to witness testing.
- (d) An electronic copy of all assembly and installation drawings shall be provided to the City. The package shall include vendor drawings required to convey the design.
- (e) All documentation shall be provided as required to certify that the New Revenue Vehicles comply with Transport Canada requirements, such as smoke, flame and toxicity test certificates, EMI limitations, etc. Project Co shall support the city in gaining compliance with all Transport Canada rules and regulations.
- (f) All Operations and Maintenance Manuals shall be provided in English.

1.30 Special Tools

- (a) Project Co shall submit their standard list of special tools for review by the City.

1.31 Materials and Workmanship

- (a) Project Co shall ensure the following standards are follows in the design and construction of the New Revenue Vehicle:
- (i) All materials shall conform to APTA, AISI, ANSI ASTM, ASME, IEEE, CEC, CAN/CSA and other specifications as stated herein or as otherwise applicable.
- (b) Project Co shall ensure the following prohibited materials are considered:
- (i) The New Revenue Vehicle shall comply with the Toxic Reductions Act of 2009, Ontario Regulation 455/09.
 - (ii) In addition, the following materials shall not be permitted for use on the New Revenue Vehicles:
 - A. PVC except in limited quantities, as approved on a case by case basis;
 - B. Asbestos;
 - C. Cadmium (except for battery);
 - D. Lead (except in solder used for electrical purposes and engine starter batteries);

- E. PCBs;
 - F. Carcinogenic materials as listed by current Publication of TLV and BEIs guidelines published by the ACGIH;
 - G. Materials that, in their normal installed state, emit products that are known to be toxic or irritants as per materials listed in 29 CFR 1910.19;
 - H. All CFC and HCFC compounds classified as ozone depleting substances per 40 CFR 82; and
 - I. Urethane Foam.
- (c) Project Co shall design and construct fasteners in accordance with the following:
- (i) Fasteners – General
 - A. No protruding screws, rivets, mounting bolts, or similar items shall be permitted on the exterior of the New Revenue Vehicle. Interior fasteners shall not protrude enough to become a tripping or snagging hazard.
 - B. Fasteners exposed to Passengers shall be tamperproof.
 - C. All carbon steel fasteners shall be zinc plated.
 - (ii) Fasteners – Locking Requirements
 - A. Threaded fasteners shall be self-locking or provided with locking devices. Project Co may propose a list of fasteners without locking devices for review/acceptance of the City. The list shall be risk based and shall detail the results of each fastener's loosening.
- (d) Project Co shall design and construct elastomers in accordance with the following:
- (i) Elastomers – General
 - A. Elastomeric parts shall be designed for the temperature extremes listed in this Part 8.
 - B. Elastomeric parts used for interior decorative trim shall be coloured to harmonize with adjacent surfaces. All colors shall be as approved by the City.
 - C. Elastomers shall meet the combustibility requirements of this Part 8.
 - (ii) Elastomers – Floor Covering
 - A. Project Co shall submit color and material samples and material friction tests in wet and dry conditions to demonstrate safety of Passengers in accordance with Schedule 10 – Review Procedure.
- (e) Project Co shall design and construct laminated safety glass in accordance with the following:

- (i) Laminated safety glass shall be used exclusively and shall conform to the following general, manufacturing, and finish requirements:
 - A. Float glass quality shall conform to ASTM C1036, Type 1, Class 1, quality Q3.
 - B. Tinted assemblies shall use a tinted PVB layer with clear glass laminate. Tinting shall be applied to the perimeter of the glass to mitigate UV damage of the elastomer surround or bonding agent.
 - C. Manufacturers stamp shall be positioned in lower right hand corner as viewed from inside the New Revenue Vehicle.
 - (ii) Forward facing glazing shall:
 - A. Be clear laminated safety glass;
 - B. Meet the requirements of 49 CFR 223, FRA Type I rating, having a minimum thickness of 14 mm; and
 - C. Be certified to comply with the requirements of ANSI Z26.1.
- (f) Project Co shall design and construct tempered safety glass in accordance with the following:
- (i) Tempered safety glass that may be used for internal glazing and partitions, shall be manufactured to ASTM C1048, Kind FT, Condition A, Type 1 clear, Class 1 clear, quality Q3 (or Class 3, tinted, light reducing).
- (g) Project Co shall design and construct piping and fittings in accordance with the following:
- (i) Piping and Fittings – General
 - A. Project Co shall perform a leak test on the final air and coolant piping system, with all components installed, on each New Revenue Vehicle in accordance with IEC 61133. A copy of the test report for each Vehicle, including retest reports if appropriate, shall be included with each Vehicle history book.
 - (ii) Piping and Tubing
 - A. Piping and tubing shall be fastened with insulated clamps.
 - B. Inside surfaces of Piping shall be cleaned after fabrication and ends shall be capped.
- (h) Project Co shall design and construct wire and cable in accordance with the following:
- (i) Wire and Cable – General
 - A. All wire and cable shall be in accordance with AAR RP-585 and the recommendations of APTA RP-E-009-98 section 6.0 (or latest version).

- i. Alternatively, all wire and cable shall be in accordance with EN 50343, EN 50355, and EN 50153.
 - B. New wire and cable shall be soft annealed copper, tinned, stranded, and jacketed with radiation cross linked polyolefin (Exane), or City accepted equal, in accordance with ASTM B33 and AAR Standard S 501.
 - C. The use of aluminum wire and/or cable shall not be permitted.
 - D. The insulation system for all internal wires and cables shall be flame retardant and be specifically formulated to minimize smoke, noxious emissions or corrosive fumes in the event of severe overheating or fire. Materials used for the insulation shall be free of halogens.
 - E. All wires and cables shall be protected against movement, chafing and contact with other components that might cause damage to the insulation.
- (ii) Wire and Cable – High Temperature
- A. High temperature wire and cable shall be used in locations where the operating temperatures shall exceed the limits of the other indicated insulations.
 - B. High temperature wire insulated with PTFE shall not be used in conduit or raceways. This type of wire and cable shall not be bundled together or run with any other type of cable.
- (i) Project Co shall design and construct wiring in accordance with the following:
- (i) Wiring – General
- A. Wiring which is used for the transmission of signals and the control of vehicle functions shall not be placed in the same conduits, raceways, or ducts as wiring used for the transfer of power.
 - B. Wiring shall be in conduit, raceways or ducts.
 - C. Safety grounds shall utilize dedicated grounding bosses or grounding pads.
 - D. Power train line cables shall be supported by insulated cable cleats with sufficient spacing between individual conductors to permit adequate ventilation.
 - E. Wire markers shall be used on all cable ends, to the maximum extent practicable.
 - F. Low and high voltage cables shall have separate individual raceways.
 - G. Splicing of conductors shall not be permitted.
- (ii) Wiring – Terminals
- A. All wiring shall be fitted with pre-insulated diamond grip terminals.

- i. Alternate terminals may be proposed for consideration by the City.
 - (iii) Wiring – Grounding
 - A. Battery (low voltage DC) circuits shall not be individually grounded.
 - B. All equipment enclosures and frames of all resiliently mounted electrical apparatus, with the exception of the battery box, shall be suitably grounded to the car body.
 - C. The New Revenue Vehicle grounding system shall meet all technical requirements of IEEE Std 16-2004 and APTA SS-E-005-98 (or latest version). Alternatively, the system may be designed in accordance with EN 50153.
 - D. A guaranteed shunt value of 0.06 Ohms shall be provided.
 - (iv) Wiring – Conduits and Fittings
 - A. Wires shall not occupy more than 50% of the free cross-sectional area of any conduit.
 - B. Where necessary to facilitate component removal and replacement, minimum lengths of flexible liquid tight conduit may be used.
 - C. Insulated bushings shall be used in all conduit and conduit fittings.
- (j) Project Co shall include the following flammability, toxicity and smoke emission requirements in the design and construction:
- (i) Materials shall comply with the flammability, smoke emission, toxic gas and fire retardation requirements specified herein.
 - (ii) Materials shall be low halogen in addition to meeting the low-smoke requirements specified herein.
 - (iii) As a minimum, all materials used in the construction of the New Revenue Vehicle shall meet the requirements of the 49 CFR 238.103, and Appendix B to Part 238 – Test Methods and Performance Criteria for the Flammability and Smoke Emission Characteristics of Materials Used in Passenger Cars and Locomotive Cabs. Unless otherwise specified, all materials and construction shall meet the requirements of NFPA 130-2017.
 - (iv) Should a conflict exist between the NFPA requirements, federal requirements and requirements listed elsewhere in these provisions, the more restrictive requirement shall govern.
 - (v) Project Co shall retain a list of materials (flammability matrix) used in the New Revenue Vehicles showing location of material, weight (density and total weight), heat value per pound and per Vehicle, flame spread, flashpoint, smoke generation and toxicity.

- (vi) Project Co shall retain laboratory test results for each test, including a technical data sheet.
- (vii) Test report documentation shall specifically identify the tested material by the same description that appears on the technical data sheet and other related references. This documentation shall be directly traceable to the applicable Contractor drawings.
- (viii) Flammability and Smoke Generation Criteria, Flammability and Smoke Generation Criteria requirements are outlined in Table 8-1.1.

Table 8-1.1

Function of Material	Test Procedure	Performance Criteria
All Vehicle materials and components except as otherwise noted.	ASTM E162 ASTM E662	$I_s \leq 35$ $D_s (1.5) \leq 100, D_s (4.0) \leq 165$
HVAC Ducting	ASTM E162 ASTM E662	$I_s \leq 35$ $D_s (4.0) \leq 100$
Lighting Diffusers / Plastic Glazing	ASTM E162 ASTM E662	$I_s \leq 100$ $D_s (1.5) \leq 100, D_s (4.0) \leq 200$
Thermal and Acoustical Insulation	ASTM E162 ASTM E662	$I_s \leq 25$ $D_s (4.0) \leq 100$
Flexible Cellular Foams	ASTM D3675 ASTM E662	$I_s \leq 25$ $D_s (1.5) \leq 100, D_s (4.0) \leq 175$
Elastomers – Lock strip gaskets	ASTM C542 ASTM E662	$D_s (1.5) \leq 100, D_s (4.0) \leq 200$
Elastomers – Other gaskets or seals	ASTM C1166 ASTM E662	100mm (4.0in), maximum flame propagation (15) $D_s (1.5) \leq 100, D_s (4.0) \leq 200$
Structural – Floor, Roof	ASTM E119	Pass (30 minutes minimum endurance at AW3 loading)
Floor Covering	ASTM E648 ASTM E662	$CRF \geq 0.5W/cm^2$ $D_s (1.5) \leq 100, D_s (4.0) \leq 200$
Seat Cushion, Mattresses	ASTM D3675 ASTM E662	$I_s \leq 25$ $D_s (1.5) \leq 100, D_s (4.0) \leq 175$
Seat Frame, Seat Shroud	ASTM E162 ASTM E662	$I_s \leq 35$ $D_s (1.5) \leq 100, D_s (4.0) \leq 200$
Upholstery	14 CFR (FAR) 25.853 (Appendix F, vertical, textiles) ASTM E662	Flame Time $\leq 10s$ Burn Length $\leq 150mm$ (6in) $D_s (4.0) \leq 200$
Wire Insulation	IEEE Std 383 – Flammability ASTM E662	Pass $D_s (4.0) \leq 50$

(ix) Toxic Content Limits In Combustion Products

- A. The maximum toxic gas concentration in the combustion products of any materials used in the construction of the New Revenue Vehicle shall not exceed the values outlined in Table 8-1.2:

Table 8-1.2

Toxic Gas – BSS-7239	Maximum Concentration
CO	3500ppm
Hydrogen Fluoride (HF)	200ppm
Nitrogen dioxide (NO2)	100ppm
Hydrogen Chloride (HCL)	500ppm
Hydrogen cyanide (HCN)	150ppm
Sulphur dioxide (SO2)	100ppm

(k) Project Co shall design and construct films and graphics in accordance with the following:

(i) Films and Graphics – General

- A. All graphic materials shall be transportation grade materials. Signage graphics shall have an opaque background with clear, vandal resistant overlayment. Printed signage graphics shall be either reverse printed on the back of the clear overlayment, or printed on opaque background and covered by the clear overlayment.
- B. Films and graphics shall withstand effects of detergents and brushes used in washing procedures for removal of multiple applications of graffiti.
- C. Films shall use a removable grade adhesive that upon removal does not require use of solvents, or secondary operations to remove adhesive or graphic residue.

(ii) Films and Graphics – Emergency Exit Signage

- A. Emergency exit signage shall comply with APTA SS-PS-004-99, Standard for LLEPM and 49 CFR, Part 238.
- B. LLEPM material shall be provided to illuminate the path to each Emergency exit.
- C. The LLEPM and Emergency exit signage shall be passive and independent of the car's normal and Emergency lighting systems.
- i. HPPL material shall be used in the fabrication of the exit signage and the LLEPM.

(iii) Films and Graphics – Emergency Access Signage

- A. Each door intended for use by Emergency responders for rescue access shall be identified with Emergency access signs and instructions consisting of retro-reflective materials.
- (l) Project Co shall design and construct electrical devices and hardware in accordance with the following:
 - (i) Electrical Devices and Hardware – Contactors, Relays and Switches
 - A. All devices shall be readily identifiable by means of a permanent, durable marking strip giving the device circuit designation.
 - B. Switches shall be provided with a “keying” feature that prevents the body of the switch from rotating.
 - (ii) Electrical Devices and Hardware – Circuit Breakers
 - A. The “on” and “off” positions of all circuit breakers shall be permanently marked.
 - B. All circuit breakers shall be sized by current rating and tripping time to protect both the associated equipment and the minimum size wire.
 - C. All circuit breakers shall be of a high shock-resistant design.
 - (iii) Electrical Devices and Hardware – Fuses
 - A. Fuses shall be used only where the use of a circuit breaker is not technically feasible.
 - B. Each fuse shall be permanently identified and readily accessible.
 - i. The rating of each fuse shall be clearly and permanently marked on the fuse and holder.
 - C. The fuse holder shall have fuse retention devices at both ends.
 - D. Blown fuse indication shall be provided.
 - (iv) Electrical Devices and Hardware – Bus Bars
 - A. Bus bars shall conform to the requirements of IEEE Std 16-2004.
 - (v) Electrical Devices and Hardware – Switch, Circuit Breaker, and Fuse Panels
 - A. All live portions of the protected circuitry shall be completely concealed so that no danger of electrocution or shock exists from the touching of the panel or any appurtenances or devices mounted thereto.
 - B. All switches, circuit breakers, fuses, and indicating lights shall be provided with a nameplate.

- (vi) Electrical Devices and Hardware – Illuminated Status Indicators and Annunciators
 - A. All illuminated status indicators, annunciators or similar devices shall be long-life LED type lamps.
- (vii) Electrical Devices and Hardware – Rotating Equipment
 - A. Rotating machinery shall be suitable for continuous duty, and the continuous duty shall be confirmed in accordance with IEEE Std 11-2000 or IEC 60349-2.

1.32 Vehicle Testing

- (a) Project Co shall conduct New Revenue Vehicle testing in accordance with the following:
 - (i) General
 - A. Project Co shall be responsible for testing the vehicles.
 - B. Vehicle testing or operation on the mainline shall be coordinated between Project Co and the City. City Operators will operate all Trains on the mainline.
 - C. Project Co may provide test results from a similar Vehicle and submit to the City with a request for a waiver. Tests may be waived, at the sole discretion of the City.
 - D. Project Co shall notify the City of the planned test date no less than 30 calendar days prior to the planned start of the test.
 - E. Additional tests shall be performed by Project Co as required to ensure complete compliance, as well as all Applicable Laws, regulations and standards.
 - F. Production tests shall take place on all Vehicles.
 - G. All tests shall be submitted for review by the City
 - (ii) Test Documentation
 - A. Test Plan
 - i. Project Co shall prepare and submit a Master Test Plan. The Master Test Plan shall include all tests required to prove complete compliance to this Part 8.
 - ii. Test order shall be arranged, to the maximum extent possible, such that failures resulting in re-design do not nullify the results of successfully completed tests.
 - iii. Subsystem performance requirements may be addressed in one or more comprehensive tests, as elected by Project Co.
 - (iii) Test Procedures

- A. All test procedures shall be submitted to the City during the Final Design Review.
- (iv) Test Reports
 - A. Test reports shall be produced by Project Co and be available for review by the City. Reports shall be submitted after each test is completed.
- (v) Test Protocol
 - A. Labs shall be certified to perform tests, if required by applicable agency or administration.
 - B. All equipment used in the performance of tests shall be calibrated by an independent test laboratory on an annual basis, or more often, if required by the specific test.
- (vi) Test Notification
 - A. The City reserves the right to witness any test or portion of a test required on any New Revenue Vehicle delivered under this contract. Project Co shall notify the City of any planned tests a minimum of 30 calendar days prior to the test taking place.
- (vii) Types of tests
 - A. Component Qualification Tests
 - i. Components shall be Qualification tested before they are presented for review and approval at the FAI. FAI approval shall be required prior to sub-system installation on the first production car.
 - ii. Component qualification testing is documented in the previous sections of this Article.
 - B. Component Production Tests
 - i. Components shall be production tested at the New Revenue Vehicle supplier factory before shipment to the Project Site.
 - ii. Test reports shall be shipped with each component. Copies of the test reports shall be included in each car history book.
 - C. New Revenue Vehicle Qualification Testing
 - i. Qualification tests are one-time tests on the first production Vehicles produced by Project Co. The tests shall be performed to prove that the Vehicle performs as required by the specification and to Transport Canada requirements.

ii. Vehicles other than the first production car may be used to complete tests, such as carbody compression and HVAC climate room, as deemed appropriate by the City.

iii. Testing shall be performed on the completed Vehicles with production components.

D. New Revenue Vehicle Production Tests

i. Vehicle production tests shall be completed before Project Co requests permission to ship each car.

ii. Test reports shall be shipped with each New Revenue Vehicle. Copies of the test report shall be included in the Car history Book.

iii. Production Tests shall include:

1 All of the tests necessary to prove proper functionality of the New Revenue Vehicle;

2 Verification that water shall not enter the Vehicle during Revenue Service operation; and

3 Vehicle weighing.

E. On-Site Commissioning Tests

i. New Revenue Vehicles arriving on City property shall be Commissioned to ensure they are ready to run in Revenue Service.

ii. Testing shall include all tests required to ensure the Vehicle is safe to operate.

iii. Testing shall also include all production tests required to verify complete functionality of all equipment.

F. Integration Testing

i. Project Co shall perform integration testing to ensure the New Revenue Vehicle is fully compatible with the System Infrastructure.

ii. The number of burn-in hours shall be selected by Project Co. Burn-in shall take place with Vehicles out of service, without Passengers. Burn-in shall be performed by Project Co and shall be coordinated with the City.

1.33 System Safety and Security Certification

(a) Project Co shall prepare a complete assessment of risk following the requirements of Schedule 15-2, Part 1, Article 7 – System Safety Certification, using the CENELEC standards and shall

form part of Project Co's safety case to the City. Any statements as to the safety hazards associated with the proposed equipment are to be substantiated by means of a risk assessment, including identification of safety issues and measures proposed to control and mitigate the risks.

- (b) Project Co shall prepare, with Vehicle Supplier input, an SSAP that encompasses system RAM in accordance with the requirements of Schedule 15-2, Part 1, Clause 7.8. The RAM requirements shall apply to all of the System.

1.34 Rail Regulatory Obligations

- (a) Project Co shall be responsible for providing Revenue Vehicle information to support regulatory filings by the City including all relevant technical, O&M, and supporting documentation, in accordance with the requirements of Schedule 15-2, Part 1, Article 6 – Rail Regulatory Structure and Obligations.

- (i) Project Co shall prepare a compliance and homologation package to assist the City in demonstrating to Transport Canada, with verifiable documentation, that the equipment meets all applicable legislation, regulation, rules and standards under the Railway Safety Act including a standards compliance verification matrix demonstrating how the Revenue Vehicles comply with APTA standards directly. Where compliance to the APTA standards are demonstrated through equivalent standards, Project Co must thoroughly document how equivalency is achieved. The full compliance and homologation package shall be made available to Transport Canada.
- (ii) Project Co shall prepare a complete assessment of risk for the City to share with Transport Canada.
- (iii) Project Co shall assist the City with submission of amendments to existing rules that require modification to allow the Revenue Vehicles to operate in Canada. For changes to existing rules and regulations, Project Co shall work with the City to detail risk scenarios that the proposed rule change intends to address in order to facilitate Transport Canada's determination as to whether the proposal would be conducive to safe railway operations.

1.35 Revenue Vehicle Supply Contract Technical Documents

- (a) Project Co shall provide Trains in accordance with the Revenue Vehicle Supply Contract and the technical documents that comprise Appendices 2 to 7 of that contract.

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**SCHEDULE 15-2
DESIGN AND CONSTRUCTION**

**PART 9
DESIGN AND CONSTRUCTION REQUIREMENTS – EXISTING FLEET**

ARTICLE 1 INTRODUCTION

1.1 Scope of Work

- (a) Project Co shall perform the following Works on the Existing Vehicle Fleet during the Shutdown Period:
- (i) All stand-still maintenance as well as scheduled overhaul maintenance. The Existing Vehicle Fleet is scheduled for an 8-year overhaul including a powerpack and transmission overhaul, and Project Co may need substantial lead time to procure necessary spare parts to perform these overhauls.
 - (ii) Project Co shall design and construct all equipment needed for wireless communication between Revenue Vehicles and the TOCC.
 - (iii) A Security Alarm System shall be provided in accordance with Clause 1.24(b)(xvii) of Schedule 15-2, Part 8 – Vehicles.
 - (iv) Provide onboard CCTV cameras, NVR, and cab video display per all requirements in Clauses 1.24(b)(xviii), 1.24b(xix), and 1.24(b)(xx) of Schedule 15-2, Part 8 – Vehicles.
 - (v) Retrofit S&TCS as required, in accordance with Schedule 15-2, Part 3 – Systems.
 - (vi) Paint the interior handhold and stanchions per the requirements of Clause 1.25(a)(ii)B of Schedule 15-2, Part 8 - Vehicles.
 - (vii) Retrofit with Voice and Data Radio System, per the requirements of Clause 5.4(a) of Schedule 15-2, Part 3 - Systems.
 - (viii) Modify the event recorder per the requirements of Clause 1.28(c) of Schedule 15-2, Part 8 - Vehicles.
 - (ix) Modify the announcement signs so that all Station stops are properly displayed on the Existing Vehicle Fleet.
 - (x) Modify the threshold extender to provide level boarding with a Platform height of 574mm with a maximum horizontal gap of 75mm. Level boarding shall be defined as Revenue Vehicle threshold height at $\pm 16\text{mm}$ from Platform height for all wheel diameters and Passenger loading, up to and including AW1, with standing Passengers at $3.3/\text{m}^2$.
 - A. Project Co shall provide a description of the method used to address wheel wear and the expected time required to perform the task.

- (xi) Any other works that Project Co deem necessary to ensure the Existing Vehicle Fleet meets the requirements of the Project Agreement for Readiness for Revenue Service.
- (xii) Testing, as applicable and Trial Running shall be performed in accordance with Schedule 14 – Testing and Commissioning. Test requirements, as applicable, are contained within Schedule 15-2, Part 8, Clause 1.32.
- (xiii) Operator Training shall be performed in accordance with Schedule 15.2, Part 1, Article 12 – Operations Training.

1.2 Access to Existing Walkley Yard

- (a) Project Co will be allowed access to certain areas within the Existing Walkley Yard upon commencement of the Shutdown Period for the sole purpose of performing Works on the Revenue Vehicles. Refer to Schedule 33 – Lands for further details.

1.3 System Safety and Security Certification

- (a) Project Co shall prepare a complete assessment of risk following the requirements in Schedule 15-2, Part 1, Article 7 – System Safety Certification, using the CENELEC standards and shall form part of Project Co's Safety Case to the City. Any statements as to the Safety Hazards associated with the proposed equipment shall be substantiated by means of a risk assessment, including identification of Safety issues and measures proposed to control and mitigate the risks.
- (b) Project Co shall prepare an SSAP that encompasses system RAM in accordance with the requirements of Schedule 15-2, Part 1, Clause 7.8. The RAM requirements shall apply to all of the System.

1.4 Rail Regulatory Obligations

- (a) Project Co shall be responsible for providing Existing Vehicle Fleet information to support regulatory filings by the City including all relevant technical, operations, Maintenance, and supporting documentation, in accordance with the requirements of Schedule 15-2, Part 1, Article 6 – Rail Regulatory Structure and Obligations.
 - (i) Project Co shall prepare a compliance package to assist the City in demonstrating to Transport Canada, with verifiable documentation, that the modified/new equipment meets all applicable legislation, regulation, rules and standards under the Railway Safety Act including a standards compliance verification matrix demonstrating how the Existing Vehicle Fleet complies with APTA standards directly. Where compliance to the APTA standards are demonstrated through equivalent standards, Project Co shall thoroughly document how equivalency is achieved.
 - (ii) Project Co shall prepare a complete assessment of risk for the City to share with Transport Canada.

SCHEDULE 15-3
MAINTENANCE AND REHABILITATION REQUIREMENTS

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**PART 1
MAINTENANCE AND REHABILITATION**

ARTICLE 1 MAINTENANCE AND REHABILITATION REQUIREMENTS

1.1 Responsibility for Maintenance and Rehabilitation

- (a) Throughout the Maintenance Period, Project Co shall perform and be fully responsible for the Maintenance and Rehabilitation Services in accordance with the terms of this Project Agreement and in such a manner as to comply with the requirements of this Schedule 15-3 and all other applicable Project Agreement requirements.
- (i) This Schedule has three Appendices that are interrelated and collectively outline the scope of the Maintenance and Rehabilitation Services:
- A. Appendix A (Maintenance Performance Requirements) defines general Maintenance and Rehabilitation Requirements during the Maintenance Period;
 - B. Appendix B (Asset Preservation) defines the requirements and performance measures for preserving and maintaining the System's integrity with a view of proactive asset preservation practices during the Maintenance Period;
 - C. Appendix C (Expiry Date Requirements) defines the condition of System and their remaining service life before it is turned back to the City on the Expiry Date.
- (ii) Table 1.1 sets out a summary list of activities comprising the Maintenance and Rehabilitation Requirements with reference to the relevant Appendix of this Schedule 15-3.

TABLE 1.1
Maintenance References

Activity	Appendix	Attachment
Appendix A Maintenance Performance Requirements		
Maintenance and Rehabilitation Plan	A	1
Operations Service Plan	A	2
Systems Maintenance Services	A	3
Track Maintenance Services	A	4
Vehicle Maintenance Services	A	5
Facilities Maintenance Services	A	6
Station Maintenance Services	A	7

TABLE 1.1 Maintenance References		
Activity	Appendix	Attachment
Tunnel Maintenance Services	A	8
Structure Maintenance Services	A	9
Alignment Maintenance Services	A	10
Help Desk Services	A	11
Maintenance Records and Reporting	A	12
Maintenance Activities and Coordination	A	13
Operations and Maintenance Interface	A	14
Maintenance Responsibility Table	A	15
Vandalism and Graffiti	A	16
Appendix B Asset Preservation		
Asset Management Plan	B	Not Applicable
Appendix C Expiry Date Requirements		
Handover Maintenance Plan	C	Not Applicable

- (b) Maintenance activities will occur primarily within the geographical boundaries of the Lands; however, in some circumstances, the performance of maintenance, including maintenance associated with traffic detouring and access to System Infrastructure, will occur on property located outside the geographical boundaries of the Lands but within the limits of City Road Allowance Lands, the use of which is subject to the terms of required permits and approvals, including Road Cut Permits and Temporary Construction–Related Encroachment Permits to be obtained by Project Co in accordance with Schedule 32- Permits, Licenses, Approvals and Agreements. In addition to observing and complying with all restrictions and requirements applicable to the use of the Lands and/or City Road Allowance Lands established by the Project Agreement, including in Schedule 33 – Lands and Schedule 32 – Permits, Licenses, Approvals and Agreements, Project Co shall be responsible to carry out maintenance as follows:
- (i) Temporary roads and detours including the Transitway shall be maintained by Project Co from the commencement of the phase of construction works in accordance with Schedule 15-2 – Design and Construction Specifications of the design and construction schedule until Handover. Maintenance shall be according to Output Specifications, Good Industry Practice, be safe for travel, and meet the intent of the requirements in Appendix A of this Schedule 15-3 for ongoing maintenance.

- (ii) New Municipal Infrastructure (NMI) – The Design and Construction Specifications, Appendix A and Appendix C of this Schedule 15-3 apply to the NMI until Handover of the NMI to the City in accordance with Schedule 15-2, Part 1, Article 14 – New Municipal Infrastructure of the Design and Construction Specifications. The requirements of Schedule 23 – Expiry Transition Procedure shall not apply to NMI.
 - (iii) Existing infrastructure—Such existing infrastructure shall be maintained by Project Co in accordance with Appendix A of the Maintenance Specifications, and at a minimum, at the same condition as when handed over to Project Co until the commencement of the Maintenance Period. Exclusions to the requirements of Appendix A for the purposes of maintaining the existing infrastructure until the commencement of the Maintenance Period are further defined in Appendix A of this Schedule 15-3.
 - (iv) From the commencement of the Maintenance Period to the Expiry Date, and unless stated otherwise in this Schedule 15-3 or the Project Agreement, all System Infrastructure that falls within the Lands shall be subject to all applicable requirements of this Project Agreement, which include the Maintenance Specifications in their entirety. For further certainty, all existing infrastructure, which in whole or in part forms part of the System shall be maintained to a condition as prescribed in this Schedule 15-3.
 - (v) System Infrastructure – From the time in which the System Infrastructure is commissioned or required for service to the general public or Stakeholders or the City, Project Co shall perform all Maintenance and Rehabilitation Services.
 - (vi) Upon the start of the Shutdown Period or as may be otherwise provided in the Project Agreement or prescribed within the Shutdown Period Transition and Maintenance Plan, Project Co shall be responsible for the Existing Trillium Line Assets and the Shutdown Period Service Obligations. For certainty, Project Co's responsibilities include but are not limited to the care, continuation of maintenance, refurbishment, rehabilitation, improvements, modifications, repairs, upgrades (in whole or part), decommissioning, removal, disposal and or salvage as determined by the Design and Construction Requirements.
- (c) Project Co's responsibility to undertake maintenance on the Site commences, with respect to every parcel comprising the Lands, on the Commencement Date designated for such parcel in the Lands Table contained in Schedule 33 – Lands, and in respect of the new MTO infrastructure being constructed over the 417 near Gladstone Station, the date of completion of such construction by MTO and the demobilization from such Site, and extends until the earlier of:
- (i) the Termination Date;
 - (ii) the date upon which Project Co returns possession of such parcel of the Lands to the City in accordance with the Project Agreement, including Schedule 33 –Lands;
 - (iii) not used;

- (iv) in respect of the New Municipal Infrastructure, the applicable New Municipal Infrastructure Component Acceptance Date; or
- (v) in respect of the System Infrastructure, the Substantial Completion Date.

1.2 General Maintenance and Rehabilitation Obligations

- (a) Project Co shall be responsible for all Maintenance and Rehabilitation Services, and construction means, methods and techniques used to undertake the Maintenance and Rehabilitation Services and shall provide all aspects (including labour, plant, equipment and materials) necessary for the performance of the Maintenance and Rehabilitation Services. Project Co shall in a timely and professional manner and in accordance with the requirements of this Project Agreement:
 - (i) execute the Maintenance and Rehabilitation Services diligently, expeditiously and in a thorough and worker-like manner consistent with Schedule 11 – Integrated Management System Requirements;
 - (ii) execute the Maintenance and Rehabilitation Services diligently, expeditiously and in a thorough and worker-like manner consistent with Schedule 17 – Environmental Obligations;
 - (iii) ensure that no works other than the Maintenance and Rehabilitation Services under this Project Agreement are performed on the Lands by Project Co or any person for whom Project Co is responsible at law; and
 - (iv) use plant, equipment, and materials that:
 - A. are of a kind that are consistent with the Output Specifications, and for further certainty:
 - i where technological advancement and/or upgrades are necessary, the replacing or re-specifying of the system, subsystem or component shall be with one that is equal or better in form, fit and function when compared with the original Output Specification requirement; and
 - ii notwithstanding the requirements of Appendix C, when obsolescence of system components occurs, replacement of the system components shall only be necessary where the system component fails to comply with the Design Life or Output Specification requirements and not simply by virtue of the system component becoming obsolete, or as may be otherwise agreed by the City pursuant to Article 1.2(a)(iv)C;
 - B. are new or suitably refurbished, of good quality, and are used, handled, stored, and installed in accordance with Applicable Law and Good Industry Practice with respect to health and safety so as not to be hazardous or dangerous; and

- C. where they differ from the Output Specifications, have been substituted with the City's prior written consent in accordance with the Project Agreement.
- (b) Project Co shall appoint a Maintenance Director who shall, throughout the Maintenance Period and irrespective of such person's other responsibilities, have defined authority and full responsibility for ensuring, in respect of all Maintenance and Rehabilitation Services, compliance with all requirements of this Schedule 15-3.
- (c) Without limiting the generality of the foregoing, the job specification and responsibilities of the Maintenance Director shall include the following:
- (i) directing all aspects of the Maintenance and Rehabilitation Services;
 - (ii) ensuring Maintenance and Rehabilitation Services issues and obligations are addressed and requirements are met in accordance with this Project Agreement;
 - (iii) establishing and maintaining professional working relationships with Relevant Authorities and Stakeholders through the City;
 - (iv) liaising with the City and with Governmental Authorities (through the City) as required and acting as the single point representative for Project Co on all matters relating to the Maintenance and Rehabilitation Services;
 - (v) coordinating with the Environmental/Sustainability Director with respect to the preparation and submission to the City of all reports required under the Environmental Approvals and other Permits, Licences and Approvals; and
 - (vi) directing the preparation and submission to the City of any additional reports that may be required under the terms of the Project Agreement.

1.3 Maintenance and Rehabilitation Performance Measure System Framework

- (a) The performance measures for Maintenance and Rehabilitation Services are structured as described below:
- (i) Performance measures and requirements stating the minimum criteria and measures for requirements relating to the Maintenance and Rehabilitation Services to be met by Project Co, which consist of the following:
- A. Maintenance performance measures that define the minimum performance criteria for asset classes and System management requirements reflecting the expectations of System Users with respect to day-to-day serviceability (including condition and response times), as specified in Appendix A to this Schedule 15-3.
 - B. APPMs that define the minimum asset preservation criteria during the Maintenance Period to achieve the desired levels of service and to limit the extent of asset consumption, as specified in Appendix B to this Schedule 15-3.

- C. Expiry Date requirements define the remaining service life and condition of System before it is turned over to the City, as specified in Appendix C to this Schedule 15-3.
- (ii) The submission of reports on a regular basis in an auditable format with sufficient detail of Project Co's activities and how the Project objectives are being met, as specified in Appendix A, B and C of this Schedule 15-3.

1.4 Availability of Maintenance Director or Substitute

- (a) Project Co shall ensure that:
- (i) the Maintenance Director; or
- (ii) in the case of any temporary absence or unavailability of the Maintenance Director, one or more suitable substitutes, each with the qualifications and authority to act in the place and instead of the Maintenance Director during such absence or unavailability;
- (iii) is at all times during the Maintenance Period available by telephone, email, and facsimile transmission or other appropriate means of communication, 24 hours per day, seven days a week to respond on behalf of Project Co and its applicable Construction Contractor or Maintenance and Rehabilitation Contractor to any matters relating to the Maintenance and Rehabilitation Services.

1.5 Construction Activities during Maintenance Period

- (a) The Project Agreement requirements relating to design and construction, including the Design and Construction Specifications and the Design and Construction Requirements apply, mutatis mutandis, to any design and Construction Activities carried out as part of the Maintenance and Rehabilitation Services by Project Co during the Maintenance Period.
- (b) Without derogation or limitation to article 1.5(a) and the Project Agreement, Project Co shall be required to comply with the Airport Zoning Regulations (AZR) prior to and upon expiration of the City's current Airport Zoning Regulations Exemption, as referenced in Schedule 32-City Permits, Licences, Approvals and Authorizations to the Project Agreement (AZR Exemption), which is scheduled to occur in year 2041. Project Co shall be responsible for all work and associated costs required to design, construct, complete, test, commission, and maintain all System Infrastructure to comply with the AZR Exemption, and prior to the expiry of the AZR Exemption, to design, relocate, modify and construct all System Infrastructure at the locations which contravene the AZR so as to bring the System Infrastructure into compliance with the requirements of the AZR, while maintaining the Design and Construction Requirements as prescribed in Schedule 15-2. In achieving this compliance with the requirements of the AZR, and in addition to any temporary works required by Project Co to comply with the Design and Construction Requirements as prescribed in Schedule 15-2, Project Co shall decommission and remove all redundant infrastructure from the Lands including but not limited to all infrastructure associated with any rail over road grade separation at Leitrim Road. Project Co shall remove all

redundant System Infrastructure whether temporary or as originally designed and constructed, including but not limited to bridges, track, ties, ballast, systems, that is no longer required to meet the Design and Construction Requirements as prescribed in Schedule 15-2. For certainty, Project Co shall be subject to all Availability Failure and other Deductions resulting from loss in Revenue Service as provided in this Schedule 15-3 and Schedule 19-Payment Mechanism arising from the requirement to comply with these requirements.

1.6 Condition of System

- (a) Project Co, at its expense, shall ensure that upon the Expiry Date, each element of the System shall:
 - (i) comply in all respects with the applicable requirements set out in Appendices A, B, and C to this Schedule 15-3; and
 - (ii) meet all other Project Agreement requirements, as applicable.

- (b) If the Project Agreement is terminated prior to the Expiry Date, the System shall meet the requirements of Appendices A and B to this Schedule 15-3 at the relevant Termination Date.

1.7 References

- (a) Article 2.12 of Schedule 1 – Definitions and Interpretation applies to all documents listed in any Article titled “References” or otherwise referred to as a “Reference Document” in this Schedule 15-3, including Appendices A, B, and C hereto.

**APPENDIX A
MAINTENANCE PERFORMANCE REQUIREMENTS**

ARTICLE 1 MAINTENANCE OF SYSTEM

1.1 Introduction

- (a) The specifications in this Schedule 15-3 apply to the Maintenance of the System.
- (b) Project Agreement
 - (i) Any capitalized term used in this Schedule 15-3 but not defined herein has the meaning given to it in the Project Agreement.
 - (ii) Each reference in this Schedule 15-3 to “Section”, “Article”, “Appendices” and “Schedule” is a reference to a Section of, an Article of, an Appendix to or a Schedule to this Schedule 15-3, except where expressly stated otherwise.

1.2 Project Co to Maintain

- (a) Project Co shall have complete control of (subject to the rights and obligations of the City pursuant to the Project Agreement) and responsibility for the Maintenance of the System during the Maintenance Period.
- (b) Project Co shall, in addition to and without derogation from its Maintenance obligations set out in Article 1.2(a), perform the Maintenance and Rehabilitation Services in accordance with this Schedule 15-3 and otherwise in accordance with terms of the Project Agreement, to the extent that it provides for Project Co’s performance of Maintenance and Rehabilitation Services that are not set out in this Schedule 15-3.
- (c) So long as the Project Agreement remains in effect and has not been terminated in accordance with its terms and conditions, Project Co shall be unconditionally obligated to perform the Maintenance and Rehabilitation Services throughout and diligently at all times during the Maintenance Period in accordance with the Project Agreement, notwithstanding the existence of any Dispute, including any Dispute respecting Payments. For further certainty, in no event shall the existence of a Dispute or the fact that a Party has invoked the Maintenance Dispute Resolution Procedure exempt Project Co, for any period of time during the Maintenance Period, from the fulfillment of its obligations to perform the Maintenance and Rehabilitation Services pursuant to the Project Agreement. For further certainty, Project Co’s obligation to perform the Maintenance and Rehabilitation Services shall be subject to any time relief granted to Project Co by the provisions of the Project Agreement (including the Maintenance and Rehabilitation Requirements) following the occurrence of a Relief Event.
 - (i) In the event that a Dispute exists which relates to monetary matters, including, without limitation, any amount payable by a Party to the other under the Project Agreement, the Parties shall pay to each other all amounts payable under the Project Agreement which

are not the subject matter of a Dispute, in compliance with the terms and conditions of the Project Agreement, notwithstanding the existence of a Dispute respecting amounts payable or other monetary matters under the Project Agreement, or the fact that a Party has invoked or may invoke the Maintenance Dispute Resolution Procedure with respect to such Dispute, subject to the City's rights contained in Article 14.4 (City's Right of Set-Off) of the Project Agreement.

1.3 Scope of Maintenance

- (a) General
 - (i) Project Co shall conduct all Maintenance, on and for the System, as and when required, so as to meet and maintain the Standard.
 - (ii) Project Co shall perform or cause to be performed all inspection and testing on and for the System, as and when required, so as to meet and maintain the Standard.
- (b) Fixed and Vehicle Component Maintenance Requirements
 - (i) In performing the Maintenance Project Co shall provide all Maintenance with respect to the System including, but not limited to, all required Preventive Maintenance, Corrective Maintenance, Custodial Maintenance and Handover Maintenance for the System.
- (c) Custodial Maintenance
 - (i) Project Co shall provide Custodial Maintenance within and for the Custodial Maintenance Areas.
 - (ii) Project Co shall provide Custodial Maintenance for the Custodial Maintenance Areas, in accordance with the Standards set out in Appendix A.
- (d) Corrective Maintenance
 - (i) If at any time during the Maintenance Period:
 - A. a Defect or a Deficiency in any design or construction of the System undertaken during the Maintenance Period, is discovered; or
 - B. for any reason any element of the System requires Corrective Maintenance, Project Co shall undertake Corrective Maintenance in a timely way, in accordance with the requirements of the Project Agreement.
 - (ii) Project Co shall perform the Corrective Maintenance in a manner that reasonably minimizes:
 - A. the interference to or adverse effect on the Passengers; and

- B. interference which prevents compliance with the Operational Requirements and Specifications or the Revenue Service Hours required by the City's Operations Service Plan.
- (e) Preventive Maintenance
 - (i) Project Co shall perform Preventive Maintenance for the System.
 - (ii) Project Co shall provide Preventive Maintenance pursuant to the Annual Preventive Maintenance Plan as described in Article 1.4 (a)(ii).
 - (iii) Project Co shall replace system components prior to or upon expiry of their Design Life.
- (f) Allocation of Maintenance and Rehabilitation Services
 - (i) Project Co shall be responsible for Maintenance of the System and for ensuring that the Maintenance of the System is sufficient to permit the Operation of the System in accordance with the Operation Requirements and Specifications. Project Co shall be responsible for all elements of Maintenance on the System, excepting any element of maintenance which is expressly identified by the Project Agreement as the responsibility of the City or other Person (“Person” for purposes of this Article 1.3(f) shall exclude the Parties). For further certainty, any element of Maintenance for the System which is not expressly provided for by the Project Agreement shall be the obligation of Project Co. For further certainty, Project Co shall not be responsible for the Operation of the System.
- (g) Training
 - (i) Notwithstanding Article 3.3, Project Co shall be responsible for providing training services for personnel carrying out Maintenance and Rehabilitation Services including:
 - A. preparing, revising, coordinating and scheduling Maintenance training programs as required;
 - B. providing training to newly-hired Maintenance employees and providing ongoing re-certification training to existing employees as required;
 - C. providing ongoing staff development training;
 - D. providing training to Service Providers employed by Project Co to perform Maintenance and Rehabilitation Services on the System;
 - E. maintaining up to date training records on all Maintenance employees; and
 - F. maintaining up to date training manuals for Operation and Maintenance Services, and for certainty does not include the Operations training required by the City specific to operating the Revenue Vehicles.

- (ii) Project Co shall be responsible for all training required to the City and third parties the City considers necessary, acting reasonably, as a result of any changes to the System.

1.4 Maintenance and Rehabilitation Plan

- (a) Project Co shall develop and submit pursuant to Schedule 10 – Review Procedure, a Maintenance and Rehabilitation Plan which includes but is not limited to the requirements of this Schedule 15-3. The Maintenance and Rehabilitation Plan shall be submitted 90 days prior to the Testing and Commissioning phase as prescribed in Schedule 14 – Commissioning.
- (i) The Maintenance and Rehabilitation Plan shall, at all times, comply with the Standard.
- (ii) The Maintenance and Rehabilitation Plan shall, without limitation and at all times during the Maintenance Period, include the following for the System:
- A. a Custodial Maintenance Plan;
- B. a Corrective Maintenance Plan; and
- C. a Preventive Maintenance Plan.
- (iii) Starting the Contract Year following Revenue Service, Project Co shall provide an Annual Preventive Maintenance Plan for each Contract Year which shall comply with the Maintenance and Rehabilitation Plan. The Annual Preventive Maintenance Plan shall be submitted to the City at least 60 days prior to the commencement of the Contract Year to which the Annual Preventive Maintenance Plan applies. The City shall be entitled to review and provide commentary to Project Co in respect of the Annual Preventive Maintenance Plan.
- (b) Project Co shall ensure that it has sufficient staff, equipment and materials, and that there shall be proper procedures and processes in place to fulfill its obligations to perform Custodial Maintenance, Preventive Maintenance and Corrective Maintenance. Project Co shall ensure that Project Co and Contractors employed in the execution of the Maintenance and Rehabilitation Services implement policies, processes and procedures to remedy any Epidemic Defect in a timely and effective manner and in accordance with the Maintenance and Rehabilitation Requirements and Standards in this Appendix A.
- (c) Compliance with Maintenance Plans
- (i) Project Co shall perform Maintenance in accordance with and implement the Maintenance and Rehabilitation Plan.
- (d) Revision of Maintenance and Rehabilitation Plan
- (i) Project Co may at any time during the Maintenance Period, propose a revision to the Maintenance and Rehabilitation Plan, which Project Co shall propose in accordance with Schedule 10 – Review Procedure.

- A. In the event that a proposed revision pursuant to Article 1.4(d):
- i does not comply with the Standard;
 - ii results in increased costs to the City in any Contract Year of the Maintenance Period; or
 - iii results in any adverse change to Operations;

the proposed revision shall constitute a Variation and the provisions of Schedule 21 – Variation Procedure shall apply. For further certainty, in the event that a proposed revision constitutes a Variation pursuant to this Article 1.4(d), the Maintenance and Rehabilitation Plan shall not be amended except in accordance with Schedule 21 – Variation Procedure.

- (ii) In the event that a proposed revision does not constitute a Variation pursuant to Article 1.4(d), should the City determine that it disagrees with the proposed revisions, the City may refer the matter to Schedule 26 – Dispute Resolution Procedure for a resolution.
- (iii) The City may at any time during the Maintenance Period, in its discretion, propose a revision to the Maintenance and Rehabilitation Plan, and the provisions of Schedule 21 – Variation Procedure shall apply.
- (iv) In the event that the proposed revision does not constitute a Variation, subject to Article 1.4 (d)(v), the Maintenance and Rehabilitation Plan shall be deemed to have been amended in accordance with a proposed revision pursuant to Schedule 10 – Review Procedure, failing which the Maintenance and Rehabilitation Plan shall not be amended except as mutually agreed between the Parties or in accordance with the Schedule 26 – Dispute Resolution Procedure.
- (v) Notwithstanding Article 1.4 (d)(iv), the Maintenance and Rehabilitation Plan shall be deemed to be amended pursuant to Schedule 21 – Variation Procedure.

1.5 Maintenance Coordination

- (a) General
- (i) Subject to this Article 1.5, Project Co and the City shall coordinate the Maintenance and Rehabilitation Services and the Operations, respectively, so as to facilitate effective implementation of both the Maintenance and Rehabilitation Requirements and the Operational Requirements and Specifications, provided that:
- A. unless otherwise authorized by the City acting reasonably, maintenance activities affecting System operation, safety, or security shall be conducted during non-revenue periods;
 - B. at no time shall Operations be adversely affected by Maintenance and Rehabilitation Services, unless planned and approved in coordination with the City; and

- C. notwithstanding the provisions of Article 1.5 including Article 1.5(d) (Approval of Scheduled Maintenance and Rehabilitation Services) or Article 1.5(e) (Major Maintenance Shutdown Periods), Project Co shall use commercially reasonable efforts to prevent any complete or partial shutdowns of the System.
- (b) Coordination Meetings
- (i) Daily: Project Co shall communicate with the City Representative to review daily performance, resolve service availability and delay issues and coordinate all Maintenance and Rehabilitation Services on the System that could potentially affect System operation, public safety or concerns and all other related issues.
- (ii) Weekly: Project Co shall attend a weekly meeting with the City to discuss, review and coordinate Maintenance of the System including any Maintenance and Rehabilitation Services that require coordination with third parties and Third Party Land Interest Holders as indicated in Article 1.12, have regulatory implications or could have a public or community impact and all other related issues, including without limitation the implementation of the Maintenance and Rehabilitation Plan, compliance with the Maintenance and Rehabilitation Requirements and standards defined in the Attachments to Appendix A.
- A. Project Co shall meet with the City to determine if Track outages are required to accommodate the Maintenance and Rehabilitation Services which Project Co plans to undertake within the System. Such meetings shall be scheduled once weekly, between Project Co, the City and any third parties whose attendance the City in its discretion deems necessary. Project Co shall, at least one week prior to any such meeting, advise the City of any proposed Maintenance and Rehabilitation Services on the Track or System ROW which is scheduled to take place during the week immediately following that meeting, provided that in the event the nature of any proposed Maintenance and Rehabilitation Services is so as to require earlier notice for purposes of coordination with Operations, Project Co shall provide the City with sufficient prior notice to effect such coordination.
- (iii) Monthly: Project Co shall meet with the City on a monthly basis to review status of capital program work activities, lookahead schedule of planned Maintenance and Rehabilitation Services on the System and other technical issues related to the effective implementation of the Maintenance and Rehabilitation Plan and compliance with the Maintenance and Rehabilitation Requirements and standards defined in the Attachments to Appendix A.
- (c) Quarterly Performance Review
- (i) The City shall, on a quarterly basis during each Contract Year, conduct a formal review of Project Co's performance of the Maintenance and Rehabilitation Services as well as the co-ordination between the City's operational scope of responsibility and Project Co's scope of maintenance responsibility (the "Quarterly Performance Review"). The

Quarterly Performance Review shall include a written report drafted by the City (“Quarterly Performance Report”) which includes an assessment of:

- A. Review of data collected pursuant to the Project Agreement respecting Project Co’s performance of the Maintenance and Rehabilitation Services, including but not limited to the Performance Monitoring Reports and Daily Operating Reports for the relevant quarter;
 - B. Specific incidents or failures to meet the service standards set out in Schedule 15-3 occurring during the relevant quarter, in particular repeated incidents or failures;
 - C. Logistical, scheduling, and/or co-ordination issues occurring during the relevant quarter;
 - D. Follow-up and progress reporting on Action Plans previously issued and implemented by Project Co;
 - E. Functioning of the contract management and interface framework set out in the Project Agreement, including performance monitoring, daily meetings, Helpdesk mechanism; and
 - F. Other issues relevant to the performance of the Maintenance and Rehabilitation Services in accordance with the standards set out in Schedule 15-3 and/or a smooth interface between the City and Project Co in relation to the operation and maintenance of the System.
- (ii) The City and Project Co shall meet to review the Quarterly Performance Report (“Quarterly Performance Review Meeting”). The City shall provide Project Co with a draft copy of the Quarterly Performance Report at least five Business Days in advance of the meeting. Project Co shall have the opportunity to respond, both during the meeting and in writing following the meeting, concerning any identified performance issues.
- (iii) The City shall provide a finalized Quarterly Performance Report no later than 10 Business Days following the performance review meeting between the City and Project Co. The City may, as part of such Quarterly Performance Report, issue a directive to Project Co to provide an Action Plan to address any identified issues in Project Co’s performance of the Maintenance and Rehabilitation Services, provided that any such identified performance issues shall be limited to:
- A. Repeated or systemic failures to provide the Maintenance and Rehabilitation Services in accordance with the standards set out in Schedule 15-3;
 - B. Co-ordination issues between the City and Project Co; or
 - C. Levels of performance which have triggered, during the relevant quarter, the issuance of a Warning Notice, Monitoring Notice, exercise of the City’s

Remedial Rights, or an Event of Default, under the terms of the Project Agreement.

- (iv) If so required by the City, Project Co shall provide such Action Plan for the City's review and approval within 21 calendar days of the City's written request. The Action Plan shall include:
- A. A clear statement of the performance issues to be addressed;
 - B. A clear statement of the methodology to address each issue;
 - C. A timeline for implementing the methodology;
 - D. Clear performance measures and performance targets for each identified issue; and
 - E. An expected timeline for when the methodology will yield the identified performance improvement targets.
- (v) The City shall review the Action Plan within five Business Days of receipt and shall, acting reasonably, approve the Action Plan or decline to approve the Action Plan, providing details and a date for re-submission.

(d) Approval of Scheduled Maintenance and Rehabilitation Services

- (i) Project Co shall obtain the prior approval of the City Representative for the scheduling of all Maintenance and Rehabilitation Services on the system that could potentially affect System operation or public safety or concerns. The City may impose reasonable conditions on the performance of such work by Project Co so as to ensure the Operation of the System in accordance with the Operational Requirements and Specifications and the Safety Management System, and Project Co shall comply with all such conditions. The City's approval of Project Co's proposed Maintenance and Rehabilitation Services shall not be unreasonably withheld, however Project Co acknowledges that the Operation of the System in accordance with the Operational Requirements and Specifications and the Safety Management System shall be paramount.
- (ii) Project Co shall coordinate all Custodial Maintenance, Preventive Maintenance and Corrective Maintenance and Rehabilitation Services on the System with the City that could potentially affect System operation or public safety or concerns. Project Co shall advise the City in advance, and where reasonably possible on the occasion of weekly Track outage meetings identified in Article 1.5(b), of all such planned Preventive Maintenance and Corrective Maintenance, and the City and Project Co shall mutually establish the Schedule for such Maintenance. In no event shall Project Co perform such Maintenance within the Alignment without receiving prior approval from the City or TOCC as required by this Article. Project Co shall coordinate Preventive Maintenance and Corrective Maintenance activities with the TOCC:

- A. All employees of Project Co performing Maintenance on the areas between or adjacent to the Tracks are governed by the Capital Railway rules, regulations and the Standard Operating Procedures;
 - B. All employees of Project Co performing Maintenance shall receive clearance from the TOCC to enter and perform Maintenance and Rehabilitation Services on the areas between or adjacent to the Tracks;
 - C. All employees of Project Co performing Maintenance on the areas between or adjacent to the Tracks shall be certified in Capital Railway rules, regulations and the Standard Operating Procedures;
 - D. No equipment other than hand tools shall be operated in proximity to the areas between or adjacent to the Tracks without prior approval of the TOCC;
 - E. Neither Operators of Trains nor employees operating Non-Revenue Vehicles shall operate on the Track or in areas between or adjacent to the Tracks unless the Operators and / or employees are certified to operate the Trains or Vehicles in accordance with the Capital Railway rules, regulations and the Standard Operating Procedures, and has received appropriate clearance in accordance with Article 1.5(d)(ii);
 - F. Maintenance on the areas between or adjacent to the Tracks shall be performed outside of Revenue Service Hours, unless the City approves the performance of specified Maintenance and Rehabilitation Services during Revenue Service Hours in accordance with Article 1.5(d)(ii) such approval not to be unreasonably withheld or delayed; and
 - G. Subject to Article 1.5(d)(ii)(F), in the event that Project Co carries out approved Maintenance and Rehabilitation Services during Revenue Service Hours, the Payment Mechanism shall continue to apply and Project Co shall be held accountable for all Availability Failures, Quality Failures, and/or Service Failures which occur during such period, except as referenced in 1.5(e).
- (e) Major Maintenance Shutdown Periods
- (i) Project Co shall be permitted to shut down portions of the System during Revenue Service Hours in order to perform major maintenance on the Track, systems, or Structures, subject to the conditions set out in this Article 1.5(e), for a maximum of 80 hours during each Contract Year. Each such period of permitted System shutdown shall be termed a “Major Maintenance Shutdown Period”.
 - A. During a Major Maintenance Shutdown Period, Project Co shall not be subject to deductions under the Payment Mechanism for the portions of the System which Project Co has shutdown pursuant to this article.

- B. Project Co shall obtain the written approval of the City Representative, not to be unreasonably withheld, to schedule a Major Maintenance Shutdown Period. Project Co's request for approval shall be submitted to the City Representative at least 45 calendar days in advance of the proposed Major Maintenance Shutdown Period, and shall include but not be limited to:
- i the duration of such period;
 - ii start time;
 - iii end time;
 - iv portion of the System to be shutdown and / or otherwise affected by the shutdown period, including a written explanation / rationale of the limits of the portion of the System proposed to be shutdown;
 - v purpose of the planned Maintenance and Rehabilitation Services to be carried out during the shutdown period including a written explanation of why a Major Maintenance Shutdown period is required to perform the Maintenance and Rehabilitation Services; and
 - vi Traffic and transit management plans pursuant to Article 1.5(h).
- C. A Major Maintenance Shutdown Period shall only be scheduled during weekends, certain holidays, and during weekdays between the hours of 23:30 and the start of the Scheduled Station Hours on the following service day.
- D. Unused time shall be carried over into a subsequent Contract Year to a maximum of 192 hours.
- E. A Major Maintenance Shutdown Period shall only be permitted on portions of the System, and for further certainty, the shutdown of the entire System is not permitted, unless approved by the City.
- F. The City shall provide a written response within 15 calendar days of receiving Project Co's request in compliance with the provisions in Article 1.5(e)(i)(B).
- (ii) Notwithstanding the Major Maintenance Shutdown Periods contemplated by article 1.5(e)(i), Starting in Year 12 of the Maintenance Period, Project Co. may accumulate unused time as contemplated in article 1.5(e)(i)D. to:
- A. enable a single continuous 8-day (maximum) shutdown for major rehabilitation on the System. The plans for shutdown period shall be approved by the City at least 12 months in advance and shall be scheduled during low periods of ridership (summer / long weekends). The City will not apply availability deductions for work under this planned and City approved activity. . Project Co may plan and request subsequent single continuous eight-day shutdowns for approval by the City limited in that a re-occurrence of a subsequent single

continuous eight-day shutdown shall not be permitted any sooner than five years from the previous single continuous eight-day shutdown approved by the City.

B. Project Co may undertake major rehabilitation work of Station systems. The plans for such rehabilitation work shall be approved by the City at least 12 months in advance and shall be scheduled during low periods of ridership (summer / long weekends). The City will not apply service failures or quality failures for station equipment and systems that are otherwise rehabilitated under this planned and City approved work.

(f) Specific Coordination Requirements

- (i) The City and Project Co shall comply with established Capital Railway rules, regulations and the Standard Operating Procedures for the coordination of Maintenance and Operations activities and personnel at the Maintenance and Storage Facility. The rules and procedures shall include, without limitation, the coordination of Maintenance activities with the entry of Trains into and their removal from Revenue Service. Any negligent act or omission with respect to the Operation of the System by a City employee employed in the Operation of the System, or a failure by the City or a City employee employed in the Operation of the System to comply with the established Capital Railway rules, regulations and the Standard Operating Procedures shall be a Relief Event, to the extent that any such negligent act or omission or failure materially adversely affects, or increases the cost of, the performance by Project Co of the Maintenance and Rehabilitation Services.
- (ii) Project Co acknowledges that the City shall conduct training of City employees in accordance with the Safety Management System, including its ability to conduct City employee training as required and Project Co shall make reasonable efforts to cooperate with the City to accommodate all training activities in accordance with training programs approved by the City. The City and Project Co shall jointly determine the requirements for and scheduling of all such training activities, provided that the City shall have final authority to establish such requirements and scheduling while reasonably incorporating Project Co's comments. The City shall be entitled to vary the requirements for such training in response to Operations requirements. Project Co shall ensure that Vehicles are available for use in such training activities as required and directed by the City.
- (iii) Upon either the TOCC or Project Co becoming aware of the failure of any system or City owned assets, equipment or component of the System, that Party shall inform the other Party of the failure. Upon discovering or becoming aware of a failure, the City shall take immediate action to reduce, to the extent reasonably possible, loss of Scheduled Revenue Service Vehicle Kilometres and/or Station Availability, and Project Co shall immediately commence Corrective Maintenance, as required.
- (iv) Project Co shall obtain the prior approval of the City for the scheduling of Mainetannce and Rehabilitation Services on the System, including inspection and testing, that could

- potentially affect System operation or public safety or concerns, such approval not to be unreasonably withheld or delayed.
- (v) Project Co shall establish a plan detailing Project Co's Maintenance and Rehabilitation strategy in the event of the failure of any system, equipment or component of the System. The plan shall include response and repair strategies in the event of:
- A. failures which immobilize Trains or the System;
 - B. problems or failures which may result in the immobilization of Trains or the System;
 - C. problems or failures unlikely to result in the immobilization of Trains or the System; and
 - D. a Train- or System-immobilizing failure occurring in the Tunnel or aerial portions of the System.
- (vi) Project Co shall record any incidence of the failure of any system, equipment or component of the System and shall document the actions taken by Project Co to restore the System to the required Design and Construction Requirements.
- (vii) In addition to the requirements of Schedule 15-2, Part 1, Article 3 – Operational Performance Requirements and to be included as part of the Capital Railway rules, regulations and the Standard Operating Procedures, Project Co shall develop policies and procedures associated with weather related events and/or natural disasters, including but not limited to:
- A. winter snow and / or freezing rain;
 - B. severe wind;
 - C. extreme rainfalls and / or hail;
 - D. lightning;
 - E. earthquakes;
 - F. extreme hot or cold temperatures; and
 - G. flooding.
- Project Co shall, in coordination with the City, define roles and responsibilities of the Parties, communication / reporting protocols, resources available and / or contingent dependent on the severity of the event, standard operating procedures, prior to, during and after the event, and procedures for recovery of System or system components which are partially or completely not functional as a result of the event.
- (g) Emergency and Safety Procedures and Investigations shall be in accordance with Schedule 15-2.

(h) Traffic and Transit Management During Maintenance Period

- (i) Project Co shall be responsible for traffic management in accordance with the Ontario Traffic Manual and any Applicable Law relating to the protection of the safety of:
 - A. If working within boundaries of Airport Lands, Airport authority to provide direction through permitting;
 - B. MTO (I/F with 417);
 - C. [REDACTED];
 - D. [REDACTED]; and
 - E. [REDACTED].
- (ii) Project Co shall be responsible for transit management to the extent required by Project Co to coordinate Maintenance Activities with OC Transpo pursuant to Article 1.5.
- (iii) Project Co shall coordinate with the City, OC Transpo, and other Relevant Authorities when planning and developing Traffic and Transit Management Plans.
- (iv) Project Co's Traffic and Transit Management Plans shall include but are not limited to the following:
 - A. Maintenance and Rehabilitation Services affecting traffic and / or transit services;
 - B. Anticipated duration of the Maintenance and Rehabilitation Services;
 - C. Planned lane closures, full closures, lane shifts, detour routes and diversions;
 - D. Key Individuals responsible for implementation and management of Traffic and Transit Management Plan;
 - E. Provisions for Permits and / or Approvals required by the City, OC Transpo, or Relevant Authorities, including permitted times for lane closures, full closures, lane shifts, detour routes and diversions, and detouring and / or mitigation measures to maintain transit services; and
 - F. Coordination with Third Party Land Interest Holders that may be required as a result of the implementation of Project Co's Traffic and Transit Management Plans.
- (v) Prior to implementation of Traffic and Transit Management Plans, Project Co shall obtain all required permits and approvals from the City, OC Transpo, and Relevant Authorities.
- (vi) During implementation of Traffic and Transit Management Plans, Project Co shall:

- A. coordinate with the City, OC Transpo, and other Relevant Authorities on all closures, full closures, detour routes, lane shifts and diversions on roads that intersect or cross Major Municipal Roadways, Transitway and Minor Municipal Roadways.
 - B. obtain all required closure permits or approvals.
 - C. notify the City, OC Transpo, and Relevant Authorities immediately of any changes to a closure, full closure, detour route, lane shift and diversion, or anticipated problems that may delay the opening time / removal of the traffic control measures and / or removal of detouring and / or mitigation measures to maintain transit services, stating the closure / permit notification number and details of the changes to and/or problems with the closure, full closure, detour route, lane shift and diversion.
- (vii) Project Co shall be responsible for any such delays to the Operation of the System that result from the Traffic and Transit Management Plans and for further certainty Project Co shall be subject to all penalties resulting from loss in service as provided in this Schedule 15-3 and Schedule 19.
- (viii) When performing Maintenance and Rehabilitation Requirements, Project Co may apply for permission to use of the City's Southeast Transitway conditional on the following requirements:
- A. when Maintainers are traveling from a location north of Walkley Station to a Station south of South Keys Station;
 - B. when Maintainers are traveling from a location south of Walkley Station to a Station north of Carleton Station;
 - C. weekday peak periods, between 07:00 to 09:00 or between 16:00 and 18:00;
 - D. Maintainer shall enter a separate formal agreement with the City, which includes description of SE Transitway limited use, start and end dates of the permitted use, proof of insurance including general commercial liability and motor vehicle liability insurance coverage as deemed necessary by the City for the respective period of the agreement;
 - E. Maintainers employees shall be required to successfully complete the City's Transitway training provided by the City and as may be updated by the City acting reasonably from time to time; and
 - F. If the Maintainer fails to comply with the formal agreement, permit conditions, Operators instructions, and conditions of this article, the City may revoke, or suspend, or opt not to renew or extend the usage of the Southeast Transitway limited use.

- (i) Costs Incurred by Project Co
 - (i) The City shall not reimburse Project Co for costs incurred by Project Co as a result of any Maintenance Emergency.
 - (ii) The City shall reimburse Project Co for costs incurred by Project Co as a direct result of performing its obligations in response to a Non-Maintenance Emergency on the System (the “**Emergency Costs**”), in accordance with the procedure set out in Schedule 22 – Variation Procedure.
 - (iii) In the event that an Emergency is confirmed or determined by the City to be a Non-Maintenance Emergency, the City shall promptly so notify Project Co. Within 10 Business Days following the City’s notification with respect to a Non-Maintenance Emergency, Project Co shall submit to the City an invoice for its Emergency Costs determined in accordance with Schedule 21 – Variation Procedure, with the changes necessitated by context.
 - (iv) Upon receipt of an invoice from Project Co pursuant to Schedule 21 – Variation Procedure, the City shall evaluate the invoiced amount of the Emergency Costs to Project Co on the basis of the City’s record of the actions taken by Project Co in response to the Non-Maintenance Emergency. The City shall pay all amounts it determines to be due and payable as Emergency Costs.
 - (v) In the event that the City’s evaluation of the Emergency Costs differs from the invoiced amount, Project Co may refer the matter to the Maintenance Dispute Resolution Procedure.

1.6 Compliance

- (a) Inspection and Right of Access
 - (i) In addition to the rights stated elsewhere in the Project Agreement, the City shall have all rights with respect to oversight and monitoring of Project Co’s performance, to inspect and audit the System including the Vehicles in order to provide assurance that Project Co is performing its obligations under the Project Agreement.
 - (ii) The City, acting reasonably, shall ensure that any interference with the performance of the Maintenance and Rehabilitation Services which may be caused by any inspection conducted or authorized by the City is limited to the minimum interference necessary to conduct such inspection.
 - (iii) Project Co, acting reasonably, shall not limit the City’s access to the MSF for the purpose of inspecting vehicles, systems, or facilities so long as it does not interfere with maintenance activities.
 - (iv) Notwithstanding Article 1.7 the City, subject to Article 1.6(a)(ii), shall be entitled to inspect and audit the System and/or the records and reports required to be kept under the

Project Agreement, including without limitation (i) work orders and (ii) records of expenses respecting any Non-Maintenance Repair, upon reasonable prior notice, and without prior notice to Project Co where such inspection and/or audit is undertaken for cause related to:

- A. an Emergency;
 - B. an Environmental Event or reasonable evidence that same may have occurred or have the potential to occur, including the presence or potential presence of Hazardous Substances on the System;
 - C. the occurrence of or reasonable evidence of the occurrence of illegal activities either on the System or with respect to the Maintenance or Operation of the System;
 - D. an incident which is the subject matter of an investigation, inquiry or prosecution by Governmental Authorities; or
 - E. upon the City's identification of an existing or potential material Safety issue on the System.
- (v) Where the City exercises its right to inspect or audit, a representative of Project Co shall be present during such inspection or audit. In no event shall the City's exercise of its right to inspect or audit or the presence or absence of a representative of Project Co during any such inspection or audit relieve Project Co of any of its obligations under this Schedule 15-3. The City's right to inspect and audit the records and reports required to be kept under the Project Agreement shall be subject to the right of Project Co to withhold financial information unrelated to information the City would reasonably require to exercise to the City's rights and obligations under the Project Agreement.
- (vi) The City, acting reasonably, has a right, at all reasonable times during the Maintenance Period, subject to Article 1.6(a)(viii), to access and inspect the System (including installation of testing equipment on Vehicles and other System assets and carrying out sample checks) and any work Project Co undertakes on the System, so as to confirm:
- A. the adequacy of the supervision by Project Co for any Maintenance; and
 - B. that the System is being maintained in accordance with the terms of the Project Agreement.
- (vii) The City may at any time appoint an agent for the purposes of carrying out any inspection, testing or audit pursuant to the Project Agreement. The City will in a timely way advise Project Co of any requirement for Corrective Maintenance or Custodial Maintenance of which it becomes aware.
- (viii) The City, acting reasonably, may at any time advise Project Co that it requires access to the New Walkley Yard, alignment, or other facility maintained by Project Co for the

purposes of inspecting Vehicles or other elements of the System. The City shall provide notice to Project Co two Business Days in advance of any planned inspection or audit for which it or its agents require access to the New Walkley Yard, alignment or other facilities.

- (ix) Upon the City's request, acting reasonably, Project Co shall grant the City access to the New Walkley Yard for the purpose of conducting educational tours of the System for the public and other interested Persons, provided that the City shall give Project Co a minimum of one week notice of any planned tour of the New Walkley Yard and provided that the City's conduct of any such tour shall not impede performance of the Maintenance and Rehabilitation Services.

(b) Safety Audit

- (i) Without limitation of the rights of the City pursuant to Article 1.6(a) and otherwise provided in this Agreement, the City shall be entitled at any time during the Maintenance Period to inspect and audit the System (including the New Walkley Yard) and the records and reports required to be kept under the Project Agreement, including without limitation records of work orders respecting the Maintenance and Rehabilitation Services, for the purpose of conducting a Safety Audit. The City shall provide Project Co with such prior notice of any Safety Audit as is reasonable in the circumstance, except in the circumstances in which no notice is required pursuant to Article 1.6(a)(iv).
- (ii) Project Co shall cooperate with the City to facilitate any Safety Audit. Project Co shall grant to the City and its agents, upon the City's request, access to the New Walkley Yard and all Vehicles located therein for purposes of conducting a Safety Audit.

(c) Review of Performance

- (i) Project Co shall comply with the requirements of Schedule 11 – Integrated Management System. For further certainty, Project Co shall conduct regularly scheduled reviews of its performance in meeting the Standard and provide to the City a written report on such performance. Project Co shall participate in consultations with the City regarding Project Co's performance.
- (ii) In the event that, upon review of Project Co's performance, as reported by Project Co or otherwise, or at any other time during the Maintenance Period, it is determined by the City, in consultation with Project Co, that Project Co's performance is failing to meet the Standard in any respect, then in addition to and not in derogation from all other remedies and obligations of the City and Project Co under the Project Agreement, Project Co shall be obligated to improve its performance in respect of the relevant matter so as to meet the Standard.

(d) City's Remedial Action

- (i) Without prejudice to any other express rights of the City under the Project Agreement or otherwise, if in the City's reasonable opinion remedial action is required immediately because:
- A. there is an Emergency and delay would risk damage to the System, the Real Property Interests, adjacent lands or personal property;
 - B. there is a public Safety concern and delay could result in personal injury or death; or
 - C. a Project Co Event of Default has occurred,

or where a provision of this Schedule 15-3 expressly permits the City to take remedial action, then the City may give a notice to Project Co (the "**Remedial Action Notice**") that the City will take or cause to be taken remedial action without any requirement for further notice or delay. The City may take remedial action pursuant to Article 1.6(d)(i)A or 1.6(d)(i)B without first delivering a Remedial Action Notice, but shall deliver the Remedial Action Notice thereafter. Project Co may inspect any such remedial action undertaken by the City during the performance of the remedial action, or, in the event the remedial action is taken pursuant to Articles 1.6(d)(i)A or 1.6(d)(i)B, upon receipt of the Remedial Action Notice or earlier with the consent of the City.

(e) Payment for the City Remedial Action

- (i) In the event that the City takes remedial action:
- A. pursuant to Article 1.6(d)(i)C; or
 - B. otherwise pursuant to Article 1.6(d) in the event the remedial action would not, if performed by Project Co, constitute a Non-Maintenance Repair;
- (ii) Project Co shall be responsible to the City for [REDACTED] of the cost incurred by the City to complete any remedial action. For further certainty, the City shall be entitled pursuant to Article 34.13 (City's Right of Set Off) of the Project Agreement to subtract the cost incurred by the City to complete any remedial action, plus an administration fee of [REDACTED] of such cost, from any Payments due to Project Co under the Project Agreement. Any Maintenance Dispute which arises in connection with this Article 1.6(e) shall be settled pursuant to the Maintenance Dispute Resolution Procedure.

(f) Warranties Unaffected by Remedial Action

- (i) The Parties agree that no remedial action which the City may undertake in accordance with Article 1.6(d) shall affect, alter, reduce or qualify any warranty provided by Project Co in respect of the System, including without limitation any warranties provided for in connection with the Revenue Vehicle Supply Contract.

(g) Remedies Cumulative

- (i) For further certainty and without limiting Article 64.14 of the Project Agreement, all of the rights and remedies of the City contained in the Project Agreement including this Schedule 15-3 are cumulative and not alternative. The City may exercise separately or simultaneously any and all rights and remedies contained in this Schedule 15-3 and/or otherwise contained in the Project Agreement.

1.7 Access to Maintenance Records

(a) The City's Right to Information

- (i) Without derogation from any of the other rights of the City under the Project Agreement including this Schedule 15-3, the City shall have the right to obtain from Project Co, and Project Co shall deliver to the City as soon as possible and in no event later than seven calendar days following a written request by the City, any reasonable information which is in the possession of or available to Project Co and which is directly related to the Maintenance and Rehabilitation Services or the System. Notwithstanding any provisions in this Schedule 15-3 which entitle the City to obtain access to or require production of information which is in the possession of or available to Project Co, Project Co shall not be required to deliver any business records which are legally privileged (save for reports prepared by environmental consultants other than in contemplation of litigation) or contain confidential financial information which confidential information is not reasonably required by the City for its purposes.

(b) Audits and Inspections

- (i) The City may, upon prior written notice of one week to Project Co, inspect and audit the records and reports required to be kept under the Project Agreement, including financial records respecting the Maintenance and Rehabilitation Services. The City's right to inspect and audit the records and reports required to be kept under the Project Agreement shall be subject to the right of Project Co to withhold financial information unrelated to information the City would reasonably require for its purposes related to the City's rights and obligations under the Project Agreement. The City shall be entitled to make copies or take extracts of Project Co's documents subject to providing Project Co with a list of the documents or extracts that have been taken. Such inspection and/or audit may take place at any reasonable time during Project Co's regular business hours at Project Co's place of business in the New Walkley Yard or such other location where such records are regularly kept. Such inspection and audit shall be at the City's cost.
- (ii) Prior to any inspection or audit by the City, Project Co may require the City and its auditors to execute confidentiality agreements acceptable to Project Co, acting reasonably, in respect of the subject matter of the audit or inspection, subject to requirements of Law where information or portions thereof cannot be kept confidential.

1.8 Records and Reporting

(a) Records and Reporting Obligations

- (i) Project Co shall record and retain for review and audit by the City, upon the City's request, the following information:
- A. Comprehensive Custodial Maintenance, Preventive Maintenance, Corrective Maintenance, Handover Maintenance and other Maintenance records for the System including without limitation all Defects and Deficiencies identified, the date and time of the Maintenance activity undertaken in response, detailed work orders, the scope of the activity including the labour and materials used and their cost, payroll burden and indication of compliance or non-compliance with the Maintenance and Rehabilitation Plan;
 - B. records of all purchases, supplier invoices and transactions related to Non-Maintenance Repairs;
 - C. automatically collected comprehensive electronic records of all Train movements including actual arrival and departure times at all Stations in the format described in Schedule 15-2;
 - D. automatically collected electronic Passenger counts;
 - E. automatically collected electronic records of all security alarms, equipment status or failure indicators, including the nature of the indicator, the date and time of occurrence and the date and time of the indicator clearance;
 - F. automatically or manually recorded descriptions of the actions initiated to respond to the incidents reported in the Attachments;
 - G. automatically or manually recorded information regarding incidents involving Passenger and employee Security or Safety, including the date and time of occurrence and the response taken;
 - H. automatically or manually recorded incidents involving damage to or Deficiencies existing in the System affecting Passengers, including date and time of occurrence and response taken;
 - I. automatically recorded Vehicle time and distance operated information for each Vehicle for the life of the Vehicle;
 - J. maintenance activities undertaken in response to a Non-Maintenance Repair and the costs of such activities;
 - K. the records in respect of Events of Vandalism and associated Vandalism Repair Costs required by Section 8.0 of Attachment 16 to this Schedule 15-3; and
 - L. all such other reports, records and information regarding the System which the City may reasonably require from time to time.

- (ii) Project Co. shall maintain records and prepare any reports for Transport Canada regulatory filings as may be required by the City in accordance with Schedule 15-2, Part 1, Article 6 – Rail Regulatory Structure and Obligations.
- (iii) Project Co shall prepare monthly status reports identifying all Maintenance performed on the System within the last quarter of each Contract Year (the “**Monthly Activity Report**”), and shall submit the Monthly Activity Reports to the City for review within seven business days after each completed quarter.
- (iv) Project Co shall use an electronic asset management system (the “**Maintenance Management System**”) to manage Maintenance activities performed on all major components of the System, including all information which Project Co is required to record pursuant to Article 1.8(a)(i). Project Co shall prepare monthly summary reports of such Maintenance activities, which shall be submitted to the City as part of the Monthly Activity Report. The City shall have access to the Maintenance Management System at all times for purposes of review, and for further certainty including remote access by a secured web based software for sharing information.
- (v) The “**Maintenance Management System**” shall include Reliability, Availability, and Maintainability monitoring and reporting capabilities. Project Co shall produce monthly Reliability, Availability, and Maintainability reports including a two year moving history for all major systems and subsystems, including but not limited to:
 - A. Revenue Vehicle;
 - B. S&TCS, TVS control equipment, and CTS;
 - C. Track and MOW;
 - D. Structures;
 - E. Facilities including Stations, Bus Operator Buildings, and the New Walkley Yard;
 - F. Shop Equipment; and
 - G. MOW equipment.
- (vi) Project Co shall produce Reliability, Availability, and Maintainability reports utilizing key performance indicators including but not limited to:
 - A. Mean Distance Between Maintenance Failures;
 - B. Mean Distance Between All Failures;
 - C. Mean Time Between Maintenance Failures;
 - D. Mean Time Between All Failures;

- E. Mean Time to Repair;
 - F. Mean Time to Restore;
 - G. Rolling Stock Availability;
 - H. Backlog of Deferred Maintenance;
 - I. Campaign/Modifications Programs; and
 - J. All applicable key performance indicators as prescribed in Schedule 19 – Payment Mechanism..
- (vii) As part of the Maintenance Management System as described in Article 1.8(a)(iii), Project Co shall prepare and submit to the City a daily report (the “**Daily Report**”), in accordance with Appendix A, which shall include, but not be limited to:
- A. Deficiencies of which Project Co has become aware;
 - B. Maintenance and Rehabilitation Services which has been undertaken or completed in respect of Deficiencies;
 - C. All Deficiencies reported by the City, including through any report submitted pursuant to Appendix A.
- (viii) Reports
- A. Project Co shall prepare all reports related to the Maintenance and Rehabilitation Services, to be submitted by the City to any federal, provincial or municipal governmental agency, railways and any other third party. Project Co shall also promptly furnish to the City copies of any citations or complaints issued to Project Co by an enforcement or regulatory body which affect the Maintenance and Rehabilitation Services or the Vehicles. Project Co shall advise the City and the disposition of such citations or complaints shall be coordinated through the City.
- (b) Licence, Certificate and Permit Records
- (i) Project Co shall be responsible for completing or cause to be completed all regulatory inspections and testing necessary for the licences, certificates and permits associated with the System.
 - (ii) Project Co shall maintain and furnish to the City records of all licences, certificates, and permits required to be obtained for the performance of the Maintenance and Rehabilitation Services and Operation of the System.
- (c) Environmental Records, Samplings, and Reports, Project Co shall comply with Schedule 17 – Environmental Obligations.

(d) City's Recovery of Shared Maintenance Costs

- (i) Project Co shall develop, execute, and maintain procedures to compile and report all labour, equipment, and material resources consumed by Project Co for the Maintenance and Rehabilitation Services as prescribed in Schedule 16 Article "B Specific Encumbrances" within the scope of the Maintenance and Rehabilitation Services as may be required by the City reconciliation, acting reasonably and for the purpose of the City's recovery of the Maintenance and Rehabilitation Services costs from Third Parties as applicable.
- (ii) In support of Article 1.8(d)(i), Project Co shall provide the City with the specific and discrete Monthly Activity Report as prescribed in Article 1.8(a)(iii) for the Maintenance and Rehabilitation Services provided at each of the locations as defined in Article 1.8(d)(i).
- (iii) In such, specific Monthly Activity Report provided by Project Co for the purpose of Article 1.8(d), Project Co shall include a detailed accounting of Project Co's labour, equipment and materials used in support of Project Co's Maintenance and Rehabilitation Services activities described in the respective Monthly Activity Reports, and present all costs for labour, equipment, and materials including all payroll burden, overhead markups and profit, under the signature of a Project Co representative responsible for the authenticity and declaration of the preparation and representation of the respective Maintenance and Rehabilitation Services rendered.
- (iv) No later than 90 days prior to the anticipated start of the Maintenance Period, Project Co shall submit the unit rates, payroll burdens, markups and profit margins that are to be used to determine the specific Maintenance and Rehabilitation Services costs, and annually thereafter the start of the Maintenance Period no later than 90 days from Project Co's fiscal year end or as may be proposed by Project Co and approved by the City.
- (v) In all instances, the information provided by Project Co pursuant to Article 1.8(d)(iv) shall be submitted under the signature of Project Co's authorized representative, and whereby Project Co's representative authenticates and declares the unit rates, payroll burdens, markups and profit margins are derived using generally acceptable accounting principles and commensurate of the Maintenance and Rehabilitation Services rendered.
- (vi) All costs recovered by the City for the shared Maintenance Services shall be for the City's benefit and use, and for certainty, the City has no obligation to surrender to Project Co, in whole or part thereof, any such shared Maintenance and Rehabilitation Services costs recovered by the City.
- (vii) Article 1.8(a)(i) applies to all Project Co deliverables described under Article 1.8(d).

1.9 Project Co access for the City to Maintain City Assets

- (a) The City shall, acting reasonably and subject to Article 1.5, require access to Maintain City assets from time to time during the Maintenance Period which Maintenance activities includes but is not limited to:
 - (i) Inspect assets to be maintained by the City of Ottawa including but not limited to various existing retaining wall and/or Bridge Structures and / or Dow's Lake Tunnel.
 - (ii) To effect repairs to assets to be maintained by the City of Ottawa using City resources or resources contracted to the City of Ottawa.
 - (iii) To contract with Project Co for repairs to City assets in the event that Project Co prices to perform the work are considered reasonable and commercially acceptable.
- (b) The City shall submit access requests no less than 2 weeks prior to the monthly maintenance coordination meeting described in Article 1.5(b) that precedes the City's desired access.
- (c) Upon receiving the City's notice requesting Project Co access for work on, under, over or adjacent to the right of way requiring Project Co access through the System, equipment or personnel, Project Co shall coordinate with the City for each to achieve their respective obligations.

1.10 Utilities

- (a) The City shall be responsible for the payment to all Utility Companies for the consumption of water, electricity, propane required for Track switch heating equipment, and natural gas throughout the Maintenance Period, notwithstanding the Project Co responsibilities as indicated in Schedule 19 Payment Mechanism and the Project Co responsibilities in Article 1.10(b) of Schedule 15-3, Appendix A. For further certainty regarding the propane required for Track switch heating equipment, the City shall:
 - (i) be the Utility Company that will supply any propane required by Project Co for Track switch heating equipment;
 - (ii) not be obligated to provide any propane supply amount over the quantity requested by Project Co as per article 1.10(b)(iv) of this Schedule 15-3; and
 - (iii) be responsible to provide Project Co with the propane supplier's contact information to allow Project Co to fulfill their responsibilities set out in article 1.10(b)(v) of this Schedule 15-3.
- (b) Project Co shall be responsible for Utility work and costs and or Utility service connections and costs to the Utility Infrastructure required for the System prescribed as follows:
 - (i) Relocation and / or installation of new utilities and or Utility service connections to the Utility Infrastructure resulting from Project Co's responsibility and performance of the requirements included Schedule 15-3;

- (ii) Removal and / or decommissioning of existing utilities and or Utility service connections to the Utility Infrastructure resulting from Project Co's responsibilities and performance of the requirements included in Schedule 15-3;
 - (iii) All approvals, permits, and costs determined by the Utility Company resulting from Project Co's performance of the requirements included in Article 1.10(b). For further certainty, all such approvals and permits shall be contemplated as Project Co Permits;
 - (iv) Prior to July 1 of any year within the Maintenance Period, Project Co may provide a written request to the City to adjust the quantity of propane required for the next winter season. If Project Co fails to provide such written request by July 1 of any given year during the Maintenance Period, the City shall provide a quantity of propane for the next winter season that is equal to the amount provided for the previous winter season; and
 - (v) To contact and coordinate with the City's propane supplier as referenced in article 1.10(a)(iii) of this Schedule 15-3 with any refill requirements during the Maintenance Period.
- (c) During the Maintenance Period, Project Co shall be responsible for co-ordinating maintenance activities with the Utility Companies, as required, to ensure that the Utility Infrastructure can provide the water, electricity, propane required for Track switch heating equipment, and natural gas required by the System.
- (d) For further certainty, during the Maintenance Period, Project Co is not responsible for the Utility Infrastructure within the Lands including any changes determined by the Utility Company without limiting Project Co's responsibilities specifically included in Article 1.10(b) and Project Co's responsibilities for protecting infrastructure during Project Co's performance of the Maintenance Services throughout the Maintenance Period.

1.11 Artwork

- (a) Project Co shall be responsible for all Maintenance Services required for artwork provided for in Schedule 15-2 Part 4 – Stations.
- (b) Project Co shall:
 - (i) Clean and maintain all artworks in the art program in accordance with an annual Maintenance schedule as part of the overall Station Maintenance program;
 - (ii) Consult every five years, or as required due to damage, with a professional conservator to provide a condition report on each art project;
 - (iii) Take any necessary action to mitigate any recommendations within these condition reports; and,
 - (iv) Provide overstock on art materials at the time of installation and fabrication of artwork, where applicable, in order to assist in the long-term Maintenance of art projects.

1.12 Maintenance Coordination with Third Party Land Interest Holders

(a) General

- (i) Subject to this Article 1.12, Project Co shall coordinate the Maintenance and Rehabilitation Services with the activities of the Ottawa Airport, NRC, [REDACTED], [REDACTED], [REDACTED], MTO, and RTG (“**Third Party Land Interest Holders**”), so as to facilitate effective implementation of both the Maintenance and Rehabilitation Requirements and the Operational Requirements and Specifications, provided that:
- A. at no time shall activities or the performance of activities in respect of Third Party Land Interest Holders infrastructure not considered to be part of the System Infrastructure be adversely affected by Maintenance and Rehabilitation Services; and
- B. Project Co shall use all reasonable efforts in accordance with Good Industry Practice to prevent any complete or partial shutdown of the Third Party Land Interest Holders’ infrastructure notwithstanding the provisions of:
- (I) this Article 1.12 including Article 1.12(c) (Scheduled Maintenance and Rehabilitation Services); and
- (II) Article 1.5 (e) (Major Maintenance Shutdown Periods) of this Appendix A.
- (ii) The agreements between the City and Ottawa Airport, NRC, [REDACTED], [REDACTED], [REDACTED] and MTO are respectively referred to in Schedule 33 as Third Party Access Agreements; the agreement with [REDACTED] is referred to in subarticle (viii) of this Article 1.12. Cooperation, Communication, and Coordination.

(b) Cooperation, Communication, and Coordination

- (i) Project Co shall work with each of the Third Party Land Interest Holders in order to achieve a common objective of the parties’ respective maintenance and rehabilitation objectives.
- (ii) Project Co shall coordinate activities with each of the Third Party Land Interest Holders to reduce outages and inconvenience to System Users and beneficiaries of the Third Party Land Interest Holders infrastructure.

(c) Scheduled Maintenance and Rehabilitation Services

- (i) Project Co shall not undertake scheduled Maintenance and Rehabilitation Services unless the relevant Third Party Land Interest Holder’s infrastructure owner has been notified in writing five days prior to the commencement of such scheduled Maintenance and Rehabilitation Services.
- (ii) Project Co shall perform scheduled Maintenance and Rehabilitation Services adjacent to Third Party Land Interest Holders infrastructure outside Revenue Service Hours, unless:

- A. Project Co can demonstrate that the scheduled Maintenance and Rehabilitation Services have limited or no impact on the Third Party Land Interest Holders infrastructure and System Users; and
 - B. in the event that Project Co carries out approved Maintenance and Rehabilitation Services during Revenue Service Hours, Schedule 19 – Payment Mechanism shall continue to apply and Project Co shall be held accountable for all Availability Failures, Quality Failures, or Service Failures that occur during such periods.
- (d) Unscheduled Maintenance and Rehabilitation Services
- (i) If Project Co becomes aware of a defect or deficiency of the Third Party Land Interest Holders infrastructure, Project Co shall inform the City and the Third Party Land Interest Holder of that defect or deficiency.
 - (ii) Upon discovering or becoming aware of a defect or deficiency of the Third Party Land Interest Holders infrastructure in which such defect or deficiency presents an immediate danger to the Safety and Security of the System, Project Co shall commence Corrective Maintenance, as required to ensure the Safety and Security of the System. Project Co shall notify the City and Other of the Corrective Maintenance by Project Co at the time the Corrective Maintenance is performed.
- (e) Access to Lands by Third Party Land Interest Holders
- (i) Airport Authority
 - A. The Airport Authority may require access to the Airport Lands (as defined in the Airport Authority MOU) from time to time in the interests of the safety and security of the Airport. Upon receiving notification from the City, Project Co shall provide access to the Airport Authority via the Trillium Line System when required. Such cooperation by Project Co shall be governed by the Airport Authority MOU, Airport Authority Sublease, Airport Authority Construction Agreement and Airport Authority Operating Agreement.
 - (ii) National Research Council of Canada's ("NRC")
 - A. The NRC may require access to the Lands from time to time in the interests of moving freight to and from their facility located at 2320 Lester Road in Ottawa, Ontario (the "NRC Facility") and maintaining the NRC connecting track to the Trillium Line's freight spur beyond the Lands. Upon receiving notification from the City, Project Co shall provide access via the Trillium Line System when required. Such access shall be governed by the provisions of the Rail Car Transfer Agreement between the City and the National Research Council of Canada referenced in Schedule 33-Lands to the Project Agreement.
 - (iii) [REDACTED] Separation
 - A. [REDACTED] may require access to the Lands from time to time in the interests of their infrastructure that crosses the Lands and for certainty, includes

but is not necessarily limited to the new track and guideway infrastructure created by the grade separation contemplated in Schedule 15-2, and contemplated Elwood Diamond for future freight access. Such access shall be governed by the provisions of the agreements between the City and [REDACTED] referenced in Schedule 33-Lands to the Project Agreement.

(iv) [REDACTED] (Walkley Interlocking)

- A. [REDACTED] may require access to the Lands from time to time in the interests of their infrastructure immediately adjacent to the Lands, moving freight on and across the Lands, and for certainty, includes but is not necessarily limited to the existing [REDACTED] Walkley Line and for certainty connecting tracks east and west of the Walkley Diamond.
- B. Project Co's costs associated with the Walkley Diamond are provided as follows:
 - i Project Co shall be responsible for all Maintenance Services associated with the Walkley Diamond as detailed in the [REDACTED] / City agreement. All Project Co costs for Maintenance Services on the Walkley Diamond as contemplated by the City / [REDACTED] agreement shall be included within Project Co's Maintenance Services pricing and for further certainty shall not constitute a Variation; and
 - ii All Project Co costs specific to Project Co's access required to facilitate [REDACTED] freight movements on or across the lands except those already contemplated under Article 1.12 (e)(i) in this schedule 15-3 Appendix A shall be governed by the applicable provisions of Schedule 33-Lands, and Schedule 16-Encumbrances to the Project Agreement.
- C. Project Co shall be responsible for all maintenance within the Walkley Interlocking as prescribed in the [REDACTED]/City Agreement. Project Co's responsibilities include but are not necessarily limited to the tracks operated by Capital Railway (Walkley Yard Main Lead Track, north and south connecting tracks and Ellwood Subdivision), all signal maintenance between Signals 1,5,6,203, 205, 210 and 212 (limits of the interlocking) and the Walkley Diamond. For further certainty, [REDACTED] is responsible for the track maintenance on the [REDACTED] Walkley Line (excluding the Walkley Diamond track piece) between Signals 203, 205 and 210, notwithstanding the cost share contemplated by the [REDACTED]/City Agreement.

(v) [REDACTED]

- A. [REDACTED][REDACTED] may require access to the Lands from time to time in the interests of their infrastructure that crosses the Lands and for certainty, includes but is not necessarily limited to the existing tunnel network serving as an east west connection within the campus, existing underground utility corridor, Campus Avenue bridge, and the existing/proposed expansion of the parkade structure.. Upon receiving notification from the City, Project Co shall provide access via the Trillium Line System when required. Such access governed by the applicable provisions of the agreements between the City and [REDACTED]

referred to in Schedule 33-Lands, and Schedule 16-Encumbrances to the Project Agreement.

(vi) MTO

- A. MTO may require access to the Lands from time to time in the interests of their infrastructure that crosses the Lands and for certainty, includes but is not necessarily limited to the proposed Highway 417 bridge. Upon receiving notification from the City, Project Co shall provide access via the Trillium Line System when required. Such access shall be governed by the applicable provisions of the agreements with MTO referred to in Schedule 33-Lands to the Project Agreement.

(vii) [REDACTED]

- A. [REDACTED] may require access to the Lands from time to time in the interests of their infrastructure that crosses and or is immediately adjacent to the Lands and for certainty, includes but is not necessarily limited to the proposed Pedestrian connection between Bayview Station and the proposed development at [REDACTED]. Upon receiving notification from the City, Project Co shall provide access via the Trillium Line System when required. Such access shall be governed by the applicable provisions of the agreements with [REDACTED] referred to in Schedule 33-Lands to the Project Agreement.

(viii) Bayview Station ([REDACTED])

- A. [REDACTED] may require access to the Lands from time to time in the interests of their infrastructure that is immediately adjacent to the Lands and for certainty, includes but is not necessarily limited to the new Confederation Line Bayview Station. Upon receiving notification from the City, Project Co shall provide access to the structural elements of the Bayview Station. Such access shall be governed by the applicable provisions of the Capital Railway rules, regulations, and the Standard Operating Procedures.

1.13 Regulatory Authority Rulings

- (a) Without derogation of the City's rights to remedy any defects or deficiencies in, and the City's rights to deduct all monetary penalties resulting from, Project Co's failure to comply with the requirements of the Project Agreement including, without limiting the generality of the foregoing, Failure Points allocated to Project Co pursuant to Schedule 19 Payment Mechanism, the City shall notify and provide to Project Co, no later than 5 business days of receiving following receipt of claims, demands, notices of violation, notices of fines, penalties, assessments, levies and supporting details issued to the City by a Regulatory Authority in connection with or arising from Project Co's performance of the Project Operations.
- (b) The City shall have the right to recover the fines, penalties, assessments and levies imposed by a Regulatory Authority against the City or any City Party where the act or omission resulting in the fines, penalties assessments and levies imposed are a direct consequence of Project Co' failure to perform the Project Operations.

- (c) Subject to subsection (d) below, Project Co shall have the right, at Project Co's cost and risk, to request the City to contest or appeal any fines, penalties, assessments and levies imposed by a Regulatory Authority arising from Project Co' failure to perform the Project Operations in accordance with the Maintenance Dispute Resolution Procedure detailed in Schedule 15-3.
- (d) The monetary penalties sanctioned by a Regulatory Authority themselves are not subject to Dispute by Project Co with the City within under the Dispute Resolution Procedure in the Project Agreement, while but the City may pursue an appeal available by a Regulatory Authority for the benefit of Project Co in accordance with subsection (c) above when evidence by either the City or Project Co is supportive of such an appeal. A decision of a Regulatory Authority where appeal opportunities are exhausted are considered final. When an appeal is exercised, the City shall provide the final written decision from a Regulatory Authority to Project Co within 5 business days.
- (e) The final monetary penalties sanctioned by a Regulatory Authority shall be set off and deducted by the City, acting reasonably and upon completion of the Maintenance Dispute Resolution Process or a final determination of the Regulatory Authorities appeal process, from Project Co's next regular payment administered pursuant to Schedule 19 Payment Mechanism.

1.14 Freight Movements within the Trillium Line Railway Corridor

- (a) Project Co shall perform all maintenance services to allow for freight movements as may be requested by the City from time to time, and for certainty, freight movements for NRC to their facility at the end of the freight spur line just south of Lester Road.

ARTICLE 2 MAINTENANCE AND PERFORMANCE STANDARDS

2.1 Applicable Standards

- (a) Project Co shall at all times and in all respects undertake the Maintenance required:
- (i) to meet the Design and Construction Requirements for the System;
 - (ii) so that the Design Life of the System including its components and subsystems is realized throughout the Maintenance Period;
 - (iii) in accordance with Law;
 - (iv) in accordance with regulatory requirements applicable to federally controlled railroads;
 - (v) in accordance with the Safety Management System;
 - (vi) in accordance with the Security Management System;
 - (vii) to permit the Operation of the System to meet all Scheduled Revenue Service Kilometres in accordance with the Operations Service Plan;
 - (viii) to ensure that the Maintenance of the System is sufficient to permit the Operation of the System to meet the Operational Requirements and Specifications, including without limitation the Headway required by the Operational Requirements and Specifications , issues related to the Operation of the System, or any other matters unrelated to design, construction and Maintenance; and
 - (ix) to meet or exceed the Maintenance and Service requirements including for further certainty the Attachments to this Schedule 15-3.

2.2 Quality Performance Criteria

- (a) Project Co shall comply with the requirements set out in this Schedule 15-3 and the Project Agreement.
- (b) In event that the City identifies or is notified of a Deficiency in the System which constitutes a failure to meet the Quality Performance Criteria, as defined in the Attachments to this Appendix, including as a result of any report by an Operator, the City shall promptly provide notification to Project Co of the existence of the Deficiency through the Help Desk Services.

ARTICLE 3 OPERATION OF THE SYSTEM

3.1 Operation by City

- (a) The City shall be responsible for the operation of the System.

3.2 Service Level

- (a) Operating Headway:

- (i) Project Co shall design the System to support a reliable operating headway of 12 minutes on both the mainline and Airport Link services utilizing the proposed passing sidings as specified in PA Schedule 15-2 – Design and Construction Requirements.

- (b) Operating Configuration:

- (i) Weekdays

- A. Trains with a minimum capacity of 420 passengers operating on 12-minute headways on the mainline between Bayview Station and Limebank Station.

- B. Trains with a minimum capacity of 240 passengers operating on 12-minute headways on the Airport Link between Airport Station and South Keys Station.

- (ii) Weekends

- A. Trains with a minimum capacity of 240 passengers, operating on 12-minute headways on the mainline between Bayview Station and Limebank Station.

- B. Trains with a minimum capacity of 240 passengers, operating on 12-minute headways on the Airport Link between Airport Station and South Keys Station.

- (c) Unless otherwise agreed by Project Co and the City, on the Revenue Service Commencement Date Project Co shall be required to provide Service Level 1.

- (d) The City may vary any aspect of the Operations Service Plan in its sole discretion, subject to the notice periods provided for in Section 3.3, below, and subject to any rights of Project Co granted by this Section 3 to the extent that such variance of the Operations Service Plan results in a Service Change.

- (e) During delay causing events, the City shall implement delay management strategies that minimizes the impact and inconvenience to the majority of customers. During such delay causing events, it is the City's intent when practical to maintain some level of rail service on unaffected segments of the Expanded Trillium Line system supplemented by a bus bridge operation around an affected segment.

- (f) The City may require Project Co to provide Service Level 5 as provided in Attachment 2 of this Schedule 15-3 in the event the Interim Substantial Completion Date as prescribed in the Project Agreement is implemented. Notwithstanding the reduced limit of operations prescribed in

Service Level 5, Project Co shall be required to perform all Maintenance Services for the System, with the following specific requirements to Service Level 5:

- (i) Existing Revenue Service Vehicles shall be used to deliver Service Level 5;
- (ii) Bowesville, Limebank, Leitrim, Airport, Uplands and South Keys Stations shall be locked and secured in accordance with article 5.2 of this Schedule 15-3;
- (iii) All elevators within the Stations indicated in article 3.2(e)(i) of this Schedule 15-3 shall be restricted from public use;
- (iv) New Revenue Vehicles not delivered, tested and commissionined prior to Interim Substantial Completion shall be managed in accordance with Schedule 39 Trillium Vehicle Supply Contract; and
- (v) All regulatory requirements, and for certainty, inspections, reporting, and Maintenance applies.

3.3 Booking Process

- (a) The City shall provide to Project Co, at least 30 calendar days prior to the commencement of each quarterly Booking (quarterly Booking dates are normally January 1, end of April, End of June, and start of September of each year), the Revenue Service requirements for that Booking period in the form of:
 - (i) confirmation of the Service Level and Operations Service Plan for that Booking period;
 - (ii) the number of Vehicles constituting the minimum required fleet throughout each day during that Booking period, in accordance with the relevant Service Level (the “Scheduled Revenue Service Vehicles”); and
 - (iii) the Train consist assignments and pull-out schedule during that Booking period.
- (b) The City may modify the Booking for a given day (including the Train consist assignments and Scheduled Revenue Service Vehicles for any period of the service day) provided that the City gives Project Co at least seven calendar days’ notice.
- (c) The City may request a modification to the Booking for a given day (including the Train consist assignments and Scheduled Revenue Service Vehicles for any period of the service day) less than seven calendar days before the proposed modification. If such a request is made, less than seven calendar days before the proposed Booking modification, Project Co and the City shall mutually make reasonable efforts to provide the modified level of service while preserving Project Co’s ability to fulfill its Maintenance and Rehabilitation Services obligations.

3.4 Hand Off of Trains

- (a) Project Co shall ensure that, at the start of Revenue Service, the Scheduled Revenue Service Vehicles are composed into Train consists according to the Operations Service Plan requirements

and are made available to the City, in accordance with the Vehicle Availability Standards of Appendix A, to be entered into Revenue Service.

- (b) Project Co shall develop, in consultation with the City, clear procedures for the release and assignment of Trains at the start of Revenue Service as required pursuant to Schedule 15-2, Part 1, Article 3 - Operational Performance Requirements, and Capital Railway rules, regulations and the Standard Operating Procedures.
- (c) Project Co and the City shall mutually make reasonable efforts such that during Off-Peak Periods and outside of Revenue Service Hours, Vehicles which are not in Revenue Service and which the City in its discretion has not elected to utilize for Operator training, special events or other purposes as the City shall determine, from time to time, shall be made available to Project Co in the New Walkley Yard for Maintenance activities. The City shall, in exercising its discretion, take into account the obligations of Project Co to perform the Maintenance and Rehabilitation Services.

3.5 Service Level Increase

- (a) The City may require a Service Level Increase by providing written notice to Project Co clearly indicating the desired new Service Level and the date on which such new Service Level is to be implemented and in accordance with Article 3.3,. On the Service Level Increase Date, the scope of Project Co's Maintenance and Rehabilitation Services obligations shall become based on the requested Service Level.
- (b) A Service Level Increase shall trigger a change in the Annual Service Payment – Service Portion, in accordance with Schedule 19 – Payment Mechanism, on the Service Level Increase Date. .

3.6 Service Level Decrease

- (a) The City may require a Service Level Decrease by providing written notice to Project Co clearly indicating the desired new Service Level and the date on which such new Service Level is to be implemented and in accordance with Article 3.3,. On the Service Level Decrease Date, the scope of Project Co's Maintenance and Rehabilitation Services obligations shall become based on the requested Service Level.
- (b) A Service Level Decrease shall trigger a change in the Annual Service Payment – Service Portion, in accordance with Schedule 19 – Payment Mechanism, on the Service Level Decrease Date. Maintenance and Rehabilitation Services

3.7 Operator Training

- (a) Following the Revenue Service Commencement Date, the City shall provide all required training and certification of Operators of Revenue Service Trains.

3.8 Capital Railway Rules, Regulations and Standard Operation Procedures

- (a) Project Co shall abide by the Capital Railway rules, regulations and the Standard Operating Procedures, where applicable, in its performance of the Maintenance and Rehabilitation Services.

- (b) Project Co shall cooperate with the City in the ongoing development of the Capital Railway rules, regulations and the Standard Operating Procedures.
- (c) throughout the Maintenance Period, including the identification and implementation of such changes and adjustments to the Capital Railway rules, regulations and the Standard Operating Procedures.
- (d) as the City may in its discretion, but with the participation of Project Co, deem advisable.
- (e) Project Co shall prepare and abide by Maintenance policy and procedure manuals as required in Schedule 14 - Commissioning which set out instructions to employees and technical procedures for the provision of Maintenance and Rehabilitation Services. All policy and procedure manuals shall comply with the provisions of this Schedule 15-3. Project Co shall provide ongoing training to its employees and shall monitor the performance of all Maintenance and Rehabilitation Services so as to ensure the policies and procedures are complied with.
- (f) Project Co shall implement quality control and assurance procedures, including without limitation the requirements set out in Schedule 11 – Integrated Management System Requirements, as amended from time to time, in respect of the Maintenance and Rehabilitation Services.

ARTICLE 4 SYSTEM INFRASTRUCTURE

- (a) Project Co shall be responsible for Maintenance and Rehabilitation Services on the System Infrastructure, and for certainty does not include the following:
- (i) structural elements of Dows Lake Tunnel;
 - (ii) Bridges not carrying Vehicles, except as otherwise indicated in the Schedule 15-2 and Schedule 15-3. Generally and unless expressly stated otherwise in Schedule 15-2,
 - A. where the grade separation contemplates rail over other infrastructure / obstacles (road, MUP, water, Transitway, Railway), all aspects of the infrastructure required to support the rail over the other shall be considered System Infrastructure;
 - B. where the grade separation contemplates other infrastructure (road, MUP, rail, Utility) over rail, all aspects of the infrastructure required to support the other over the rail shall be New Municipal Infrastructure;
 - C. there are instances where there are MUP Bridges in which such infrastructure required to support the MUP are categorized as System Infrastructure including but not limited to the MUP Bridge over Hunt Club and the MUP Bridge connecting Bayview Station to 900 Albert Street. For certainty, the City has no responsibility for maintenance of these MUP Bridges, such as surface maintenance, snow-clearing, etc.
 - (iii) communications systems and PA / PIDs supplied and maintained pursuant to Schedule 15-2, Part 4 – Stations (to the extent of the obligations identified as City or Other responsibilities in the Maintenance Responsibility Table);
 - (iv) watermains;
 - (v) sanitary sewers;
 - (vi) street lights and illumination required for City's streets, roadways, parking lots, and active transportation systems;
 - (vii) traffic signals not part of Train Control;
 - (viii) Third Party Works;
 - (ix) Airport Authority performed Works;
 - (x) NRC connecting tracks and infrastructure outside of the Lands;
 - (xi) [REDACTED] existing infrastructure as defined in the Elwood Subdivision, including proposed infrastructure crossing the Trillium Line grade separation for [REDACTED];
 - (xii) [REDACTED] Walkley Line as defined in the [REDACTED] / City Agreement;

- (xiii) Existing Walkley MSF including all MOW supporting the Existing Walkley MSF;
 - (xiv) [REDACTED] existing and proposed infrastructure outside of the Lands, notwithstanding the interface resulting from the connection of [REDACTED] existing and proposed infrastructure to the Lands;
 - (xv) MTO existing and proposed infrastructure outside of the Lands, notwithstanding the interface resulting from the connection of MTO's existing and proposed infrastructure to the Lands; and
 - (xvi) [REDACTED] existing and proposed infrastructure outside of the Lands, notwithstanding the interface resulting from the connection of [REDACTED]'s existing and proposed infrastructure to the Lands.
- (b) The City shall be responsible for the Maintenance and Rehabilitation Services of all MUPs, with the following exceptions that remain with Project Co:
- (i) certain MUP Bridges which are designated as System Infrastructure, such as those over Hunt Club Road, Lester Road, and all at [REDACTED];
 - (ii) portions of the MUP that are required by Project Co which provide access to the System Infrastructure; and
 - (iii) portions of the MUP that are required for the egress and fire safety plan to the designated point of refuge.
- (c) If existing infrastructure that falls within the Lands is modified or altered or improved by Project Co, Project Co shall be responsible for the existing infrastructure which modifications, alterations, or improvements have adversely or are considered detrimental to the life cycle or asset preservation requirements and Project Co using all applicable regulations, codes, and specifications and applying engineering principles and Good Industry Practices cannot demonstrate to the City, with the City acting reasonably, that the modifications or alterations or improvements are not detrimental to the existing infrastructure.

ARTICLE 5 SECURITY

5.1 System Security

- (a) The City shall provide Security for the System, except as otherwise expressly provided in this Schedule 15-3. The City shall have governing and paramount authority for all matters of Security on or relating to the System. Project Co shall cooperate with the City to ensure the Safety and Security of the public, Passengers, employees and the System.

5.2 Project Co's Security Obligations

- (a) Project Co shall be responsible for locking and unlocking all doors or gates (except fare gates remotely controlled by Operator) required to:
- (i) control Passenger access to the System, and for further certainty by ensuring the Stations are available pursuant to the Station Access Standard as described in Attachment 7 of Appendix A to this Schedule 15-3. This includes ensuring, in cooperation with Special Constables Unit, that all Passengers have left the public areas of the Trillium Line System . For further clarity, Project Co shall be physically present for Station locking and unlocking or Project co shall provide adequate remote equipment including surveillance to verify Stations are remotely locked or unlocked in accordance with the Station Access Standard prescribed in Attachment 7 Article 3(b)(i);
 - (ii) restrict unauthorized entry or trespassing to the System through engineering controls, and for further certainty to ensure the System is unavailable and not accessible by unauthorized persons, public, or Passengers; or
 - (iii) control or allow Passenger and workers egress or evacuation from the System when an Emergency situation is declared and Emergency response and preparedness requires evacuation from the System as being part of the Standard Operating Procedures for such an Emergency.
- (b) Project Co shall provide Security for the New Walkley Yard, subject to the City's governing and paramount authority for Security as provided in Article 5.1(a). Project Co shall, without limitation:
- (i) erect and maintain fencing along the perimeter of the New Walkley Yard to prevent unauthorized entry;
 - (ii) establish and monitor Security measures so as to protect the New Walkley Yard from unauthorized entry, criminal activity and vandalism, which measures may include but shall not be limited to:
 - A. security alarm systems;
 - B. Maintenance staff competently trained in the provision of Security for the System, working 24 hours per day from Monday to Sunday;

- C. card access entry systems;
 - D. closed circuit television systems; and
 - E. the establishment of secure public zones;
- (iii) respond to incidents of unauthorized entry to or criminal activity within the New Walkley Yard. Project Co shall notify the City of such incidents in accordance with the Standard Operating Procedures.
- (c) Project Co shall establish policies and procedures with respect to Security for the New Walkley Yard in compliance with this Schedule 15-3. Project Co's Security policies and procedures shall be submitted to the City for its review and approval.
- (d) Project Co's performance of the Maintenance and Rehabilitation Services, including its Security obligations, shall comply with:
- (i) the Standard Operating Procedures regarding Security for the System;
 - (ii) any Security policies and procedures and Security Standards with respect to the System; and
 - (iii) any directions or instructions from the City with respect to the City's Security policies and procedures.
- (e) In the event that, in the ordinary course of its performance of the Maintenance and Rehabilitation Services, Project Co becomes aware of any criminal or other activity on the System which it appears may pose a threat to the Safety and Security of the public and/or the System, Project Co shall immediately notify the City of such activity.
- (f) For further certainty, in the event of an Emergency, or in the event that, in the discretion of the City, it shall be desirable for ensuring the Safety or Security of the public, Passengers or the System, the City shall have the right to establish additional Security measures for the System, and Project Co shall immediately comply with such additional Security measures as directed by the City.
- (g) In furtherance of the authority of the City referred to in this Schedule 15-3, the City shall be entitled to approve any and all plans and procedures of Project Co with respect to the Security obligations of Project Co contained in Article 5.1 and to make inspections from time to time in the City's discretion to ascertain whether Project Co is in compliance with the Security obligations of Project Co contained in Article 5.2.
- (h) The provisions contained in Article 5.2 shall not derogate from Project Co's primary responsibility to provide all Security for the New Walkley Yard.

5.3 Project Co's Employees

- (a) Project Co shall establish and implement a system of security clearance and identification with respect to its employees, to be approved by the City. Project Co's system of security clearance and identification shall comply with the Employee Security Standard. Project Co shall ensure that each of its employees have met the Employee Security Standard.

5.4 Compliance with System Security

- (a) Project Co shall comply with any and all decisions of the City respecting matters of Security affecting the System. The City may direct Project Co to effect compliance with the Safety and Security Standard (“**City Direction**”) and Project Co shall forthwith act in accordance with such directions in the performance of the Maintenance and Rehabilitation Services under this Schedule 15-3, including its Security obligations. In the event that the City amends the Safety and Security Standard, the City shall issue a City Direction and Project Co shall forthwith comply with the amended Safety and Security Standard in its performance of the Maintenance and Rehabilitation Services, including its Security obligations.

5.5 Changes to Security

- (a) For further certainty, in the event that the City amends the Employee Security Standard or the Security Standard with the result that Project Co's costs of compliance are increased, the amendment shall constitute a Variation and the provisions of Schedule 21 – Variation Procedure shall apply. The City shall inform Project Co of any change to the Employee Security Standard where such change affects the employees.

ARTICLE 6 TECHNICAL CAPACITY

- (a) Project Co shall ensure that, as a result of Project Contracts and Sub-Contracts into which it has entered in accordance with the Project Agreement, it has the necessary professional capabilities, qualifications, licences, skilled personnel, experience, expertise and financial resources, and that it shall provide the necessary tools, equipment and materials, to perform the Maintenance and Rehabilitation Services in an efficient, professional and timely manner in accordance with the terms and conditions of the Project Agreement.
- (b) Project Co shall ensure that the management assigned to the Maintenance and Rehabilitation Services, including the management of Project Co, Project Contractors and the Sub-Contractors, as applicable, shall have knowledge and expertise in the area of maintenance of rail systems, and all components thereof including Rolling Stock, sufficient to fulfill Project Co's obligations under the Project Agreement, and additionally that such management shall have authority to make decisions concerning the daily functions and management of the Maintenance and Rehabilitation Services consistent with the Project Agreement.
- (c) Technical Support
 - (i) In addition to the requirements of Schedule 14 – Commissioning and notwithstanding Project Co's obligations included in this Schedule 15-3, Project Co shall provide sufficient technical support and capacity during the Maintenance Period. In fulfilling this requirement, Project Co shall:
 - A. coordinate with the City for the most efficient and least disruptive effect on the Operation of the System, when the Operation of the System is impaired as a result of any Maintenance Service deficiency;
 - B. coordinate Project Co service providers and deploy Corrective Maintenance Plans required to address any Maintenance Service deficiency; and
 - C. consider lessons learned during this period and propose any improvements to the Maintenance and Rehabilitation Plan, Capital Railway rules, regulations and the Standard Operating Procedures.

APPENDIX A – ATTACHMENT 1

MAINTENANCE AND REHABILITATION PLAN

Project Co shall prepare and submit the Maintenance and Rehabilitation Plan to be attached as Appendix A Attachment 1 in accordance with this Schedule 15-3.

APPENDIX A – ATTACHMENT 2

OPERATIONS SERVICE PLAN

The Operations Service Plan is a “living” document . The City controls the Operations Service Plan and may amend or change the Operations Service Plan within the terms of the Project Agreement, and may be required to compensate Project Co for such changes in accordance with the terms of the Project Agreement.

The Operations Service Plan attached at Financial Close is a baseline reference document. It defines the Service Levels for the duration of the PA and acts as a reference point for measuring any variation from the service level that Project Co based its Proposal upon.

Service Level 1 - Base Service Plan

Limebank to Bayview												South Keys to Airport													
	Period		Duration	Headway	Round Trips	Roundtrip Run Time	Total Terminal	Cycle Time	Revenue Train Hours	Route Length	Revenue Train KM	Trains in Service	Operators in Service	Revenue Operator Hours	Headway	Round Trips	Roundtrip Run Time	Total Terminal	Cycle Time	Revenue Train Hours	Route Length	Revenue Train KM	Trains in Service	Operators in Service	Revenue Operator Hours
Mon-Thurs	AM	6am-9am	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
	PM	3pm-6pm	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Late	6pm-12am	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
									126		3,294.0			144.0						36		756.0			54.0
Friday	AM	6am-9am	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
	PM	3pm-6pm	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Late	6pm-12am	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
									126		3,294.0			144.0						36		756.0			54.0
Saturday	AM	6:30am-9am	2.5	12	12.5	62	22	84	18	18.3	457.5	7	8	20.0	12	12.5	15	9	24	5	4.2	105.0	2	3	7.5
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
	PM	3pm-6pm	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Late	6pm-12am	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
									123		3,202.5			140.0						35		735.0			52.5
Sunday / Hol	AM	7:30am-9am	1.5	12	7.5	62	22	84	11	18.3	274.5	7	8	12.0	12	7.5	15	9	24	3	4.2	63.0	2	3	4.5
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
	PM	3pm-5:30pm	2.5	12	12.5	62	22	84	18	18.3	457.5	7	8	20.0	12	12.5	15	9	24	5	4.2	105.0	2	3	7.5
	Late	5:30pm-11:30pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
									112		2,928.0			128.0						32		672.0			48.0
Annual Quantities																									
Mon-Thurs																									
Mon-Thurs	203	25,578				668,682					29,232														10,962
Fri	52	6,552				171,288					7,488														2,808
Sat	50	6,125				160,125					7,000														2,625
Sun/Hol	60	6,720				175,680					7,680														2,880
	365	44,975				1,175,775					51,400														19,275
Limebank Airport Total																									
Annual Revenue Train Hours	44,975	12,850				57,825																			
Annual Operator Hours	51,400	19,275				70,675																			
Annual Revenue Train Kilometers	1,175,775	269,850				1,445,625																			

Service Plan 2 - Early Start of Service

Limebank to Bayview

	Period		Duration	Headway	Round Trips	Roundtrip Run Time	Total Terminal	Cycle Time	Revenue Train Hours	Route Length	Revenue Train KM	Trains in Service	Operators in Service	On Track %
Mon-Thurs	AM	5am-9am	4	12	20	62	22	84	28	18.3	732.0	7	8	98.5%
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	98.5%
	PM	3pm-6pm	3	12	15	62	22	84	21	18.3	549.0	7	8	98.5%
	Late	6pm-12am	6	12	30	62	22	84	42	18.3	1,098.0	7	8	98.5%
									133		3,477.0			
Friday	AM	5am-9am	4	12	20	62	22	84	28	18.3	732.0	7	8	98.5%
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	98.5%
	PM	3pm-6pm	3	12	15	62	22	84	21	18.3	549.0	7	8	98.5%
	Late	6pm-12am	6	12	30	62	22	84	42	18.3	1,098.0	7	8	98.5%
									133		3,477.0			
Saturday	AM	5am-9am	4	12	20	62	22	84	28	18.3	732.0	7	8	98.5%
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	98.5%
	PM	3pm-6pm	3	12	15	62	22	84	21	18.3	549.0	7	8	98.5%
	Late	6pm-12am	6	12	30	62	22	84	42	18.3	1,098.0	7	8	98.5%
									133		3,477.0			
Sunday / Hol	AM	5am-9am	4	12	20	62	22	84	28	18.3	732.0	7	8	98.5%
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	98.5%
	PM	3pm-5:30pm	2.5	12	12.5	62	22	84	18	18.3	457.5	7	8	98.5%
	Late	5:30-11:30pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	98.5%
									130		3,385.5			

South Keys to Airpo

operator Hours	Headway	Round Trips	Roundtrip Run Time	Total Terminal	Cycle Time	Revenue Train Hours	Route Length	Revenue Train KM	Trains in Service	Operators in Service	Operat- or Hours
32.0	12	20	15	9	24	8	4.2	168.0	2	3	12.0
48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
152.0						38		798.0			57.0
32.0	12	20	15	9	24	8	4.2	168.0	2	3	12.0
48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
152.0						38		798.0			57.0
32.0	12	20	15	9	24	8	4.2	168.0	2	3	12.0
48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
152.0						38		798.0			57.0
32.0	12	20	15	9	24	8	4.2	168.0	2	3	12.0
48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
20.0	12	12.5	15	9	24	5	4.2	105.0	2	3	7.5
48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
148.0						37		777.0			55.0

Annual Quant

Mon-Thurs	203	26,999		705,831		30,6
Fri	52	6,916		180,804		7,9
Sat	50	6,650		173,850		7,6
Sun/Hol	60	7,770		203,130		8,8
	365	48,335		1,263,615		55,2

Annual Quantities

Mon-Thurs	203	7,714	161,994		11,571
Fri	52	1,976	41,496		2,961
Sat	50	1,900	39,900		2,850
Sun/Hol	60	2,220	46,620		3,330
	365	13,810	290,010		20,711

	Limebank	Airport	Total
Annual Revenue Train Hours	48,335	13,810	62,145
Annual Operator Hours	55,240	20,715	75,955
Annual Revenue Train Kilometers	1,263,615	290,010	1,553,625

Service Plan 3 - Late End of Service

Limebank to Bayview												South Keys to Airport													
	Period		Duration	Headway	Round Trips	Roundtrip Run Time	Total Terminal	Cycle Time	Revenue Train Hours	Route Length	Revenue Train KM	Trains in Service	Operators in Service	Operator Hours	Headway	Round Trips	Roundtrip Run Time	Total Terminal	Cycle Time	Revenue Train Hours	Route Length	Revenue Train KM	Trains in Service	Operators in Service	Operator Hours
Mon-Thurs	AM	6am-9am	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
	PM	3pm-6pm	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Late	6pm-1am	7	12	35	62	22	84	49	18.3	1,281.0	7	8	56.0						14	4.2	294.0	2	3	21.0
									133		3,477.0			152.0						38		798.0			57.0
Friday	AM	6am-9am	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
	PM	3pm-6pm	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Late	6pm-1am	7	12	35	62	22	84	49	18.3	1,281.0	7	8	56.0						14	4.2	294.0	2	3	21.0
									133		3,477.0			152.0						38		798.0			57.0
Saturday	AM	6:30am-9am	2.5	12	12.5	62	22	84	18	18.3	457.5	7	8	20.0	12	12.5	15	9	24	5	4.2	105.0	2	3	7.5
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
	PM	3pm-6pm	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Late	6pm-1am	7	12	35	62	22	84	49	18.3	1,281.0	7	8	56.0						14	4.2	294.0	2	3	21.0
									130		3,385.5			148.0						37		777.0			55.5
Sunday / Hol	AM	7:30am-9am	1.5	12	7.5	62	22	84	11	18.3	274.5	7	8	12.0	12	7.5	15	9	24	3	4.2	63.0	2	3	4.5
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
	PM	3pm-5:30pm	2.5	12	12.5	62	22	84	18	18.3	457.5	7	8	20.0	12	12.5	15	9	24	5	4.2	105.0	2	3	7.5
	Late	5:30pm-1am	7.5	12	37.5	62	22	84	53	18.3	1,372.5	7	8	60.0						15	4.2	315.0	2	3	22.5
									123		3,202.5			140.0						35		735.0			52.5

Annual Quantities					
Mon-Thurs	203	26,999		705,831	
Fri	52	6,916		180,804	
Sat	50	6,475		169,275	
Sun/Hol	60	7,350		192,150	
	365	47,740		1,248,060	
				54,560	

Annual Quantities					
Mon-Thurs	203	7,714		161,994	
Fri	52	1,976		41,496	
Sat	50	1,850		38,850	
Sun/Hol	60	2,100		44,100	
	365	13,640		286,440	
				20,460	

	Limebank	Airport	Total
Annual Revenue Train Hours	47,740	13,640	61,380
Annual Operator Hours	54,560	20,460	75,020
Annual Revenue Train Kilometers	1,248,060	286,440	1,534,500

Service Plan 4 - Extended Hours of Service

Limebank to Bayview												South Keys to Airport													
	Period		Duration	Headway	Round Trips	Roundtrip Run Time	Total Terminal	Cycle Time	Revenue Train Hours	Route Length	Revenue Train KM	Trains in Service	Operators in Service	Operator Hours	Headway	Round Trips	Roundtrip Run Time	Total Terminal	Cycle Time	Revenue Train Hours	Route Length	Revenue Train KM	Trains in Service	Operators in Service	Operator Hours
Mon-Thurs	AM	5am-9am	4	12	20	62	22	84	28	18.3	732.0	7	8	32.0	12	20	15	9	24	8	4.2	168.0	2	3	12.0
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
	PM	3pm-6pm	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Late	6pm-1am	7	12	35	62	22	84	49	18.3	1,281.0	7	8	56.0	12	35	15	9	24	14	4.2	294.0	2	3	21.0
									140		3,660.0									40		840.0			60.0
Friday	AM	5am-9am	4	12	20	62	22	84	28	18.3	732.0	7	8	32.0	12	20	15	9	24	8	4.2	168.0	2	3	12.0
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
	PM	3pm-6pm	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Late	6pm-2am	8	12	40	62	22	84	56	18.3	1,464.0	7	8	64.0	12	40	15	9	24	16	4.2	336.0	2	3	24.0
									147		3,843.0									42		882.0			63.0
Saturday	AM	6am-9am	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
	PM	3pm-6pm	3	12	15	62	22	84	21	18.3	549.0	7	8	24.0	12	15	15	9	24	6	4.2	126.0	2	3	9.0
	Late	6pm-2am	8	12	40	62	22	84	56	18.3	1,464.0	7	8	64.0	12	40	15	9	24	16	4.2	336.0	2	3	24.0
									140		3,660.0									40		840.0			60.0
Sunday / Hol	AM	8am-9am	1	12	5	62	22	84	7	18.3	183.0	7	8	8.0	12	5	15	9	24	2	4.2	42.0	2	3	3.0
	Mid	9am-3pm	6	12	30	62	22	84	42	18.3	1,098.0	7	8	48.0	12	30	15	9	24	12	4.2	252.0	2	3	18.0
	PM	3pm-5:30pm	2.5	12	12.5	62	22	84	18	18.3	457.5	7	8	20.0	12	12.5	15	9	24	5	4.2	105.0	2	3	7.5
	Late	5:30-11pm	5.5	12	27.5	62	22	84	39	18.3	1,006.5	7	8	44.0	12	27.5	15	9	24	11	4.2	231.0	2	3	16.5
									105		2,745.0									30		630.0			45.0

Annual Quantities					
Mon-Thurs	201	28,140		735,660	
Fri	51	7,497		195,993	
Sat	53	7,420		193,980	
Sun/Hol	60	6,300		164,700	
	365	49,357		1,290,333	
				56,408	

Annual Quantities					
Mon-Thurs	201	8,040		168,840	
Fri	51	2,142		44,982	
Sat	53	2,120		44,520	
Sun/Hol	60	1,800		37,800	
	365	14,102		296,142	
				21,153	

	Limebank	Airport	Total
Annual Revenue Train Hours	49,357	14,102	63,459
Annual Operator Hours	56,408	21,153	77,561
Annual Revenue Train Kilometers	1,290,333	296,142	1,586,475

Service Level 5 - Trillium Interim Substantial Completion - Bayview to Greenboro Only

	Period		Duration	Headway	Round Trips	Roundtrip Run Time	Total Terminal	Cycle Time	Revenue Train Hours	Route Length	Revenue Train KM	Trains in Service	Operators in Service	Revenue Operator Hours
Mon-Thurs	AM	6am-9am	3	12	15	44.5	15.5	60	15	7.8	232.5	5	6	18.0
	Mid	9am-3pm	6	12	30	44.5	15.5	60	30	7.8	465.0	5	6	36.0
	PM	3pm-6pm	3	12	15	44.5	15.5	60	15	7.8	232.5	5	6	18.0
	Late	6pm-12am	6	12	30	44.5	15.5	60	30	7.8	465.0	5	6	36.0
									90		1,395.0			108.0
Friday	AM	6am-9am	3	12	15	44.5	15.5	60	15	7.8	232.5	5	6	18.0
	Mid	9am-3pm	6	12	30	44.5	15.5	60	30	7.8	465.0	5	6	36.0
	PM	3pm-6pm	3	12	15	44.5	15.5	60	15	7.8	232.5	5	6	18.0
	Late	6pm-12am	6	12	30	44.5	15.5	60	30	7.8	465.0	5	6	36.0
									90		1,395.0			108.0
Saturday	AM	6:30am-9am	2.5	12	12.5	44.5	15.5	60	13	7.8	193.8	5	6	15.0
	Mid	9am-3pm	6	12	30	44.5	15.5	60	30	7.8	465.0	5	6	36.0
	PM	3pm-6pm	3	12	15	44.5	15.5	60	15	7.8	232.5	5	6	18.0
	Late	6pm-12am	6	12	30	44.5	15.5	60	30	7.8	465.0	5	6	36.0
									88		1,356.3			105.0
Sunday / Hol	AM	7:30am-9am	1.5	12	7.5	44.5	15.5	60	8	7.8	116.3	5	6	9.0
	Mid	9am-3pm	6	12	30	44.5	15.5	60	30	7.8	465.0	5	6	36.0
	PM	3pm-5:30pm	2.5	12	12.5	44.5	15.5	60	13	7.8	193.8	5	6	15.0
	Late	5:30pm-11:30pm	6	12	30	44.5	15.5	60	30	7.8	465.0	5	6	36.0
									80		1,240.0			96.0

Annual Quantities						
Mon-Thurs	203	18,270		283,185		21,924
Fri	52	4,680		72,540		5,616
Sat	50	4,375		67,813		5,250
Sun/Hol	60	4,800		74,400		5,760
	365	32,125		497,938		38,550

	Greenboro Total
Annual Revenue Train Hours	32,125
Annual Operator Hours	38,550
Annual Revenue Train Kilometers	497,938

APPENDIX A – ATTACHMENT 3
SYSTEMS MAINTENANCE SERVICES

1.0 Scope of Services

- (a) Project Co shall be responsible for the Custodial, Preventive, and Corrective Maintenance activities on all of the systems assets, including but not limited to:
 - (i) S&TCS including the BCC and TOCC control system components supplied by Project Co, excluding Custodial Maintenance within the BCC and TOCC which shall be performed by the City;
 - (ii) communications systems (excluding Voice and Data Radio System), safety and security, and public information; and
 - (iii) Dow's Lake Tunnel facilities including fire, life, safety, and drainage systems and BCC and TOCC control system components supplied by Project Co.

2.0 Service Requirements

- (a) In general, Project Co shall maintain all systems assets in accordance with the Fixed Component Availability Standard, to ensure that the service levels outlined in the Operations Service Plan can be provided at all times during Revenue Hours.
- (b) Signaling & Train Control
 - (i) S&TC
 - A. Project Co shall maintain the S&TC system and its components to meet the Fixed Component Availability Standard.
 - B. Project Co shall immediately respond to and repair any failure of any element of the S&TC system whether or not the Fixed Component Availability Standard is violated.
 - C. Project Co shall use diagnostic equipment and test software to identify problems.
 - D. Project Co shall have backup copies of the original operating system and application software immediately available for use.
 - E. Project Co shall implement procedures for verifying the integrity of all vital S&TC software when any software changes, reloads or upgrades are made.
 - F. Project Co shall maintain strict version control of all software on all S&TC systems. Version control records shall be made available for inspection by the City or by regulatory agencies upon request.

- G. Project Co shall perform all periodic and Corrective Maintenance required by the System Safety Plan described in Schedule 15-2, Part 1, Article 7 – System Safety Certification and in accordance with the approved safety procedures.
 - H. Project Co shall maintain records of all Preventive Maintenance and Corrective Maintenance performed on the S&TC systems. These records shall be made available to the City and to regulatory agencies upon request.
 - I. Project Co shall monitor the security of the S&TC network and shall take counter measures against intrusion attempts and attacks. All attacks and intrusion attempts shall be reported to the City.
- (ii) TOCC and BCC
- A. Project Co shall test and troubleshoot all transit monitoring, operation and control equipment, including computers, software, electronic devices and communication equipment, supplied for the TOCC and BCC at 875 Belfast and 805 Belfast by Project Co as part of the System.
 - B. Project Co shall ensure that the Trillium Line equipment located in the BCC at 805 Belfast is operational at all times, so as to be available in the event Operations cannot be conducted from the TOCC.
 - C. Project Co shall ensure the hardware and software for the System is kept up to date, in accordance with the manufacture's recommendations and latest revisions while accounting for any configuration issues or concerns.
 - D. Project Co shall maintain an adequate number of spare parts to allow for an immediate replacement of equipment.
 - E. In the event of a failure of any element of the TOCC which causes the System to fail to meet the Fixed Component Availability Standard, Project Co shall immediately respond and Repair the Deficiency.
 - F. In the event of a failure which does not violate the Fixed Component Availability Standard, Project Co shall respond within two hours of notification, to perform Corrective Maintenance on the failure.
 - G. Project Co shall maintain records of all Preventive Maintenance and Corrective Maintenance performed on the transit monitoring, Operation and control equipment. These records shall be made available to the City upon request.
 - H. Access to the TOCC and BCC shall be scheduled by Project Co and coordinated with the City pursuant to Appendix A Article 1.5 of Schedule 15-3.
 - I. The City shall be responsible for Custodial Maintenance within the TOCC and BCC in accordance with Project Co's Custodial Maitnenance Plan required for the Fixed Components.

(c) Communications

(i) Radio Communications

- A. Project Co shall work with the selected Radio System Supplier to ensure that radio transmission and reception via the City wide radio network meets the expected Radio system reliability necessary to achieve operational and maintenance performance targets for the Trillium Line.
- B. On discovery of a radio fault Project Co shall implement special operational procedure, record and notify the Radio System Supplier of the failure condition.
- C. Project Co shall permit the Radio System Supplier to perform Corrective Maintenance to maintain availability of the radio system. Where necessary or as part of a supplementary agreement, Project Co shall provide training and protection to the City of Ottawa Public Safety Radio System or Radio Supplier employees. Project Co shall perform regular radio protocol checks and provide evidence that these are conducted at prescribed intervals.

(ii) Safety and Security Systems

- A. Project Co shall maintain all Safety and Security systems elements in a state of good repair and working order in accordance with the approved Corrective and Preventive Maintenance Plans.
- B. Project Co shall maintain all Safety and Security systems elements and its components to meet the Fixed Component Availability Standard.
- C. Project Co shall maintain records of all Preventive Maintenance and Corrective Maintenance performed on the Safety and Security Systems. These records shall be made available to the City and to regulatory agencies upon request
- D. Project Co shall immediately respond to and repair any failure of any element of the Safety and Security systems whether or not the Fixed Component Availability Standard is violated.
- E. Where applicable, Project Co shall use diagnostic equipment and test software to identify problems.
- F. Project Co shall have backup copies of the original operating system and application software immediately available for use.
- G. In case of breakdowns and failures, Project Co shall have procedures and resources in place to dispatch forthwith the resources necessary to perform Corrective Maintenance.

(iii) PA/PID Systems

- A. Project Co shall maintain the PA/PID systems at the Stations and on the Vehicles under the Project Agreement (including Schedule 15-3) in accordance with the Passenger Information Systems Standard.
 - B. Passenger information systems refers to the PA/PID systems located at Stations that display Train arrival/departure times, delay information, cancellation information, destination, general announcements, news or advertising displays.
 - C. Project Co shall be responsible for identifying the Defect and performing remedial actions in accordance with the PA/PID Systems Standard and the timeframes established in the Performance Indicators. Notwithstanding, the Defect, timelines and remedial actions identified, prevailing legislation and City by-laws shall take precedence if they are more restrictive.
 - D. Project Co shall maintain records of all Preventive Maintenance and Corrective Maintenance performed on the Passenger Information Systems. These records shall be made available to the City and to regulatory agencies upon request
- (d) Project Co shall ensure compliance with Schedule 17- Environmental Obligations.
- (e) Project Co's performance with respect to vandalism and graffiti shall be in accordance with:
- (i) Appendix A, Attachment 10 – Alignment Maintenance Services, Article 2.0(f) “Vandalism and Graffiti Repair”, Article 3.0(e) “Vandalism and Graffiti Standard”, and Article 5.0 “Performance Criteria”, and for further certainty, Project Co’s rectification and / or response times and the assessment of Service Failure Points; and
 - (ii) Appendix A, Attachment 16 – Vandalism and Graffiti.
- 3.0 Service Standards**
- (a) Fixed Component Availability Standard
- (i) Any Fixed Component in the System (including S&TC communications, etc.) is considered to not meet the Standard if any Defect or Deficiency is identified in that Fixed Component that:
- A. affects the Safety of the public, Passengers or Operator in a manner contrary to the Safety Management System;
 - B. adversely affects Operations such that the System does not meet the Operational Requirements and Specifications.
- (b) PA/PID System Standard
- (i) A component of the PA/PID system (at a Station or on a Vehicle) will fail to meet the Standard in the event any of the following failures occur:

- A. If visual system information does not display on display unit;
- B. If the display unit is not readable (poor picture quality or fuzzy) from 3m away;
- C. If the audio system is not audible and intelligible, in whole or in part as a result of a hardware failure; or
- D. If the system is not performing according to requirements (missing or wrong information).

4.0 Quality Monitoring and Reporting

- (a) Periodically, the City will audit Project Co's Systems Maintenance documentation and reporting. Failures to maintain documentation and report on systems Maintenance activities shall result in penalties being assessed as described in the Performance Criteria.
- (b) Maintenance Plans
 - (i) Project Co shall at all times maintain complete and updated versions of the Custodial Maintenance Plan, the Corrective Maintenance Plan, and the Preventive Maintenance Plan.
 - (ii) Project Co shall follow the requirements set out in Article 1.4 of Appendix A with regard to the drafting, approval, and revisions process for these Maintenance Plans.
- (c) Maintenance Reporting
 - (i) Project Co shall report on the status and completion of various systems Maintenance activities.
 - (ii) Project Co shall follow the maintenance reporting requirements set out in Article 1.8 of Appendix A with regard to reporting procedures and the Daily, Monthly, and Annual submittals that are required.

5.0 Performance Criteria

FE Type	Category	Response	Rectification / Remedial	Recording Frequency
AF =Availability Failure SF = Service Failure QF = Quality Failure	Major Medium Minor Veh. Avail. = Captured by the Vehicle Availability deduction regime	N/A = Not Applicable Immediate (“Immed.”) = No later than 30 minutes from the time of the Event.	N/A = Not Applicable	PR = Per Request PE = Per Event D = Daily W = Weekly M = Monthly Q = Quarterly B = Bi-Annually A = Annually R = Randomly, At Any Moment in Time

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
<i>Systems Elements (Train Control, Communications)</i>							
KPM A(3)2.0(b)(i)(D)	Project Co shall have backup copies of the original operating system and application software immediately available for use.	QF	Major	NA	1 week	R	
KPM A(3)2.0(b)(ii)(A)	Project Co shall test and troubleshoot all transit monitoring, operation and control equipment, supplied for the TOCC and BCC by Project Co.	QF	Major	NA	1 week	R	
KPM A(3)2.0(b)(ii)(B)	Project Co shall ensure that the Trillium Line BCC equipment is operational at all times.	QF	Major	NA	1 hour	PE	
KPM A(3)2.0(b)(ii)(C)	Project Co shall ensure the hardware and software for the System is kept up to date while maintaining configuration control.	QF	Major	NA	NA	R	Project Co to be permitted reasonable Remedial Period, based on nature of non-compliance.
KPM A(3)2.0(b)(ii)(E)	In the event of a failure of any element of the TOCC which causes the System to fail to meet the Fixed Component Availability Standard, Project Co shall immediately respond and Repair the Deficiency.	SF	Major	Immed.	2 hours	PE	
KPM A(3)2.0(b)(ii)(F)	In the event of a failure which does not violate the Fixed Component Availability Standard, Project Co shall respond within two hours of notification, to perform Corrective Maintenance on the failure.	SF	Major	2 hours	8 hours	PE	
KPM A(3)2.0(c)(ii)(A)	Project Co shall maintain all Safety and Security systems elements in a state of good repair and working order in accordance with the approved Corrective and Preventive Maintenance Plans.	QF	Major	NA	NA	R	Project Co to be permitted reasonable Remedial Period, based on nature of non-compliance.

KPM A(3)2.0(c)(ii)(D)	Project Co shall immediately respond to and repair any failure of any element of the Safety and Security systems whether or not the Fixed Component Availability Standard is violated.	SF	Major	Immed.	4 hours	PE	
KPM A(3)2.0(c)(iii)(A)	Failure of Passenger Information Systems to meet Passenger Information Systems Standard	SF	Medium	2 hours	24 hours	PE	SF assessed per PIS monitor, up to a maximum exposure of 10 PIS monitors malfunctioning at any one time.

APPENDIX A – ATTACHMENT 4
TRACK MAINTENANCE SERVICES

1.0 Scope of Services

- (a) Project Co shall be responsible for the Custodial, Preventive, and Corrective Maintenance activities of all Track infrastructure on the System including but not limited to:
- (i) All mainline, sidings, pocket and tail Tracks, yard leads, connecting, storage yard and shop Tracks;
 - (ii) All turnouts, crossovers, diamond crossings; and
 - (iii) Rail bed and other supporting portions of the Track infrastructure.

2.0 Service Requirements

- (a) Project Co shall maintain all Track components (including Track, turnouts, diamond crossings and rail related components) in a state of good repair and working order in accordance with the more stringent requirements of the following:
- (i) the Revenue Vehicle operating reliability limitations;
 - (ii) TC RRTS;
 - (iii) the APTA Rail Transit Track Inspection and Maintenance Standard APTA RT-FS-S-002-02, Revised April 7, 2017; and
 - (iv) the approved Maintenance and Rehabilitation Plan
- (b) Project Co shall conduct maintenance activities to ensure that all Track meets the Fixed Component Availability Standard.
- (c) Project Co shall provide vegetation control on the Alignment and Custodial Maintenance for the Tracks in accordance with the Standards described in Attachment 10 – Alignment Maintenance Services.
- (d) In case of breakdowns and failures, Project Co shall have procedures in place to dispatch forthwith the appropriate resources necessary to Repair the problems.
- (e) Project Co shall perform visual Track inspections twice weekly on foot or by vehicle and Project Co shall provide appropriate illumination when performing inspections in the absence of sufficient daylight..
- (f) Project Co shall perform or otherwise facilitate automated Track geometry inspections by self-propelled equipment compliant with RRTS, AREMA or EN standards on a quarterly basis,

outside of the winter months (January to March) as equally timed as possible, no less than 60 calendar days and no more than 100 calendar days between inspections.

- (g) Project Co shall perform continuous welded rail inspections compliant with RRTS, AREMA or APTA standards when the ambient temperature causes the rail temperature to meet or exceed the neutral temperature of the rail. Particular attention is given to periods of temperature fluctuations, looking for signs of high thermal stress in the rails. In the event that daily cycles of extreme temperatuere fluctuation occurs, consideration should be given to repeated inspections.
- (h) Project Co shall perform mainline switch and crossing inspections for defects monthly and yard switche inspections for defects every three months compliant with RRTS, AREMA or EN standards.
- (i) Project Co shall perform or otherwise facilitate automated rail profile measurements compliant with RRTS, AREMA or EN standards on an annual basis.
- (j) Project Co shall perform or otherwise facilitate automated ultrasonic rail flaw detection compliant with RRTS, AREMA or EN standards on an annual basis.
- (k) Project Co shall have available the necessary tools, materials and equipment required to perform the Track Maintenance Services.
- (l) Project Co shall ensure compliance with Schedule 17- Environmental Obligations.
- (m) Project Co's performance with respect to vandalism and graffiti shall be in accordance with:
 - (i) Appendix A, Attachment 10 – Alignment Maintenance Services, Article 2.0(f) “Vandalism and Graffiti Repair”, Article 3.0(e) “Vandalism and Graffiti Standard”, and Article 5.0 “Performance Criteria”, and for further certainty, Project Co's rectification and / or response times and the assessment of Service Failure Points; and
 - (ii) Appendix A, Attachment 16 – Vandalism and Graffiti.

3.0 Service Standards

(a) Track Maintenance Standard

- (i)** All mainline Track components, including north and south connecting Tracks to the New Walkley Yard shall be maintained to meet or exceed APTA Class 4 standards irrespective of design or operating speeds, and be in a state of good repair and functioning in accordance with the Design and Construction Requirements, the Revenue Vehicle Operating Reliability requirements and the approved Maintenance and Rehabilitation Plan.
- (ii)** All yard and yard lead Track components shall be maintained to APTA Class 3 standards, irrespective of design or operating speeds and be in a state of good repair and functioning in accordance with the Design and Construction Requirements and the approved Maintenance and Rehabilitation Plan.
- (iii)** NRC Spur Track components shall be maintained to APTA Class 2 standards, irrespective of design or operating speeds,, and be in a state of good repair and functioning in accordance with the Design and Construction Requirements and the approved Maintenance and Rehabilitation Plan

(b) Fixed Component Availability Standard

- (i)** Any Fixed Component in the System (including Track and related Track components) is considered to not meet the Standard if any Defect or Deficiency is identified in that Fixed Component that:
 - A.** affects the Safety of the public, Passengers or Operator in a manner contrary to the Safety Management System;
 - B.** adversely affects Operations such that the System does not meet the Operation Requirements and Specifications;
 - C.** negatively affects Revenue Vehicle mainline ride quality to the point of not complying with ISO 2631; or
 - D.** causes anomalous wear or damage to Revenue Vehicle wheels, bogies, and/or primary and secondary suspension components

(c) Quality Monitoring and Reporting

- (i)** Periodically, the City will audit Project Co's Track Maintenance documentation and reporting. Failures to maintain documentation and report on Track Maintenance activities shall result in penalties being assessed as described in the Performance Criteria.

(d) Maintenance Plans

- (i) Project Co shall at all times maintain complete and updated versions of the Custodial Maintenance Plan, the Corrective Maintenance Plan, and the Preventive Maintenance Plan.
 - (ii) Project Co shall follow the requirements set out in Article 1.4 of Appendix A with regard to the drafting, approval, and revisions process for these Maintenance Plans.
- (e) Maintenance Reporting
- (i) Project Co shall report on the status and completion of various Track Maintenance activities.
 - (ii) Project Co shall follow the maintenance reporting requirements set out in Article 1.8 of Appendix A with regard to reporting procedures and the Daily, Monthly, and Annual submittals that are required.

4.0 Performance Criteria

FE Type	Category	Response	Rectification / Remedial	Recording Frequency
AF =Availability Failure SF = Service Failure QF = Quality Failure	Major Medium Minor Veh. Avail. = Captured by the Vehicle Availability deduction regime	N/A = Not Applicable Immediate (“Immed.”) = No later than 30 minutes from time of Event	N/A = Not Applicable	PR = Per Request PE = Per Event D = Daily W = Weekly M = Monthly Q = Quarterly B = Bi-Annually A = Annually R = Randomly, At Any Moment in Time

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
<i>Track Maintenance Services</i>							
KPM A(4)2.0(e)	Project Co shall perform or otherwise facilitate automated Track geometry inspections.	QF	Major	NA	NA	Q	[REDACTED]
KPM A(4)2.0(f)	Project Co shall perform or otherwise facilitate automated rail profile measurements	QF	Major	NA	NA	A	[REDACTED]
KPM A(4)2.0(g)	Project Co shall perform or otherwise facilitate automated rail flaw detection inspection	QF	Major	NA	NA	A	[REDACTED]
KPM A(4)3.0(a)	Project Co shall maintain Tracks in accordance with APTA RT-FS-S-002-02, Revised April 7, 2017 and the approved Maintenance and Rehabilitation Plan	QF	Major	NA	NA	R	
KPM A(4)3.0(b)	Project Co shall maintain Tracks to meet the Fixed Component Availability Standard	QF	Major	NA	NA	R	

APPENDIX A – ATTACHMENT 5
VEHICLE MAINTENANCE SERVICES

1.0 Scope of Services

- (a) Project Co shall be responsible for the Custodial, Preventive, and Corrective Maintenance activities for the following Vehicle Maintenance Services activities including but not limited to:
- (i) Vehicle Cleaning;
 - A. Daily Vehicle Inspection and Cleaning; and
 - B. Regular Heavy Vehicle Cleaning;
 - (ii) Vehicle Maintenance;
 - (iii) Provision of Vehicles to the City for Revenue Service in accordance with the Cleaning and Maintenance and Rehabilitation Requirements.

2.0 Service Requirements

- (a) Vehicle Cleaning
- (i) Project Co shall maintain the Vehicles in a condition which is physically clean and suitable to be placed into Revenue Service.
 - (ii) Project Co shall inspect the Vehicles with sufficient regularity to maintain the foregoing standard, provided that the frequency of inspection of Vehicles shall never be less than daily. Such inspections may where feasible be conducted in the course of performing the Maintenance required to maintain the foregoing standard, subject to the requirement that Project Co undertake the required frequency of inspection.
 - (iii) Project Co shall develop Vehicle cleaning procedures and plans that shall be incorporated into the Custodial Maintenance Plan.
 - (iv) On a daily basis, Project Co shall ensure that the Vehicle and its components are clean and in a good state of operation and repair in accordance with the Vehicle Cleaning Standards.
 - (v) Within a 21 service day cycle or more often if required, Project Co shall undertake a deep cleaning and repair of Vehicle components in accordance with the Vehicle Cleaning Standards.
 - (vi) Twice a year, at the end of the winter and summer seasons, Project Co shall take the Vehicle off-line for a thorough cleaning. Project Co shall undertake major repairs at this time and the Vehicle shall be pressure washed and sanitized.
- (b) Vehicle Maintenance

(i) General

- A. Project Co shall perform Preventive and Corrective Maintenance in accordance with the Maintenance Plan requirements and the requirements of this Schedule 15-3.
- B. Project Co shall ensure that all Vehicle Components affecting Passenger safety and/or the safe operation of the Vehicle are in accordance with the Safety Management System.
- C. Project Co shall ensure that all Vehicle Components that do not affect Passenger safety and/or the safe operation of the Vehicle are fully functional, materially undamaged, and in good condition, subject to normal wear and tear.
- D. Project Co shall develop a Corrective Maintenance Plan, based on industry best practices and manufacturer's recommendations for the selected Vehicle type, to ensure that damage to or failures of all Vehicles and Vehicle components are addressed and corrected in accordance with the requirements of this Article.
- E. Project Co shall develop a Preventive Maintenance Plan, based on industry best practices and manufacturer's recommendations for the selected Vehicle type, to ensure that the fleet is maintained in a state of good repair.

(ii) Daily Activities – Inspection and Corrective Maintenance

- A. Project Co shall ensure that all Vehicles comprising a Train consist are inspected prior to entering Revenue Service and meet the Vehicle Maintenance Standard. The inspection shall include all matters on an inspection checklist which has been approved by the City. Following the inspection, Project Co shall provide a copy of the checklist to the Operator, who shall verify, prior to accepting the Vehicle, that the checklist has been completed and signed by a responsible and qualified Project Co employee.
- B. Any structural or paint / wrap damage to a Vehicle shall be reported in the Daily Report. A thorough inspection shall be conducted of the drive train and safety components when structural damage is evident or suspected. Project Co shall undertake Corrective Maintenance of the damaged components, including paint/wrap finishing.

(iii) Regular Preventive Maintenance Activities

- A. Project Co shall conduct regular preventive maintenance activities on Vehicles in accordance with best practices and manufacturer's recommendations as laid out in the Preventive Maintenance Plan as described in Appendix A, Article 1.4.

- B. Project Co shall conduct additional rehabilitation activities on the Vehicle Fleet as necessary in accordance with the asset preservation requirements, as described in Appendix B.
- (c) Vehicle Availability
- (i) Vehicles Entering Revenue Service
- A. Project Co shall ensure that, at the start of Revenue Service, the number of Trains which are required to meet the Operations Service Plan and the Train consist assignments as established by the City, are available to be entered into Revenue Service in accordance with the Vehicle Availability Standards.
- B. This number of Vehicles shall constitute the minimum required Vehicle fleet for the duration of that service day (the “**Scheduled Revenue Service Vehicles**”).
- C. In the event that any Train scheduled to be entered into Revenue Service is prohibited from being placed into Revenue Service pursuant to Article 3.0, Project Co shall immediately either:
- i Perform cleaning or Corrective Maintenance on the Deficient Vehicle(s); or
- ii Replace the Deficient Vehicle(s) in the Train consist with another available Vehicle.
- (ii) Vehicles In Revenue Service
- A. Project Co shall ensure that at all times during Revenue Service Hours the number of Trains which are required to meet the current Operations Service Plan and the Train consist assignments as established by the City, meet the Vehicle Availability Standards.
- B. In the event that any Vehicle that is part of a Train in Revenue Service is found not to meet either the Vehicle Cleaning Standard or the Vehicle Maintenance Standard and Public Safety or comfort is compromised, Project Co shall, as necessary, either:
- i Promptly perform cleaning or Corrective Maintenance on the Deficient Vehicle(s) without removing it from Revenue Service, subject to Article 1.5 of Appendix A or;
- ii Promptly coordinate the removal of the Train from Revenue Service with the TOCC and provide the City with a replacement consist.
- C. Project Co shall, where reasonably possible, perform Cleaning or Corrective Maintenance to correct the Defect or Deficiency on the Vehicle(s) without removing the Train from Revenue Service. For further certainty, the removal of

a Train from Revenue Service pursuant to the above statements does not derogate from Project Co's obligations under these Vehicle Maintenance Services Requirements, including the provision of the Scheduled Revenue Service Vehicles.

- (b) Project Co shall ensure compliance with Schedule 17 – Environmental Obligations.
- (c) Project Co's performance with respect to vandalism and graffiti shall be in accordance with:
 - (i) Appendix A, Attachment 10 – Alignment Maintenance Services, Article 2.0(f) “Vandalism and Graffiti Repair”, Article 3.0(e) “Vandalism and Graffiti Standard”, and Article 5.0 “Performance Criteria”, and for further certainty, Project Co's rectification and / or response times and the assessment of Service Failure Points; and
 - (ii) Appendix A, Attachment 16 – Vandalism and Graffiti.

3.0 Service Standards

- (a) Vehicle Cleaning Standards
 - (i) Daily Inspection and Cleaning Standard
 - A. Vehicles shall meet the following standard daily before entering Revenue Service:
 - i Clean Operator's cab including floor, seat, dashboard and windshield;
 - ii Clean interior windows;
 - iii Vehicle clean of all litter, spills, bodily fluids, personal accidents, unsanitary conditions and garbage;
 - iv Vehicle clean after Vehicle maintenance operations;
 - v Clean seats;
 - vi Seat covers are not damaged or torn;
 - vii Gum has been removed from seat covers, handrails and seat backs;
 - viii Graffiti marks have been removed;
 - ix Any loose floor mats/fittings have been repaired;
 - x Floor has been cleaned if soiled including vacuum and mopping;
 - xi Working CCTV;
 - xii Working Passenger information systems;

- xiii Lights are not burnt out or flickering;
 - xiv Vehicle lights, lenses, windshield, windows, mirrors and wipers are clean and functional; and
 - xv Vehicle exterior is clean and has been washed at least once in the last 3 days.
- (ii) Heavy Cleaning Standard
- A. Vehicles shall meet the Heavy Cleaning Standard if Project Co completes the following cleaning activities and repairs within 21 service days or more often as required:
- i Deep cleaning of the Vehicle including vacuuming, mopping and washing;
 - ii Scuff and burn marks have been removed;
 - iii Gum has been removed from floors;
 - iv Graffiti damage has been repaired;
 - v Loose/rattling panels, fixtures and screws have been repaired;
 - vi Loose/rattling doors have been repaired;
 - vii Damaged seats, handrails and fixtures have been replaced;
 - viii Paint-wrap surface damage has been repaired;
 - ix Ceiling damage has been repaired; and
 - x Exterior surface elements, including glass, panels, trim, paint-wrap and finishing details have been inspected and repaired as required.

(b) Vehicle Maintenance Standards

- (i) Train Scheduled for Revenue Service
- A. A Train scheduled for Revenue Service shall not meet the Vehicle Maintenance Standard if any Vehicle in the Train consist meets any of the following:
- i Any condition that affects Passenger or Operator Safety in a manner contrary to the Safety Management System;
 - ii Malfunction of Operator control elements or Operator seat;
 - iii The failure of brakes to meet the Design and Construction Performance Requirements;

- iv Any Deficiency in Vehicle operation such that the Vehicle cannot maintain the Headway required by the Operations Service Plan;
- v Broken or damaged Vehicle furniture;
- vi Broken windshield, glass elements, mirrors, wipers, closed circuit television, etc.;
- vii Malfunctioning or broken regulatory Vehicle elements, including headlights and marker lights;
- viii Malfunctioning doors;
- ix Malfunction of Vehicle Passenger information systems;
- x Malfunctioning communication equipment;
- xi Malfunctioning interior illumination;
- xii Malfunctioning heating, ventilating and air conditioning systems; A malfunctioning heating system shall be defined as a system that is not capable of maintaining an interior temperature of at least +15°C with the door(s) closed when the outside air temperature is colder than minus -18°C. A malfunctioning air conditioning system shall be defined as a system not capable of maintaining an interior temperature of less than +27°C with the door(s) closed when the outside air temperature is in excess of +27°C, but not greater than +35°C;
- xiii Any failure of any Vehicle Component to perform its intended purpose; and
- xiv Damage to Vehicle or Vehicle components as a result of vandalism or graffiti.

(ii) Vehicles In Revenue Service

- A. A Train in Revenue Service shall not meet the Vehicle Maintenance Standard if any Vehicle in the Train consists of any of the following:
 - i Any unsafe condition that may affect Passenger or Operator Safety, or safe Vehicle operation (including suspension failure and on board CCTV failure) in a manner contrary to the Safety Management System;
 - ii Any Deficiency in Vehicle operation such that the Train cannot maintain the scheduled Headway, including the loss of traction drive on one bogie;
 - iii Insufficient fuel, sand or washer fluid;
 - iv Malfunction of Operator control elements and Operator seat;

- v Brake failure on any single axle or dragging brake and/or inconsistent and deteriorated brake operation;
- vi Broken windshield, glass elements, mirrors or wipers that pose an immediate Safety hazard in a manner contrary to the Safety Management System;
- vii Regulatory Vehicle elements, such as headlights and marker lights, that pose an immediate Safety hazard in a manner contrary to the Safety Management System;
- viii Malfunctioning doors (such that more than one door is locked off);
- ix Malfunctioning heating system when outside temperature is below 0°C;
- x Malfunctioning air conditioning and ventilation system when outside temperature is above 25°C;
- xi Malfunctioning radio communication equipment;
- xii Malfunctioning illumination where Safety is compromised (in a manner contrary to the Safety Management System);
- xiii Broken/damaged Vehicle furniture elements where Safety is compromised (in a manner contrary to the Safety Management System);
- xiv Train interior fouled by bodily fluids, spills or unsanitary conditions (The conditions in Article 3(b)(ii)(A)(xiv) shall not result in Failure Points, however Project Co shall promptly remedy the condition as soon as possible);
- xv If there is graffiti on Vehicles or Vehicle components , and results in non-compliance to the vandalism and graffiti standard as described in Attachment 10; and
- xvi Vandalism on Vehicles or Vehicle components, and results in a non-compliance to the Safe operation of the Train and / or Schedule 17 – Environmental Obligations.
- xvii Secondary suspension is not adjusted correctly by shimming or other offset, to achieve compliance with level boarding requirement of a maximum height difference of 16mm between threshold extender and Platform under AW2 with 3.3 Passengers/m².

(c) Vehicle Availability Standards

(i) Vehicles Entering Revenue Service

- A. A Train shall not be considered available and shall not be permitted to be entered into Revenue Service if any of the Vehicles in the Train consist fails to meet:
 - i The Vehicle Cleaning Standard set out in Article 3.0 (a), or
 - ii The Vehicle Maintenance Standard for Vehicles entering Revenue Service set out in Article 3.0 (b).
 - B. The City, in its discretion, may permit a Vehicle which fails to meet
 - i the Vehicle Cleaning Standard described in Article 3.0 (a) to be entered into Revenue Service as part of a Train consist, or
 - ii the Vehicle Maintenance Standard (i)(xiv) to the extent that temporary repairs and remedial action required for compliance with the Vandalism and Graffiti Standard included in Attachment 10 article 3(e) and Attachment 16 are performed.
 - C. Notwithstanding the foregoing, in no event shall the City permit a Vehicle to enter Revenue Service as part of a Train consist if an identified Deficiency in the Vehicle results in the Vehicle's failure to meet the requirements of the Safety Management System, affects Passenger Safety or comfort, or otherwise prevents the safe operation of the Train.
 - D. In no event shall the fact that the City permits or has permitted a Vehicle which does not comply with the Vehicle Cleaning Standard to enter in Revenue Service as part of a Train consist relieve Project Co of its obligation to comply with the Vehicle Cleaning Standard or alter such obligation, including with respect to such Vehicle.
- (ii) Vehicles In Revenue Service
- A. A Train already in Revenue Service shall no longer be considered available if any of the Vehicles in the Train consist fails to meet:
 - i the Design and Construction Performance Requirements;
 - ii the Vehicle Cleaning Standard set out in Article 3.0(a); or
 - iii the Vehicle Maintenance Standard for Vehicles in Revenue Service set out in Article 3.0(b).
 - B. The City in its discretion may permit a Train which is engaged in Revenue Service, and which does not meet either the Vehicle Cleaning or the Vehicle Maintenance Standard, to remain in Revenue Service.
 - C. In the event that the City permits any such Train to remain in Revenue Service, following the removal of the Train from Revenue Service, Project Co shall

perform cleaning or Corrective Maintenance and ensure that the Vehicle or Train is available for Revenue Service at the beginning of the next Revenue Service Day.

- D. Notwithstanding the foregoing, in no event shall the City permit a Train to remain in Revenue Service if an identified Defect or Deficiency in any Vehicle(s) in the Train consist results in the Train's failure to comply with the Safety Management System or otherwise prevents the safe operation of the Train.
- E. In no event shall the fact that the City permits or has permitted a Train which does not meet either the Vehicle Cleaning or the Vehicle Maintenance Standard to remain in Revenue Service relieve Project Co of its obligation to meet the Vehicle Cleaning and the Vehicle Maintenance Standard, but in the event that the City permits or has permitted a Train which does not meet either the Vehicle Cleaning or the Vehicle Maintenance Standard to remain in Revenue Service, in accordance with the provisions of this Schedule 15-3 (including Schedule A) a Non Performance Adjustment Charge is applicable only to the extent that there is a Service Availability Loss, if any, in respect of such Vehicle.

4.0 Quality Monitoring and Reporting

- (a) Periodically, the City will audit the Project Co's Vehicle cleaning and Maintenance documentation and reporting. Failures to maintain documentation and report on Vehicle cleaning and Maintenance activities shall result in penalties being assessed as described in the Performance Criteria section.
- (b) Maintenance Plans
 - (i) Project Co shall at all times maintain complete and updated versions of the Custodial Maintenance Plan, the Corrective Maintenance Plan, and the Preventive Maintenance Plan.
 - (ii) Project Co shall follow the requirements set out in Article 1.4 of Appendix A with regard to the drafting, approval, and revisions process for these Maintenance Plans.
- (c) Maintenance Reporting
 - (i) Project Co shall report on the status and completion of various Vehicle cleaning and Maintenance activities, including Daily Inspection and cleaning, Weekly and heavy cleaning, Corrective Maintenance, and Preventive Maintenance.
 - (ii) Project Co shall follow the maintenance reporting requirements set out in Article 1.8 of Appendix A with regard to reporting procedures and the Daily, Monthly, and Annual submittals that are required.

5.0 Performance Criteria

FE Type	Category	Response	Rectification / Remedial	Recording Frequency
AF =Availability Failure SF = Service Failure QF = Quality Failure	Major Medium Minor Veh. Avail. = Captured by the Vehicle Availability deduction regime	N/A = Not Applicable Immediate (“Immed.”) = No later than 30 minutes from time of Event	N/A = Not Applicable ND = Correct by start of service the following day	PR = Per Request PE = Per Event D = Daily W = Weekly M = Monthly Q = Quarterly B = Bi-Annually A = Annually R = Randomly, At Any Moment in Time

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
<i>Vehicle Maintenance Services</i>							
KPM A(5)2.0(a)(v)	On a 21 service day cycle or more often if required, Project Co shall undertake a deep cleaning and repair of Vehicle components in accordance with the Vehicle Cleaning Standards.	QF	Medium	NA	ND	PE	[REDACTED]
KPM A(5)2.0(a)(vi)	Twice a year, at the end of the winter and summer seasons, Project Co shall take the Vehicle off line for a thorough cleaning.	QF	Major	NA	1 month	B	[REDACTED]

APPENDIX A – ATTACHMENT 6
FACILITIES MAINTENANCE SERVICES

1.0 Scope of Services

- (a) Project Co shall be responsible for the Custodial, Preventive, and Corrective Maintenance activities in the major buildings and facilities of the System, including but not limited to:
- (i) New Walkley Yard Maintenance and Storage Facility
 - A. Maintenance Building;
 - B. Storage Yard; and
 - C. Operations Crew Facilities.
 - (ii) Other facilities not contemplated as part of the Stations or New Walkley Yard
 - A. Fare Control shelters and buildings; and
 - B. Integrated Station entrances and connections.

2.0 Service Requirements

- (a) Custodial Maintenance Requirements
- (i) Project Co shall conduct all physical removal of dirt, soot, stains, marks, liquids and materials that come in contact with floors, walls, doors, windows, furniture and other building components.
 - (ii) Project Co shall repair any broken or malfunctioning floors, walls, doors, windows, furniture and other building components.
 - (iii) Project Co shall be responsible for identifying the Defect and performing remedial actions in accordance with the Custodial Maintenance Standard and the timeframes established in the Performance Criteria. Notwithstanding the Defect, timelines and remedial actions identified, prevailing legislation and City by-laws shall take precedence if they are more restrictive.
 - (iv) Project Co shall place particular attention on the Cleaning and Maintenance of washroom facilities, locker rooms, cafeteria, offices and general areas frequented by people.
 - (v) Project Co shall immediately clean or repair any Defect that affects the Safety of the public or the employees of Project Co and the City in accordance with the Custodial Maintenance Standard.

- (vi) Project Co shall conduct daily debris removal and general cleaning of frequented areas in accordance with the Daily Custodial Maintenance Standard.
 - (vii) Project Co shall conduct weekly heavy cleaning of interior and frequented areas in accordance with the Weekly Custodial Maintenance Standard.
 - (viii) Project Co shall conduct seasonal cleaning and maintenance of exterior surfaces and surface treatments in accordance with the Seasonal Custodial Maintenance Standard.
 - (ix) Project Co shall conduct bi-annual heavy cleaning of floor surfaces in accordance with the Bi-Annual Custodial Maintenance Standard.
- (b) Corrective and Preventive Maintenance Requirements
- (i) Maintenance Buildings
 - A. Project Co shall maintain the Maintenance Buildings.
 - B. Project Co shall provide all necessary trade fixtures, shop tools, heavy lifts, washers, equipment, vehicles and furniture as may be necessary in the Maintenance Building to undertake the Maintenance activities.
 - C. Project Co shall provide all security for the Maintenance Building. Project Co shall ensure the security of the Maintenance Building perimeter is maintained and immediately repaired if it is breached.
 - D. Project Co shall maintain the Maintenance Building and associated Vehicle Maintenance equipment in a state of good repair and working order in accordance with the approved Maintenance and Rehabilitation Plan.
 - E. Project Co shall provide Corrective Maintenance for:
 - i all interior Maintenance Building services (including but not limited to cleaning, heating, ventilation, air conditioning, sewage, potable water, painting, lighting and electrical services); and
 - ii the exterior of the Maintenance Building including lighting.
 - F. Project Co shall repair damage and vandalism as may be required.
 - (ii) Storage Yards
 - A. Project Co shall maintain the Storage Yards.
 - B. Project Co shall be responsible and shall have the authority for operations, Security and Safety within the Storage Yards.

- C. Project Co shall, in cooperation with the City, implement a Maintenance operations procedure to ensure the efficient transfer of Vehicles at the beginning and the end of each shift.
 - D. Project Co shall maintain the Storage Yards in a state of good repair and working order in accordance with the approved Maintenance and Rehabilitation Plan.
 - E. Project Co shall provide Preventive Maintenance, Corrective Maintenance and Custodial Maintenance for the Storage Yards in accordance with the Standards established for the following other Maintenance types:
 - i Alignment Maintenance Services;
 - ii Systems Maintenance Services, and
 - iii Track Maintenance Services.
- (iii) Operations Crew Facilities
- A. Project Co shall provide all Security for the Operations Crew Facilities.
 - B. Project Co shall ensure the Security of the Operations Crew Facilities perimeters are maintained and immediately repaired if it is breached.
 - C. Project Co shall maintain the Operations Crew Facilities in a state of good repair and working order in accordance with the approved Maintenance and Rehabilitation Plan.
 - D. Project Co shall provide Corrective Maintenance for:
 - i all interior Operations Crew Facilities services (including but not limited to cleaning, heating, ventilation, air conditioning, sewage, potable water, painting, lighting and electrical services); and
 - ii the exterior of the Operations Crew Facilities including lighting.
 - iii Project Co shall provide Custodial Maintenance for the Operations Crew Facilities in accordance with the Custodial Maintenance Standard.
 - E. Project Co shall not be responsible for City supplied equipment including microwave oven, toaster oven, vending machines, refrigerators, desk top computers, HASTUS monitor, coffee machine, and kettle.
- (iv) Bayview Station Connection Confederation Line Maintenance Responsibilities
- A. The structural maintenance of the new Bayview Station Trillium Line connection to the existing Bayview Station Confederation Line shall be the responsibility of Project Co.

- B. The custodial and day to day maintenance of the new pedestrian link shall be as follows:
- i Project Co shall be responsible for the custodial and day to day maintenance of the pedestrian link.
- (v) Bayview Station Connection 900 Albert Street Maintenance Responsibilities
- A. All Maintenance and Rehabilitation services for the new pedestrian link shall be the responsibility of Project Co.
- B. The limit of Project Co responsibility for the new pedestrian link shall be the eastern limit of the new structure interface with the proposed expansion joint connection to be constructed by the developer. For further clarity, Project Co shall not be responsible for the existing or future infrastructure outside of the Lands and beyond the expansion joint, including the locking and unlocking of the access within 900 Albert Street.
- (vi) Fare Control Buildings and Shelters
- A. Project Co shall maintain the Fare Control buildings and shelters;
- B. For certainty, Project Co's Maintenance responsibilities include all supporting infrastructure for the Fare Control equipment such as concrete pads, electrical, communications, conduits and access panels / holes; and
- C. Project Co shall maintain the Fare Control buildings and shelters in a state of good repair and working order in accordance with the approved Maintenance and Rehabilitation Plan.
- (c) Project Co shall ensure compliance with Schedule 17 – Environmental Obligations.
- (d) Project Co's performance with respect to vandalism and graffiti shall be in accordance with:
- (i) Appendix A, Attachment 10 – Alignment Maintenance Services, Article 2.0(f) “Vandalism and Graffiti Repair”, Article 3.0(e) “Vandalism and Graffiti Standard”, and Article 5.0 “Performance Criteria”, and for further certainty, Project Co's rectification and / or response times and the assessment of Service Failure Points; and
- (ii) Appendix A, Attachment 16 – Vandalism and Graffiti.
- 3.0 Service Standards**
- (a) Custodial Maintenance Standard
- (i) The buildings and facilities within the Scope of Facilities Maintenance Services shall fail to meet the Custodial Maintenance Standard if:

- A. Any condition exists that impacts Public Safety or the Safety of the employees of Project Co and the City or fails to comply with the Safety Management System, including:
 - i any accidental spills or bodily fluids;
 - ii floor treatments that represent a tripping hazard;
 - iii any unsafe accumulation of ice and snow, and for clarity accumulation of ice and snow shall be deemed to be “unsafe” if not in compliance with the Snow and Ice Clearing Standard including safe access to all areas of the buildings and facilities; and
 - iv illumination and / or lighting levels are not in compliance with Schedule 15-2; or benchmarking levels as otherwise determined prior to Revenue Service.
 - B. Any damage as a result of vandalism and/or graffiti has not been repaired as required and specified elsewhere.
 - C. Any of the subsequent time-dependent standards are violated:
- (ii) Daily Custodial Maintenance Standard
- A. Buildings and facilities under Project Co’s responsibility shall meet the Daily Custodial Maintenance Standard if the following conditions exist after daily cleaning activities:
 - i All debris has been removed and disposed of; and
 - ii General cleaning of frequented areas (including offices, washrooms, locker rooms, and cafeteria) has occurred. These general cleaning activities include washing floors, cleaning toilets, cleaning urinals, restocking supplies, and cleaning counters, basins, cooking surfaces, and mirrors.
- (iii) Weekly Custodial Maintenance Standard
- A. Buildings and facilities under Project Co’s responsibility shall meet the Weekly Custodial Maintenance Standard if the following conditions exist after heavy cleaning activities have occurred weekly (or more frequently as required):
 - i hard floors are washed;
 - ii carpets are vacuumed;
 - iii surfaces dusted;

- iv gum, scuff marks and other similar semi-permanent markings have been removed by use of scrapping, abrasives and/or chemical removal;
- v inside windows are clean; and
- vi non-slip carpets used during inclement weather are clean.

(iv) Seasonal Custodial Maintenance Standard

- A. Buildings and facilities under Project Co's responsibility shall meet the Seasonal Custodial Maintenance Standard if the following conditions exist after seasonal cleaning activities have occurred:
 - i Windows and exterior surfaces are thoroughly cleaned; and
 - ii Damaged surface treatments have been painted, repaired, or replaced as needed.

(v) Bi-Annual Custodial Maintenance Standard

- A. Buildings and facilities under Project Co's responsibility shall meet the Bi-Annual Custodial Maintenance Standard if the following conditions exist after bi-annual cleaning activities have occurred:
 - i Carpets are steam cleaned; and
 - ii All linoleum floors are burnished.

4.0 Quality Monitoring and Reporting

- (a) Periodically, the City will audit the Project Co's Facilities Maintenance documentation and reporting. Failures to maintain documentation and report on Facilities Maintenance activities shall result in penalties being assessed as described in the Performance Criteria section.
- (b) Maintenance Plans
 - (i) Project Co shall at all times maintain complete and updated versions of the Custodial Maintenance Plan, the Corrective Maintenance Plan, and the Preventive Maintenance Plan.
 - (ii) Project Co shall follow the requirements set out in Article 1.4 of Appendix A with regard to the drafting, approval, and revisions process for these Maintenance Plans.
- (c) Maintenance Reporting
 - (i) Project Co shall report on the status and completion of various Facilities Maintenance activities.

- (ii) Project Co shall follow the maintenance reporting requirements set out in Article 1.8 of Appendix A with regard to reporting procedures and the Daily, Monthly, and Annual submittals that are required.

5.0 Performance Criteria

FE Type	Category	Response	Rectification / Remedial	Recording Frequency
AF =Availability Failure SF = Service Failure QF = Quality Failure	Major Medium Minor Veh. Avail. = Captured by the Vehicle Availability deduction regime	N/A = Not Applicable Immediate (“Immed.”) = No later than 30 minutes from time of Event	N/A = Not Applicable ND = Correct by start of service the following day	PR = Per Request PE = Per Event D = Daily W = Weekly M = Monthly Q = Quarterly B = Bi-Annually A = Annually R = Randomly, At Any Moment in Time

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
<i>Facilities Maintenance Services</i>							
KPM A(6)2.0(a)(v)	Project Co shall immediately clean or repair any Defect that affects the Safety of the public or the employees of Project Co and the City in accordance with the Custodial Maintenance Standard.	SF	Major	Immed.	1 hour	PE	[REDACTED]
KPM A(6)2.0(a)(vi)	Project Co shall conduct daily debris removal and general cleaning of frequented areas in accordance with the Daily Custodial Maintenance Standard.	QF	Minor	ND	NA	D	[REDACTED]
KPM A(6)2.0(a)(vii)	Project Co shall conduct weekly heavy cleaning of interior and frequented areas in accordance with the Weekly Custodial Maintenance Standard.	SF	Minor	NA	24 hours	W	[REDACTED]
KPM A(6)2.0(a)(viii)	Project Co shall conduct seasonal cleaning and maintenance of exterior surfaces and surface treatments in accordance with the Seasonal Custodial Maintenance Standard.	SF	Minor	NA	7 days	Q	[REDACTED]
KPM A(6)2.0(a)(ix)	Project Co shall conduct bi-annual heavy cleaning of floor surfaces in accordance with the Bi-Annual Custodial Maintenance Standard.	QF	Minor	NA	1 week	B	[REDACTED]

APPENDIX A – ATTACHMENT 7
STATION MAINTENANCE SERVICES

1.0 Scope of Services

- (a) Project Co shall be responsible for the Custodial, Preventive, and Corrective Maintenance activities on all Stations including but not limited to:
- (i) Electrical, mechanical, HVAC, and other infrastructure;
 - (ii) Elevators;
 - (iii) Green roof;
 - (iv) Building structural elements;
 - (v) integrated architectural elements; and
 - (vi) artwork.

2.0 Service Requirements

- (a) Custodial Maintenance Requirements
- (i) Project Co shall conduct all physical removal of dirt, soot, stains, marks, liquids and materials that come in contact with floors, walls, doors, windows, furniture and other Station components.
 - (ii) Project Co shall repair any broken or malfunctioning floors, walls, doors, windows, furniture and other Station components.
 - (iii) Project Co shall be responsible for identifying the Defect and performing remedial actions in accordance with the Custodial Maintenance Standard and the timeframes established in the Performance Indicators. Notwithstanding, the Defect, timelines and remedial actions identified, prevailing legislation and City by-laws shall take precedence if they are more restrictive.
 - (iv) Project Co shall immediately clean or repair any Station Defect that affects the Safety of the public or the employees of Project Co and the City in accordance with the Custodial Maintenance Standard.
 - (v) Project Co shall conduct daily trash removal and general cleaning of frequented areas in accordance with the Daily Custodial Maintenance Standard.
 - (vi) Project Co shall conduct weekly heavy cleaning of interior and frequented areas in accordance with the Custodial Maintenance Standard.

- (vii) Project Co shall conduct bi-annual heavy cleaning in accordance with the Bi-Annual Custodial Maintenance Standard.
- (b) Maintenance and Rehabilitation Requirements
 - (i) Project Co shall maintain all Stations in the System and all Station components in a good state of repair and working order in accordance with the approved Corrective and Preventive Maintenance Plans.
 - (ii) Project Co shall maintain all Stations in the System and all Station components in accordance with the Station Access Standard.
- (c) Elevator Maintenance Requirements
 - (i) Project Co shall regularly inspect and maintain all elevators in accordance with manufacturer and governmental regulatory requirements to maintain the Station Access Standard.
 - (ii) Project Co shall perform Preventive Maintenance and Corrective Maintenance in accordance with manufacturer recommendations, and the accepted maintenance plan.
 - (iii) Elevators shall be maintained to minimize disruption to vertical transportation, particularly for mobility impaired Passengers. Routine elevator maintenance or elevator failure shall not be allowed to take out of service more than one elevator serving a Station entrance.
- (d) Project Co's shall ensure compliance with Schedule 17 – Environmental Obligations.
- (e) Project Co's performance with respect to vandalism and graffiti shall be in accordance with:
 - (i) Appendix A, Attachment 10 – Alignment Maintenance Services, Article 2.0(f) “Vandalism and Graffiti Repair”, Article 3.0(e) “Vandalism and Graffiti Standard”, and Article 5.0 “Performance Criteria”, and for further certainty, Project Co’s rectification and/or response times and the assessment of Service Failure Points; and
 - (ii) Appendix A, Attachment 16 – Vandalism and Graffiti.

3.0 Service Standards

- (a) Custodial Maintenance Standard
 - (i) Stations shall fail to meet the Custodial Maintenance Standard if:
 - A. Any condition exists that impacts Public Safety or the Safety of the employees of Project Co and the City or fails to comply with the Safety Management System, including:
 - i. any accidental spills or bodily fluids;

- ii floor treatments that represent a tripping hazard;
 - iii free from any unsafe accumulation of ice and snow, and for clarity accumulation of ice and snow shall be deemed to be “unsafe” if not in compliance with the Snow and Ice Clearing Standard pursuant to Attachment 10 of this Schedule 15-3, including safe access to all areas of the buildings and facilities;
 - iv illumination and / or lighting levels are not in compliance with Schedule 15-2; or benchmarking levels as otherwise determined prior to Revenue Service; and
- B. Any damage as a result of vandalism and/or graffiti has not been repaired as required and specified elsewhere.
- C. Any of the subsequent time-dependent standards are violated.
- (ii) Daily Custodial Maintenance Standard
- A. Stations under Project Co’s responsibility shall meet the Custodial Maintenance Standard if the following conditions exist after daily cleaning activities:
- i All trash and debris has been removed and disposed of; and
 - ii General cleaning of high Passenger frequented areas has occurred. These general cleaning activities include washing floors and cleaning station furniture as needed.
- (iii) Weekly Custodial Maintenance Standard
- A. Stations under Project Co’s responsibility shall meet the Weekly Custodial Maintenance Standard if the following conditions exist after heavy cleaning activities have occurred weekly (or more frequently as required):
- i Station floors are washed;
 - ii all Station surfaces are dusted and cleaned; and
 - iii gum, scuff marks and other similar semi-permanent markings have been removed inside windows are clean.
- (iv) Bi-Annual Custodial Maintenance Standard
- A. Buildings and facilities under Project Co’s responsibility shall meet the Bi-Annual Custodial Maintenance Standard if the following conditions exist after bi-annual cleaning activities have occurred:
- i Windows, floors and exterior surfaces are thoroughly cleaned; and

- ii Damaged surface treatments have been painted, repaired, or replaced as needed.
- (b) Station Access Standard, Station Groups and Hours of Operation
- (i) All Stations with elevators that require locking doors and or rolling grills and or ornamental gates and or other means to secure, as prescribed in Schedule 15-2, Part 4, clause 2.5(f) shall be open and in compliance with the Station Access Standard at least 15 minutes before the first scheduled Revenue Service Train, and closed within 15 minutes after the last scheduled Revenue Service Train (“**Scheduled Station Hours**”) or as otherwise directed from time to time by the City Representative. The City shall be responsible for opening and closing Stations, other than those with elevators as determined by Schedule 15-2, Part 4, clause 2.5 (f), by the Operator through deactivation of the fare gates. Notwithstanding the Operators remote control of the fare gates when opening and closing the affected Stations, Project Co shall be responsible to comply with the Station Access Standard prescribed in article 3(b)(ii) of this Attachment 7. For further certainty, the Operators responsibilities relative to Stations not specifically Project Co’s to open and close shall not derogate Project Co’s responsibilities to comply with the “Station Access Standard”. In all instances when Stations are locked remotely, Project Co shall physically verify the Station is locked and clear of all Passengers from the public areas of the Trillium Line System within 1 hour of the Hours of Operation.
- (ii) A Station is considered to meet the Station Access Standard if:
- A. All entrances to the Stations with elevators that require locking doors and or rolling grills and or ornamental gates and or other means to secure, as prescribed in Schedule 15-2, Part 4, Clause 2.5 (f) are open and Passengers have access to the Passenger waiting areas in the Station;
 - B. Where applicable each Station Platform is accessible from each Station entrance, via: (i) elevator; or (ii) alternate means of vertical transportation within 50m of the Station entrance.;
 - C. The Station is free from any unsafe accumulation of ice and snow, and for clarity accumulation of ice and snow shall be deemed to be “unsafe” only if: (1) the Station is not in compliance with the Snow and Ice Clearing Standard pursuant to Attachment 10 of this Schedule 15-3, and (2) safe access to Trains for all Passengers, including mobility impaired Passengers, is compromised;
 - D. The Station is free from any other hazard or event that results in Passengers, including mobility impaired Passengers, being unable to safely enter and leave the Station for purposes of accessing Trains, for example, failures with fire life safety systems; and
 - E. During any period of time when a Station does not meet the Station Access Standard due to non-compliance with one or more of the standards listed above

in subsections (ii)(A) to (ii)(D), Project Co shall make best efforts to mitigate the effects of such non-compliance and to provide, where possible, safe access to Trains for as many Passengers as possible.

(iii) Station Groups:

- A. Group 1: Bowesville, Limebank, Leitrim, Airport, South Keys, Carleton, Carling, and Bayview
- B. Group 2: Uplands, Greenboro, Walkley, Mooney's Bay, and Gladstone.

4.0 Quality Monitoring and Reporting

- (a) Periodically, the City will audit the Project Co's Station Maintenance documentation and reporting. Failures to maintain documentation and report on Station Maintenance activities shall result in penalties being assessed as described in the Performance Criteria section.
- (b) Maintenance Plans
 - (i) Project Co shall at all times maintain complete and updated versions of the Custodial Maintenance Plan, the Corrective Maintenance Plan, and the Preventive Maintenance Plan.
 - (ii) Project Co shall follow the requirements set out in Article 1.4 of Appendix A with regard to the drafting, approval, and revisions process for these Maintenance Plans.
- (c) Maintenance Reporting
 - (i) Project Co shall report on the status and completion of various Station Cleaning and Maintenance activities, including Daily Inspection and Cleaning, Weekly and Bi-Annual Custodial, Corrective Maintenance, and Preventive Maintenance.
 - (ii) Project Co shall follow the maintenance reporting requirements set out in Article 1.8 of Appendix A with regard to reporting procedures and the Daily, Monthly, and Bi-Annual submittals that are required.

5.0 Performance Criteria

FE Type	Category	Response	Rectification / Remedial	Recording Frequency
AF =Availability Failure	Major	N/A = Not Applicable	N/A = Not Applicable	PR = Per Request
SF = Service Failure	Medium		PE = Per Event	
QF = Quality Failure	Minor		D = Daily	
	Veh. Avail. = Captured by the Vehicle	Immediate ("Immed.") = No later than 30 minutes from time of Event	W = Weekly	
	Availability deduction regime		M = Monthly	
	St. Avail = Captured by the Station Availability deduction regime		Q = Quarterly	
			B = Bi-Annually	
			A = Annually	
			R = Randomly, At Any Moment in Time	

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
<i>Facilities Maintenance Services</i>							
KPM A(7)2.0(a)(iv)	Project Co shall immediately clean or repair any Defect that affects the Safety of the public or the employees of Project Co and the City in accordance with the Custodial Maintenance Standard.	SF	Major	Immed.	1 hour	PE	
KPM A(7)2.0(a)(v)	Project Co shall conduct daily trash removal and general cleaning of frequented areas in accordance with the Daily Custodial Maintenance Standard.	QF	Medium	NA	ND	D	[REDACTED]
KPM A(7)2.0(a)(vi)	Project Co shall conduct weekly heavy cleaning of interior and frequented areas in accordance with the Weekly Custodial Maintenance Standard.	SF	Medium	NA	24 hours	W	[REDACTED]
KPM A(7)2.0(a)(vii)	Project Co shall conduct bi-annual heavy cleaning of floor surfaces in accordance with the Bi-Annual Custodial Maintenance Standard.	SF	Medium	NA	7 days	B	[REDACTED]
KPM A(7)2.0(b)(i)	Project Co shall maintain all Stations in a state of good repair and working order in accordance with the approved Corrective and Preventive Maintenance Plans.	QF	Major	NA	NA	R	[REDACTED]
KPM A(7)2.0(c)	Elevators shall be maintained in service in accordance with Article 2.0(c)	SF	Major	30 minutes	4 hours	PE	[REDACTED]
KPM A(7)3.0(b)	Project Co shall ensure each Group 1 Station is available as per the Station Access Standard and Hours of Operations	SF	Major	15 minutes	60 minutes	PE	[REDACTED]
KPM A(7)3.0(b)	Project Co shall ensure each Group 2 Station is available as per the Station Access Standard and Hours of Operations	SF	Major	30 minutes	2 hours	PE	[REDACTED]

APPENDIX A – ATTACHMENT 8
TUNNEL MAINTENANCE SERVICES

1.0 Scope of Services

- (a) The City shall be responsible for maintaining the structural integrity of the Dows Lake Tunnel.
- (b) Project Co shall be responsible for the Custodial, Preventive, and Corrective Maintenance activities on Tunnel components and systems.
- (c) Project Co's obligation for Maintenance of Tunnels includes but is not limited to:
 - (i) Maintenance of Tunnel Drainage systems;
 - (ii) Maintenance of active FLS systems; and
 - (iii) Maintenance of passive FLS systems.

2.0 Service Requirements

- (a) Project Co shall maintain all Tunnel systems within Project Co's responsibility in a state of good repair and working order in accordance with the approved Preventive and Corrective Maintenance Plans.
- (b) Project Co shall maintain all Tunnel systems to ensure that the Fixed Availability Component Standard as provided in Article 3.0(a) is met and that service can be safely and reliably provided.
- (c) Custodial Maintenance
 - (i) Project Co shall perform all Custodial Maintenance activities in the Tunnel areas in accordance with the Requirements and Standards described in Attachment 10 Alignment Maintenance Services.
 - (ii) Tunnel Drainage
 - A. Project Co shall perform all Custodial Maintenance activities on Tunnel drainage inlets, ditches and gutters in accordance with the Tunnel Drainage Standard.
 - (iii) Passive FLS Systems
 - A. Project Co shall maintain all Emergency egress pathways and related components including, but not limited to: walkways, access doors, and Emergency signage in the Tunnel.
 - B. Project Co shall maintain these Emergency egress elements according to the Emergency Egress Standard.
 - (iv) Active FLS Systems

- A. Project Co shall conduct all inspection, maintenance, and testing of all active Fire/Life/Safety protection systems. Active Fire/Life/Safety protection systems include, but are not limited to the following:
- i Tunnel lighting, including Emergency lighting;
 - ii Smoke and fire detection;
 - iii Tunnel ventilation;
 - iv Dry standpipe system and portable fire extinguishers
 - v Backup power systems; and
 - vi Security systems and intrusion detection.
- (d) Project Co shall conduct all inspection, maintenance, and testing of Tunnel Drainage systems in accordance with the Fixed and Vehicle Component Maintenance Requirements. Project Co shall ensure that all Tunnel Drainage systems are fully functional at all times in accordance with the Tunnel Drainage Standard. Tunnel Drainage systems include, but are not limited to, the following:
- (i) Drainage inlets, outlet pipes, ditches and gutters;
 - (ii) Sewers and maintenance holes;
 - (iii) Pumps, motors, valves, forcemains, and associated electrical, instrumentation and control equipment;
 - (iv) Heat tracing of gutters, sewers and drip trays;
 - (v) Expansion joint water infiltration management system;
 - (vi) Pump house and facilities within the fenced area including fence;
 - (vii) Outlet including water quality management facilities from pump house to Dow's Lake; and
 - (viii) concrete slab, curbs and gutters supporting the Track and drainage within the Tunnel Structure.
- (e) Structural Maintenance
- (i) Project Co shall maintain all structural elements (with exception of the Dow's Lake Tunnel structural elements which shall be maintained by the City) in a state of good repair and working order in accordance with the approved Preventive and Corrective Maintenance Plans.

- (ii) Project Co shall prepare and implement plans and procedures for Structural maintenance of Tunnel in the Preventive Maintenance Plan that includes an annual inspection program that ensures the Safety and integrity of the Structures.
 - (iii) Project Co shall conduct inspections of Structures which shall include but not be limited to:
 - A. Detailed visual survey of all support and sub-structure Structures;
 - B. Detailed tactile inspection of all support and sub-structure Structures; and
 - C. Concrete coring and testing to determine the condition of the concrete.
 - (iv) Project Co shall undertake the work set out in Schedule 15-2 to the Project Agreement on an annual basis or more frequently as may be required and in accordance with any applicable local, provincial, or national requirements.
 - (v) Project Co and the City shall coordinate access requirements to the Dow's Lake Tunnel in order for the City to conduct required inspections and maintenance work to the structural elements of Dow's Lake Tunnel. The City's notice for access to the Dow's Lake Tunnel shall be coordinated pursuant to article 1.5 and 1.9 of Appendix A to Schedule 15-3.
- (f) Project Co shall ensure compliance with Schedule 17 – Environmental Obligations.
- (g) Project Co's performance with respect to vandalism and graffiti shall be in accordance with:
- (i) Appendix A, Attachment 10 – Alignment Maintenance Services, Article 2.0(f) “Vandalism and Graffiti Repair”, Article 3.0(e) “Vandalism and Graffiti Standard”, and Article 5.0 “Performance Criteria”, and for further certainty, Project Co's rectification and/or response times and the assessment of Service Failure Points; and
 - (ii) Appendix A, Attachment 16 – Vandalism and Graffiti.

3.0 Service Standards

(a) Fixed Component Availability Standard

- (i) Any Fixed Component in the System (including Tunnel Structures, drainage features, and FLS Systems) is considered to not meet the Standard if any Defect or Deficiency is identified in that Fixed Component that:
 - A. affects the Safety of the public, Passengers or Operator in a manner contrary to the Safety Management System;
 - B. adversely affects Operations such that the System does not meet the Operation Requirements and Specifications;

- C. free from any unsafe accumulation of ice and snow, and for clarity accumulation of ice and snow shall be deemed to be “unsafe” if not in compliance with the Snow and Ice Clearing Standard including safe access to all areas of the buildings and facilities;
 - D. illumination and/or lighting levels are not in compliance with Schedule 15-2; or benchmarking levels as otherwise determined prior to Revenue Service; or
 - E. Any damage as a result of vandalism and/or graffiti has not been repaired as required and specified elsewhere.
- (b) Tunnel Drainage Standard
- (i) Any of the following conditions shall constitute a Tunnel Drainage failure:
 - A. Any debris blocking a drainage inlet or other drainage structure, including the outlet pipe and outfall to Dow’s Lake; or
 - B. Any ponding and/or standing water within the Tunnel; or
 - C. Any formation of ice within a heat-traced drainage gutter or sewer.
 - D. Any failure of the water infiltration management system at the expansion joints
- (c) Passive FLS systems Standard
- (i) At all times, all Emergency egress pathways and related components in the Tunnel (including, but not limited to walkways, access doors, and Emergency signage) shall be kept clear, functional, and available for use in the event of an Emergency.
- (d) Active FLS systems Standard
- (i) At all times, the various Active Fire/Life/Safety systems elements shall be inspected, maintained, and tested to ensure they function according to the requirements of Schedule 15-2 and Schedule 15-3. Project Co shall be responsible to test the Active Fire/Life/Safety systems no less than monthly. In addition, they shall provide a written report to the City detailing the proper working condition of each element of the System. Any Defects shall be detailed in the report, which shall include an acceptable repair schedule.
- 4.0 Quality Monitoring and Reporting**
- (a) Periodically, the City will audit the Project Co’s Tunnel Maintenance documentation and reporting. Failures to maintain documentation and report on Tunnel Maintenance activities shall result in penalties being assessed as described in the Performance Criteria section.
- (b) Maintenance Plans

- (i) Project Co shall at all times maintain complete and updated versions of the Custodial Maintenance Plan, the Corrective Maintenance Plan, and the Preventive Maintenance Plan.
 - (ii) Project Co shall follow the requirements set out in Article 1.4 of Appendix A with regard to the drafting, approval, and revisions process for these Maintenance Plans.
- (c) Maintenance Reporting
- (i) Project Co shall report on the status and completion of various Tunnel Maintenance activities.
 - (ii) Project Co shall follow the maintenance reporting requirements set out in Article 1.8 of Appendix A with regard to reporting procedures and the Daily, Monthly, and Annual submittals that are required.

5.0 Performance Criteria

FE Type	Category	Response	Rectification / Remedial	Recording Frequency	
AF =Availability Failure SF = Service Failure QF = Quality Failure	Major Medium Minor Veh. Avail. = Captured by the Vehicle Availability deduction regime St. Avail = Captured by the Station Availability deduction regime	N/A = Not Applicable Immediate (“Immed.”) = No later than 30 minutes from time of Event	N/A = Not Applicable ND = Correct by start of service the following day	PR = Per Request PE = Per Event D = Daily W = Weekly M = Monthly Q = Quarterly B = Bi-Annually A = Annually R = Randomly, At Any Moment in Time	Per Request Per Event Daily Weekly Monthly Quarterly Bi-Annually Annually Randomly, At Any Moment in Time

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
<i>Tunnel Maintenance Services</i>							
KPM A(8)2.0(a)	Project Co shall maintain all Tunnel systems within Project Co's responsibility in a state of good repair and working order in accordance with the approved Preventive and Corrective Maintenance Plans.	QF	Major	NA	NA	R	Project Co to be permitted reasonable Remedial Period, based on nature of non-compliance.

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
KPM A(8)2.0(c)(i)	Project Co shall perform all Custodial Maintenance activities in the Tunnel areas in accordance with the Requirements and Standards described in Attachment 10 Alignment Maintenance Services.						As per relevant KPM in Attachment 10.
KPM A(8)2.0(c)(ii)(A)	Project Co shall perform all Custodial Maintenance activities on Tunnel drainage inlets, outlet pipes, ditches and gutters in accordance with the Tunnel Drainage Standard.	SF	Medium	2 hours	24 hours	PE	SF assessed per Defect/issue.
KPM A(8)2.0(d)	Project Co shall ensure that all Tunnel Drainage systems are fully functional at all times in accordance with the Tunnel Drainage Standard.	SF	Medium	2 hours	24 hours	PE	SF assessed per Defect/issue.
KPM A(8)2.0(g)	Project Co shall perform maintenance activities on any vandalism within the Tunnel in accordance with the vandalism and graffiti control requirements in Attachment 10 - Alignment Maintenance Services.						As per relevant KPM in Attachment 10.
KPM A(8)2.0(c)(iii)	Project Co shall comply with the Passive FLS systems Standards	QF	Major	NA	30 minutes	PE	SF assessed per Defect/issue.
KPM A(8)2.0(c)(iv)	Project Co shall comply with the Active FLS systems Standards	QF	Major	Immed.	48 hours	PE	SF assessed per Defect/issue.

APPENDIX A – ATTACHMENT 9
STRUCTURE MAINTENANCE SERVICES

1.0 Scope of Services

- (a) Project Co shall be responsible for maintaining Structures, unless as identified otherwise in the Maintenance Responsibility Table.
- (b) Project Co's obligation for Maintenance of the fixed facilities includes, without limitation, all structural elements, including Bridges, retaining walls, drainage outlets, Culverts and other fixed Structures in such a manner as to meet the requirements of Capital Railway's BSMP, the minimum Bridge Condition Index as prescribed in Appendix B, and ensuring the Structure's integrity and durability is not compromised.

2.0 Service Requirements

- (a) Project Co shall maintain all Bridges and Structures within Project Co's responsibility in a state of good repair and working order in accordance with the approved Preventive and Corrective Maintenance Plans, Capital Railway's BSMP and in accordance with Transport Canada's Guideline for Bridge Safety Management and Guideline for Culvert Safety Management requirements.
- (b) Project Co shall prepare and implement plans and procedures for Structural maintenance in the Preventive Maintenance Plan that includes an annual inspection program that ensures the Safety and integrity of the Structures.
- (c) Project Co shall maintain all Bridges and Structures to meet the Fixed Component Availability Standard.
- (d) Project Co shall conduct inspections, including but not limited to:
 - (i) Cursory inspections of all Overhead Bridges;
 - (ii) Periodic visual inspections;
 - (iii) Detailed visual inspections;
 - (iv) Underwater inspections;
 - (v) Special inspections; and
 - (vi) Condition surveys.
- (e) Project Co shall undertake the work set out in Schedule 15-3 to the Project Agreement as may be required by Capital Rail's BSMP and in accordance with the requirements provided in Appendix B.
- (f) Project Co's shall ensure compliance with Schedule 17 – Environmental Obligations.

- (g) Project Co's performance with respect to vandalism and graffiti shall be in accordance with:
- (i) Appendix A, Attachment 10 – Alignment Maintenance Services, Article 2.0(f) “Vandalism and Graffiti Repair”, Article 3.0(e) “Vandalism and Graffiti Standard”, and Article 5.0 “Performance Criteria”, and for further certainty, Project Co's rectification and/or response times and the assessment of Service Failure Points; and
 - (ii) Appendix A, Attachment 16 – Vandalism and Graffiti.

3.0 Service Standards

- (a) Fixed Component Availability Standard
- (i) Any Fixed Component in the System (including Bridges and Structures) is considered to not meet the Standard if any Defect or Deficiency is identified in that Fixed Component that:
 - A. affects the Safety of the public, Passengers or Operator in a manner contrary to the Safety Management System;
 - B. adversely affects Operations such that the System does not meet the Operation Requirements and Specifications;
 - C. free from any unsafe accumulation of ice and snow, and for clarity accumulation of ice and snow shall be deemed to be “unsafe” if not in compliance with the Snow and Ice Clearing Standard including safe access to all areas of the buildings and facilities;
 - D. illumination and / or lighting levels are not in compliance with Schedule 15-2; or benchmarking levels as otherwise determined prior to Revenue Service; or
 - E. any damage as a result of vandalism and / or graffiti has not been repaired as required and specified elsewhere.

4.0 Quality Monitoring and Reporting

- (a) Periodically, the City will audit the Project Co's Structure Maintenance documentation and reporting. Failures to maintain documentation and report on Structure Maintenance activities shall result in penalties being assessed as described in the Performance Criteria section.
- (b) Maintenance Plans
- (i) Project Co shall at all times maintain complete and updated versions of the Custodial Maintenance Plan, the Corrective Maintenance Plan, and the Preventive Maintenance Plan.
 - (ii) Project Co shall follow the requirements set out in Article 1.4 of Appendix A with regard to the drafting, approval, and revisions process for these Maintenance Plans.

(c) Maintenance Reporting

- (i) Project Co shall report on the status and completion of various Structure Maintenance activities.
- (ii) Project Co shall follow the maintenance reporting requirements set out in Article 1.8 of Appendix A with regard to reporting procedures and the Daily, Monthly, and Annual submittals that are required.

5.0 Performance Criteria

FE Type	Category	Response	Rectification / Remedial	Recording Frequency
AF =Availability Failure SF = Service Failure QF = Quality Failure	Major Medium Minor Veh. Avail. = Captured by the Vehicle Availability deduction regime St. Avail = Captured by the Station Availability deduction regime	N/A = Not Applicable Immediate (“Immed.”) = No later than 30 minutes from time of Event	N/A = Not Applicable ND = Correct by start of service the following day	PR = Per Request PE = Per Event D = Daily W = Weekly M = Monthly Q = Quarterly B = Bi-Annually A = Annually R = Randomly, At Any Moment in Time

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
<i>Structure Maintenance Services</i>							
KPM A(9)2.0(a)	Project Co shall maintain all Bridges and Structures within Project Co's responsibility in a state of good repair and working order in accordance with the approved Preventive and Corrective Maintenance Plans.	QF	Major	NA	NA	R	[REDACTED]
KPM A(9)2.0(d) and A(9)2.0(e)	Project Co shall conduct inspections of Structures in compliance with Articles 2.0(d) and (e)	QF	Major	NA	1 month	A	[REDACTED]

APPENDIX A – ATTACHMENT 10
ALIGNMENT MAINTENANCE SERVICES

1.0 Scope of Services

- (a) Project Co shall be responsible for the Custodial, Preventive, and Corrective Maintenance activities for the Alignment Maintenance activities including but not limited to:
- (i) Vegetation Control, including Grass, Weed, and Tree and Shrub Control;
 - (ii) Debris Collection and Removal;
 - (iii) Rock wall stabilization / rock fall cleanup;
 - (iv) Noise wall(s), includes new and existing within the Lands;
 - (v) Drainage Control;
 - (vi) Vandalism and Graffiti Repair, including and as indicated in Attachments 3 to 9;
 - (vii) Maintenance of Fencing; and
 - (viii) Snow and Ice Removal, including and as indicated in Attachments 3 to 9.

2.0 Service Requirements

- (a) Project Co shall conduct all Custodial, Corrective, and Preventive Maintenance activities along the System alignment unless assigned to Third Party Land Interest Holders in the Maintenance Responsibility Table.
- (b) The following sections provide details about Project Co's responsibilities for specific maintenance types.
- (c) Vegetation Control
- (i) Project Co shall perform inspections during growing seasons to ensure compliance with the requirements included herein, Schedule 15-2, Schedule 17, and the Project Agreement. The inspections, reports, and actions shall be included as part of the annual reporting requirements of the assets condition as prescribed in Schedule 15-3 Appendix B.
 - (ii) Project Co shall perform Grass and Weed Control in order to:
 - A. maintain the condition of the ballast;
 - B. ensure sight distances;
 - C. provide unobstructed view;

- D. control noxious weeds (The Weed Control Act and Regulations);
 - E. reduce drainage impairment;
 - F. improve turf; and
 - G. improve landscape and overall aesthetics.
- (iii) Grass Control
- A. Project Co shall conduct mowing or trimming operations to control grass growth in accordance with the Vegetation Control Standard.
 - B. Project Co shall conduct seeding, sodding, or planting to control erosion in accordance with the Vegetation Control Standard.
 - C. Project Co shall be responsible for identifying the Defect and performing remedial actions in accordance with the Vegetation Control Standard and the timeframes established in the Performance Indicators. Notwithstanding, the Defect, timelines and remedial actions identified, prevailing legislation and City by-laws shall take precedence if they are more restrictive.
- (iv) Weed Control
- A. Project Co shall conduct weed control operations to eradicate or control undesirable herbaceous vegetation (including grass) using integrated management techniques.
 - B. Project Co shall remove, by mechanical mowing or chemical spraying (in accordance with prevailing legislation and City by-laws), deficient weed growth in accordance with the Vegetation Control Standard.
 - C. Project Co shall be responsible for identifying the Defect and performing remedial actions in accordance with the Vegetation Control Standard and the timeframes established in the Performance Indicators. Notwithstanding, the Defect, timelines and remedial actions identified, prevailing legislation and City by-laws shall take precedence if they are more restrictive.
- (v) Tree and Shrub Maintenance and Control
- A. Project Co shall perform Tree and Shrub Control in order to:
 - i maintain a safe environment;
 - ii maintain the condition of the ballast;
 - iii prevent fires;
 - iv ensure sight distances;

- v prevent encroachment into Track clearance envelope;
 - vi provide unobstructed view; and
 - vii improve landscape and overall aesthetics.
- B. Project Co shall conduct tree and shrub maintenance consisting of various activities including, but not limited to, trimming, fertilizing and watering, as required to keep trees and shrubs healthy and in control and in accordance with:
- i the Vegetation Control Standard; and
 - ii accepted horticultural and arboricultural standards.
- C. Project Co shall conduct ongoing Preventive Maintenance on trees and shrubs during the Maintenance Period.
- D. Project Co shall be responsible for identifying the Defect and performing remedial actions in accordance with the Vegetation Control Standard and the timeframes established in the Performance Indicators. Notwithstanding, the Defect, timelines and remedial actions identified, prevailing legislation and City by-laws shall take precedence if they are more restrictive.
- E. Project Co shall perform inspections which shall be carried out by a qualified professional with the knowledge of tree and shrub maintenance practices and identification and diagnosis of diseases and Defects. The qualified professional shall have a minimum of three years' experience in the field of tree and shrub maintenance.
- (d) Debris Collection and Disposal
- (i) Project Co shall conduct all debris collection and disposal in order to:
 - A. prevent damage to vehicles;
 - B. equipment and property;
 - C. manage environmental, commercial, residential and tourism concerns; and
 - D. maintain the image of the Trillium Line and the landscape aesthetics.
 - (ii) Project Co shall collect and dispose of objectionable items such as rubbish (garbage, cans, bottles, paper, plastic products, etc.), dead animals, batteries, tires, metal products, containers, rocks, building materials, etc., in according with the Debris Collection and Disposal Standard Attachment 10 Article 3(b).
 - (iii) Project Co shall perform all debris collection and disposal activities in accordance with local, provincial, and national Health and Safety regulations and at least on a weekly

basis. In the case of a dead animal carcass, Project Co shall remove within 24 hours of becoming aware of such debris.

- (iv) Project Co shall ensure that debris is promptly removed from the Custodial Maintenance Areas.
- (v) Project Co shall immediately notify TOCC and the police of any suspicious items that may have been placed with the specific intent to cause public harm or property damage.
- (vi) Project Co shall be responsible for identifying the Defect and performing remedial actions in accordance with the Debris Collection and Disposal Standard and the timeframes established in the Performance Indicators. Notwithstanding, the Defect, timelines and remedial actions identified, prevailing legislation and City by-laws shall take precedence if they are more restrictive.

(e) Fences

- (i) Project Co shall provide and maintain perimeter security fencing, rectify Safety Deficiencies and perform Custodial Maintenance with respect to the Alignment in accordance with the Fencing Standard.
- (ii) Project Co shall maintain all of the fencing including physical barriers made of chain link fence, farm fence, wooden materials, metal panels, composite materials, concrete, brick and various types of Noise walls owned by the City within the Alignment and Maintenance and Storage Facilities under the Project Agreement (including Schedule 15-3).
- (iii) Project Co shall be responsible for identifying the Defect and performing remedial actions in accordance with the Fencing Standard and the timeframes established in the Performance Indicators.
- (iv) Project Co shall immediately take temporary and / or permanent measures if considered a Security or Safety concern. Notwithstanding, the Defect, timelines and remedial actions identified, prevailing legislation and City by-laws shall take precedence if they are more restrictive.

(f) Vandalism and graffiti repair

- (i) Project Co shall remove all graffiti and repair all vandalism..
- (ii) Project Co shall remedy graffiti and vandalism on the System in accordance with the Vandalism and Graffiti Standard.
- (iii) Project Co shall cover or remove offensive material and graffiti by painting over, cleaning, or mechanical removal in accordance with the Vandalism and Graffiti Standard.
- (iv) Project Co shall repair any infrastructure or components damaged by vandalism in accordance with the Vandalism and Graffiti Standard. Notwithstanding the requirements

provided in Attachment 16 – Vandalism and Graffiti, Project Co shall present proposals to the City for approval or repair or replacement of equipment or parts damaged by vandalism to Trillium Line SI, equipment, or landscaping before proceeding with repairs.

- (v) Project Co shall be responsible for identifying the Defect and/or upon becoming aware performing remedial actions in accordance with the Vandalism and Graffiti Standard and the timeframes established in the Performance Criteria. Notwithstanding, the Defect, timelines and remedial actions identified, prevailing legislation and City by-laws shall take precedence if they are more restrictive.

(g) Drainage Control

- (i) Project Co shall inspect and clean all drainage culverts, outlets and ditches to ensure they are not blocked and functioning as intended in accordance with the Drainage Control Standard.
- (ii) Project Co shall remove any vegetation impeding proper drainage in accordance with the Drainage Control Standard.
- (iii) Project Co shall conduct efforts to eliminate ponding and/or standing water, in accordance with:
- A. the City of Ottawa program to control the spread of the West Nile Virus; and
 - B. the Drainage Control Standard.
- (iv) Project Co shall undertake formal drainage design and construction treatments in persistent problem areas to eliminate the water ponding/standing concerns, in accordance with Project Agreement including Schedules 15-2 and this Schedule 15-3.
- (v) In response to ponding and/or standing water during the Spring and Summer months, Project Co shall notify the City, such that the City will provide remedial measures if necessary, in accordance with the City's monitoring and treatment plans.

(h) Snow and Ice Clearing, Sanding, De-Icing and Removal

- (i) Project Co shall perform all ice and snow clearing and removal services for the System in accordance with the Snow and Ice Removal Standard.
- (ii) Project Co shall perform all snow and ice clearing, de-icing and removal (including the application of other ice melt products and / or use of other means and methods for meeting the Snow and Ice Removal Standard) in order to:
- A. ensure the Safety of Operator, Passengers and pedestrians throughout the System, except in the areas as otherwise identified in the Maintenance Responsibility Table;

- B. permit the safe operation of Vehicles on the System in accordance with the Safety Management System, designated Emergency evacuation routes, and the Operational Requirements and Specifications. This includes the clearing and removal of snow and ice on the Tracks, turnouts, and switches and as may be required to ensure safe operation of the Vehicles; and
 - C. permit safe access to the System by Operators, Passengers and pedestrians, and for further certainty to ensure compliance with the Station Access Standard.
- (iii) Project Co shall coordinate with the City when operations outside of Revenue Hours are necessary to prevent the accumulation of snow or ice on the Tracks.
- (iv) Project Co shall have available equipment for plowing / clearing the Tracks when necessary.
- (v) At the daily meeting prior to an anticipated weather event, Project Co shall review with the City, Project Co's weather event policies and procedures, including but not limited to:
- A. Forecasted severity of the weather event;
 - B. Project Co's resources allocated to address the weather event and in maintaining compliance with the Standard along with the Safe operation of the System;
 - C. Project Co's designated employee(s) responsible for reporting the progress of performance prior to, during, and after the weather event; and
 - D. Project Co shall be responsible to coordinate with the City and other third party service providers.
- (vi) At the daily meeting following the storm event, Project Co shall review with the City, Project Co's performance in meeting the Standard.
- (i) Project Co's shall ensure compliance with Schedule 17 – Environmental Obligations.

3.0 Service Standards

(a) Custodial Maintenance Standard

- (i) The Alignment Maintenance Services shall fail to meet the Custodial Maintenance Standard if:
- A. Any condition exists that impacts Public Safety or the Safety of the employees of Project Co and the City or fails to comply with the Safety Management System, including:
 - i any unsafe accumulation of ice and snow, and for clarity accumulation of ice and snow shall be deemed to be “unsafe” if not in compliance with the Snow and Ice Clearing Standard including safe access to all areas of the Alignment designated for Emergency evacuation routes; and

- ii illumination and / or lighting levels are not in compliance with Schedule 15-2; or benchmarking levels as otherwise determined prior to Revenue Service.

(b) Vegetation Control Standard

(i) Grass Control Standard

- A. The following areas and heights of grass growth shall constitute a grass control deficiency to be corrected by Project Co:
 - i Any grass growing along Tracks within ballast and shoulder areas and between pavement or concrete cracks;
 - ii Any grass in urban areas, areas adjacent to residential homes or manicured lawns and at the Maintenance and Storage Facilities, exceeding 100mm in height;
 - iii Any grass outside of urban areas, areas away from residential homes and manicured lawns exceeding 300mm in height; or
 - iv Locations where lack of vegetation is causing erosion.

(ii) Weed Control Standard

- A. The following areas of weed growth shall constitute a weed control deficiency to be corrected by Project Co:
 - i Weeds growing along Tracks within ballast and shoulder areas and between pavement or concrete cracks;
 - ii Noxious weeds that are identified through a weed control order or by-law;
 - iii Noxious weeds that are identified to pose a negative economic impact to horticultural, agricultural and residential land uses; or
 - iv Weeds impeding drainage or contributing to erosion by destroying desirable groundcovers.

(iii) Tree and Shrub Control Standard

- A. The following types of tree and shrub growth shall constitute a tree and shrub control deficiency to be corrected by Project Co:
 - i dead trees and shrubs;
 - ii evidence of disease or pests;

- iii any broken and damaged trees, limbs or branches;
- iv limbs or branches encroaching on Track clearance envelope;
- v any uncontrolled areas of growth such as wild brush areas, or growth encroaching on public areas.

(c) Debris Collection and Disposal Standard

- (i) The presence of any of the following shall constitute a debris collection deficiency to be corrected by Project Co:
 - A. any debris within the Alignment that remains after one week from when Project Co becomes aware of the presence of the debris:
 - i all debris along Tracks within ballast, shoulder areas, in the Alignment and at Maintenance and Storage Facilities;
 - ii any debris along Tracks within ballast and shoulder areas that may affect the Safety or operation of the Trillium Line; or
 - iii any debris that may present a public Safety concern, environmental or property damage.
 - B. any dead animal carcasses within the System alignment that are not removed within 24 hours of becoming aware.

(d) Fencing Standard

- (i) Any of the following shall constitute a fencing deficiency to be corrected by Project Co:
 - A. any damaged fence not owned by the City;
 - B. any damage to fence owned by the City; or
 - C. damaged or defective personnel access gates or locks.

(e) Vandalism and Graffiti Standard

- (i) All vandalism and graffiti shall be covered or removed by painting over, cleaning, or mechanical removal within 24 hours of Project Co identifying and / or becoming aware of the Defect.
- (ii) Project Co shall report any vulgar, hate, racist, or gang related vandalism and graffiti to the Special Constables Unit immediately. The City will provide a quick reference guide to Project Co for recognizing hateful symbols and text, of which may be revised by the City from time to time.

- (iii) If considered vulgar hateful, racist, or gang related the Defect shall not be covered or removed until the City's Police or Special Constables Unit has conducted a crime scene investigation and subsequent release of the crime scene for Project Co's remedial action.
 - (iv) If permanent repairs cannot be completed with the initial response time, any infrastructure or components damaged by vandalism and graffiti shall be repaired within the Remedial Period (time required to complete permanent repairs as proposed by Project Co, acting reasonably and based on the nature and extent of the damage, with the time being determined from when Project Co identified and / or became aware of the Defect until such time that permanent repairs are complete), and notwithstanding the requirements of Attachment 16 – Vandalism and Graffiti, after City approval of the proposed remedy.
 - (v) In all cases, if public Safety or the continued operation of the System at the prescribed service levels is a concern, temporary repairs shall be made immediately.
- (f) Drainage Control Standard
- (i) Any of the following conditions shall constitute a Drainage Control Deficiency to be corrected by Project Co:
 - A. Any vegetation growth impeding drainage;
 - B. Any debris blocking a drainage culvert, outlet, or ditch; or
 - C. Any ponding and/or standing water during the Spring and Summer months.
- (g) Snow and Ice Removal Standard
- (i) During the weather event, the following shall constitute snow and ice deficiencies on the System to be corrected by Project Co:
 - A. any accumulation in excess of trace amounts within 1m horizontal distance measured perpendicular to edge of the respective Station Platform immediately adjacent to the Track, inclusive of the Platform extenders where applicable, and where the area shall extend to the ends of the respective Station Platform; and
 - B. any snow and ice accumulation that impairs the operation of the System, including but not limited to the following:
 - i on the Tracks;
 - ii turnouts and switches;
 - iii New Walkley Yards;
 - iv designated egress and fire safety plans; or

- v as may be required to ensure safe operation of the System and defined by the Capital Railway rules, regulations, and the Standard Operating Procedures, for further certainty, includes but not limited to the Station Platform and other areas within the limits of the Fare Paid Zone but outside of the limits described in article 3.0(g)(i)A.;
- C. any snow and ice accumulation in public areas (where Project Co is responsible for surface maintenance) that does not comply with Article 3.0(g)(iii), notwithstanding when Project Co is exempt from maintenance responsibilities that includes snow and ice clearing / removal as indicated in Appendix A Article 4(b) and Attachment 15 Footnote 8; and
- D. any snow and ice clearing / removal on walking surfaces within 3 meters of the entrance and / or building facade for an entrance that does not comply with Article 3.0(g)(iii).
- (ii) Prior to the start of the next Revenue Service day after the weather event has ended, the following shall constitute snow and ice deficiencies on the System:
- A. any accumulation in excess of trace amounts at the Station Platforms within the area prescribed in article 3(g)(i)A., public areas (where Project Co is responsible for surface maintenance), and for further certainty Project Co shall be responsible for snow and ice clearing/removal on walking surfaces within 3m of the entrance and/or building facade for an entrance;
- B. any snow and ice accumulation along the Tracks, Guideway, and New Walkley Yard that impairs the operation of the System.
- (iii) For public areas of the Stations, notwithstanding Project Co's requirements prescribed in Article 3.0(g)(i) and Article 3.0(g)(ii), Project Co shall commence snow removal activities no later than the accumulation of 3cm of snow or at the start of any freezing rain event each measured *in situ*. Maximum time to remove ice/snow to reach bare surface from the end of the accumulation event each measured *in situ* shall be as per the table below.

Precipitation	Station Platform ¹	Other ²
Freezing rain	1 hr	2 hrs
Up to 10cm snow	1 hr	1 hr
10 - 20cm snow	2 hr	2 hr
20+ cm snow	3 hrs	4 hrs

¹ Station Platform means areas of the Platform not required to be maintained to trace amounts of snow as prescribed in Article 3.0(g)(i)A.

² Other means public areas of the Stations within and outside of the fare paid, which Project Co is required to Maintain

4.0 Quality Monitoring and Reporting

- (a) Periodically, the City will audit the Project Co's Alignment Maintenance documentation and reporting. Failures to maintain documentation and report on Alignment Maintenance activities shall result in penalties being assessed as described in the Performance Criteria section.
- (b) Maintenance Plans
 - (i) Project Co shall at all times maintain complete and updated versions of the Custodial Maintenance Plan, the Corrective Maintenance Plan, and the Preventive Maintenance Plan.
 - (ii) Project Co shall follow the requirements set out in Article 1.4 of Appendix A with regard to the drafting, approval, and revisions process for these Maintenance Plans.
- (c) Maintenance Reporting
 - (i) Project Co shall report on the status and completion of various Alignment Maintenance activities.
 - (ii) Project Co shall follow the maintenance reporting requirements set out in Article 1.8 of Appendix A with regard to reporting procedures and the Daily, Monthly, and Annual submittals that are required.

5.0 Performance Criteria

FE Type	Category	Response	Rectification / Remedial	Recording Frequency
AF =Availability Failure SF = Service Failure QF = Quality Failure	Major Medium Minor Veh. Avail. = Captured by the Vehicle Availability deduction regime St. Avail = Captured by the Station Availability deduction regime	N/A = Not Applicable Immediate ("Immed.") = No later than 30 minutes from time of Event	N/A = Not Applicable ND = Correct by start of service the following day	PR = Per Request PE = Per Event D = Daily W = Weekly M = Monthly Q = Quarterly B = Bi-Annually A = Annually R = Randomly, At Any Moment in Time

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
<i>Alignment Maintenance Services</i>							
KPM A(10)3.0(a)	Project Co shall perform Custodial Maintenance in accordance with Article 3.0(a)	SF	Minor	NA	1 day	PE	SF assessed per issue not in compliance with Standard.

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
KPM A(10)2.0(c)(ii)	Project Co shall perform Grass Control in accordance with Article 2.0(c)(ii) and the Vegetation Control Standard.	SF	Minor	NA	7 days	PE	SF assessed per segment to a maximum exposure of 10 segments in non-compliance at any one time.
KPM A(10)2.0(c)(iv)	Project Co shall perform Weed Control in accordance with Article 2.0(c)(iv) and the Vegetation Control Standard.	SF	Minor	NA	7 days	PE	SF assessed per segment to a maximum exposure of 10 segments in non-compliance at any one time.
KPM A(10)3.0(b)(iii) (A)(i)	Project Co shall perform Tree and Shrub Maintenance and Control in accordance with the Vegetation Control Standard, Item A(i) (free from dead trees and shrubs).	SF	Minor	NA	NA	PE	SF assessed per segment to a maximum exposure of 10 segments in non-compliance at any one time.
KPM A(10)3.0(b)(iii) (A)(ii)	Project Co shall perform Tree and Shrub Maintenance and Control in accordance with the Vegetation Control Standard, Item A(ii) (free from evidence of disease or pests).	SF	Minor	NA	NA	PE	SF assessed per segment to a maximum exposure of 10 segments in non-compliance at any one time.
KPM A(10)3.0(b)(iii) (A)(iii)	Project Co shall perform Tree and Shrub Maintenance and Control in accordance with the Vegetation Control Standard, Item A(iii) (free from broken and damaged trees, etc.).	SF	Minor	NA	14 days	PE	SF assessed per segment to a maximum exposure of 10 segments in non-compliance at any one time.
KPM A(10)3.0(b)(iii) (A)(iv)	Project Co shall perform Tree and Shrub Maintenance and Control in accordance with the Vegetation Control Standard, Item A(iv) (free from uncontrolled areas of growth etc.).	SF	Minor	NA	28 days	PE	SF assessed per segment to a maximum exposure of 10 segments in non-compliance at any one time.
KPM A(10)2.0(c)(v)(C)	Project Co shall perform ongoing Preventive Maintenance on trees and shrubs during the Maintenance Period as required by Article 2.0 (c)(v)(C)	QF	Minor	NA	NA	R	SF assessed per segment to a maximum exposure of 10 segments in non-compliance at any one time.
KPM A(10)2.0(d)(ii)	Project Co shall perform Debris Collection and Disposal in accordance with Article 2.0(d)(ii) and the Debris Collection and Disposal Standard.	SF	Major	NA	NA	PE	SF assessed per segment to a maximum exposure of 10 segments in non-compliance at any one time.

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
KPM A(10)2.0(d)(iv)	Project Co shall ensure that debris is promptly removed from the Custodial Maintenance Areas.	SF	Major	NA	4 hours	PE	[REDACTED]
KPM A(10)2.0(d)(v)	Project Co shall immediately notify TOCC and the police of any suspicious items that may have been placed with the specific intent to cause public harm or property damage.	QF	Major	NA	NA	PE	[REDACTED]
KPM A(10)2.0(e)(i)	Project Co shall perform maintenance of fencing in accordance with Article 2.0(e)(i) and the Fencing Standard.	SF	Minor	NA	7 days	PE	[REDACTED]
KPM A(10)2.0(e)(iv)	Project Co shall immediately take temporary and / or permanent measures if an identified Defect is considered a Security or Safety concern.	SF	Major	Immed.	4 hours	PE	[REDACTED]
KPM A(10)2.0(f)(ii)	Project Co shall remedy all vulgar or offensive graffiti and vandalism in accordance with the Graffiti and Vandalism Standard.	SF	Medium	Immed	24 hours	PE	[REDACTED]
KPM A(10)2.0(f)(iv)	Project Co shall repair any infrastructure or components damaged by vandalism in accordance with the Graffiti and Vandalism Standard.	SF	Medium	NA	ND	PE	[REDACTED]
KPM A(10)2.0(f)(v)	Project Co shall repair any infrastructure or components damaged by vandalism, where public safety or continuation of Service is a concern, in accordance with the Graffiti and Vandalism Standard.	SF	Major	Immed	4 hours	PE	[REDACTED]
KPM A(10)2.0(g)(i)	Project Co shall inspect and clean all drainage culverts, outlets and ditches to ensure they are not blocked and functioning as intended in accordance with the Drainage Control Standard.	SF	Minor	NA	7 days	PE	SF assessed per Defect/issue to a maximum exposure of 10 Defects/issues at any one time.

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
KPM A(10)2.0(g)(ii)	Project Co shall remove any vegetation impeding proper drainage in accordance with the Drainage Control Standard.	SF	Minor	NA	7 days	PE	[REDACTED]
KPM A(10)2.0(g)(v)	In response to ponding and/or standing water during the Spring and Summer months, Project Co shall notify the City.	QF	Major	NA	NA	PE	[REDACTED]
KPM A(10)2.0(h)(iv)	Project Co shall have available equipment for plowing / clearing the Tracks when necessary.	QF	Major	NA	NA	PE	[REDACTED]

APPENDIX A – ATTACHMENT 11

HELP DESK SERVICES

- (a) Project Co shall develop, implement, maintain up to date and provide to the City upon request appropriate operational policies, procedures and practices relative to help desk services. The information and documentation shall initially be provided to the City 10 months prior to the Scheduled Revenue Service Date for review in accordance with the review process described in Schedule 10 of the RFP. Subsequently the plans, sample reports, policies, practices and operational procedures shall be submitted to the City throughout the Maintenance Period as required, and at a minimum, annually on the anniversary of the Revenue Service Date of each year for review using the process described in Schedule 10 – Review Procedure.
- (b) Project Co shall provide help desk service 24 hours per day and for 365(6) days per year throughout the Maintenance Period, with provisions for backup if required, which shall form the day-to-day notification interface between the City and Project Co and any of its Project Co Parties in relation to the following matters:
 - (i) all enquiries and service requests for assistance relating to the Project Co Services;
 - (ii) notification of Events, complaints or compliments from any of the Passengers relating to the Project Co Services;
 - (iii) service requests for temporary changes to the delivery and scope of the Project Co Services which shall not be a Variation;
 - (iv) monitoring of System and system alarms;
 - (v) notification of accidents or emergencies;
 - (vi) notification of safety issues or concerns related to the SMS;
 - (vii) notification of security issues or concerns related to the SMS;
 - (viii) notification of trespassing or un-authorized access to the System;
 - (ix) request for information relating to the operation of the help desk service;
 - (x) update of progress regarding any Events notified to the help desk; and
 - (xi) Lost and found.
- (c) Project Co shall provide updates to the instructions for help desk services to the City from time-to-time, as required.
- (d) Following the completion of the user instructions, Project Co shall ensure that all Project Co Staff, Project Co Parties and the City representatives are trained and/or familiarized with these help desk service instructions.

- (e) Project Co shall make the initial determination and categorize each and every service request and Event using the classification (priority) protocol established pursuant to Article (a) as part of the help desk services.
- (f) Project Co shall maintain, as part of the help desk service, a daily electronic log of all service requests and calls reporting Events, along with lost and found items recovered within the System. The help desk service shall record into the electronic log all relevant details, including but not limited to the following information:
 - (i) help desk / Project Co receiving and recording the request or Event;
 - (ii) requester's name;
 - (iii) date and time;
 - (iv) location;
 - (v) nature of the request or Event;
 - (vi) service required;
 - (vii) classification (priority);
 - (viii) unique request reference identifier;
 - (ix) the Project Co Party, if applicable, and contact name to which the request was passed on to;
 - (x) date and time the request was passed on to the relevant Project Co Party;
 - (xi) action taken and by whom; and
 - (xii) Response Time and Rectification Time.
- (g) Project Co shall adhere to the City's lost and found policy. As part of the help desk service, Project Co shall maintain a daily electronic log of all lost and found items recovered from within the System. The help desk service shall record into the electronic log the following:
 - (i) Project Co employee that recovered or is reporting the lost and found item;
 - (ii) date and time item was recovered / reported;
 - (iii) assigned item number;
 - (iv) description of the item; and
 - (v) location where the item was recovered, including Vehicle number or Station.
- (h) Project Co shall not delete or alter any details recorded by the help desk unless approved by the City or designate and the following information is recorded:

- (i) The exact nature and impact of the amendment;
 - (ii) The reason for the amendment; and
 - (iii) By whom the amendment was authorized.
- (i) Project Co shall ensure that in the event of Emergencies, at whatever time, the help desk service is alerted and to report and / or record the incident or Event to internal and external authorities, subject to the provisions resulting from Capital Railway rules, regulations and the Standard Operating Procedures and the Emergency Response Plan. Project Co shall coordinate the Response Time and log the details of the Emergency.
- (j) Project Co shall ensure that the help desk service maintains confidentiality consistent with the Capital Railway rules, regulations and the Standard Operating Procedures.
- (k) Project Co and all Project Co Staff shall at all times adhere to, update and maintain as current the operational policies and procedures set out and agreed with the City pursuant to Schedule 15-2. On a quarterly basis pursuant to Article 1.5(c), Project Co shall provide the City or designate a report detailing where non-adherence has been identified.
- (l) Project Co shall prepare and submit a monthly summary report in a format suitable to the City as part of the Monthly Activity Report as described in Appendix A, Article 1.8 – Records and Reporting.
- (m) Project Co shall provide the capability for City employees who have made service requests to review and monitor the status of their requests over the internet.
- (n) Project Co shall, when receiving a call about services not provided by Project Co or about issues related to the City responsibilities, redirect the caller to the appropriate City contact as directed by the City.
- (o) Project Co shall deliver all lost and found items recovered within the System to the City's lost and found during the next regular business day or as directed by the City.
- (p) Quality Monitoring
 - (i) Prior to the Revenue Service Date, Project Co and the City shall develop, maintain and implement a system for recording and acting on Passenger or Operator feedback and satisfaction with respect to the help desk services in accordance with the provisions set out in this attachment.

1.0 Performance Criteria

FE Type	Category	Response	Rectification / Remedial	Recording Frequency
AF =Availability Failure SF = Service Failure QF = Quality Failure	Major Medium Minor Veh. Avail. = Captured by the Vehicle Availability deduction regime St. Avail = Captured by the Station Availability deduction regime	N/A = Not Applicable	N/A = Not Applicable ND = Correct by start of service the following day	PR = Per Request PE = Per Event D = Daily W = Weekly M = Monthly Q = Quarterly B = Bi-Annually A = Annually R = Randomly, At Any Moment in Time

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
<i>Help Desk Services</i>							
KPM A(II)(b)	The help desk service is available during Revenue Service operating times for the Project Term.	SF	Major	N/A	1 hour	R	
KPM A(II)(c) and (d)	Help Desk Service Instructions are updated and training provided to Project Co and City employees.	QF	Major	N/A	N/A	M	[REDACTED]
KPM A(II)(e) and (f)	All Service Requests and Failure Events are categorized and recorded in accordance with this Attachment.	QF	Medium	N/A	N/A	PE	[REDACTED]
KPM A(II)(g) and (o)	All lost and found items recovered from within the System are recorded and delivered in accordance with this Attachment.	QF	Medium	N/A	N/A	PE	[REDACTED]
KPM A(II)(i)	Report Events to internal and external authorities, subject to Capital Railway rules, regulations and the Standard Operating Procedures, Environmental Reporting requirements, and Emergency Response Plan requirements, and log the details in the event of an Emergency.	SF	Major	N/A	N/A	PE	[REDACTED]
KPM A(II)(j)	Confidentiality is maintained in accordance with the Project Agreement	QF	Major	N/A	N/A	PE	[REDACTED]

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Notes
KPM A(II)(k)	Project Co adheres to the operational policies and procedures provided by Schedule 15-2, Part 1, Article 6 – Rail Regulatory Structure and Obligations.	QF	Major	N/A	N/A	B	[REDACTED]
KPM A(II)(k)	Every quarter pursuant to Appendix An Article 1.5(c) Project Co shall provide the City Representative or designate a report detailing where non-adherence has been identified.	QF	Major	N/A	1 week	B	[REDACTED]
KPM A(II)(m)	Project Co shall provide the capability for City employees who have made service requests to review and monitor the status of their requests over the internet	QF	Major	N/A	N/A	M	[REDACTED]
	All requests and Events reported to the help desk service are answered and coordinated promptly in accordance with the specifications.	QF	Major	N/A	N/A	PE	[REDACTED]

APPENDIX A – ATTACHMENT 12

MAINTENANCE RECORDS AND REPORTING

1.0 Maintenance Records and Reporting

- (a) Pursuant to Appendix A, Article 1.8, periodically, the City will audit the Project Co's Maintenance records and reporting. Failures to maintain records and report on Maintenance activities shall result in penalties being assessed as described in the Performance Criteria section.
- (b) Maintenance Plans
- (i) Project Co shall follow the requirements set out in Article 1.4(a)(ii) of Appendix A with regard to the drafting, approval, and revisions process for the Maintenance and Rehabilitation Plan.
- (ii) Project Co shall at all times maintain complete and updated versions of the Maintenance and Rehabilitation Plan, along with the sub plans described as the Custodial Maintenance Plan, the Corrective Maintenance Plan, and the Preventive Maintenance Plan. The performance requirements associated with the Asset Management Plan and the Handover Maintenance Plan are included in Appendices B and C respectively.
- (c) Maintenance Reporting
- (i) Project Co shall report on the status and completion of various Maintenance activities.
- (ii) Project Co shall follow the maintenance reporting requirements set out in Article 1.8 of Schedule 15-3 with regard to maintenance reporting procedures and the Daily, Monthly, Quarterly, and Annual submittals that are required.

2.0 Performance Criteria

FE Type	Category	Response	Rectification / Remedial	Recording Frequency
AF =Availability Failure	Major	N/A = Not Applicable	N/A = Not Applicable	PR = Per Request
SF = Service Failure	Medium		PE = Per Event	
QF = Quality Failure	Minor		D = Daily	
	Veh. Avail. = Captured by the Vehicle		W = Weekly	
	Availability deduction regime		M = Monthly	
	St. Avail = Captured by the Station Availability deduction regime		Q = Quarterly	
			B = Bi-Annually	
			A = Annually	
			R = Randomly, At Any Moment in Time	

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Application (Maximum Project Co exposure)
<i>Maintenance Records and Reporting</i>							
A(12)1.0(c)(ii)	Project Co shall follow the maintenance reporting requirements set out in Article 1.8 of Schedule 15-3 with regard to the Daily submittals that are required. (Daily Report as per Article 1.8(a)(vii))	QF	Minor	NA	NA	D	[REDACTED]
A(12)1.0(c)(ii)	Project Co shall follow the maintenance reporting requirements set out in Article 1.8 of Schedule 15-3 with regard to the Monthly submittals that are required. (Monthly Activity Report as per Article 1.8(a)(iii))	QF	Minor	NA	NA	M	[REDACTED]
A(12)1.0(c)(ii)	Project Co shall follow the maintenance reporting requirements set out in Article 1.8 of Schedule 15-3 with regard to reports submitted to a third party (per Article 1.8(a)(viii))	QF	Major	NA	NA	PR	[REDACTED]
A(12)1.0(b)(i)	Project Co shall submit Annual Preventative Maintenance Plan in compliance with Article 1.4(b).	QF	Major	NA	NA	A	[REDACTED]
A(12)1.0(c)(ii)	Project Co shall comply with the record-keeping requirements of Article 1.8(a)(i).	QF	Major	NA	NA	R	[REDACTED]
A(12)1.0(b)(ii)	Project Co shall at all times maintain complete and updated versions of the Maintenance and Rehabilitation Plan, along with the sub plans described as the Custodial Maintenance Plan, the Corrective Maintenance Plan, and the Preventive Maintenance Plan.	QF	Major	NA	NA	R	[REDACTED]

APPENDIX A – ATTACHMENT 13
MAINTENANCE ACTIVITIES AND COORDINATION

1.0 Maintenance Activities and Coordination

- (a) Pursuant to Appendix A, Article 1.4, when performing the Maintenance and Rehabilitation Services, Project Co shall provide all maintenance activities, as defined in whole or in part as part by the Maintenance and Rehabilitation plan, and maintenance coordination, as defined in whole or in part by Appendix A of this Schedule 15-3 and for further clarity including the Capital Railway rules, regulations and the Standard Operating Procedures, in accordance with the performance requirements described throughout Schedule 15-3 and diligently at all times during the Maintenance Period in accordance with the Project Agreement, notwithstanding Project Co's rights and entitlements as provided elsewhere in the Project Agreement.
- (d) Project Co shall perform Maintenance and Rehabilitation Services on the System in accordance with all applicable regulatory requirements as identified in Schedule 15-2, Part 1, Article 6 – Rail Regulatory Structure and Obligations, of this PA. Specifically, Project Co shall ensure maintenance plans and procedures are in accordance with applicable legislation, certificates, rules, standards, orders, MOUs and guidelines that may include, but are not limited to, those cited in the table below.

Applicable Legislation, Certificates, Rules, Standards, Orders, MOUs and Guidelines

Type/Title
Railway Safety Act (RSA) (R.S., 1985, c. 32 (4 th Supp.))
Legislation - Regulations
Grade Crossing Regulations
Notice of Railway Works Regulations
Prevention and Control of Fires on Line Works Regulations (June 2017)
Certificates, Rules, Standards, Orders, MOUs
Grade Crossing Standards
Work/Rest Rules for Capital Railway
Canadian Rail Operating Rules
Standards Respecting Pipeline Crossings
Railway Employee Radio Communication Rule
Railway Medical Rules for Positions Critical to Safe Railway Operations

Railway Rules Governing Safety Critical Positions
Rules for the Control and Prevention of Fires on Railway Rights-of-Way
Rules for the Installation, Inspection and Testing of Air Reservoirs (Other than on Locomotives)
Rules for the Protection of Track Units and Track Work
Rules Respecting Track Safety
Standard Respecting Railway Clearances
Capital Railway LINT Diesel Multiple Units Inspection and Safety Rules
Railway Equipment Reflectorization Rules
Standard for LED Signal Modules at Highway/Railway Grade Crossings
Engineering Standards for “Walk Light” Grade Crossing Warning Systems
A Guide on the Development and Implementation of Railway Safety Management Systems
Guideline No. 1 – Procedure and Conditions for Eliminating Whistling at Public Crossings
Guideline for Bridge Safety Management
Guideline for Culvert Safety Management
Guideline: Engineering Work Related to Railway Works
Fatigue Management Plans – Requirements and Assessment Guidelines
Railway Signal & Traffic Control Systems Standards

(b) Performance Requirements

(i) General

- A. Project Co shall coordinate and perform such Maintenance activities within the System only upon receiving prior approval from the City as required by Appendix A, Article 1.5.
- B. Project Co shall ensure all employees performing Maintenance on the System are governed by the Capital Railway rules, regulations and the Standard Operating Procedures
- C. Project Co shall ensure all employees performing Maintenance on the System receive clearance from the TOCC to enter and perform Maintenance and

- Rehabilitation Services when so required by the Capital Railway rules, regulations and the Standard Operating Procedures.
- D. Project Co shall ensure all employees performing Maintenance on the System are certified and trained on the Capital Railway rules, regulations and the Standard Operating Procedures.
- E. Project Co shall ensure that all Non-Revenue Vehicles and equipment are operated in accordance with the Capital Railway rules, regulations and the Standard Operating Procedures and Good Industry Practice, and for further certainty may require prior approval for use on the System by the TOCC.
- F. Project shall ensure Maintenance plans and services are in compliance with all applicable regulatory requirements as cited in 1.0 (b) of this Article
- (ii) Deficiencies
- A. Upon receiving notification of the Deficiency in accordance with Article 2.2(b) Project Co shall promptly take steps to remedy the Deficiency as follows:
- i in the event that the Deficiency constitutes an issue with respect to the Safety Management System, Project Co shall remedy the Deficiency immediately if possible, but at least within 24 hours of the City's notice, notwithstanding more stringent response and / or rectification times as may be prescribed in the Attachments to Appendix A of Schedule 15-3; and
 - ii in the event that the Deficiency does not contravene the Safety Management System, Project Co shall take corrective action to remedy the Deficiency, and / or shall submit an acceptable remediation plan to the City in respect of the Deficiency, including a deadline for rectification of the Deficiency, at the next weekly meeting occurring pursuant to Article 1.5 of Appendix A of this Schedule 15-3.
 - iii in the event that the Deficiency constitutes an issue with respect to a regulatory requirement pursuant to Schedule 15-2, Part 1, Article 6 – Rail Regulatory Structure and Obligations, Project Co shall take corrective action to remedy the Deficiency, and / or submit an acceptable remediation plan to the City in respect of the Deficiency, including a deadline for rectification of the Deficiency, at the next weekly meeting occurring pursuant to Article 1.5 of Appendix A of this Schedule 15-3

2.0 Performance Criteria

FE Type	Category	Response	Rectification / Remedial	Recording Frequency
AF =Availability	Major Medium	N/A = Not Applicable	N/A = Not Applicable	PR = Per Request PE = Per Event

Failure SF = Service Failure QF = Quality Failure	Minor Veh. Avail. = Captured by the Vehicle Availability deduction regime St. Avail = Captured by the Station Availability deduction regime		ND = Correct by start of service the following day	D = Daily W = Weekly M = Monthly Q = Quarterly B = Bi-Annually A = Annually R = Randomly, At Any Moment in Time
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<i>Maintenance Activities and Coordination</i>							
Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Application (Maximum Project Co exposure)
A(13)I.0(c)(i)(A)	Project Co shall coordinate and perform such Maintenance activities within the System only upon receiving prior approval from the City as required by Appendix A, Article 1.5.	QF	Major	NA	NA	PE	[REDACTED]
A(13)I.0(c)(i)(B) and (D)	Project Co shall ensure all employees working on the Maintenance of the System are governed, trained and certified with the Capital Railway rules, regulations and the Standard Operating Procedures prior to performing any Maintenance work on the Trillium Line System	QF	Major	NA	NA	PE	[REDACTED]
A(13)I.0(c)(i)(E)	Project Co shall ensure the use of all Non-Revenue Vehicles and equipment is in compliance with the Capital Railway rules, regulations and the Standard Operating Procedures and Good Industry Practice.	QF	Major	NA	NA	PE	[REDACTED]
A(13)I.0(c)(i)(F)	Project Co shall ensure Maintenance plans and services are in compliance with all regulatory requirements	QF	Major	NA	NA	PE	[REDACTED]

APPENDIX A – ATTACHMENT 14
OPERATIONS AND MAINTENANCE INTERFACE

- (a) Project Co, in conjunction with the City, shall develop a Performance Reporting System that combines service delivery and maintenance performance information. The plan for developing the Performance Reporting System shall initially be provided to the City 10 months prior to the Scheduled Revenue Service Date for review in accordance with the review process described in Schedule 10 – Review Procedure. The Performance Reporting System shall be fully FAT, SAT, and SIT tested to demonstrate accuracy of the data being collected, analyzed, and reported.
- (b) Project Co shall integrate data from SCADA, ATS, Maintenance Information Systems, Help Desk, Automatic Passenger Counters and other information systems to produce a daily operating report, in accordance with the requirements set out in (c) and (d) below (“Daily Operating Report”).
- (c) Project Co and the City shall meet each morning of regular Business Days in order to review operations and maintenance performance. The purpose of the morning business meeting shall be to coordinate operations and maintenance activities, to review the prior day(s) performance, to assign responsibility for lost service, to assess performance, to discuss current day’s plans, future plans, planning for special events, weather events, and to conduct other operational business necessary for the delivery of safe, reliable and high quality Passenger service. The meetings shall be attended in person (or unless mutually agreed to otherwise) by the City Representative and the Project Co Representative, or their delegates. The City and Project Co may mutually agree to cancel or postpone any morning business meeting and use subsequent meetings to catch up as required.
- (d) Project Co shall produce a draft Daily Operating Report for each day’s operation for each morning business meeting, including the information set out below. Project Co shall deliver the draft Daily Operating Report at least two hours prior to the scheduled start time of the relevant morning meeting and shall indicate the time of delivery through a time stamp method or electronic delivery. The draft Daily Operating Report shall contain, at a minimum, the following information relevant to the previous day or days performance:
 - (i) Operations
 - A. Revenue Service Vehicle Kilometres delivered versus Scheduled Revenue Service Vehicle Kilometres;
 - B. Description of events that resulted in loss of Scheduled Revenue Service Vehicle Kilometres, indicating which are claimed by Project Co to be due to a Non-Project Co Cause supported by a description of the event and a justification for meeting the Non Project Co Cause criteria;
 - C. Service Reliability Standard:

i The City has established a Service Reliability Standard of [REDACTED]% on-time performance, where a trip is considered on time if it is available to depart the following Terminal Stations within 30 seconds of scheduled departure time, respecting a minimum terminal time of 3 minutes for:

1. Mainline – Bayview and Limebank;
2. Airport Shuttle – Airport and South Keys.

During times when through-service is operated between the Airport and Bayview stations, terminal departure statistics shall be captured and reported for the Limebank/South Keys shuttle trips.

The report shall differentiate between trips that were available to depart within 30 seconds of scheduled departure time and those that departed on-time due to the City accepting a diminished terminal time of less than 3 minutes.

ii The City may choose, but shall not be obligated, to reduce terminal time for purposes of achieving an on-time departure.

iii Late Departures from Yard: Trains departing yard more than one minute after scheduled departure time, including reason.

- D. Accidents / Injuries of Passengers and employees;
- E. A listing of annulled trips – a trip that is not operated – including reason;
- F. A listing of partial Trips – trip that does not complete its run – including reason;
- G. Trips with standing delays of over 3 minutes; and
- H. Trips requiring Passenger offloads including reason.

(ii) Ridership

- A. Daily ridership totals from the Automatic Passenger Counters; and
- B. Average load by Vehicle, by trip.

(iii) Systems Status

- A. Fleet Availability (identify peak Vehicles and consist make-up utilized for service, Vehicles held for maintenance, any Vehicles held out of service due to Defect);
- B. Non-revenue fleet availability (identify any fleet Defects);

- C. Station Availability (including status of elevators), including a breakdown of Scheduled Station Hours and Station Availability Failure Hours (if any) for each Station, indicating the time and duration of any such Station Availability Failure Hours;
 - D. Identification of any Station Related Non Project Co Cause, supported by a description of the event and a justification for meeting the Station Related Non Project Co Cause criteria;
 - E. Tunnel (identify status of all Fire/Life/Safety elements including Emergency ventilation system, Emergency lighting, Emergency walkways, backup power supply, Passenger address system, Emergency telephones, blue light stations);
 - F. Track Availability (report slow orders or Tracks out of service);
 - G. Train Control and Signalling (identify any system Defects);
 - H. Communication/SCADA System Availability; and
 - I. Maintenance and Storage Facilities (identify any Defects).
- (iv) Help Desk
- A. Calls received versus calls cleared;
 - B. Status/summary of open calls.
- (e) Project Co and the City shall review the draft Daily Operating Report at the morning meetings.
- (f) The City shall, within 24 hours of the delivery of the draft Daily Operating Report (as indicated by the time stamp or other method used pursuant to Section (d), above), either:
- (i) Approve the draft Daily Operating Report, in which case the report shall be considered closed and shall be used as a basis for developing the Performance Monitoring Report and otherwise recording Project Co performance, subject to any errors or omissions subsequently discovered; or
 - (ii) Decline to approve all or part of the draft Daily Operating Report, and specify the amendments required by the City.
- (g) If the City fails to respond within the relevant 24 hour time period, then the City shall be deemed to approve the draft Daily Operating Report in accordance with (f)(i), above.
- (h) If the City declines to approve all or part of the draft Daily Operating Report, then Project Co shall, within 24 hours of notice by the City that it does not approve, either:
- (i) Amend the draft Daily Operating Report in accordance with the amendments required by the City, subject to final review and approval by the City; or

- (ii) Dispute all or part of the amendments required by the City, in which case the matter shall be referred to the Maintenance Committee for resolution.
- (i) If Project Co fails to respond within the relevant 24 hour time period, then Project Co shall be deemed to have accepted the City's amendments to the draft Daily Operating Report and the report shall be considered closed.
- (j) If Project Co disputes all or part of the amendments required by the City, as per Section (h)(ii), then:
 - (i) All aspects of the Daily Operating Report which are not the subject of a dispute shall be considered closed and shall be used as a basis for developing the Performance Monitoring Report and otherwise recording Project Co performance, subject to any errors or omissions subsequently discovered; and
 - (ii) All aspects of the Daily Operating Report which are the subject of a dispute shall be assumed, for the purposes of developing the Performance Monitoring Report and otherwise recording Project Co performance, to be resolved in favour of the City, pending the outcome of resolution by the Maintenance Committee or additional dispute resolution processes selected by the Maintenance Committee, provided that:
 - A. In the case of a disputed matter which would, if resolved in favour of the City, result in Failure Points being assigned to Project Co, no Failure Points shall be assigned until resolution of the dispute; and
 - B. In the case of a disputed matter or matters which could result in cumulative Deductions in excess of [REDACTED] (Adjusted for Inflation) being assigned to Project Co related to the matter(s) in dispute, no Deductions related to such matter(s) in excess of this amount shall be applied until resolution of the dispute.

1.0 Performance Criteria

FE Type	Category	Response	Rectification / Remedial	Recording Frequency	
AF =Availability Failure SF = Service Failure QF = Quality Failure	Major Medium Minor Veh. Avail. = Captured by the Vehicle Availability deduction regime St. Avail = Captured by the Station Availability deduction regime	N/A = Not Applicable Immediate (“Immed.”) = No later than 30 minutes from time of Event	N/A = Not Applicable ND = Correct by start of service the following day Immediate (“Immed.”) = No later than 30 minutes from time of Event	PR = PE = D = W = M = Q = B = A = R =	Per Request Per Event Daily Weekly Monthly Quarterly Bi-Annually Annually Randomly, At Any Moment in Time

Ref	Parameter	Failure Type	Category	Resp. Time	Rect. Or Rem. Time	Recording Frequency	Application (Maximum Project Co exposure)
<i>OPERATIONS AND MAINTENANCE INTERFACE</i>							
<i>A(14)(d)</i>	Project Co shall produce the Daily Operating Report in accordance with the requirements in Section (d).	QF	Major	NA	NA	PE	[REDACTED]
<i>Appendix A, Article 3.4</i>	Revenue ready trains, made up in the proper consist shall be available to the City a minimum of 15 minutes prior to scheduled departure time from the Yard	SF	Major	Immed	120 seconds	PE	
<i>A(14)(d)(i)(C)</i>	Vehicle and system availability shall allow for 98.5 % of trips to depart terminal stations no later than 30 seconds after scheduled departure times, in accordance with the Service Reliability Standard	SF	Major	Immed	I	PE	

APPENDIX A – ATTACHMENT 15 MAINTENANCE RESPONSIBILITY TABLE

- (a) This Maintenance Responsibility Table sets out as a general guide, for the convenience only of the Parties to the Project Agreement, the allocation of maintenance responsibilities with respect to the Trillium Line System. However, this Maintenance Responsibility Table is not intended to specifically or exhaustively define the allocation of responsibilities for Maintenance on the Trillium Line System nor is it to be construed as a detailed or complete list of Maintenance responsibilities for the System. In the event of any conflict between the Project Agreement (including this Schedule 15-3) and Maintenance Responsibility Table the provisions of the Project Agreement including this Schedule 15-3 (excluding Attachment 15) shall prevail. For further certainty, all System Infrastructure shall be the responsibility of Project Co, unless expressly stated otherwise in the Project Agreement.

MAINTENANCE RESPONSIBILITY TABLE	Project Co	City / Other
Systems	✓	
Vehicles	✓	
Non-Revenue Vehicles	✓	
Fire/Smoke Detection	✓	
Intrusion alarm subsystem	✓	
Telephone equipment [Footnote 1]	✓	
Cable and raceway subsystem	✓	
Switch heaters	✓	
Train Control and Signaling System	✓	
Vital Microprocessor Interlocking Systems	✓	
Non-vital control logic	✓	
Vehicle location system	✓	
Onboard logic processor	✓	
ATP	✓	
Grounding	✓	
Fuses and electrical protection	✓	
Local control panels	✓	

MAINTENANCE RESPONSIBILITY TABLE	Project Co	City / Other
Event recorders	✓	
Wayside switch indicators	✓	
Mainline switch machines	✓	
Track switch heaters	✓	
Relays	✓	
Control circuitry and software	✓	
Balise /Train position detection and associated signalling	✓	
Instrument houses, cases and junction boxes	✓	
Wayside signal equipment	✓	
Batteries	✓	
Wheel detectors	✓	
Yard switch machines	✓	
Communications and Control systems	✓	
Communication Transmission System (CTS) [Footnote 12]	✓	✓
Public address (PA)	✓	
Passenger information display system (PIDS)	✓	
Closed circuit television (CCTV)	✓	
Workstations [Footnote 3]	✓	
Monitors [Footnote 3]	✓	
Application Servers [Footnote 3]	✓	
Database Servers [Footnote 3]	✓	
Network Recorders [Footnote 3]	✓	
Intrusion access control system (IAC)	✓	
Telephone and Intercom System [Footnote 1]	✓	✓

MAINTENANCE RESPONSIBILITY TABLE	Project Co	City / Other
SCADA		✓
Train control	✓	
Rail Dispatcher Consoles	✓	
Rail Signalling Room	✓	
Backup & Yard Control Centre	✓	
Radio communication systems [Footnote 13]		✓
Fare collection [Footnote 4]	✓	✓
Master clock	✓	
Miscellaneous System Infrastructure		
Uninterruptible power supplies and battery banks	✓	
Lighting controls	✓	
Guideway intrusion detection and monitoring system	✓	
Emergency equipment	✓	
Motor control centers	✓	
Emergency generators	✓	
DC power disconnects, transfer switches, and ground switches	✓	
Tunnel lighting	✓	
Tunnel ventilation systems	✓	
Tunnel pumping operation	✓	
Safety and monitoring system	✓	
Dynamic information signs	✓	
Passenger information signs	✓	
Public address system – Stations	✓	
Public address system – Vehicles	✓	

MAINTENANCE RESPONSIBILITY TABLE	Project Co	City / Other
Trackwork (including Tracks):		
Track, running rails (including railhead profiling, Track adjustment and levelling, and noise and vibration mitigation)	✓	
Sleepers, ties/transition ties, electrical insulation and impedance bonds	✓	
Turn outs, switches, crossovers, etc.	✓	
Ballast (including tamping)	✓	
Removal of debris and contaminants from switches, turnouts, and Track and rail head	✓	
MOW equipment	✓	
Track heaters and controls	✓	
Noise and vibration control measures	✓	
Ice and snow removal from Tracks & switches, and drainage structures	✓	
Alignment:	✓	
Multi-Use Pathways [Footnote 16]	✓	✓
Guideway walkways	✓	
Railbed	✓	
Service and Track access roads/driveways/walkways	✓	
Grading, erosion control and ditch cleaning	✓	
Drainage control and systems including Catch Basins, Ditch Inlets, Manholes, Sewers and Culverts (including stormwater quality and quantity management ponds) [Footnote 5]	✓	
Fencing [Footnote 6]	✓	
Noise Walls	✓	
Illumination	✓	
Signing (warning, guidance, location, identification, regulatory,	✓	

MAINTENANCE RESPONSIBILITY TABLE	Project Co	City / Other	
operational and Third Party Land Interest Holders)			
Removal of rock fall and debris from Tunnel portal Structures and Guideway below portals	✓		
Custodial Maintenance	✓		
Alignment:			
Debris collection and disposal [Footnote 7]	✓		
Snow and ice clearing, removal, sanding and salting	✓		
Landscaping	✓		
Vegetation control	✓		
Grass control	✓		
Weed Control/ Brush Cutting	✓		
Tree and shrub maintenance	✓		
Vandalism & graffiti	✓		
Pest Control	✓		
Retaining Walls: [Footnote 6]			
Name:	Location		
Bowseville Road Bridge retaining walls (new) [Footnote 15]	Bowseville Road	✓	✓
Earl Armstrong Bridge retaining walls (new) [Footnote 15]	Earl Armstrong Road	✓	✓
Leitrim Road Bridge retaining walls (new) [Footnote 15]	Leitrim Road	✓	✓
Limebank Road Bridge retaining walls (new) [Footnote 15]	Limebank Road	✓	✓

MAINTENANCE RESPONSIBILITY TABLE		Project Co	City / Other
Rail Bridge over Lester Road retaining walls (new) [Footnote 15]	Lester Road	✓	
Retaining walls required for road construction/grading not associated with the guideway	Various locations		✓
Retaining walls under Highway 417 (SN 019160 / 019161)	Under Highway 417	✓	
Existing rock cut trench	Extends from north of Gladstone Avenue to northern portal to Dows Lake Tunnel	✓	
Culverts / Sewers:			
(Culverts refers to lateral conveyance of storm water roughly perpendicular to the LRT ROW, while sewers refers to longitudinal conveyance of storm water parallel to the LRT ROW) [Footnote 5]			
New and existing culverts required to support System Infrastructure	Various locations	✓	
New and existing culverts required for road construction/grading, not associated with the System Infrastructure	Various locations		✓
Mainline culvert (58900)	Under Brookfield siding, 800m north of Walkley Road	✓	
Mainline culvert (58910)	100m north of Walkley Road	✓	
Mainline culvert (T058800)	50m south of Walkley Road	✓	
Mainline culvert (58920)	230m south of Greenboro Station	✓	
Mainline culvert (228050)	Approximately 200m south of Hunt Club Road	✓	
Mainline culvert (228060)	Approximately 400m south of Hunt Club Road	✓	
Mainline culvert (T225160)	Approximately 750m north of Lester Road	✓	

MAINTENANCE RESPONSIBILITY TABLE		Project Co	City / Other
Mainline culvert (228420)	Approximately 50m south of Lester Road	✓	
Culvert under Albion Road (access to Walkley Yard)	Under Albion Road	✓	
Osgoode Link Pathway Culvert (R225105)	Immediately north of Leitrim Road	✓	
Osgoode Link Pathway Culvert (R225100)	Immediately south of Leitrim Road	✓	
Stormwater infrastructure at Leitrim Park and Ride	Leitrim Park and Ride		✓
Bridges/Structures: [Footnote 8]			
Mainline			
Limebank Road Bridge (SN225710) (new) [Footnote 15]	Limebank Road	✓	✓
Mosquito Creek Rail Bridge (SN225050) (new)	Approximately 2000m west of Bowesville Road	✓	
Bowesville Road Bridge (SN225690) (new) [Footnote 15]	Bowesville Road	✓	✓
Earl Armstrong Bridge (SN225680) (new) [Footnote 15]	Earl Armstrong Road	✓	✓
High Road Bridge (SN225670) (new)	High Road		✓
Leitrim Road Bridge (SN225610) (new) [Footnote 15]	Leitrim Road	✓	✓
Rail Bridge over Lester Road (SN225620) (new)	Lester Road	✓	
Hunt Club Road Bridge (SN055350)	Hunt Club Road	✓	
Rail Bridge over Hunt Club Road (SN055440) (new)	Hunt Club Road	✓	

MAINTENANCE RESPONSIBILITY TABLE		Project Co	City / Other
Hunt Club Road MUP Bridge (SN058620) (new)	Hunt Club Road	✓	
Rail Bridge over MUP north of Hunt Club Road (SN055740) (new)	Approximately 200m north of Hunt Club Road	✓	
Rail Bridge over MUP at South Keys Station (SN058490)	Under South Keys Station	✓	
Pedestrian Overpass north of South Keys Station (SN055750)	Under South Keys Station	✓	
Greenboro LRT Station pedestrian Bridge (058432)	Greenboro Station	✓	
Greenboro BRT Station pedestrian Bridge (058430-1)	Greenboro Station		✓
Walkley Yard Lead over Transitway (SN055900)	Approximately 1000m south of Walkley Road	✓	
Rail Bridge over / Transitway at Walkley Yard Connecting Track (SN055910)	Approximately 1000m south of Walkley Road	✓	
Airport Parkway overpass (SN056610)	Airport Parkway, approximately 200m SE of Heron Road		✓
Walkley Road overpass (SN 055330)	Walkley Road		✓
Sawmill Creek Culvert (SN055470)	Over Sawmill Creek, approximately 150m SE of Walkley Diamond	✓	
Sawmill Creek Bridge (SN055200)	Over Sawmill Creek, approximately 200m SE of Ellwood Diamond	✓	
Sawmill Creek MUP Bridge (SN058560)	South bank of Sawmill Creek, under LRT		✓
Rail Bridge over Southeast Transitway (SN055930)	Approximately 200m SE of Ellwood Diamond	✓	
[REDACTED] rail grade separation(SN055940) (new)	Approximately 300m south-east of Mooney's Bay Station	✓	
Heron Road overpass (SN055260)	Heron Road		✓

MAINTENANCE RESPONSIBILITY TABLE		Project Co	City / Other
Riverside Drive overpass (SN055280)	Riverside Drive		✓
Rideau River Bridge (SN015290)	Over Rideau River, south of [REDACTED]	✓	
University Road Pedestrian Bridge over Rideau River (SN018750) (new)	Over Rideau River		✓
South Rail Bridge over MUP at [REDACTED] (SN018510)	Approximately 50m north of University Drive	✓	
North Rail Bridge over MUP at [REDACTED] (SN018490)	Approximately 80m south of Carleton Station	✓	
Existing [REDACTED] Tunnel System (SN015440)	[REDACTED]		✓
[REDACTED] Tunnel at Carleton Station (SN015440) (new)	Carleton Station	✓	
Campus Avenue overpass (SN015850)	Campus Avenue		✓
[REDACTED] parkade Structure (SN019035)	North of Campus Avenue		✓
Existing Tunnel under Dow's Lake (SN019020)	Under Dow's Lake	✓	✓
Prince of Wales Drive overpass (SN015870)	Prince of Wales Drive		✓
Carling Avenue overpass (SN015860)	Carling Avenue		✓
Adeline-Hickory Street pedestrian Bridge (SN015830)	Intersection of Adeline and Hickory Streets		✓
Beech Street overpass (SN015890)	Beech Street		✓
Young Street pedestrian Bridge (SN018420)	Young Street		✓
Queensway (Hwy 417) overpass (SN014640)	Queensway		✓
Gladstone Avenue overpass (SN015880)	Gladstone Avenue		✓
Somerset Street overpass (SN015340)	Somerset Street		✓
Trinity Pedestrian Bridge (SN018430) (new)	Bayview Station Pedestrian Bridge connection to 900 Albert Street	✓	
Albert Street Overpass O- Train Line (SN015380)	Albert Street		✓

MAINTENANCE RESPONSIBILITY TABLE		Project Co	City / Other
Airport Link			
Elevated Guideway to OMCIA Terminal (SN225110) (new)	Airport Station	✓	
Rail Bridge over Uplands Drive (SN 225640) (new)	Uplands Drive	✓	
Rail Bridge over Airport Parkway (SN 225630)	Airport Parkway	✓	
Maintenance and Storage Facility:		✓	
Service and access roads/driveways		✓	
Paving, parking lots and signing		✓	
Entrances, Pedestrian walkways and sidewalks		✓	
Stairways & elevators		✓	
Grading and erosion control		✓	
Drainage control including sewers, maintenanceholes, catchbasins, and culverts		✓	
Fencing		✓	
Illumination		✓	
Noise control measures and noise walls		✓	
Signing (warning, guidance, location, identification, regulatory, operational, etc.)		✓	
Structural- footings, floors, walls, ceilings, chimneys, beams, columns, roof, insulation, etc.		✓	
Wall components, doors, frames, windows, glazing systems, entry systems, finishes, etc.		✓	
Washrooms, locker rooms, offices, storage space, etc.		✓	
Interior finishes – floor & wall coverings, painting and finishes		✓	
Plumbing – Water & sewer services, waste water		✓	

MAINTENANCE RESPONSIBILITY TABLE	Project Co	City / Other
Electrical – wiring, service, conduits, illumination, etc.	✓	
New Walkley Yard Mechanical systems:		
Telephone and radio communications system wiring within complex [Footnote 1]	✓	✓
Utility services (Hydro, water, sewer, heating and any Third Party Land Interest Holders) including service invoices [Footnote 1]		✓
Heating Ventilating and Air Conditioning (HVAC) system and air filtration.	✓	
Automatic door systems for Vehicle entry and exit	✓	
Waterproofing and building drainage control	✓	
Security – locks, guards, CCTV, alarms, monitoring, intrusion detection, video recording and Third Party Land Interest Holders.	✓	
Fire Protection and safety measures (includes standpipes)	✓	
Office furniture and equipment	✓	
Emergency Generators and UPS	✓	
Automotive service vehicles	✓	
Custodial Maintenance – Maintenance and Storage Facilities:	✓	
Debris collection and disposal [Footnote 7]	✓	
Snow and ice clearing, removal, sanding and de-icing	✓	
Oil and grit separator	✓	
Landscaping	✓	
Vegetation control	✓	
Grass control	✓	
Weed Control/ Brush Cutting	✓	
Tree and shrub maintenance	✓	
Vandalism & graffiti	✓	

MAINTENANCE RESPONSIBILITY TABLE	Project Co	City / Other
Pest Control	✓	
Daily Washroom cleaning and supplies	✓	
Cleaning of offices, furniture, walls, floors, windows, maintenance and general purpose areas	✓	
Maintenance Building:	✓	
Monthly telephone service charges [Footnote 1]		✓
Vehicle and system maintenance equipment including hydraulic lifts, forklifts and other specialized equipment	✓	
Workshop equipment including lubrication systems, compressors, air dryers, vacuum systems, sumps, etc.	✓	
Hi rail and recovery vehicles	✓	
Vehicle wash systems	✓	
New Walkley Yard:	✓	
Fueling station	✓	
Waste removal and recycling, such as wheel swarf, coolant disposal, oil recycling	✓	
Service and access roads/driveways	✓	
Snow and ice clearing of Track, switches, etc.	✓	
Transit Operations Control Centre:		
Hardware and software [Footnote 3]	✓	✓
Communications between equipment and backbone communications modem	✓	
Stations:		
Structural	✓	
Plumbing [Footnote 1]	✓	
Electrical [Footnote 1]	✓	
HVAC	✓	

MAINTENANCE RESPONSIBILITY TABLE	Project Co	City / Other
Shelter	✓	
Station furnishings, including Passenger benches, refuse containers, cabinets, sign boards, bike racks and Third Party Land Interest Holders.	✓	
Entry systems: doors & windows [Footnote 11]	✓	
Roof and water protection	✓	
Platform: Stairs, floors, walls, furniture and finishes	✓	
Passenger information systems	✓	
Signage (warning, guidance, location, identification, regulatory, operational, and Third Party Land Interest Holders)	✓	
Utilities [Footnote 1]	✓	✓
Advertising [Footnote 9]		✓
Advertising frames, hardware and fixed assets [Footnote 9]	✓	
Illumination – poles and fixtures	✓	
Storm water drainage [Footnote 5]	✓	
Elevators	✓	
Roof	✓	
New onsite sewage treatment systems	✓	
Custodial maintenance of Station:		
Debris collection and disposal [Footnote 7]	✓	
Snow and ice clearing, removal, sanding and de-icing [Footnote 8]	✓	
Cleaning – floors, walls, windows, vandalism & graffiti, etc.	✓	
Elevators	✓	
Washroom cleaning and supplies	✓	
Illumination – cleaning & bulb replacement	✓	

MAINTENANCE RESPONSIBILITY TABLE	Project Co	City / Other
Landscaping including planters		✓
Vegetation control		✓
Grass control		✓
Weed Control/ Brush Cutting		✓
Tree and shrub maintenance		✓
Graffiti and vandalism	✓	
Pest Control	✓	
Bus Transit System:		✓
Bowesville Park and Ride		✓
Leitrim Park and Ride		✓
Passenger Pickup and Drop Off		✓
Bus Terminals		✓
Bus Operator Facilities [Footnote 14]	✓	✓
Miscellaneous:		
Public Telephones		✓
Salt Storage Boxes	✓	
Artwork	✓	
Advertising (Hard surface / integrated) [Footnote 9]	✓	
Station Identification Signage	✓	
Security Enclosures / Gates at Station Entry Points	✓	
Retail Facilities [Footnote 9]	✓	✓
Entrance connections to the system [Footnote 11]	✓	
South Keys Fare Control Building		✓

[Footnotes:]

- 1) City shall be responsible for the service / usage charges related to all utilities during the Maintenance Period. Project Co shall be responsible for all infrastructure required up to the demarcation point established pursuant to Schedule 15-2 and / or as may be agreed to with the utility service provider.
- 2) Regarding City of Ottawa Corporate Radio System, Project Co shall enter into maintenance and licensing agreements with the Radio Supplier and install radio equipment into the Trillium Line System. The Radio Supplier shall be responsible for the communication of the radio signal under all operating scenarios. For further certainty, the Radio Supplier shall be responsible for all City of Ottawa Corporate Radio System Infrastructure located within the Lands, Any additional maintenance access, licensing or joint agreements shall be formalized in a separate contract outside of the Trillium Line contract. “[REDACTED] will operate up to the customer’s ownership demarcation point and may operate the customer’s first protective device in from [REDACTED] distribution system. [REDACTED] clarifies the customer’s interface responsibilities with each connection agreement. [REDACTED] defines three areas of responsibility between itself and the customer’s interface: ownership demarcation (‘O’), electrical control authority (‘C’), and maintenance authority (‘M’). All electrical devices and support structures on [REDACTED]’s distribution system receive unique identifying nomenclature with the required ‘OCM’ suffix” indicating the defined roles. For example, an OCM suffix of “HHH” indicates [REDACTED] owned, controlled, and maintained device. Where the nomenclature suffix is ‘CHZ’, Project Co customer owns the device, [REDACTED] controls the device, and Project Co’s qualified contractor maintains the device.
- 3) Software and Hardware Upgrades, Project Co shall coordinate with OC Transpo for the upgrade of software and hardware with respect to systems within the equipment room at 875 Belfast. OC Transpo may retain non-essential software and / or hardware exclusive for their use. 24/7 maintenance of the equipment room will be supplied by OC Transpo. Project Co shall provide suitable expertise to diagnose and replace equipment to maintain operational efficiency.
- 4) Project Co shall be responsible for the Custodial Maintenance of the fare collection equipment. The City shall be responsible for all Preventive and Corrective Maintenance along with all Life Cycle Preservation and Rehabilitation of all of the fare collection equipment.
- 5) City / Municipal Services
 - a) Sanitary – All existing and new works is to be maintained by the City, with the exception of all System Infrastructure that falls entirely within the Lands.
 - b) Watermain – All existing and new works is to be maintained by the City, with the exception of all System Infrastructure that falls entirely within the Lands.
 - c) Storm sewers and culverts – All existing and new works is to be maintained by the City, with the exception of all System Infrastructure that falls entirely within the Lands. If Project Co elects to reuse an existing storm sewer / culvert that remains entirely within the Lands, then Project Co shall be responsible for the requirements set out in Schedule 15-3, including Appendix A, B, and C.
- 6) Project Co shall be responsible for maintenance of the fencing installed throughout the Lands, with the exception of the fencing that falls beyond the maintenance demarcation of the existing retaining walls of which the City remains responsible for maintenance.
- 7) Debris / Rubbish / Garbage Cleanup, Project Co shall not use the Tunnel as a means of storing and / or transporting any debris / rubbish / garbage. Project Co shall be responsible for performing

Custodial Maintenance responsibilities such as removing debris / rubbish / garbage from within the Tunnel pursuant to Appendix A, Attachment 8.

- 8) Surface Maintenance,
 - a) “Surface” means the part of the municipal road, street, or pathway required for the passage of vehicles / pedestrians within the Municipal ROW intended for Public use and includes: the travelled lanes and shoulders whether they are paved or not, a boulevard, sidewalk or median and any appurtenances necessary for the illumination and drainage of the municipal road, street or pathway surface and the conveyance and safety of the motorists / pedestrians.
 - b) The Maintenance and Repair of the Surface, in addition to the requirements provided in Schedule 15-3 Appendices A, B, and C, includes all summer operations, such as pothole repairs / patching, crack sealing, depression / settlement repairs, sidewalk patching, catch basin and storm sewer cleanout, and all winter operations such as plowing, snow removal, sanding, spring cleanup, and Bridge deck washing.
 - c) See Schedule 33 - Lands which includes Property Request Plans illustrating the Lands and NMI.
 - d) Generally, Project Co shall be responsible for the Maintenance and Repair of the Surface in the Lands, with exception:
 - i) of surfaces that are clearly demarcated as the City’s Maintenance responsibilities;
 - ii) NMI upon the completion of the design, construction, and maintenance term as provided in Schedule 15-2, Part 1, Article 14 – New Municipal Infrastructure;
 - iii) of Bridge overpasses which are a continuation of the existing infrastructure or New Municipal Infrastructure which the City is responsible for the Maintenance, and for further certainty, surface maintenance activities as provided in bullet b) above.
- 9) City shall be responsible for the sale of the advertising and / or retail space. Project Co shall be responsible for the infrastructure that supports the advertising and / or retail space as defined in the Schedule 15-2.
- 10) City shall be responsible for Custodial Maintenance of areas designated exclusively for OC Transpo staff use such as washrooms and lunch rooms pursuant to Schedule 15-2 and for further clarity not including OC Transpo designated areas at the New Walkley Yard.
- 11) Maintenance of Entrance Connections,
 - a) Within Private Developments, Project Co shall be responsible for maintaining entrance connections to grade that are constructed as part of the project. The maintenance of entrance connections shall include the following entrance connection components:
 - i) Doors into private developments;
 - ii) Any vestibules (finishes, walls, floors, ceilings);
 - iii) Joints/waterproofing;
 - iv) Utilities;
 - v) Light fixtures/Emergency lighting;
 - vi) Fire control systems to exterior doors;
 - vii) Cleaning to inside face of exterior doors/developer to clean exterior face of exterior doorsProject Co shall be responsible for locking and unlocking of any doors into private developments.
- 12) CTS Connections
 - a) The CTS shall be collocated with other City optical fibre services. Project Co shall not be responsible for the maintenance of these additional optical fibre services. If any maintenance responsibility is requested this will be negotiated with Project Co under a variation to order.

- 13) Radio – Project Co shall provide access and training to the Radio System Supplier's maintainers or enter into a supplementary agreement outside of the Trillium Line contract for the responsibility of maintenance. The Radio System Supplier shall maintain the radio system to provide radio coverage and enable safe operations of the Trillium Line.
- 14) Bus Operator Facilities - Project Co shall be responsible for structural and exterior maintenance of the bus operator facilities. The City shall be responsible for custodial and interior maintenance of the bus operator facilities.
- 15) Rail-carrying Bridges (overpasses) shall be maintained by Project Co. Road-carrying Bridges (underpasses) shall be maintained by the City.
- 16) Refer to Schedule 15-3 Appendix A Article 4 (b) for further certainty on maintenance demarcation of MUPs.

**APPENDIX A – ATTACHMENT 16
VANDALISM AND GRAFFITI**

1.0 General

- (a) This Attachment 16 sets out the Parties' respective roles and responsibilities in respect of Response to and Rectification of incidents of Vandalism.

2.0 Definitions

- (a) The following capitalized terms shall have the meanings ascribed to them below:

- (i) "**Event of Vandalism**" means any incident of Vandalism occurring on the System.
- (ii) "**Graffiti**" means the visual or physical defacement of any component of the System by drawing, painting, spraying, scratching or inscribing.
- (iii) "**Physical Damage**" means damage deliberately caused to the Structure or physical integrity of any component of the System that requires repair or replacement, and includes breakage and cracking, indentations, impacts to a Structure which disable the functionality of a component, dislocation of a component, or other similar forms of harm which would commonly be understood as physical damage.
- (iv) "**Vandalism**" means the deliberate destruction, defacement, or damage of any component of the System, and includes Graffiti, Physical Damage, and any other form of deliberate destruction, defacement, or damage.
- (v) "**Vandalism Matrix**" means the responsibility matrix defining specific categories of Vandalism, set out in Section 6.0 of this Attachment.
- (vi) "**Vandalism Repair Costs**" are determined in accordance with Section 4.0 of this Attachment.

3.0 Response and Rectification of Vandalism

- (a) Project Co shall be solely responsible for all Response and Rectification in respect of all Events of Vandalism occurring on the System at all times and in accordance with the requirements of Schedule 15-3.

4.0 Determination of Vandalism Repair Costs

- (a) Project Co's Vandalism Repair Costs shall be limited to the following items:

- (i) Project Co's Direct Costs (as such term is defined in Appendix A of Schedule 22 to the Project Agreement) for Response and Rectification of any Event of Vandalism; and
- (ii) Project Co's Applicable Margins, determined in accordance with Appendix B of Schedule 22 to the Project Agreement.

- (b) Project Co's Vandalism Repair Costs shall be exclusive of any insurance proceeds due to Project Co, or to which Project Co would have been entitled had insurance been maintained in accordance with the requirements of the Project Agreement, which are payable in respect of the relevant Event of Vandalism. For clarity, any such insurance proceeds shall be subtracted from the amount calculated in Section 4.0(a), above, to determine the total Vandalism Repair Costs.
- (c) Project Co's Vandalism Repair Costs shall not include any Deductions applied under the Payment Mechanism in relation to an Event of Vandalism.

5.0 Responsibility for Vandalism Repair Costs

- (a) Project Co shall be wholly responsible for all Vandalism Repair Costs, as well as any other associated costs, which result from an Event of Vandalism that is denoted as "Project Co Cost" under the column titled "Cost Risk" in the Vandalism Matrix.

- 6.0** Project Co shall be reimbursed by the City for [REDACTED] of the Vandalism Repair Costs which result from an Event of Vandalism that is denoted as "City Cost" under the column titled "Cost Risk" in the Vandalism Matrix. **Vandalism Matrix**

Project Period	Description of Vandalism Event	Responsibility for Response/Rectification	Relief from deductions under the Payment Mechanism (Non Project Co Cause or Station-Related Non Project Co Cause)?	Cost Risk	Application Guidance
Pre-Revenue Service Commencement Date	Vandalism in respect of any part of the Works (subject to the other provisions of the Project Agreement, including Section 30, 41, 43 and 44)	Project Co	N/A	Project Co Cost	N/A
Post-Revenue Service Commencement Date	Graffiti – interior or exterior of Vehicles	Project Co	No	City Cost	N/A
Post-Revenue Service Commencement Date	Graffiti –Stations and Alignment	Project Co	No	City Cost	N/A

Project Period	Description of Vandalism Event	Responsibility for Response/Rectification	Relief from deductions under the Payment Mechanism (Non Project Co Cause or Station-Related Non Project Co Cause)?	Cost Risk	Application Guidance
Post-Revenue Service Commencement Date	Graffiti – interior or exterior of New Walkley Yard	Project Co	No	Project Co Cost	N/A
Post-Revenue Service Commencement Date	Physical Damage to Vehicle, or Graffiti on Vehicles that necessitates structural repairs. Applies to Vehicles vandalized while in Revenue Service.	Project Co	A Non-Project Co Cause is applicable under the Payment Mechanism where Vandalism is severe enough that Vehicle is taken out of Revenue Service as a result. The Non-Project Co Cause shall be limited to losses of service caused by the requirement to remove the affected Vehicle from service and enter spare Vehicle into service.	City Cost	Vandalism must have occurred while Vehicle is in Revenue Service. Project Co maintenance records (pre-service and end-of-service inspection) may be relied upon to demonstrate timing of Vandalism. Example: Project Co pre-departure inspection records show no vandalism, following return from Revenue Service Project Co maintenance records show that vandalism is noted/reported.
Post-Revenue Service Commencement Date	Physical Damage to Vehicles, or Graffiti that necessitates structural repairs. Applies to Vehicles vandalized while out of Revenue Service, i.e. stored at the Maintenance and Storage Facilities.	Project Co	Only where Vandalism is caused by an Excusing Cause or Force Majeure event. In this case, as per provisions of Project Agreement governing Excusing Causes and Force Majeure.	Project Co Cost	N/A
Post-Revenue Service Commencement Date	Physical Damage to Stations and Alignment	Project Co	Only where Vandalism is severe enough that it disables E&M, blocks the	City Cost	N/A

Project Period	Description of Vandalism Event	Responsibility for Response/ Rectification	Relief from deductions under the Payment Mechanism (Non Project Co Cause or Station-Related Non Project Co Cause)?	Cost Risk	Application Guidance
			Guideway, or causes Station(s) to fail to meet the Station Access Standard.		
Post-Revenue Service Commencement Date	All Physical Damage to the New Walkley Yard facility	Project Co	No	Project Co Cost	N/A
Post-Revenue Service Commencement Date	Any Vandalism committed by City employee while in course of employment	Project Co	Only where Vandalism is severe enough that: (a) Vehicle is taken out of Revenue Service as a result. Relief shall be limited to losses of service caused by requirement to remove affected Vehicle from service and enter spare Vehicle into service; (b) it disables E&M; (c) blocks the Guideway; or (d) causes Station(s) to fail to meet the Station Access Standard.	City Cost	This category overrides all Third Party Land Interest Holders specified above.

7.0 Process for Reimbursement

- (a) Upon Project Co becoming aware of the occurrence of an Event of Vandalism, Project Co shall promptly notify the City of the Event of Vandalism and document what remedial action will be taken to restore or repair the System.
- (b) No longer than 60 days following completion of the required restoration or repair by Project Co in respect of the Event of Vandalism, Project Co shall submit to the City a request for reimbursement for associated Vandalism Repair Costs, calculated in accordance with Section 4.0 of this Appendix A. The request for reimbursement shall provide a comprehensive breakdown of

the nature of work completed to restore the System, the hours worked and any insurance proceeds that have been paid or are payable in relation to the Event of Vandalism.

- (c) The City will notify Project Co of any issues or disputes in respect of Project Co's calculation of the Vandalism Repair Costs within 10 Business Days of receipt of the request for reimbursement. If the City does not dispute Project Co's claimed Vandalism Repair Costs, then the City shall confirm its approval. The City's failure to respond within 10 Business Days shall constitute approval.
- (d) If the City and Project Co are unable to resolve such issues or disputes within a further 10 Business Days, then either Party may refer the issue or dispute for resolution pursuant to the Dispute Resolution Procedure. Where the dispute involves only a portion of the claimed Vandalism Repair Costs, then the undisputed portion shall be deemed to be approved and eligible for payment in accordance with 8.0(e), below.
- (e) Upon receipt by Project Co of the City's approval in accordance with 7.0(c) or (d), above, of the content and amount set out in Project Co's request for reimbursement, Project Co shall include as part of the next invoice issued to the City and prepared in accordance with Section 32.6 of the Project Agreement the approved Vandalism Repair Cost and shall also append the final approved request for reimbursement in respect of the Vandalism Repair Cost. The City shall make payment in accordance with Section 34 of the Project Agreement.

**APPENDIX B
ASSET PRESERVATION**

1.0 Introduction

- (a) This Appendix outlines the requirements for the System asset preservation activities required pursuant to this Project Agreement. Project Co shall be responsible for meeting the performance outcomes and objectives outlined in this Appendix which include:
- (i) Achieving defined service levels;
 - (ii) Limiting System consumption;
 - (iii) Ensuring safety of System is a continual and ongoing focus;
 - (iv) Achieving Design Life expectations; and
 - (v) Providing a sound Asset Management Plan to maintain long-term serviceability and structural integrity of the System.

2.0 Scope

- (a) Project Co shall be solely responsible for the provision of products and services associated with the planning, management and delivery of System asset preservation activities to meet the Project Agreement requirements and in accordance with Good Industry Practice. The System asset preservation process is described as follows:
- (i) Project Co develops an Asset Management Plan that meets the Project Agreement requirements and delivers the required Asset Preservation Performance Measures;
 - (ii) Project Co implements the Asset Management Plan;
 - (iii) Project Co continually monitors System condition and reports achievements; and
 - (iv) Project Co adjusts the Asset Management Plan as required to achieve the desired outcomes.

3.0 References

- (a) Reference Documents are noted elsewhere in this Project Agreement. Accordingly, the following is a partial listing of Reference Documents:
- (i) City of Ottawa's Asset Management Plan provides an Overall Condition of City Assets.

4.0 Performance Outcomes

(a) General

- (i) Project Co shall develop and implement an Asset Management Plan that limits the extent of consumption of individual asset categories comprising the System by maintaining and preserving the performance and operational integrity and safety on an ongoing basis throughout the Maintenance Period.
- (ii) Details of routine maintenance requirements applicable to the System and their relevant Outcome Target indicators and consequences of Non-Conformance are noted in Appendix A – Maintenance Performance Requirements to this Schedule 15-3, and the Expiry Date Requirements are noted in Appendix C to this Schedule 15-3 and are not repeated here. Project Co's Asset Management Plan shall address those requirements and the key outcome objectives described in these Appendices. The subsequent sections provide the key outcome objectives for the asset categories.

(b) Guideway Elements

TABLE 4.1 Guideway Elements	
Item	Outcome Objectives
a. Civil / Drainage / Utilities	<ul style="list-style-type: none"> • Ensure that Track subbase, grading, and drainage provide a high quality Track foundation • Convey surface and groundwater within and across the ROW in compliance with environmental requirements • Ensure that Trillium Line patrons and infrastructure are not at risk from flood, groundwater, scour and/or drainage system failures • Ensure that all surfaces remain free draining without ponding • Ensure utilities crossing or occupying the ROW are properly protected/isolated to provide their intended public service and do not pose a safety hazard to the System and its occupants
b. Track / Trackwork/Special Trackwork	<ul style="list-style-type: none"> • Provide high quality Track and Special Trackwork within specified tolerances to the design geometry • Provide a ride quality that complies with ISO 2631 • Minimize Track-generated noise and vibration to within acceptable levels • Avoid anomalous wear and damage to the wheels, bogies and/or primary and secondary suspension components of Revenue Vehicles through active management of wheel-rail interface • Minimize rail and Track system component wear through the active management of wheel-rail interface • Eliminate the probability of Train derailments • Eliminate perceptible lateral swaying / hunting and perceptible vertical bouncing. • Eliminate wheel-rail interface squealing or other perceptible tonal noises

TABLE 4.1 Guideway Elements	
Item	Outcome Objectives
c. Railway Bridges	<ul style="list-style-type: none"> • Ensure that all Railway Bridges remain safe and functional at all times for Trillium Line operation • Ensure that Track/guardrail fastening systems, walkways, Platform/canopies and other elements attached to, or supported by Rail Bridges remain in good condition providing their intended function • Ensure there are no load limitations or speed reductions to Trillium Line operation • Ensure that there are no hazards to undergrade roadways, walkways, trails, or other facilities
d. Non Railway Bridges	<ul style="list-style-type: none"> • Ensure that there are no load limitations to Roadway Bridges so that passage of legal vehicles is maintained in accordance with local and provincial requirements • Ensure all Bridges including for Roadways, Trails, and Pedestrian facilities remain safe and functional at all times •
e. Retaining Walls	<ul style="list-style-type: none"> • Ensure Retaining walls remain safe and functional at all times • Ensure that there are no impediments to the passage of Trillium Line Vehicles adjacent to retaining walls • Ensure that there are no impediments to the passage of roadway vehicles or other users adjacent to retaining walls on facilities crossing or paralleling the Trillium Line ROW • Ensure that retaining wall drainage systems are functional and well maintained
f. Management	<ul style="list-style-type: none"> • Meet the design requirements noted in this Project Agreement • Manage the probability and consequence of System failures throughout the Trillium Line, and develop recovery and reactivation plans • Ensure inspections, condition surveys and documentation are carried out according to Asset Management Plan requirements • Ensure programming of the Maintenance and Rehabilitation Services is complete, performed with sufficient lead time, and based upon a long-term focus • Ensure Good Industry Practice and continual improvements are applied to Maintenance and Rehabilitation Services

(c) Tunnels

TABLE 4.2
Tunnels

Item	Outcome Objectives
a. Tunnel Structures	<ul style="list-style-type: none"> • Ensure that Tunnel Structures and all associated elements are safe and functional for passage or traversing of Trillium Line Vehicles at all times • Ensure that Tunnel Structures are sound and serves its intended function in providing structural support and/or protection to all adjacent and overhead facilities such as buildings, utilities, roadways, etc. • Ensure that the Tunnel's walls/ceilings and/or Tunnel liner are well maintained and in good condition minimizing water infiltration, spalling or other cosmetic Defects • Ensure that catwalk iswell maintained, functional and available for the use in case of an Emergency • Ensure that the Tunnel drainage system including pumps are well maintained and functional at all times • Ensure that Tunnel portal Structures are well maintained and provide for safe passage of Trillium LineVehicles
b. Tunnel Equipment and systems	<ul style="list-style-type: none"> • Ensure safe, efficient and fully functional Tunnel lighting in accordance with applicable standards as identified in the design and construction requirements • Maintain and update Tunnel lighting system and fixtures to minimize energy consumption in keeping with ongoing technological advancement and compliance with federal and provincial requirements • Ensure that Emergency communication / blue light systems , exit signage, escape routes are well maintained and provide their intended function • Ensure drainage pumping systems are fully functional, in good repair, have advance warning and backup systems • Ensure that the Tunnel Emergency ventilation systems including fans, power/control systems and ventilation shafts are fully functional, in good repair and in compliance with applicable codes and standards • Ensure that Tunnel power backup systems are fully functional and in good repair • Ensure that Systems and Sub-Systems located in the TOCC and BCC are fully functional, in good repair and n compliance with applicable codes and standards
c. Management	<ul style="list-style-type: none"> • Meet the design requirements noted in this Project Agreement • Manage the probability and consequence of System failures, and develop recovery and reactivation plans • Ensure inspections, condition surveys and documentation are carried out according to Asset Management Plan requirements • Ensure programming of the Maintenance and Rehabilitation Services is complete, performed with sufficient lead time, and based upon a long-term focus • Ensure Good Industry Practice and continual improvements are applied to Maintenance and Rehabilitation Services

(d) Systems Elements

TABLE 4.3
Systems Elements

Item	Outcome Objectives
a. Train Control / Signal System	<ul style="list-style-type: none"> • Ensure a safe, efficient, and reliable Train Control System • Ensure that the System provides for fail safe operations and complies with applicable regulatory requirements and the approved System Safety Management System • Ensure that the System is fully functional at all times and supports the required Trillium Line operations and System capacity/throughput requirements • Ensure that the Train Control System is refined and updated as may be necessary in keeping with life cycle considerations, wear and tear, technological advancements, component obsolescence, equipment suppliers and industry requirements, and for further certainty includes Systems and Sub-Systems located in the TOCC and BCC
b. Communications	<ul style="list-style-type: none"> • Ensure safe, efficient and fully functional communication system • Ensure that communication system reliably supports all intended functions including provision of Passenger information, as well as all control and monitoring interfaces among Train Control, security, and other systems, and for management and communication among operating and maintenance staff. • Ensure that communication system components are updated, or replaced, as may be necessary in keeping with life cycle considerations, technological advancements, equipment suppliers and industry requirements
c. Management	<ul style="list-style-type: none"> • Meet the design requirements noted in this Project Agreement • Manage the probability and consequence of System failures throughout the Trillium Line, and develop a recovery and reactivation plans • Ensure inspections, testing, condition surveys, certifications and documentation are carried out according to Asset Management Plan requirements • Ensure programming of the Maintenance and Rehabilitation Services is complete and based upon long-term focus • Ensure Good Industry Practice and continual improvements are applied to Maintenance and Rehabilitation Services

(e) Stations

TABLE 4.4 Stations	
Item	Performance Outcomes
a. Fixed facilities including Platforms, Ramps, Stairs, Walkways, Bridges, Canopies	<ul style="list-style-type: none"> • Ensure that all fixed facilities remain structurally sound, safe and available for patrons • Ensure that the condition of the fixed facilities including all surfaces and finishes are well maintained, facilitate effective custodial maintenance and provide a high quality and comfortable Passenger environment • Ensure that all fixed facilities comply with applicable codes and regulations for safety and accessibility. For certainty, the horizontal gap and vertical height differences between the Station Platform and the Revenue Vehicles prescribed in Schedule 15-2 Part 4.
b. Elevators	<ul style="list-style-type: none"> • Ensure that all elevators are well maintained, functional and serviceable • Ensure compliance with all federal, provincial and municipal safety requirements • Ensure that elevators maintain a high degree of reliability in accordance with industry standards
c. Passenger Amenities / Station Furniture / Signs & Graphics / Artwork	<ul style="list-style-type: none"> • Provide a high quality, comfortable, and safe Passenger environment • Ensure all components are well maintained, functional, and updated, • Ensure all signage and other graphics are clear, provide their intended function, and are updated, as may be necessary due to physical or operational modifications of the System
d. Lighting, Electrical & Mechanical Equipment, and Janitorial Facilities	<ul style="list-style-type: none"> • Provide a high quality, comfortable and safe Passenger environment • Ensure all lighting and equipment is well maintained and functional • Ensure facilities support serviceability of each Station • Ensure compliance with all applicable codes and regulations
e. Management	<ul style="list-style-type: none"> • Meet the design requirements noted in this Project Agreement • Manage the probability and consequence of System failures throughout the Trillium Line, and develop recovery and reactivation plans • Ensure inspections, condition surveys and documentation are carried out according to Asset Management Plan requirements • Ensure programming of the Maintenance and Rehabilitation Services is complete and based upon long-term focus • Ensure Good Industry Practice and continual improvements are applied to Maintenance and Rehabilitation Services

(f) Maintenance and Storage Facilities

TABLE 4.5 Maintenance and Storage Facilities	
Item	Outcome Objectives
a. Trillium Line Railcar Maintenance Shop	<ul style="list-style-type: none"> • Ensure that all fixed facilities and systems (HVAC, etc.) are safe, well maintained and fully functional • Ensure the maintenance shop complies with all applicable regulatory requirements • Ensure that the facilities continues to support ongoing Vehicle Maintenance and Rehabilitation Requirements • Provide for updates to employee facilities, as may be warranted to maintain an effective and serviceable environment
b. MOW Facilities/Areas	<ul style="list-style-type: none"> • Ensure the facilities and systems are safe, well maintained and fully functional • Ensure facilities supports ongoing MOW activities • Adequately provides for storage of MOW materials and equipment
c. Shop and MOW Equipment	<ul style="list-style-type: none"> • Ensure that Shop and MOW equipment is well maintained, fully functional and safe for use • Supports all necessary maintenance and rehabilitation functions • Ensure that upgrades are made as may be necessary or appropriate due to wear out or obsolescence.
d. Storage Area / Yard Tracks	<ul style="list-style-type: none"> • Ensure that the Storage area/building and other yard Tracks and facilities are safe, well maintained and fully functional • Ensure that there is no degradation in Train speeds or flexibility of Train movements • Ensure adequate storage capacity is maintained for future fleet requirements
e. Operations Crew Facilities	<ul style="list-style-type: none"> • Ensure facilities and systems are safe for use and well maintained • Ensure that facilities supports the various City activities and functions • Provide for updates, as may be warranted to maintain an effective and serviceable staff environment
f. Management	<ul style="list-style-type: none"> • Meet the design requirements noted in this Project Agreement • Manage the probability and consequence of System failures throughout the Trillium Line, and develop recovery and reactivation plans • Ensure inspections, condition surveys and documentation are carried out according to Asset Management Plan requirements • Ensure programming of the Maintenance and Rehabilitation Services is complete and based upon long-term focus • Ensure Good Industry Practice and continual improvements are applied to Maintenance and Rehabilitation Services

(g) Other Infrastructure

TABLE 4.6 Other Infrastructure	
Item	Outcome Objectives
a. General	<ul style="list-style-type: none"> • Ensure that all infrastructure and components are well maintained and in a state of good repair • Attain full compliance with municipal, provincial, and federal safety standards • Ensure safe, efficient, and fully functional systems and Infrastructure • Ensure ongoing maintenance can be effectively and efficiently performed • Minimize the potential for chronic reliability issues
b. Management	<ul style="list-style-type: none"> • Meet the design requirements noted in this Project Agreement • Manage the probability and consequence of System failures throughout the Trillium Line, and develop recovery and reactivation plans • Ensure inspections, condition surveys and documentation are carried out according to Asset Management Plan requirements • Ensure programming of the Maintenance and Rehabilitation Services is complete and based upon long-term focus • Ensure Good Industry Practice and continual improvements are applied to Maintenance and Rehabilitation Services

(h) Revenue Service Vehicles

TABLE 4.7 Passenger Revenue Service Vehicles	
Item	Outcome Objectives
a. General	<ul style="list-style-type: none"> • Ensure that Revenue Service Vehicles are safe, fully functional, and serviceable throughout Maintenance Period • Sustain high levels of in-service reliability • Ensure compliance with all applicable standards and regulations

TABLE 4.7 Passenger Revenue Service Vehicles	
Item	Outcome Objectives
b. Interior	<ul style="list-style-type: none"> • Ensure interior components are safe, comfortable, and of high quality for Passenger use • Ensure that interior remains serviceable and can be maintained effectively and efficiently • Ensure HVAC systems continue to meet the design requirements for a comfortable Passenger environment • Provide for updates, to interior components (such as seats, flooring, finishes, etc.) and systems (HVAC, Passenger information, etc.), as may be necessary due to wear out and obsolescence • Ensure the Revenue Vehicles Passenger seat inserts, finishes, decals and signage are replaced and or renewed throughout the Maintenance Period no later than 15 years from the start of the Maintenance Period or previously performed replacement and or renewal or more frequently as required to comply with the Vehicle Maintenance Standard provided in Appendix A Attachment 5 • Ensure the Revenue Vehicles Driver's cab seat inserts, finishes, decals, and signage are replaced and or renewed throughout the Maintenance Period no later than 5 years from the start of the Maintenance Period or previously performed replacement and or renewal or as more frequently required to comply with the Vehicle Maintenance Standard provided in Appendix A
c. Exterior	<ul style="list-style-type: none"> • Ensure Vehicle exterior remains appealing, structurally sound, free of rust/corrosion and other Defects/deformities • Ensure Vehicle exterior remains serviceable and can be cleaned and maintained in a cost effective and efficient manner • Ensure Vehicle's paint / wrap is replaced and or entirely renewed as required to provide a uniform and consistent appearance free of visual inconsistencies in accordance with industry best practices or manufacturer's recommendations, as required to comply with the Vehicle Maintenance Standard provided in Appendix A Attachment 5
d. Doors	<ul style="list-style-type: none"> • Ensure safe, fully functional and serviceable doors that can be effectively maintained • Provide for a high level of reliability to meet the operational service requirements
e. Onboard Control Systems	<ul style="list-style-type: none"> • Ensure onboard Train Control Systems are fully functional, support the required operational service requirements and ensure safe operations • Ensure that onboard Train Control Systems are refined and updated as may be necessary in keeping with life cycle considerations, technological advancements, equipment suppliers and industry requirements
f. Propulsion	<ul style="list-style-type: none"> • Ensure propulsion system is highly reliable and can be maintained effectively and efficiently • Minimize degradation in Vehicle performance and ensure full compliance with operational service requirements
g. Suspension/Bogies/ Articulation	<ul style="list-style-type: none"> • Ensure that these elements are safe, highly reliable and serviceable • Provide for a high level of Passenger comfort that meets ISO 2631 as a minimum and minimizes Rail and Track component wear

TABLE 4.7 Passenger Revenue Service Vehicles	
Item	Outcome Objectives
h. Braking	<ul style="list-style-type: none"> • Ensure that braking system including all associated components are safe, highly reliable, and can be effectively and efficiently maintained • Ensure that Vehicle performance requirements continue to be met
i. Management	<ul style="list-style-type: none"> • Meet the design requirements noted in this Project Agreement • Manage the probability and consequence of System failures throughout the Trillium Line, and develop a recovery and reactivation plans • Ensure inspections, condition surveys and documentation are carried out according to Asset Management Plan requirements • Ensure programming of the Maintenance and Rehabilitation Services is complete and based upon long-term focus • Ensure Good Industry Practice and continual improvements are applied to Maintenance and Rehabilitation Services

Non-Revenue Service Vehicles

TABLE 4.8 Non-Revenue Service Vehicles	
Item	Outcome Objectives
a. General	<ul style="list-style-type: none"> • Ensure that Non-Revenue Service Vehicles are safe, fully functional, and serviceable throughout Maintenance Period • Sustain high levels of in-service reliability • Ensure compliance with all applicable standards and regulations

5.0 Documentation and Reporting

(a) General Requirements

- (i) This Article describes the plans and reports that Project Co shall submit to the City. The general purpose of the plans and the reports are for Project Co to provide documentation that demonstrates to the City:
- A. An understanding of the Asset Management requirements;
 - B. An Asset Management strategy that is based upon rationalized knowledge of System asset inventory, condition, and performance;
 - C. Logical and up-to-date reporting on the condition of System assets and meeting Operational Performance Requirements;
 - D. Asset preservation and rehabilitation work undertaken during the previous 12 months and work planned for the upcoming 12 months;

- E. Long-term asset preservation strategy and plans;
 - F. A robust and up-to-date Quality Management System and reporting;
 - G. Compliance with environmental requirements and permitting;
 - H. Reporting of results of meeting the Asset Preservation Performance Measures, which would include compliance and non-compliance reporting; and
 - I. Compliance with this Project Agreement.
- (ii) The System developed by Project Co shall be dynamic, easily auditable by the City, and kept up-to-date so that Project Co can regularly and readily provide information to the City, and be compatible with the City's Asset Management information systems.
- (b) Plans and Reports
- (i) Table 5.1 provides a summarized schedule of the plans and reports required for submission by Project Co to the City for review and input.
 - (ii) Project Co shall be assigned a Medium Quality Failure for each instance of failing to provide the City with any plan or report listed below in Table 5.1, in compliance with the requirements for such plan or report as set out in this Appendix B, by the relevant Due Date. Additionally, if Project Co does not provide the required, compliant plan or report within one Contract Month following the required Due Date, Project Co shall be assigned a further Major Quality Failure. Project Co shall be assigned a Major Quality Failure for each subsequent Contract Month it fails to provide the required, compliant documentation.

TABLE 5.1 Schedule of Deliverable Reports and Records – Response Time Measures				
Performance Measure	Deliverable Name	Specification Reference	Due Date	Submitted under the Schedule 10 – Review Procedure
PREP1	Initial Asset Management Plan (including initial five year asset preservation schedule)	5.0(d)	60 days prior to the Revenue Service Commencement Date	Yes
PREP2	Asset Management Plan Updates (including updated five year asset preservation schedule, and As-Built Drawings)	5.0(d)	December 31 annually (updated annually)	Yes
PREP3	Annual APPM Achievement Report	5.0(e), 6.0	November 30 annually (updated annually)	Yes

TABLE 5.1 Schedule of Deliverable Reports and Records – Response Time Measures				
Performance Measure	Deliverable Name	Specification Reference	Due Date	Submitted under the Schedule 10 – Review Procedure
PREP4	Structures Condition Data	5.0(f), 6.0(c)	September 30 annually (updated annual data delivered not more than 60 days following inspection)	Yes
PREP5	Tunnel Condition Data	5.0(g), 6.0(d)	September 30 annually (updated annually)	Yes
PREP6	Track Condition Data	5.0(h), 6.0(e)	September 30 annually (updated annually)	Yes
PREP7	Vehicles and Systems Data	5.0(i), 6.0(f)	September 30 annually (updated annually)	Yes
PREP8	Facilities Condition Data	5.0(j), 6.0(g)	September 30 annually (updated annually)	Yes
PREP9	Other Asset Classes Condition Data	5.0(k), 6.0(h)	September 30 annually (updated annually)	Yes
PREP10	System Asset Inventory	5.0(l)	September 30 annually (updated annual data delivered not more than 60 days following survey)	Yes
PREP11	As Built Drawings	5.0(m)	September 30 annually (updated annual data delivered not more than 60 days following survey)	Yes

(iii) The documents noted above shall include the submission of relevant reports in Appendix A – Operation and Maintenance Performance Requirements, which shall be submitted in accordance with the Schedule 10 – Review Procedure.

(c) File Formats

(i) Unless specified otherwise, electronic files shall be compatible with the most recent version of Microsoft Office and be editable. All supplied electronic files shall be on CD or DVD and be clearly labelled as to the content. Storage media shall be scanned for viruses (using an industry recognized product with appropriate updates) prior to submission to the City. In addition, all electronic files shall be made available on a secured web based website managed by Project Co.

(d) Asset Management Plan

- (i) Purpose
- A. Project Co shall provide to the City a written plan (the “Asset Management Plan”), which describes the procedures for achieving the specified Performance Measures (see Article 5.5 of this Appendix) to be attained during the Maintenance Period.
- (ii) Details
- A. The initial Asset Management Plan and all subsequent annual updates to the plan shall, as a minimum:
- i Address all System;
 - ii Include a description of and the manner in which the overall performance management reporting shall be achieved;
 - iii Be aligned with the scope of obligations under Appendices A, B, and C of the Maintenance Specifications (Maintenance and Rehabilitation Requirement, Asset Preservation, and the Expiry Date Requirements);
 - iv Meet the quality management and environmental management requirements in this Project Agreement;
 - v Be consistent with other obligations in this Project Agreement;
 - vi Identify the intervention criteria for each APPM as well as achieve the requirements set out in Appendix C, the Expiry Date Requirements to this Schedule 15-3;
 - vii Describe the approach for Infrastructure condition inspection;
 - viii Describe the approach for assessing the manner in which the APPMs shall be achieved;
 - ix Identify the deterioration rate and factors affecting the APPMs;
 - x Describe the process for asset preservation work identification, programming and prioritization in terms of developing the Asset Management Plan and the five-year asset preservation schedule, and addressing any APPM non-compliance;
 - xi Identify and describe the Asset Management approach with respect to integrating and aligning routine maintenance activities (as described in Appendix A to this Schedule 15-3) and asset preservation work;
 - xii Identify any areas of risk and describe mitigation measures;

- xiii Describe the approach for completing the annual Maintenance and Rehabilitation Services schedule including the resources employed, plant, materials, and facilities associated therewith;
- xiv Describe any processes and innovations to improve performance and performance reporting process;
- xv Provide an indication of the expected condition performance of the asset over the remainder of the Maintenance Period and how Project Co is ensuring full contractual compliance shall be achieved, including providing details of the method used to establish the predicted condition (it is anticipated that some form of asset performance modelling shall be required) and in graphical format, the current, worst case, the Expiry Date hand back and target condition of the Infrastructure; and
- xvi Include a five-year asset preservation schedule consisting of a rolling, forward Maintenance and Rehabilitation Services program that describes the planned preventative maintenance and asset preservation works (excluding minor routine maintenance) that Project Co is planning to undertake over the following five year period, and provide specific details regarding planned asset preservation works including but not limited to:
1. planned asset preservation works for both the year and each quarter within the first two years, and only for the year thereafter;
 2. advanced technical evaluations completed;
 3. field investigations completed;
 4. updated asset preservation treatment; and
 5. design documentation:
 - In respect of preparation of the five-year asset preservation schedule:
 - It is recognized that the timing of rehabilitation and other projects and activities in the future is less certain than those in the current year; and
 - Project Co has the right to perform activities that deviate from the schedule, so long as performance the system meets Project Agreement requirements.

- The five-year asset preservation schedule shall be in the following format:
 - For linear Infrastructure (Track, special Trackwork, Tunnel etc.):
 - The plan should be produced to clearly identify the start and end locations and cross-sectional position of all Maintenance and Rehabilitation Services. Where Maintenance and Rehabilitation Services is to be undertaken on only part of the cross section then the plan should be formatted to clearly indicate this;
 - Indicate the timing and nature of the Maintenance and Rehabilitation Services to be undertaken; and
 - Have some indication (code or otherwise) of the level of the priority of the Maintenance and Rehabilitation Services.
 - For point Infrastructure (such as Bridges, Stations, Facilities, Sewers, etc.):
 - Infrastructure should be grouped firstly by type, then by location along the Trillium Line;
 - Indicate the timing and nature of the Maintenance and Rehabilitation Services to be undertaken; and
 - Have some indication (code or otherwise) of the level of priority and certainty of the Maintenance and Rehabilitation Services occurring.
 - For Vehicles and equipment (such as Railcars, Non-Revenue Vehicles, etc.):
 - Vehicles and equipment should be grouped firstly by type, then by the

- identification number of each particular Vehicle/asset
- Indicate the timing and nature of the Maintenance and Rehabilitation Services to be undertaken; and
 - Have some indication (code or otherwise) of the level of priority and certainty of the Maintenance and Rehabilitation Services occurring.
- B. All plans shall address the operational impact and mitigation measures;
- C. Include Project Co's, Maintenance and Rehabilitation Quality Management Plan and provide a description of the process for reporting of audits and Nonconformity Reports in accordance with Schedule 11 – Integrated Management System Requirements;
- D. Include Project Co's reporting for its environmental management activities;
- E. Provide an update on the status of Project permitting.
- (e) Annual APPM Achievement Report
- (i) Purpose
- A. The Annual APPM Achievement Report documents the routine maintenance, preventative maintenance, rehabilitation, and asset preservation work completed in the previous year; reports the results from Infrastructure condition and inventory surveys and provides a summary of achievement compared to the APPM requirements; and outlines activities anticipated in the coming year.
- (ii) Details
- A. The Annual APPM Achievement Report shall include the following as a minimum:
- i An annual summary of the Maintenance and Rehabilitation Services (including routine, Preventive Maintenance, and Corrective Maintenance, rehabilitation and asset preservation activities) performed in the preceding year;
 - ii Methodologies for calculating the Asset Preservation Performance Measures;

- iii Analysis and presentation of the results from the annual data collection program for the Asset Preservation Performance Measures for all System assets as defined in the Asset Management Plan;
- iv Reporting of the results of surveys; and
- v Reports of the compliance and non-compliances with the APPM, and corrective actions.

(f) Structure Condition Data

- (i) Project Co shall be responsible for collecting, maintaining, reporting, and updating Structures Condition data for the purposes of Asset Management and for evaluating the APPM achievements. The requirements for such data are detailed in Table 5.2.

TABLE 5.2	
Asset Class Condition Group	Condition Data Delivery Requirements
Structures – Bridges, Recreational Trail Bridges, Retaining Walls, and Structural Culverts	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Project Co shall provide to the City a condition data information system (to be agreed between the City and Project Co) for delivering condition information for Structures • Project Co shall provide to the City all asset condition inspection reports in a digital “pdf” format.
	<ul style="list-style-type: none"> • Project Co shall provide to the City all asset condition assessments and BCI in a digital “pdf” and Microsoft Excel format. • Project Co shall provide to the City all drawings in a digital “pdf” and “Microstation” format as well as printed / plotted hardcopy.

(g) Tunnel Structures Condition Data

- (i) Project Co shall be responsible for collecting, maintaining, reporting, and updating Tunnel Structure Condition data for the purposes of Asset Management and for evaluating the APPM achievements. The requirements for such data in respect of each Phase are detailed in Table 5.3.

TABLE 5.3	
Asset Class Condition Group	Condition Data Delivery Requirements
Tunnel Structures	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Project Co shall provide to the City a condition data information system (to be agreed between the City and Project Co) for delivering condition information for Structures

(h) Track Condition Data

- (i) Project Co shall be responsible for collecting, maintaining, reporting, and updating Track Condition data for the purposes of Asset Management and for evaluating the APPM achievements. The requirements for such data in respect of each Phase are detailed in Table 5.4.

TABLE 5.4

Asset Class Condition Group	Condition Data Delivery Requirements
Mainline Track, Special Trackwork (Turnouts, Crossovers, Diamond Crossings), Yard Leads, Yard Track	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Project Co shall provide to the City a condition data information system (to be agreed between the City and Project Co) for delivering condition information for Track and associated components

(i) Vehicles and Systems Condition Data

- (i) Project Co shall be responsible for collecting, maintaining, reporting, and updating Vehicles and Systems Condition data for the purposes of Asset Management and for evaluating the APPM achievements. The requirements for such data in respect of each Phase are detailed in Table 5.5.

TABLE 5.5

Asset Class Condition Group	Condition Data Delivery Requirements
Vehicles , includes Revenue Vehicles and MOW equipment	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Project Co shall provide to the City a condition data information system (to be agreed between the City and Project Co) for delivering condition information for Vehicles
Systems Components , includes, Communication Systems, Signals and Train Controls, TOCC/BCC, Corrosion Control	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Project Co shall provide to the City a condition data information system (to be agreed between the City and Project Co) for delivering condition information for Systems

(j) Facility Condition Data

- (i) Project Co shall be responsible for collecting, maintaining, reporting, and updating Facilities Condition data for the purposes of Asset Management and for evaluating the

APPM achievements. The requirements for such data in respect of each Phase are detailed in Table 5.6.

TABLE 5.6	
Asset Class Condition Group	Condition Data Delivery Requirements
Facilities , includes Maintenance and Storage Facility and Stations	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Project Co shall provide to the City a condition data information system (to be agreed between the City and Project Co) for delivering condition information for Facilities

(k) Other Asset Classes Condition Data

- (i) Project Co shall be responsible for collecting, maintaining, reporting and updating condition data for the purposes of proper asset management and for ensuring adequate serviceability. The requirements for such data are detailed in Table 5.7.

TABLE 5.7	
Asset Class Condition Group	Condition Data Delivery Requirements
Other Structures —Culverts (Span less than 3.0 m) and Noise Barriers	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Maintenance inspection reports as outlined in Asset Management Plan, to this Schedule 15-3
Drainage and Sedimentation Control Structures —including curb and gutters, catch basins, ditch inlets, gutter outlets, grates, storm sewers with utility holes and outlet structures, and pump stations.	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Maintenance inspection reports as outlined in Asset Management Plan, to this Schedule 15-3
Signs —including all regulatory, warning, guide, informational, advisory, construction and maintenance and route markers	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Maintenance inspection reports as outlined in Asset Management Plan, to this Schedule 15-3
Electrical Components —including lighting, signals and control boxes, and electrical components associated with fire, life, and safety equipment.	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Maintenance inspection reports as outlined in Asset Management Plan, to this Schedule 15-3
Mechanical Components —including systems for drainage, pumps, fire, life and safety	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Maintenance inspection reports as outlined in Asset Management Plan, to this Schedule 15-3

Recreational Trails and Sidewalks (excluding Recreational Trail Bridges)	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Maintenance inspection reports as outlined in Asset Management Plan, to this Schedule 15-3
Landscape – including vegetation and plantings, infrastructure directly supporting vegetation and plantings	<ul style="list-style-type: none"> • All condition data collection and reporting on an annual basis in accordance with Table 5.1 • Maintenance inspection reports as outlined in Asset Management Plan, to this Schedule 15-3

(l) System Inventory Data

- (i) The electronic Infrastructure inventory records of Project Co shall be accurate and up-to-date. Project Co shall be responsible for collecting and maintaining the data.
- (ii) Project Co shall assign each asset a unique number, and name the asset consistent with the terminology used in Schedule 15-2, or reference documents, or Good Industry Practice or as agreed to by the City.

(m) As Built Drawings (Record Drawings)

- (i) Project Co shall be responsible for the production of As Built Drawings including all shop fabrication drawings. The production of the drawings shall generally take the form of the design drawings with addendums showing changes and signed by a Professional Engineer, where applicable. These shall be submitted, as applicable, with the annual Asset Management Plans noted in Table 5.1 of this Appendix.

6.0 Asset Preservation Performance Measures

(a) General

- (i) APPMs reflect the condition in which Project Co shall maintain the System. Project Co shall comply with these measures at all times throughout the Maintenance Period. Appendix A of this Schedule 15-3 outlines routine Maintenance and Rehabilitation Requirements of which are not repeated here. An integral part of the Asset Preservation is gathering and maintaining reliable inventory and condition assessment data, which are Project Co's responsibility.
- (ii) The APPMs are based on the levels of service established by the City, as determined from System condition assessments, performance monitoring, delivery methodologies, and management functions within Infrastructure management systems.
- (iii) APPMs have been developed for each Asset Category based on the specific requirements associated with each asset type. A standardized format for the measures has been adopted for consistency and presentation purposes. Elements of the measures include:
 - A. Feature;

- B. Performance measures;
 - C. minimum condition;
 - D. Maximum Response Time; and
 - E. The basis of measure and any associated response parameters required to be met.
- (iv) Project Co shall be responsible for the asset preservation of all System and ensuring that it is managed in a safe and operable condition and are preserved in accordance with the requirements of this Project Agreement and Good Industry Practice.
- (b) Performance Measures
- (i) APPM provide the ability to monitor and maintain the desired System asset condition over the Maintenance Period. Project Co shall be required to report actual APPM achievement as part of the Annual APPM Achievement Report. The achievements are measured in terms of meeting the requirements of the Asset Preservation Performance Measures and reporting requirements detailed in Article 5. Achieving the APPM noted in this Appendix includes meeting the operations and Maintenance and Rehabilitation Requirements noted in Appendix A of this Schedule 15-3.
 - (ii) Project Co shall demonstrate through its Quality Management System the processes to achieve the APPM specified in this Appendix.
 - (iii) A summary of the Asset Preservation Performance Measure and the consequences of Non-conformity – with the requirements are noted in the following Table 6.1. The composition of the APPMs is subject to review by the City during the Maintenance Period.

TABLE 6.1
Asset Preservation Performance Measures

Article Reference	Performance Requirement	APPM Measure Reference
5.0(d)	Initial Asset Management Plan	PREP1
5.0(d)	Asset Management Plan Updates	PREP2
5.0(e)	Annual APPM Achievement Report	PREP3
5.0(f)	Structures Condition Data	PREP4
5.0(g)	Tunnel Structures Condition Data	PREP5
5.0(h)	Track Condition Data	PREP6
5.0(i)	Vehicles and Systems Condition Data	PREP7
5.0(j)	Facilities Condition Data	PREP8
5.0(k)	Other Asset Classes and Condition Data	PREP9

TABLE 6.1 Asset Preservation Performance Measures		
Article Reference	Performance Requirement	APPM Measure Reference
5.0(l)	System Inventory	PREP10
5.0(m)	As Built Drawings	PREP11

(c) Structures

(i) General

- A. The APPM for Structures are targeted to ensure:
 - i Trillium Line User and Structure safety;
 - ii Structure functionality is at an acceptable level; and
 - iii Structure asset consumption is limited.
- B. Using these factors as the basis, standards and performance measures are set to ensure sound Asset Management practices are applied for Structures.
- C. The APPMs developed specifically for Structures are based upon the City's Bridge condition rating procedures, which has adopted the MTO's method of determining a Bridge Condition Index, based on Bridge inspection methods and criteria provided in OSIM, and which provides the input to these APPMs.
- D. Elements of the Structures asset management cycle include:
 - i Inspection at the specified interval;
 - ii Rating the condition of the Structure Components;
 - iii Inventory updating;
 - iv Programming correction of deficiencies;
 - v Undertaking maintenance and asset preservation works; and
 - vi Reporting achievements.
- E. The delivery of services is based upon:
 - i Emphasis on Trillium Line Operations and Structure safety for the Project;

- ii Outcome-based specification with Project Co given the latitude for treatment selection to control/correct defective conditions as per the Project Agreement requirements;
 - iii A life-cycle approach to maintenance and asset preservation in conformance with the performance measures;
 - iv A preventative rather than reactive maintenance/repair strategy is encouraged to limit asset consumption with inspections recommended to facilitate this strategy;
 - v Emphasis on meeting the prescribed standards and APPMs on an ongoing basis;
 - vi There being an ARBE and Qualified Inspector as defined in Article 6.0(c)(ii) of this Appendix nominated to take ownership for the Structures and the Structure management cycle;
 - vii A mechanism for the City to correct default if Project Co fails to meet the condition criteria on an ongoing basis;
 - viii An effective Quality Management System; and
 - ix Compliance with the Project Agreement requirements.
- F. Project Co has full responsibility for all the asset preservation activities, including Structure replacement, should that be required.
- G. Operational standards are detailed in Appendix A to this Schedule 15-3.
- (ii) Structural Inspections
- A. Structure inspection management involves field inspections that identify and monitor Structure condition. Any observed Defects shall be addressed in relevant asset preservation strategies and subsequently programmed for asset preservation (including preventative maintenance and replacement). Project Co shall respond to and rectify any urgent items identified during inspections. The asset preservation of all Structures includes performing Structural Inspections in accordance with The AREMA Inspection manual, OSIM and Capital Rail's BSMP, as well as completing condition assessments, inventory updates, and reporting of Structure condition achievements. Project Co shall also identify the appropriate condition preservation and restoration strategies in accordance with the requirements set out in this Project Agreement. Project Co shall use Qualified Inspectors, defined as individuals with at least five years of experience in Structure inspections who maintain their knowledge of inspection through participation in biennial inspection courses offered by Ministry of Transportation of Ontario.

- B. The program of Structure inspections shall be managed by a suitably qualified railway Bridge engineer (the ARBE), who:
 - i Is a Professional Engineer with a background in inspection, design, and construction of Bridges;
 - ii Has extensive experience in supervising Structure design, evaluation, construction, inspection, maintenance, rehabilitation and asset preservation;
 - iii Maintains overall management and technical supervision of the Structure inspection and Maintenance/asset preservation program;
 - iv Accepts responsibility for the technical competence of all personnel involved in Structures inspection and reporting;
 - v Accepts responsibility for the structural safety of all Structures;
 - vi Consults with other specialist professionals when necessary; and
 - vii Has the overall responsibility for assessing the Structure functionality/safety, Structure risks, and potential risks to Trillium Line Users, and to determine an appropriate asset preservation strategy.
- C. While the Qualified Inspector is tasked with identifying Defects, it is the ARBE who is required to interpret the observations and implement appropriate Structure asset preservation strategies to meet the Project Agreement performance requirements.
- D. Structure inspections and frequencies shall be carried out in accordance with the requirements of Capital Rail's BSMP and in accordance with this Schedule 15-3. There are seven types of Structure inspections required as indicated in Table 6.2.

TABLE 6.2
Inspection Types

Type	Description	Maximum Inspection Frequencies
Superficial (maintenance)	Focus on Trillium Line Passenger safety and Structure functionality; refer to Appendix A [Operation and Maintenance Performance Requirements] to this Schedule 15-3	These are as part of routine Trillium Line management and operations.
Cursory	Focus on the general condition of Overhead Bridges to determine if there are any visual deficiencies that might potentially threaten the safe railway operation. Project Co does not have maintenance responsibilities for these Structures. Detailed Bridge inspection of entire Strutture to be completed by authority responsible for Overhead Bridge. Project Co to	Once every two years

TABLE 6.2 Inspection Types		
Type	Description	Maximum Inspection Frequencies
	ensure inspection procedures are in place and keep records of the inspection.	
Periodic Visual	Focus on a general assessment of condition or change in condition that requires further attention. Results of the inspection used when developing an annual, five year and ten-year asset preservation programs (including Preventative Maintenance and replacement)	Once per calendar year with no more than 540 days between successive inspections
Detailed Visual	Focus on a general assessment of condition and record information needed for the safe operation and management of the Structure. Results of the inspection are used when planning repair work.	To be determined by the City's RBE based on results of the periodic inspection, but not exceeding five years
Condition Surveys	Focus on producing a comprehensive assessment of condition, including undertaking physical testing, in order to develop an appropriate asset preservation program (including preventative maintenance, rehabilitation and replacement)	As required or if BCI is below 70
Underwater	Focus on the inspection of structural elements underwater not visible to be inspected during periodic visual inspections.	Once every ten years, more frequently if required by previous inspection findings
Special	Focus on the inspection of structural elements that have sustained an unusual occurrence potentially affecting the ability of the Structure to support loads. Unusual occurrences may include but are not limited to flood, fire, ice flows, rock/earth instability, earthquake, derailment, vandalism, vehicular or vessel impact.	As required

- E. Structures exhibiting significant displacement, deterioration, Defects or damage are required to be inspected and assessed more frequently with the intervals determined by the ARBE to meet the performance requirements of this Project Agreement and Good Industry Practice.
- F. Structure condition surveys are required to be undertaken using format and detail consistent with that specified in the Ontario Structure Inspection Manual (OSIM), the Structure Rehabilitation Manual, the Retaining Wall Inspection Guidelines (RWIG) and the Sign Support Inspection Guidelines (SSIG). The work shall also be conducted with reference to the practice and approach of Capital Railway's BSMP recording system. It is the responsibility of the Qualified Inspector and ARBE of the Project Co to continuously liaise with Capital Railway's RBE to ensure the inspection and evaluation information can be readily assimilated into the Ottawa system.

G. Project Co shall be required to retain files of Structure inspection records and asset preservation plans so that a continuous history of each Structure is available throughout the Maintenance Period.

H. Inspections of Structures shall commence following Revenue Service Commencement Date and continue throughout the Maintenance Period.

(iii) Key Performance Measures

A. Project Co shall perform Structure inspections and calculate the BCI for all Structures at least once every two years, in accordance with the requirements of this Schedule 15-3. Project Co shall report on all BCI, BCI-C, BCI-RW and BCI-SS as indicated in this Schedule 15-3.

B. In addition, all inspections shall identify undue movements, damages or deteriorations of key structural members, if any, which, in the opinion of the ARBE, may cause instability or distress of individual Structures and pose immediate danger to the public and the LRT System.

(iv) Submissions to the City

A. Structure Condition Data

i Project Co shall submit to the City as noted in Table 5.2 of this Appendix, no later than September 30 of each year or within 60 calendar days of inspection in which measurements are taken in accordance with Article 5.2 of this Appendix, an updated copy of the following:

1. All Inspections in electronic format;
2. All the Inspection Reports in hard copy format; and
3. All BCI, BCI-C, BCI-RW, and BCI-SS calculations and values.

ii This information shall be submitted to the City, in the format prescribed and/or referenced in this schedule 15-3; and.

iii Submission of Structure condition data only applies to Structures being Maintained by Project Co.

B. System Inventory (for Structures)

i Project Co shall submit to the City, before September 30 of each year, an updated copy of the following:

1. Structure inventory list; and
2. List of Structures that may be structurally unstable, or deficient for load carrying capacity.

- C. Asset Management Plan (Initial and Updates)
- i Project Co shall submit to the City its Asset Management Plan in accordance with Article 5.2 of this Appendix which at a minimum shall include: a copy of Project Co's list of Structure asset preservation and repair accomplishments over the previous 12 months; Structure condition preservation and restoration strategies; annual plan for upcoming 12 months; achievements report based on previous plans; a copy of Project Co's Structure asset preservation list and program for the next five years.
- D. As Built Drawings—Structural drawings and As Built Drawings for the original construction, asset preservation, and repair work.
- (v) Additional Structure Inspections
- A. Project Co shall be required to undertake additional Structure inspection by a Qualified Inspector under the supervision of a ARBE under the following circumstances which include, but not limited to:
- i Accident or Vehicle collision with a Structure;
- ii Unusual/severe weather conditions or natural disasters;
- iii Where a perceived problem exists;
- iv Flooding/ice jams; and
- v Vandalism or terrorism.
- B. Project Co shall report the inspections and findings within seven days of a significant event potentially impacting Structures' integrity and safety, which includes events noted above. Meeting the APPMs is in addition to the submission of complete and satisfactory inspection reports and findings following a significant event as described earlier.
- C. At each occurrence of Project Co failing to undertake a Structure inspection within the required time period, Project Co shall be assigned a Major Quality Failure. Project Co shall be assigned an additional Major Quality Failure for each subsequent day of non-compliance until the failure is rectified.
- (vi) Asset Preservation Performance Measures
- A. Project Co shall be required to comply with APPMs as set forth in Table 6.3.
- B. The APPMs presented are in addition to the operational condition requirements as set by Appendix A (Operation and Maintenance Performance Requirements) to this Schedule 15-3.

- C. Project Co shall demonstrate through its Quality Management System the process to achieve the specified outcomes.
- D. The method for assessing the performance measure achievement is based on the definitions given in the Ontario Structure Inspection Manual.
- E. The intervention criteria to be undertaken by Project Co to meet the APPMs also reinforce the ‘whole of life’ approach, encourage proactive preventative maintenance and asset preservation strategies and require Project Co to monitor the management of the Structures.

TABLE 6.3 Structures					
Asset Preservation Performance Measure	Structure Type	Intervention Criteria	Action	Maximum Response Time	Quality Failure*
PSTR1	Bridges, Recreational Trail Bridges	<ul style="list-style-type: none"> • When BCI <70 • When 10% of any Key Structural Members is in Poor condition 	Undertake Structure Rehabilitation or repair works to address deterioration and Defects	12 months	Major
PSTR2	Structural Culverts (including submerged Culverts)	<ul style="list-style-type: none"> • Structural Culverts with a BCI-C <70 	Undertake Structure Rehabilitation or repair works to address deterioration and Defects	12 months	Major
PSTR3	Retaining Walls	<ul style="list-style-type: none"> • Retaining Walls with a BCI-RW <70 	Undertake Structure Rehabilitation or repair works to address deterioration and Defects	12 months	Major

* At each occurrence of Project Co failing to meet the Asset Preservation Performance Measure by the expiry of the Maximum Response Time, Project Co shall be assigned a relevant Quality Failure (Major, Medium, or Minor) each week beyond the Maximum Response Time until the failure has been either rectified or a disposition has been accepted by the City in accordance with Schedule 11 – Integrated Management System Requirements.

“Key Structural Members” means elements that are considered critical and should not be allowed to drop below a certain condition. This includes Deck top, Deck soffit, Expansion Joint, Bearings, Barriers, Substructure and Embankment, Girder and Coating.

Notwithstanding the above, if in the opinion of the ARBE upon discovery of undue movements, damages or deterioration of key structural members that may cause structural instability or distress, the Project Co shall provide action plan within seven days to rectify the situation. This may include immediate temporary supports and longer term rehabilitation and repair works.

(d) Tunnel Structures

(i) General

- A. The APPM for Tunnels are targeted to ensure:
 - i Trillium Line Passenger and Tunnel safety;
 - ii Tunnels functionality is at an acceptable level; and
 - iii Tunnels asset consumption is limited.
- B. Using these factors as the basis, standards and performance measures are set to ensure sound Asset Management practices are applied for Structures.
- C. The APPMs developed specifically for Tunnels are based upon FHA's Highway and Rail Transit Inspection Manual-2005 (HRTTIM) for various Tunnels, which provides the input to these APPMs.
- D. The delivery of services is based upon:
 - i Emphasis on Trillium LineOperations and Tunnels safety for the Project;
 - ii Outcome-based specification with Project Co given the latitude for treatment selection to control/correct defective conditions as per the Project Agreement requirements;
 - iii A life-cycle approach to maintenance and asset preservation in conformance with the performance measures;
 - iv A preventative rather than reactive maintenance/repair strategy is encouraged to limit asset consumption with inspections recommended to facilitate this strategy;
 - v Emphasis on meeting the prescribed standards and APPMs on an ongoing basis;
 - vi There being a Tunnel / Structural Engineer and Qualified Inspector as defined in Article 6(d)(ii) of this Appendix nominated to take ownership for the Structures and the Structure management cycle;
 - vii A mechanism for the City to correct default if Project Co fails to meet the condition criteria on an ongoing basis;
 - viii An effective Quality Management System; and

- ix Compliance with the Project Agreement requirements.
 - E. Project Co has full responsibility for all the asset preservation activities, that should that be required.
 - F. Operational standards are detailed in Appendix A to this Schedule 15-3.
- (ii) Tunnel Inspections
- A. Tunnel inspection management involves field inspections that identify and monitor Tunnel condition. Any observed Defects shall be addressed in relevant asset preservation strategies and subsequently programmed for asset preservation (including preventative maintenance and replacement). Project Co shall respond to and rectify any urgent items identified during inspections. The asset preservation of all Tunnels includes performing Tunnel Inspections (as defined in and in accordance with HRTTIM), condition assessments, inventory updates, and reporting of Structure condition achievements, as well as the identification of appropriate condition preservation and restoration strategies in accordance with the requirements set out in this Project Agreement. Project Co shall use Qualified Inspectors, defined as individuals with at least five years of experience in Tunnel inspections.
 - B. The program of Tunnel inspections shall be managed by a suitably qualified Tunnel Engineer, who:
 - i Is a Professional Engineer with a background in inspection, design, and construction of Tunnels;
 - ii Has extensive experience in supervising Tunnel design, construction, inspection, maintenance, and asset preservation;
 - iii Maintains overall management and technical supervision of the Tunnel inspection and Maintenance/asset preservation program;
 - iv Accepts responsibility for the technical competence of all personnel involved in Tunnels inspection and reporting;
 - v Accepts responsibility for the structural safety of all Tunnels;
 - vi Consults with other specialist professionals when necessary; and
 - vii Has the overall responsibility for assessing the Tunnel functionality/safety, Tunnel risks, and potential risks to Trillium Line Passengers, and to determine an appropriate asset preservation strategy.
 - C. While the Qualified Inspector is tasked with identifying Defects, it is the Tunnel Engineer who is required to interpret the observations and implement appropriate

Structure asset preservation strategies to meet the Project Agreement performance requirements.

- D. There are five types of Tunnel inspections required as indicated in Table 6.4.

TABLE 6.4. Inspection Types		
Type	Description	Maximum Inspection Frequencies
Superficial (maintenance)	Focus on Trillium Line Passenger safety and Tunnel functionality; refer to Appendix A [Operation and Maintenance Performance Requirements] to this Schedule 15-3	These are as part of routine Trillium Line management and operations.
Periodic Visual	Focus on a general assessment of condition or change in condition that requires further attention.	Once per calendar year with no more than 540 days between successive inspections
Detailed Visual	Focus on a general assessment of condition and record information needed for the safe operation and management of the Structure. Results of the inspection are used when planning repair work.	To be determined by the City's RBE based on results of the periodic inspection, but not exceeding five years
Condition Surveys	Focus on producing a comprehensive assessment of condition, including undertaking physical testing, in order to develop an appropriate asset preservation program (including preventative maintenance, rehabilitation and replacement)	As required by Tunnel Engineer
Special	Focus on the inspection of structural elements that have sustained an unusual occurrence potentially affecting the ability of the Structure to support loads. Unusual occurrences may include but are not limited to flood, fire, ice flows, rock/earth instability, earthquake, derailment, vandalism, vehicular or vessel impact.	As required

- E. Tunnels exhibiting significant displacement, deterioration, Defects or damage are required to be inspected and assessed more frequently with the intervals determined by the Tunnel Engineer to meet the performance requirements of this Project Agreement and Good Industry Practice.
- F. Tunnel condition inspection is required to be undertaken using format and detail consistent with that specified in the HRTTIM. The inspection data is to be provided to the City in a format acceptable and pursuant to Table 5.1.
- G. Project Co shall be required to retain files of Tunnel inspection records and asset preservation plans so that a continuous history of each Tunnel is available throughout the Project Term.
- H. Inspections of Structures shall commence following Revenue Service.

(iii) Key Performance Measures

- A. Project Co shall perform Tunnel inspections and calculate the Tunnel condition rating for all Tunnels at least once every two years, in accordance with the procedures shown in the HRTTIM.
- B. Project Co shall maintain the Tunnel at a condition rating of at least 6 or higher. Project Co shall implement a rehabilitation program when the condition rating falls below 6, which shall be implemented within 12 months of when condition rating falls below a 6.
- C. Project Co shall identify any safety critical repairs deemed necessary to address any severe Defects that may pose danger to the Passenger and Tunnel safety. Project Co shall categorize the “Critical Repair” in accordance with the HRTTIM, and coordinate the action to be taken with the TOCC.

(iv) Submissions to the City

- A. Tunnel Condition Rating Data
 - i Project Co shall submit to the City as noted in Table 5.1 of this Appendix, by September 30 of each year in which measurements are taken in accordance with Article 5.2 of this Appendix, an updated copy of the following:
 1. All Inspections in electronic format;
 2. All the Inspection Reports in hard copy format; and
 3. All Tunnel condition ratings, calculations and values.
- B. Trillium Line System Inventory (for Tunnels)
 - i Project Co shall submit to the City, before September 30 of each year, an updated copy of the following:
 1. Tunnel inventory list; and
 2. List of Tunnels that may be structurally deficient for load carrying capacity.
- C. Asset Management Plan (Initial and Updates)
 - i Project Co shall submit to the City its Asset Management Plan in accordance with Article 5.2 of this Appendix which at a minimum shall include: a copy of Project Co’s list of Tunnel asset preservation and repair accomplishments over the previous 12 months; Tunnel condition preservation and restoration strategies; annual plan for upcoming 12

months; achievements report based on previous plans; a copy of Project Co's Tunnel asset preservation list and program for the next five years.

D. As Built Drawings—Tunnel drawings and As Built Drawings for the original construction, asset preservation, and repair work.

(v) Additional Tunnel Inspections

A. Project Co shall be required to undertake additional Tunnel inspection by a Qualified Inspector under the supervision of a Tunnel Engineer under the following circumstances which include, but are not limited to:

- i Accident or Vehicle collision with a Tunnel;
- ii Unusual/severe weather conditions or natural disasters;
- iii Where a perceived problem exists;
- iv Flooding; and
- v Vandalism or terrorism.

B. Project Co shall report the inspections and findings within seven days of a significant event potentially impacting Tunnels' integrity and safety, which includes events noted above. Meeting the APPMs is in addition to the submission of complete and satisfactory inspection reports and findings following a significant event as described earlier.

C. At each occurrence of Project Co failing to undertake a Tunnel inspection within the required time period, Project Co shall be assigned [REDACTED] QF Points each day until the failure is rectified.

(vi) Asset Preservation Performance Measures

- A. Project Co shall be required to comply with APPMs as set forth in Table 6.5.
- B. The APPMs presented are in addition to the operational condition requirements as set by Appendix A (Operation and Maintenance Performance Requirements) to this Schedule 15-3.
- C. Project Co shall demonstrate through its Quality Management System the process to achieve the specified outcomes.
- D. The method for assessing the performance measure achievement is based on the definitions given in the HRTTIM.
- E. The intervention criteria to be undertaken by Project Co to meet the APPMs also reinforce the ‘whole of life’ approach, encourage proactive preventative

maintenance and asset preservation strategies and require Project Co to monitor the management of the Tunnels.

TABLE 6.5 Tunnels					
Asset Preservation Performance Measure	Tunnel	Intervention Criteria	Action	Maximum Response Time	Penalty*
PTUN1	Tunnel	<ul style="list-style-type: none"> • When Tunnel condition rating is less than 6 	Undertake Tunnel Maintenance and Rehabilitation to correct Defects	12 months	[REDACTED]
PTUN2	Safety Critical Repairs	<ul style="list-style-type: none"> • Coordinate access and mitigation measures to maintain Passenger and Tunnel Safety with TOCC 	Undertake repair works to address safety critical deterioration and Defects	Immediate, as coordinated with TOCC	[REDACTED]

* At each occurrence of Project Co failing to meet the Asset Preservation Performance Measure by the expiry of the Maximum Response Time, Project Co shall be assigned a relevant Quality Failure (Major, Medium, or Minor) each week beyond the Maximum Response Time until the failure has been either rectified or a disposition has been accepted by the City in accordance with Schedule 11 – Integrated Management System Requirements. “Safety – Critical Repairs” means repairs to Tunnel elements that are considered critical for the safety of the Passengers and / or Tunnel which may pose a danger if not repaired.

(e) Track

(i) General

A. The APPM are set to ensure the application of sound asset preservation practices. Asset Preservation Performance Measures are targeted to ensure:

- i Track serviceability and functionality;
- ii Structurally sound and safe Track condition; and
- iii Limited consumption, over time, of the Track.

B. The APPMs specified herein for Track provide the outcome emphasis required and focus on four key measures:

- i Track Alignment (Geometry);
- ii Rail Condition including Rail wear and Rail Defects;

- iii Rail Structure; and
 - iv Special Trackwork.
- C. Project Co shall be responsible for monitoring, maintaining, and reporting Infrastructure performance. The measures are consistent with regulatory requirements and industry standards. Asset condition and inventory data obtained from the required Track inspections provides the basis for the APPM criteria.
- D. The APPMs are applied to the following Track Sections, which include;
- i Mainline Track and Special Trackwork (turnouts, crossovers, diamond crossings) used for regularly scheduled revenue service;
 - ii All Special Trackwork and pocket Tracks;
 - iii Tail Tracks beyond terminal Stations; and
 - iv Yard lead Tracks from the New Walkley Yard up to, and including the mainline yard lead north and south connections and associated crossovers
- E. The Track Asset Management cycle includes:
- i Inspection at the specified interval;
 - ii Rating the condition of Track and Special Trackwork;
 - iii Programming treatments/rehabilitation;
 - iv Undertaking physical remedial works;
 - v Inventory and condition updating; and
 - vi Reporting achievements.
- F. These phases are fundamental to maintaining the Infrastructure and are consistent with industry practice and regulatory Track safety requirements.
- G. Project Co's delivery of services shall be based upon:
- i Emphasis on the availability of Track and Special Trackwork across a range of relevant conditions;
 - ii Outcome-based specifications, with Project Co given the latitude for treatment selection to control/correct defective conditions as per the material requirements defined in this Project Agreement;
 - iii A life-cycle approach to maintenance and asset preservation that is in conformance with sound industry practices and with the APPMs;

- iv Emphasis on meeting the prescribed standards and APPMs on an ongoing basis;
 - v A mechanism for the City to correct non-compliance if Project Co fails to meet the APPMs; and
 - vi Quality management and environmental management processes underpinning the delivery of services.
- (ii) Infrastructure Condition Data Collection
- A. Project Co shall be responsible for collecting Track Condition data for the purposes of Asset Management and measuring performance achievement based on the requirements of this Appendix, and Appendices A and C of this Schedule 15-3, as required under Article 5.6 of this Appendix. The collection of Track condition data shall occur as part of Project Co's ongoing Track inspection and monitoring activities as required by regulation, industry guidance, and as necessary for Project Co to execute its maintenance obligations as specified in Project Co's Maintenance Plans. Inspections to be used for data collection include weekly Track inspections by qualified Track inspectors, ultrasonic rail flaw detection to be performed at least once per year, automated rail profile measurements at least once per year, geometry inspections using an automated Track inspection and measurement vehicle to be performed at least quarterly, and special inspections including CWR inspections during extreme temperatures and temperature fluctuations; and other inspections precipitated due to events potentially resulting in damage to Track.
- (iii) Asset Preservation Performance Measures
- A. Project Co shall be required to comply with the APPMs noted in Tables 6.6 A, B, C, and D of this Appendix and the following criteria:
- i The combination of multiple single conditions requiring remedial actions occurring at the same point or over the same section as identified in the APPMs shall require a more immediate response; and
 - ii All other regulatory or safety requirements applicable to Track for the safe operation of Trains on the System.
- B. Project Co shall demonstrate through its Quality Management the process to achieve the specified outcome.

Table 6.6A

Track Geometry

Asset Preservation Performance Measure	Intervention Criteria	Action	Maximum Response Time	Basis of Measure	Penalty*
Geometry	Where any Track Geometry condition including gauge, horizontal alignment (line), Track surface (vertical alignment, cross level, and superelevation):			Track Geometry measurements by automated geometry vehicle and manual field measurements	
	violates APTA RT-FS-S-002-02, Revised April 7, 2017 or the Approved Maintenance and Rehabilitation Plan (whichever is more stringent) for Class 4 Track	Undertake asset preservation works to address non-compliance .	6 months		[REDACTED]
	violates the APTA RT-FS-S-002-02, Revised April 7, 2017 or the Approved Maintenance and Rehabilitation Plan (whichever is more stringent) for Class 3 Track	Undertake asset preservation works to address non-compliance	3 months		[REDACTED]
	violates the Ride Quality limits established under ISO 2631 or the Track condition causes anomalous wear on the Revenue Vehicle wheels, bogies,	Undertake asset preservation works to address non-compliance	Immediately		[REDACTED]

Table 6.6A

Track Geometry

Asset Preservation Performance Measure	Intervention Criteria	Action	Maximum Response Time	Basis of Measure	Penalty*
	and/or primary and secondary suspension components.				

* At each occurrence of Project Co failing to meet the Asset Preservation Performance Measure by the expiry of the Maximum Response Time, Project Co shall be assigned a relevant Quality Failure (Major, Medium, or Minor). Project Co shall be assigned a further relevant Quality Failure for each subsequent week of non-conformance until the failure has been either rectified or a disposition has been accepted by the City in accordance with of Schedule 11 – Integrated Management System Requirements.

Table 6.6 B					
Rail Condition					
Asset Preservation Performance Measure	Intervention Criteria	Action	Maximum Response Time	Basis of Measure	Penalty*
Rail General	Where any Rail condition violates APTA RT-FS-S-002-02, Revised April 7, 2017 or the Approved Maintenance and Rehabilitation Plan (whichever is more stringent) for Class 4 Track	Undertake asset preservation works to address non-compliance.	Within 1 month	Rail inspection measurements from Geometry Vehicle, field measurements, or from ultrasonic rail inspection	[REDACTED]
Rail Wear	Where <ul style="list-style-type: none"> • vertical running rail wear is greater than or equal to $\frac{1}{2}$ inch, or • horizontal running rail (side) wear is greater than or equal to $\frac{3}{8}$ inch, or • Guard rail side wear is greater than or equal to $\frac{1}{4}$ inch 	Monitor rail wear and program asset preservation works for rail replacement based on observed rail wear rates	Asset preservation activity plan within 1 month; implementation according to plan	Field measurements or automated measurements from appropriate inspection vehicle/equipment	[REDACTED]

Table 6.6 B					
Rail Condition					
Asset Preservation Performance Measure	Intervention Criteria	Action	Maximum Response Time	Basis of Measure	Penalty*
	<p>Where</p> <ul style="list-style-type: none"> • vertical running rail wear is greater than or equal to 5/8 inch, or • horizontal running rail (side) wear is greater than or equal to 5/8 inch, or • Guard rail side wear is greater than or equal to 7/16 inch 	Undertake asset preservation works to address non-compliance	Immediately		Major
Rail Defects	Where Rail Defects are identified in accordance with APTA RT-FS-S-002-02, Revised April 7, 2017 or the Approved Maintenance and Rehabilitation Plan (whichever is more stringent) for Class 4 Track	Perform immediate remedial actions as specified in the referenced standard. Perform asset preservation activities to fully remedy any temporary remedial actions	Immediate actions per standard. Full repair within 3 months or per the safety standard, whichever is less	Defect identification and measurement from field inspection or ultrasonic rail inspection	Major

Table 6.6 B

Rail Condition

Asset Preservation Performance Measure	Intervention Criteria	Action	Maximum Response Time	Basis of Measure	Penalty*
Rail Corrugation	Where short wave rail corrugation exceeds 1/8 inch depth and/or rail corrugation results in Track-based noise and / or vibration exceeding the limits imposed by City Bylaws or Schedule 17 of this Agreement	Perform asset preservation works to address non-compliance	1 month	Field measurements, Automatic rail inspection vehicle measurements, and noise and vibration measurements	Medium

* At each occurrence of Project Co failing to meet the Asset Preservation Performance Measure by the expiry of the Maximum Response Time, Project Co shall be assigned a relevant Quality Failure (Major, Medium, or Minor). Project Co shall be assigned a further relevant Quality Failure for each subsequent week of non-conformance until the failure has been either rectified or a disposition has been accepted by the City in accordance with Schedule 11 – Integrated Management System Requirements.

Table 6.6 C

Track Structure

Asset Preservation Performance Measure	Intervention Criteria	Action	Maximum Response Time	Basis of Measure	Penalty*
General	Where any Track structure condition including ballast, ties, rail violate the APTA RT-FS-S-002-02, Revised April 7, 2017 Maintenance	Undertake asset preservation works to address non-compliance.	6 month	Observations from field inspection or other automated vehicle-mounted inspection equipment	

Table 6.6 C

Track Structure

Standard or the Approved Maintenance and Rehabilitation Plan (whichever is more stringent) for Class 4 Track					
Where any Track structure condition including ballast, ties, rail violate APTA RT-FS-S-002-02, Revised April 7, 2017 Maintenance Standard or the Approved Maintenance and Rehabilitation Plan (whichever is more stringent) for Class 3 Track	Undertake asset preservation works to address non-compliance.	Immediately	Observations from field inspection or other automated vehicle-mounted inspection equipment	Major	

* At each occurrence of Project Co failing to meet the Asset Preservation Performance Measure by the expiry of the Maximum Response Time, Project Co shall be assigned a relevant Quality Failure (Major, Medium, or Minor). Project Co shall be assigned a further relevant Quality Failure for each subsequent week of non-conformance until the failure has been either rectified or a disposition has been accepted by the City in accordance with Schedule 11 – Integrated Management System Requirements;.

Table 6.6 D					
Special Trackwork					
Asset Preservation Performance Measure	Intervention Criteria	Action	Maximum Response Time	Basis of Measure	Penalty*
General	Where any Special Trackwork condition including turnouts, frogs, diamond crossings, restraining rail violate APTA RT-FS-S-002-02, Revised April 7, 2017 Maintenance Standard or the Approved Maintenance and Rehabilitation Plan (whichever is more stringent) for Class 4 Track	Undertake asset preservation works to address non-compliance.	6 month	Observations from field inspection or other automated vehicle-mounted inspection equipment	[REDACTED]

Table 6.6 D

Special Trackwork

Where any Special Trackwork condition including turnouts, frogs, diamond crossings, restraining rail violate APTA RT-FS-S-002-02, Revised April 7, 2017 Maintenance Standard or the Approved Maintenance and Rehabilitation Plan (whichever is more stringent) for Class 3 Track	Undertake asset preservation works to address non-compliance.	Immediately	Observations from field inspection or other automated vehicle-mounted inspection equipment	Major
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* At each occurrence of Project Co failing to meet the Asset Preservation Performance Measure by the expiry of the Maximum Response Time, Project Co shall be assigned a relevant Quality Failure (Major, Medium, or Minor). Project Co shall be assigned a further relevant Quality Failure for each subsequent week of non-conformance until the failure has been either rectified or a disposition has been accepted by the City in accordance with Schedule 11 – Integrated Management System Requirements.

(iv) References and Clarifications

- A. APTA standards as referenced in this Article refer to (RT-FS-S-002-02, Revised April 7, 2017).
- B. Appendix A (Maintenance Performance Requirements) to this Schedule 15-3 and the provisions of the Design and Construction Specifications related to Track apply in full to the requirements of this Appendix.

(f) Vehicles and Systems

(i) General

- A. Vehicles and Systems elements shall meet the provisions of the Design and Construction Specifications related to Vehicles and Systems, and meet the requirements of Appendix A and Appendix C to this Schedule 15-3. Systems elements as discussed in this Article include all systems related to the operation, control, and monitoring of the System including but not limited to Train Control/Signals and communication systems.
- B. Project Co shall be fully responsible for keeping all Vehicles and Systems assets safe, functional, reliable, maintainable and to develop an asset preservation strategy (including Preventative Maintenance and Corrective Maintenance and replacement) based on continual monitoring and assessment of the condition, functionality and reliability of Vehicles and Systems Elements.
- C. Project Co shall be responsible for monitoring, maintaining, and reporting the performance of Vehicle and Systems Elements.
- D. The Asset Management cycle for Vehicles and Systems includes:
 - i Inspection at appropriate intervals for each system and subsystem components according to regulatory requirements, industry standard or recommended practices, and as defined in Project Co's Maintenance and Rehabilitation Plan;
 - ii Rating the condition of each Vehicle and System asset;
 - iii Annual inspection, certification, and reporting of Systems related to EMI, EMC, and Corrosion Control are performing as designed;
 - iv Programming treatments/rehabilitation;
 - v Undertaking remedial works;
 - vi Inventory and condition updating; and
 - vii Reporting achievements.
- E. Project Co's delivery of services shall be based upon:
 - i Emphasis on the availability of Vehicles and Systems across a range of physical and operating conditions to comply with the Operational Performance Requirements and in accordance with the requirements of Appendix A;
 - ii Outcome-based specification, with Project Co given the latitude for treatment selection to control/correct defective conditions as per the material requirements defined in this Project Agreement;

- iii A life-cycle approach to maintenance and asset preservation that is in conformance with sound industry practices;
- iv A preventative rather than a reactive maintenance/repair strategy to limit asset consumption with inspection and monitoring actions to facilitate this strategy; and
- v Compliance with regulatory and safety requirements as applicable to Vehicles and Systems.

(ii) Vehicles and Systems Condition Data Collection and Reporting

- A. Project Co shall be responsible for collecting Vehicle and Systems condition data for the purposes of Asset Management and measuring performance achievement based on the requirements of Appendices A and C of this Schedule 15-3. The collection of Vehicle and Systems condition data shall occur as part of Project Co's ongoing inspection, testing, and monitoring activities as required and specified for Vehicle and systems assets and their subcomponents by regulation, industry standards and practices, and/or as necessary for Project Co to execute its maintenance obligations as specified in Project Co's maintenance plans.
- B. Project Co shall utilize inspection, testing and monitoring data including, but not limited to, the information required for reporting per Appendix A, Article 1.8 to assess the condition of Vehicle and systems assets and their subcomponents, to monitor trends, and proactively program asset management actions. Such data, trends, and programmed asset management activities shall be included in the annual reports as required in accordance with Article 5 of this Appendix.

(iii) Performance Measures

- A. Project Co shall be required to comply with Design and Construction Specifications and Appendices A and C to this Schedule 15-3 as relevant to Vehicles and Systems and meet the reporting requirements of this Appendix.

(g) Facilities (Stations / New Walkley Yard)

(i) General

- A. Systems elements as discussed in this Article include those Facilities related to the operation, maintenance, and preservation of the Trillium Line and include Stations and the New Walkley Yard.
- B. Project Co shall be fully responsible for keeping all Facilities assets safe, functional, reliable, maintainable and to develop an asset preservation strategy (including preventative maintenance and replacement) by focusing on general assessment of the condition of all Facility assets. The target condition for all

Facility assets is a condition rating of “Good” or better, as defined in 6.7 below, at all times.

- C. Routine maintenance of the Trillium Line is addressed in Appendix A to this Schedule 15-3. The performance requirements noted in Appendix A to the Maintenance and Rehabilitation Specifications supersede the requirements noted here.
- D. Project Co shall be responsible for monitoring, maintaining, and reporting Facilities assets performance.

(ii) The Facility Asset Management cycle includes:

- A. Inspection at appropriate intervals for each Facility according to regulatory requirements, industry standard or recommended practices, as referenced in CSA S448.1 – Repair of Reinforced Concrete in Buildings, CSA S478 – Guideline on Durability in Buildings, CSA S413 – Parking Structures (as it may be applicable to building structures), the Ontario Structure Inspection Manual (OSIM), and MTO’s Structure Rehabilitation Manual (as it may be applicable to building Structures), and as defined in Project Co’s Maintenance and Rehabilitation Plan;
- B. Rating the condition of each Facility and Facility Elements (meaning those elements as defined in the National Institute of Standards Technology’s “Unformat II Elemental Classification of Building Specifications, Cost Estimating, and Cost Analysis”);
- C. Programming treatments/rehabilitation;
- D. Undertaking remedial works;
- E. Inventory and condition updating; and
- F. Reporting achievements.

(iii) Project Co’s delivery of services shall be based upon:

- A. Emphasis on the availability of each Facility across a range of physical and operating conditions;
- B. Outcome-based specifications, with Project Co given the latitude for treatment selection to control/correct defective conditions as per the material requirements defined in this Project Agreement;
- C. A life-cycle approach to maintenance and asset preservation that is in conformance with good industry practices and with the APPMs;
- D. Emphasis on meeting the prescribed standards and APPMs on an ongoing basis;

- E. A mechanism for the City to correct non-compliance if Project Co fails to meet the APPMs; and
 - F. Quality management and environmental management processes underpinning the delivery of services.
- (iv) Facilities Condition Data Collection
- A. Project Co shall be responsible for collecting Facilities condition data for the purposes of Asset Management and measuring performance achievement based on the requirements of this Appendix, and Appendices A and C of this Schedule 15-3, as required under Article 5.0 of this Appendix. The collection of Facilities condition data shall occur as part of Project Co's ongoing inspection, testing, and monitoring activities as required and specified for each Facility and/or Facility component by regulation, good industry standards and practices, and as necessary for Project Co to execute its maintenance obligations as specified in Project Co's maintenance plans.
 - B. Facilities Inspections
 - i Project Co shall use Qualified Inspectors, defined as individuals with at least five years of experience in Facilities inspections.
 - C. The program of Facilities inspections shall be managed by a suitably qualified Buildings Structural Engineer, who:
 - i Is a Professional Engineer with a background in inspection, design, construction, maintenance, and rehabilitation of buildings;
 - ii Has extensive experience in supervising buildings design, construction, inspection, maintenance, and asset preservation;
 - iii Maintains overall management and technical supervision of the buildings inspection and Maintenance/asset preservation program;
 - iv Accepts responsibility for the technical competence of all personnel involved in Facilities inspection and reporting;
 - v Accepts responsibility for the structural safety of all buildings;
 - vi Has the overall responsibility for assessing the buildings functionality/safety, buildings risks, and potential risks to Trillium Line Passengers, and to determine an appropriate asset preservation strategy.
 - D. While the Qualified Inspector is tasked with identifying Defects, it is the Buildings Structural Engineer who is required to interpret the observations and implement appropriate Structure asset preservation strategies to meet the Project Agreement performance requirements.

- E. The types of buildings inspections required are as indicated in Table 6.7.

TABLE 6.7 Inspection Types		
Type	Description	Maximum Inspection Frequencies
Superficial (maintenance)	Focus on Trillium LinePassenger safety and Facilities functionality; refer to Appendix A [Operation and Maintenance Performance Requirements] to this Schedule 15-3	These are as part of routine Trillium Linemanagement and operations.
Detailed	Focus on a general assessment of condition and developing an annual, five year and ten-year asset preservation programs (including Preventative Maintenance and replacement)	Once every two years
Condition Surveys	Focus on producing a comprehensive assessment of condition, including undertaking physical testing, in order to develop an appropriate asset preservation program (including preventative maintenance, rehabilitation and replacement)	As required by Facilities Engineer

- F. Facilities exhibiting significant displacement, deterioration, Defects or damage are required to be inspected and assessed more frequently with the intervals determined by the Buildings Structural Engineer to meet the performance requirements of this Project Agreement and Good Industry Practice.
- G. Facilities condition inspection is required to be undertaken using format and detail consistent with that specified reference documents. The inspection data is to be provided to the City in a format acceptable and pursuant to Table 5.2.
- H. Project Co shall be required to retain files of Facilities inspection records and asset preservation plans so that a continuous history of each Facility is available throughout the Project Term.
- I. Inspections of Facilities shall commence following Commencement of Revenue Service.
- (v) Performance Measures
- A. Project Co shall utilize data from its routine inspections, testing and monitoring activities as described in this Article to prepare a condition assessment for each Facility according to the rating methodology in Table 6.7 for annual condition reporting per Article 5.0 of this Appendix. In addition, a five-year detailed rating condition assessment of each system shall be undertaken to obtain the current condition and inventory of each system and subsystem based on the rating methodology described in Table 6.8. Non-Conformance applies to each system and subsystem component that does not meet the maximum response time noted below.

- B. At each occurrence of Project Co failing to meet the Asset Preservation Performance Measure by the expiry of the Maximum Response Time, Project Co shall be assigned a relevant Quality Failure (Major, Medium, or Minor). Project Co shall be assigned a further relevant Quality Failure for each subsequent week of non-conformance until the failure has been either rectified or a disposition has been accepted by the City in accordance with Schedule 11 – Integrated Management System Requirements.

TABLE 6.8 Facilities Condition Rating			
Label	Description	Maintenance or Repair	Maximum Response Time
Excellent	New or as good as new, fully functional, high reliability, Facility components are fully supported	None	None
Good	Normal aging, fully functional, reliability meeting industry targets, Facilities are available and can be used, failures can be remedied with normal maintenance actions without significant disruption	Conduct Maintenance only	12 months
Fair	Substantial aging/wear approaching end of useful life, functional but reliability below minimum industry targets, diminishing or more costly maintenance of Facility components, requires more substantial maintenance and monitoring	Conduct Maintenance and undertake asset preservation work to correct deficiency up to and including replacement of component	12 months
Poor	Exceeds useful life, reliability well below acceptable industry targets, frequent systemic failures, Facility components unavailable, maintenance and monitoring efforts are excessive and disruptive to System operation and to other maintenance activities	Conduct Maintenance and undertake asset preservation work to correct deficiencies up to and including system or subsystem replacement	Three months, with plan of action due within two weeks

- C. Repairs and asset preservation shall be completed within the maximum response times in Table 6.8. Any safety hazards and/or conditions preventing the operation of the Trillium Line service shall be remedied immediately.

(h) Drainage and Sedimentation Control Structures

(i) General

- A. Drainage and sedimentation control structures, other than those defined as part of Structures, shall meet the provisions of the Design and Construction Specifications related to drainage and sedimentation control structures, and

continually meet the requirements of Appendix A and Appendix C to this Schedule 15-3. The drainage structures and sedimentation control structures are targeted to ensure:

- i System safety;
- ii That functionality is at an acceptable level; and
- iii Asset consumption is limited.

B. The drainage structures and sedimentation control structures Asset Management cycle includes, in addition to routine inspection and maintenance as addressed in Appendix A to this Schedule 15-3:

- i Inspection ;
- ii Rating the condition of the structure and its elements;
- iii Programming correction of deficiency;
- iv Undertaking remedial works;
- v Inventory updating; and
- vi Reporting achievements.

C. The required delivery of services is to be based upon:

- i Emphasis on System safety;
- ii Outcome based specification with Project Co given the latitude for treatment selection to control/correct defective condition as per the requirements of this Project Agreement;
- iii A life-cycle approach to maintenance and asset preservation; and
- iv A preventative rather than reactive maintenance/repair strategy to limit asset consumption with inspections recommended to facilitate this strategy.

(ii) Drainage and Sedimentation Control Structures Inspection Management

A. In this Project Agreement the maximum duration between inspections for the drainage and sediment control structures is:

- i Superficial—refer to the response times in Appendix A (Maintenance and Rehabilitation Requirements) to this Schedule 15-3;
- ii Routine structure condition inspection—annual condition assessments focused on developing an annual asset preservation program; and

- iii Detailed structure condition assessment—five yearly detailed inspections focused on producing a comprehensive assessment of condition and if necessary undertaking physical testing in order to develop an appropriate asset preservation program.
- B. Structures exhibiting significant deterioration, Defects, or damage shall be inspected more frequently with the intervals determined by experienced Professional Engineers.
- C. Project Co shall develop and report Culvert treatment recommendations based on the annual Culvert assessment findings.
- D. In general, the treatment recommendations for Culverts shall generally be developed and applied as follows (based on defined terms in the Culvert Assessment Guide):
 - i An imminent danger of failure shall be replaced immediately;
 - ii A **Remaining Life or Material Rating** in either the Poor or Below Minimum Tolerable condition category at the time of construction shall be considered for replacement or lining;
 - iii A **Shape Rating** in either the Poor or Below Minimum Tolerable condition category shall be considered for remedial action and only where the distortion to the shape of the Culvert is adversely affecting capacity or there is a reasonable expectation the distortion will continue to progress and adversely affect road performance;
 - iv A **Capacity Rating** in either the Poor or Below Minimum Tolerable condition category shall be considered for cleanout, ditching, or other remediation, and only when surface drainage is being adversely impacted;
 - v An **Invert, Scour, or Slope Erosion Rating** in either the Poor or Below Minimum Tolerable condition category shall be considered for remedial action, and only where there is a reasonable expectation that the condition may progress to undermining and failure of the Culvert invert, and adversely affect road performance;
 - vi A **Settlement Rating** in either the Poor or Below Minimum Tolerable condition category should be identified for a railway embankment or Roadway Pavement engineering investigation.
- E. Each annual assessment shall be completed and a Culvert condition assessment report including general details, condition ratings, treatment recommendations and the treatment priorities for the recommended Culvert replacements shall be completed for each Culvert within the Lands, notwithstanding the Culverts which

remain the City's responsibility as indicated in Appendix A of this Schedule 15-3. The Culvert general details shall, at minimum, include the date of inspection, municipality, Asset Inventory number, location within the Lands, type, shape, length (m), size (mm) and fill (depth and type), condition ratings, treatment recommendation, treatment priority and accomplishment.

(iii) Culvert Assessment Guide

Remaining Life Span Rating Criteria	
Category	Description
Very Good (VG)	Has more than 15 years remaining in life
Good (G)	Has Between 10 to 15 years remaining
Fair (F)	Has between five to 10 years remaining
Poor (P)	Has less than five years remaining
Below Minimum Tolerable (BMT)	Has less than one year remaining
Imminent Danger of Failure (IDF)	Failure is about to happen

Note:

Use an understanding of Culvert condition performance gained through years of engineering experience, or general maintenance activities, or equivalent, to determine the remaining life span of the Culvert and to recognize if there is an imminent danger of failure.

(iv) Material Rating Criteria

Material Rating Criteria – Corrugated Metal Culverts	
Category	Description
Very Good	New condition, may also exhibit slight discolouration of surface, galvanizing partially gone along invert.
Good	Discolouration of surface, galvanizing completely gone along invert but no layers of rust. Minor pinholes in pipe material located at end of pipe but not located beneath Roadway.
Fair	Layers of rust forming. Sporadic pitting of invert, minor pinholes forming throughout pipe.
Poor	Heavy rust, thick scaling throughout pipe. Deep pitting, perforations throughout in invert.
Below Minimum Tolerable	Extensive heavy rust, extensive perforations throughout pipe. End sections corroded away. Bottom portion completely corroded exposing underlying granular. Partially to fully collapsed.



Material Rating Criteria – Concrete Culverts	
Category	Description
Very Good	New Condition, hairline cracking without rust staining or delaminations, surface in good condition, isolated damage from construction.
Good	Hairline cracking parallel to the direction of traffic with no crack greater than 1mm and without rust staining. Light scaling on less than 10% of the exposed surface area and greater than 3mm deep. Delaminated/spalled area less than 1% of surface area.
Fair	Map cracking. Cracks parallel to traffic no greater than 4 mm, cracks transverse to traffic no greater than 2 mm. Rust staining and leakage occurring. Scaling on less than 30% of exposed area and less than 5mm deep. Spalled areas with exposed reinforcing less than 10%.
Poor	Transverse cracks greater than 3mm wide with extensive rust staining. Spalling at numerous locations, extensive surface scaling on invert greater than 15mm Extensive cracking with cracked open more than 4 mm. Spalling has caused exposure of heavily corroded reinforcing steel in bottom or top slab. Extensive surface scaling on invert greater than 25 mm.
Below Minimum Tolerable	Full depth holes. Extensive cracking greater than 15 mm. Spalled areas with exposed reinforcing greater than 25%. Total delaminated, spalled and punky concrete areas are greater than 50% of surface area. Perimeter of reinforcing bars is completely exposed.

VERY GOOD



GOOD



FAIR



POOR



BELOW MINIMUM TOLERABLE



Material Rating Criteria – Plastic Culverts	
Category	Description
Very Good	Minor isolated rip caused by floating Debris or construction. Minor discolouration.
Good	Slit no longer than 150mm and no wider than 10mm at two or three locations. Damage (cuts, gouges or distortions) to ends sections from construction or maintenance. Perforations caused by abrasion located within 1.5m of outlet and not under Roadway.
Fair	Slit longer than 150mm and wider than 10mm at two or three locations.
Poor	Slit longer than 150mm and wider than 10mm at several locations. Perforations throughout the pipe.
Below Minimum Tolerable	Slits in pipe causing the loss of backfill. Section loses throughout the pipe caused by abrasion. Invert eroded away. Partially collapsed.

Note:

This type of material has not been in service for a sufficient period of time to obtain accurate pictures to show the various stages of deterioration.

(v) Shape Rating Criteria

Shape Rating Criteria	
Category	Description
Very Good	Smooth curvature in barrel. Span dimension within 3% of design.
Good	Smooth curvature in top half of barrel with flattening on bottom portion. Span dimension up to 5% greater than design.
Fair	Slight distortion in one location on the top portion. Bottom has slight reverse curvature in one location. Span dimension up to 10% greater than design. Non-symmetrical shape.
Poor	Significant distortion throughout length. Lower 1/3 may be kinked. Span dimension up to 15% greater than design.
Below Minimum Tolerable	Extreme deflection at isolated locations. Flattening at top of arch or crown. Bottom has reverse curvature throughout. Span dimension greater than 15% of design. Extremely non-symmetrical.

VERY GOOD



GOOD



FAIR



POOR



BELOW MINIMUM TOLERABLE



(vi) Capacity Rating Criteria

Capacity Rating Criteria	
Category	Description
Very Good	Little to no sediment build-up in pipe. Culvert ends are undamaged. Little to no Debris blocking flow.
Good	Original Culvert capacity diminished by 5% or less.
Fair	Original Culvert capacity diminished by less than 15%.
Poor	Original Culvert capacity diminished by less than 25%.
Below Minimum Tolerable	Original Culvert capacity diminished by more than 25%.

VERY GOOD



GOOD



FAIR



POOR



**BELOW MINIMUM
TOLERABLE**



(vii) Invert Rating Criteria

Inverting Rating Guideline	
Category	Description
Very Good	Invert slightly below the ditch elevation approximately 50 mm.
Good	Invert 50mm higher than the ditch elevation.
Fair	Invert less than 150mm higher or lower than the ditch elevation.
Poor	Invert greater than 150mm higher or lower than the ditch elevation.
Below Minimum Tolerable	Invert greater than 300mm higher or lower than the ditch elevation.

VERY GOOD



GOOD



FAIR



POOR



BELOW MINIMUM TOLERABLE



(viii) Scour Rating Criteria

Scour Rating Criteria	
Category	Description
Very Good	Minor Scour holes at inlet and outlet.
Good	Minor scour holes developing at inlet or outlet. Top of footing is exposed. Probing indicates soft material in scour hole.
Fair	Scour holes developing at inlet or outlet that are 300mm or less in depth. Footings along sides are exposed.
Poor	Scour holes at inlet or outlet that are 600mm or less in depth. Bottom of footing exposed.
Below Minimum Tolerable	Scour holes at inlet or outlet that are in excess of 600mm in depth. Erosion occurring behind headwall that threatens to undermine Culvert.



(ix) Slope Erosion Rating Criteria

Slope Erosion Rating Criteria	
Category	Description
Very Good	No slope erosion.
Good	Slope erosion around Culvert ends is less than 50 mm.
Fair	Slope erosion around Culvert end is less than 150 mm.
Poor	Slope erosion around Culvert end is greater than 150 mm.
Below Minimum Tolerable	Slope erosion around Culvert end is greater than 300 mm.



(x) Settlement Rating Criteria

Settlement Rating Criteria	
Category	Description
Very Good	No noticeable deflection in rail profile
Good	Less than 9mm deflection in rail profile.
Poor	10mm to 15mm deflection in Track.
Below Minimum Tolerable	deflection in Track is 16mm or more.

(xi) Asset Preservation Performance Measure

- A. Project Co shall be required to comply with the Design and Construction Specifications and Appendices A and C to this Schedule 15-3 as relevant to drainage and sedimentation control structures.

Table 6.9					
Culverts					
Asset Preservation Performance Measure	Performance Measure	Intervention Criteria	Action	Maximum Response Time	Penalty*
PCUL1	Remaining Life Span Rating	Project Co fails to meet all requirements that are specified to be taken when Project Co Detects or was Made Aware of, an imminent danger of a Culvert failure	Immediate	24 hours	[REDACTED]
PCUL2	Remaining Life Span Rating	Project Co fails to maintain a Non-Structural Culvert at a Remaining Life Span Rating of at least “Good” or better	Consider Asset Preservation or Replacement	12 months	[REDACTED]

* At each occurrence of Project Co failing to meet the Asset Preservation Performance Measure by the expiry of the Maximum Response Time, Project Co shall be assigned a relevant Quality Failure (Major, Medium, or Minor). Project Co shall be assigned a further relevant Quality Failure for each subsequent week of non-conformance until the failure has been either rectified or a disposition has been accepted by the City in accordance with Schedule 11 – Integrated Management System Requirements.

(i) Other Asset Classes

(i) General

- A. This Article relates to all other assets and asset classes for which specific APPMs have not been identified in the previous Articles.
- B. Project Co shall be fully responsible for keeping all System assets safe, clean, tidy, functional, and maintainable to develop an asset preservation strategy (including preventative maintenance and replacement) by focusing on general assessment of condition of all System assets. The target condition for all other assets is a condition rating of “Good” or better, as defined in 6.10 below, at all times.

C. Routine maintenance and operation of the System are addressed in Appendix A to this Schedule 15-3. The performance requirements noted in Appendix A to the Maintenance Specifications supersede the requirements noted here.

(ii) Performance Measures

A. Project Co shall utilize data from its routine inspections, testing, and monitoring activities to prepare a condition assessment for asset according to the rating methodology in Table 6.10 for annual condition reporting per Article 5.0 of this Appendix. Additionally, Project Co shall conduct a five-year detailed rating condition assessment of other assets and asset classes to obtain the current inventory and condition based on the rating methodology described in Table 6.10. Non-Conformance applies to each asset component that requires Asset Preservation works due to one or more of the conditions below and for which the maximum response time is exceeded.

TABLE 6.10
Other Asset Classes Condition Rating

Label	Description	Maintenance or Repair	Maximum Response Time
Excellent	New or as good as new	None	None
Good	Normal wear and tear, asset performs as intended, asset is maintainable using normal maintenance efforts and practices, no requirement for repair or replacement parts and services are readily available	Maintenance only	12 months
Fair	Minor Defects present, asset performs as intended, increasing effort is required to maintain asset, no major repairs are imminent, parts and service availability is limited.	Maintenance and asset preservation	12 months
Poor	Advanced Defect(s), asset performance frequently impaired or diminished, extensive maintenance, monitoring and/or frequent repairs are required, major repairs may be imminent, parts and/or services are unavailable	Maintenance and/or asset preservation	Three months, with plan of action due within two weeks
Very Poor	Advanced Defect(s)—Requires immediate maintenance/repair. An imminent safety Hazard	Maintenance and/or asset preservation	Immediate

At each occurrence of Project Co failing to meet the Asset Preservation Performance Measure by the expiry of the Maximum Response Time, Project Co shall be assigned a relevant Quality Failure (Major, Medium, or Minor) each week beyond the Maximum Response Time until the failure has been either

rectified or a disposition has been accepted by the City in accordance with Schedule 11 – Integrated Management System Requirements.

B. Repairs and asset preservation shall be completed within the maximum response times in Table 6.10. Any safety hazards and/or conditions preventing the operation of the Trillium Line shall be remedied immediately.

(iii) Performance Measures

A. In addition to the items noted in the above table, Project Co shall be required to comply with the measures, minimum condition and response times applicable to System as defined in Appendix A to this Schedule 15-3.

(j) Additional Inspection of the Trillium Line

(i) Project Co shall be required to undertake additional inspection of the System assets under circumstances that affect the integrity of System which include, but are not limited to:

- i Accident or Railcar collision;
- ii Vehicle collision with a Structure;
- iii Unusual/severe weather conditions or natural disasters;
- iv Where a perceived problem exists; and
- v Flooding/ice jams.

(ii) Project Co shall undertake inspection and report the inspection results within seven calendar days of any significant natural event or other events impacting the integrity of System assets or the safety of the System and Passengers. The reporting format shall be consistent with the requirements of the Operation and Maintenance Performance Requirements and Article 5 of this appendix. The APPM indicated is applicable to the submission of complete and satisfactory inspection report for each event.

(iii) At each occurrence of Project Co failing to meet the Asset Preservation Performance Measure by the expiry of the Maximum Response Time, Project Co shall be assigned a relevant Quality Failure (Major, Medium, or Minor). Project Co shall be assigned a further relevant Quality Failure for each subsequent week of non-conformance until the failure has been either rectified or a disposition has been accepted by the City in accordance with Schedule 11 – Integrated Management System Requirements.

**APPENDIX C
EXPIRY DATE REQUIREMENTS**

1.0 Introduction

(a) General

- (i) This Appendix sets forth the requirements for the condition of the System when it is returned to the City at the Expiry Date. The objectives of these requirements are to:
 - A. Define minimum required condition levels at the Expiry Date;
 - B. Ensure a suitable distribution of remaining life expectancy;
 - C. Achieve Remaining Service Life expectations;
 - D. Ensure all documentation (Design Data, Maintenance and Rehabilitation Services records and reports, Permits, Licences and Approvals, etc.) for all Infrastructure is up-to-date and submitted to the City;
 - E. Ensure all System assets are fully operational and functional;
 - F. Ensure a current and complete inventory of spare parts and supplies is provided; and
 - G. Ensure no outstanding safety issues exist.
- (ii) The procedures for meeting the Expiry Date requirements are outlined in Schedule 23 – Expiry Transition Procedure of this Project Agreement.

(b) Objective

- (i) At the Expiry Date, the condition of the System shall meet the minimum standards defined in this Appendix in addition to having met requirements stated elsewhere in this Project Agreement that include, but are not limited to, the Design and Construction Specifications and the remainder of the Maintenance Specifications. The requirements set out in this Appendix are intended to protect the City from excessive asset consumption during the Maintenance Period, to facilitate hand over of the System to the City at the Expiry Date in a condition that reflects proactive maintenance and rehabilitation during the Maintenance Period, and to ensure that the System has sufficient Remaining Service Life as defined in this Appendix. Additionally, at the Expiry Date the System shall have no material deficiencies.
- (ii) Article 1.1 (Responsibility for Maintenance and Rehabilitation) of Part 1 (Introduction) to the Maintenance Specifications discusses applicability of Expiry Date requirements set forth in this Appendix to the NMI at such time when such Infrastructure is handed back to the relevant municipality in accordance with Part 1, Article 3 of the Design and Construction Specifications.

(c) Performance Measures

- (i) In addition to the requirements set out in this Appendix, at the Expiry Date, the System condition shall also satisfy the requirements of Appendices A and B to this Schedule 15-3 and the performance measures set forth in each such Appendix.

2.0 Determination of Remaining Service Life

(a) Remaining Service Life

- (i) The Remaining Service Life for the purposes of this Appendix shall be the service life that remains for each component of the System measured in years taking into account the historic performance of the System of similar construction used under similar conditions. At the Expiry Date, the System shall meet the performance levels noted in the Project Agreement, and the Remaining Service Life shall be determined to have been achieved only if there is no need for any repairs or rehabilitation in respect of the System at such time (other than custodial, preventative and handover maintenance of any component of the System which shall be required during the anticipated Remaining Service Life).

TABLE 2.1 Remaining Service Life		
System Element	Remaining Service Life (years)	Percentage of System Element (Minimum Requirement)
New Structure	BCI > 70	100
Existing Structure	BCI > 70	100
Elevated Guideway	BCI > 70	100
Stations	>10	100
Tunnel – Fit Out	>10	100
Track – Ballasted	>10	100
Track – Fixed	>10	100
Ties	>10	100
Turnouts, Crossovers, Diamond Crossings	>10	100
Maintenance Buildings	>10	100
Communications	>10	100
Vehicles' Carbody	>10	100
Vehicle	>5	100
Train Control	>10	100

- (b) Measuring and Establishing Remaining Service Life
- (i) Project Co shall measure and establish the Remaining Service Life for each Trillium Line Element included in Table 2.1, by measuring the condition of each Trillium Line Element for;
- A. Compliance with the standards and / or requirements of Design and Construction in Schedule 15-2;
- B. Compliance with the standards and / or requirements defined in the Maintenance and Rehabilitation in Schedule 15-3, Appendix A and Appendix B;
- C. Compliance with the standards and / or requirements as proposed by Project Co and approved by the City, which resulted from Project Co's choices during the performance of Schedules 15-2 and 15-3; and
- D. Compliance with all regulatory and code requirements.
- (ii) The program of measuring the Remaining Service Life and associated inspections shall be managed by a suitably qualified Professional Engineer, who:
- A. Is a Professional Engineer with a background in inspection, design, construction, and maintenance of the respective Trillium Line System Element;
- B. Has extensive experience in supervising the respective Trillium Line System Element design, construction, inspection, maintenance, and asset preservation;
- C. Evaluates the overall management and technical supervision of the respective Trillium Line System Element inspection and Maintenance/asset preservation programs conducted pursuant to Appendix B of Schedule 15-3;
- D. Accepts responsibility for the technical competence of all personnel involved in inspection and reporting when measuring and establishing the Remaining Service Life of the respective Trillium Line System Element;
- E. Consults with other specialist professionals when necessary; and
- F. Has the overall responsibility for establishing the Remaining Service Life of the respective Trillium Line Elements.
- (c) While the Qualified Inspector is tasked with measuring, testing, and making observations, pursuant to Article 2.0(b)(1) with respect to Trillium Line System Element, it is the Professional Engineer who is required to interpret the measurements, testing, and observations and establish an appropriate Remaining Service Life.

3.0 General Requirements

- (a) Operations and Maintenance Manual

- (i) Project Co shall prepare an Operations and Maintenance Manual (OMM), the requirements of which are set forth in this Article 3.1, for each System Element provided in Table 2.1 such that the asset can be operated and maintained by the City after the Expiry Date;
 - (ii) Each OMM shall be provided to the City no later than six months prior to the Expiry Date and shall be sufficiently detailed to enable a person unfamiliar with the relevant System Element to efficiently maintain and operate it;
 - (iii) Each OMM shall include comprehensive instructions to operate and maintain all aspects of the relevant Infrastructure including at a minimum the following content:
 - A. the purpose and functional objectives of the System Element;
 - B. all necessary steps to safely operate and maintain such System Element;
 - C. any hazards to avoid while operating and maintaining such System Element;
 - D. clear diagrams and/or photographs to illustrate the operational / functional process; and
 - E. any separate component maintenance, installation and instruction manuals from the manufacturer.
 - (iv) Each OMM shall identify all activities required to maintain the relevant System Element in prescribed condition including inspections, proactive component replacements, and Preventive Maintenance, with specific instructions for:
 - A. daily requirements;
 - B. weekly requirements;
 - C. monthly requirements;
 - D. annual requirements; and
 - E. history of Maintenance and Rehabilitation Services.
- (b) Handover of System
- (i) Upon the Termination Date, Project Co shall transfer control of and responsibility for the Maintenance of the System, including all fixed equipment, Vehicles and fixed facilities which Project Co has supplied, designed, constructed, and Maintained, to the City.
- (c) Handover Maintenance Requirements
- (i) Project Co shall develop and submit a Handover Maintenance Plan which includes but not limited to the requirements of this Schedule 15-3 and the Project Agreement. The

Handover Maintenance Plan shall be submitted 6 months prior to the commencement of the Handover Maintenance Period.

- (ii) Project Co shall cause Handover Maintenance to be effected within the Handover Maintenance Period in accordance with Article 3.0(d)(ii), and prior to the expiry of the Maintenance Period, without limiting the provisions otherwise contained in this Schedule 15-3 respecting obligations which include obligations for Handover Maintenance.
 - (iii) Project Co shall ensure that at the Termination Date, the System, including all fixed equipment, Vehicles and fixed facilities which Project Co has supplied, designed, constructed, and Maintained are in a good state of repair and good working order, and in a state which complies with the Project Scope, Design and Construction Requirements, the Standard, the Design and Construction Performance Requirements and with all other standards to which Project Co shall be required to Maintain the System under the Project Agreement, taking into account the age of the System but without derogation from any of the Maintenance obligations of Project Co (including all of the foregoing obligations set out in this Article 3.0(c)(ii)) and subject always to compliance with the obligations of Project Co for performance of the Maintenance and Rehabilitation Services during the Maintenance Period (including the Termination Date). On the Termination Date, Project Co shall submit to the City a report confirming that the System meets the Standard as of the Termination Date.
 - (iv) Project Co shall ensure that each Fixed Component and Vehicle Component and each of their components and subsystems transferred to the City upon the Termination Date:
 - A. shall achieve its minimum Remaining Service Life, to the extent that the asset(s) comprising such Fixed Component or Vehicle Component have a specified Design Life, if the asset continues to be operated and maintained in an appropriate manner after the Termination Date;
 - B. shall submit the Remaining Service Life assessments as determined pursuant to Article 2.0 of this Appendix.
 - (v) For further certainty, Project Co's obligations pursuant to Article 3.0(c)(iii) do not include any obligation to provide Maintenance following the Termination Date.
 - (vi) Project Co shall perform all Handover Maintenance required to comply with Article 3.0(c)(ii), including all Corrective Maintenance required to remedy all Defects identified by the Pre-Handover Inspections, or otherwise identified by Project Co or the City, within the Handover Maintenance Period.
- (d) Inspection Prior to Handover
- (i) Prior to the Termination Date, the City and Project Co shall jointly perform three inspections of the System (the “**Pre-Handover Inspections**”), which shall consist of the examination and testing which is required of each Fixed Component and Vehicle Component so as to determine its state of repair and operation.

- (ii) The Pre-Handover Inspections shall occur as follows:
- A. the first Pre-Handover Inspection shall take place no earlier than 60 calendar months and no later than 54 calendar months prior to the Termination Date;
 - B. the second Pre-Handover Inspection shall take place no earlier than 24 calendar months and no later than 18 calendar months prior to the Termination Date;
 - C. the final Pre-Handover Inspection shall take place no later than 2 calendar months prior to the Termination Date.
- (iii) The failure of the City to request a Handover Maintenance requirement on any Pre-Handover Inspection or a repair made by Project Co following any Pre-Handover Inspection shall not constitute a waiver of or derogate from the Handover Maintenance obligations of Project Co contained in this Schedule 15-3.

(e) Remedial Action

- (i) Project Co shall perform the necessary Handover Maintenance to remedy any Defects in the System identified by the Pre-Handover Inspection, so as to meet the standard set out in Article 3.0(c)(ii).
- (ii) Following each Pre-Handover Inspection, Project Co shall prepare a handover Maintenance and Rehabilitation Services plan detailing the Handover Maintenance required to remedy all identified Defects in the System, which shall include a schedule for the performance of such Handover Maintenance (the “**Handover Maintenance Services Plan**”). The following are the deadlines by which Project Co shall be required to submit a Handover Maintenance Services Plan to the City for review:
 - A. within two calendar months of the conclusion of the first Pre-Handover Inspection;
 - B. within one calendar month of the conclusion of the first Pre-Handover Inspection;
 - C. within one week of the conclusion of the final Pre-Handover Inspection.
- (iii) The City shall review each Handover Maintenance Services Plan in consultation with Project Co to verify that the Handover Maintenance Plan complies with the Handover Maintenance Plan. Upon the City’s confirmation to Project Co that the Handover Maintenance Plan complies with the Handover Maintenance Plan, Project Co shall undertake the work set out therein, which shall be completed prior to the Termination Date. Project Co shall keep a record of all work performed in accordance with the Handover Maintenance Plan and shall advise the City, at regular intervals, of its progress toward completing the Handover Maintenance Plan.
- (iv) In the event that Project Co fails to perform the Handover Maintenance in accordance with the Handover Maintenance Plan, the City may, in addition to any other rights or

remedies of the City pursuant to the Project Agreement, undertake remedial action in accordance with provisions included in Appendix A. In addition, in the event that Project Co is in breach of any of its obligations to perform Handover Maintenance pursuant to this Schedule 15-3, the City shall be entitled to take security provided to the City in accordance with any remedial action to rectify the breach under any other provision of the Project Agreement.

(f) Turnover of Replacement Parts

- (i) On the Termination Date, Project Co shall transfer to the City all spare Fixed Components and Vehicle Component replacement parts (the “**Replacement Parts**”) that it has in its inventory and possession for purposes of the Maintenance of the System. For further certainty, at the Termination Date Project Co shall have an inventory of Replacement Parts which is reasonably in accordance with the amount and type of inventory maintained throughout the Maintenance Period in compliance with the provisions included in Appendix A. The City reserves the right not to accept obsolete, damaged or any other Replacement Parts from Project Co’s inventory the use of which the City deems not to be in the best interest of the City or the System. Project Co shall ensure that all Replacement Parts are stored on the premises of the Maintenance and Storage Facilities at the Termination Date. On the occurrence of the Termination Date, Project Co shall be deemed to have released and transferred to the City all its right, title and interest in any and all such Replacement Parts. Project Co shall, at the City’s request, provide a Bill of Sale to the City itemizing all the Replacement Parts which are required to be turned over to the City pursuant to this Appendix.
- (ii) The City shall deliver payment to Project Co on account of the Replacement Parts which the City has agreed to purchase, such payment to be equivalent to a Cost Recovery calculation with respect to the Replacement Parts.

(g) Status and Components

- (i) All system, including both hardware and software, shall be in proper working order, and shall meet all applicable requirements of the Project Agreement;
- (ii) No hardware or software components shall be incompatible with the System at the Expiry Date and all third party software shall be the latest full release version with similar compatibility; and
- (iii) Corrective and Preventative maintenance shall have been carried out throughout the Maintenance Period on all System assets in accordance with Project Co’s Maintenance and Rehabilitation Plan, applicable manufacturers’ requirements, and Good Industry Practice.

(h) Inventory and Verification of Inventory

- (i) Project Co shall provide an updated System Inventory report, in accordance with the requirements of Article 5.8 of Appendix B, plus a basic inventory of other Infrastructure

and spare parts to be handed over to the City at the Expiry Date, within 30 days prior to the Expiry Date.

(i) As Built Drawings

- (i) The most current and up-to-date versions of all As-Built Drawings prepared in connection with the Project shall be submitted to the City at Expiry Date.

SCHEDULE 16

ENCUMBRANCES

For purposes of this Schedule 16, the defined term “Lands” shall include any portion of the Lands.

A. General Encumbrances

Each of the following, to the extent affecting the interest (whether real property interest or contractual interest) of the City in the Lands or any other person who owns the Lands (or any part thereof), is, in each case, considered to be an encumbrance for the purposes of the Project Agreement (each, an “Encumbrance”):

- (i) liens, charges or prior claims for taxes (which term includes charges, rates and assessments) or utilities (including levies or imposts for sewers and other municipal utility services) not yet due or if due, the validity of which is being contested in good faith, and liens or charges for the excess of the amount of any past due taxes or utilities charges for which a final assessment or account has not been received over the amount of such taxes or utilities charges as estimated and paid by the City;
- (ii) inchoate liens incidental to construction, renovations or current operations, a claim for which shall not at the time have been registered against the Lands or of which notice in writing shall not at the time have been given to the City pursuant to the CLA or otherwise or any lien or charge, a claim for which, although registered, or notice of which, although given, relates to obligations not overdue or delinquent and in respect of any of the foregoing cases, the City has, where applicable, complied with the holdback or other similar provisions or requirements of the relevant construction contracts;
- (iii) the rights reserved to or vested in the public or any municipality or governmental or other public authority by any statutory provision;
- (iv) any subsisting reservations, limitations, provisions and conditions contained in any grants from the Crown of any land or interests therein, including reservations of under-surface rights to mines and minerals of any kind including rights to enter, prospect and remove the same;
- (v) any encroachments, easements, rights-of-way, rights to use or similar interests revealed by any survey of the Lands or which would be revealed by an up-to-date survey of the Lands;
- (vi) any rights in favour of or accruing to holders of under-surface rights which could be ascertained by a review of registered title or other public records, or, if unregistered, which do not materially interfere with the use of the Lands for the purposes of the Works;
- (vii) unregistered agreements with any municipal, provincial or federal governments or authorities and any public utilities or private suppliers of services, provided such unregistered agreements have been disclosed to Project Co, are described in Schedule 33 – Lands or could be ascertained by commercially standard off-title searches, or, if not so disclosed, described, or ascertainable, which do not materially interfere with the use of the Lands for the purposes of the Works, and further provided that such agreements have been complied with up to Financial Close, or, if not complied with (excluding non-compliance by Project Co and Project Co Parties), that any non-compliance does not materially interfere with the use of the Lands for the purposes of the Works;

- (viii) unregistered agreements, authorizations, consents, postponements, subordinations, licences or instruments entered into provided that they have been disclosed to Project Co, are described in Schedule 33 – Lands or could be ascertained by commercially standard off-title searches, or, if not so disclosed, described or ascertainable, which do not materially interfere with the use of the Lands for the purposes of the Works, and further provided such agreements, authorizations, consents, postponements, subordinations, licences or instruments have been complied with up to Financial Close, or, if not complied with (excluding non-compliance by Project Co and Project Co Parties), that any non-compliance does not materially interfere with the use of the Lands for the purposes of the Works;
- (ix) unregistered easements, rights-of-way, rights to use, restrictions, restrictive covenants and similar rights in real property or any interest therein provided that they have been disclosed to Project Co, are described in Schedule 33 – Lands or which could be ascertained by commercially standard off-title searches, or if not so disclosed, described or ascertainable, which do not materially interfere with the use of the Lands for the purposes of the Works, and further provided such easements, rights of way, rights to use, restrictions, restrictive covenants and similar rights or interests have been complied with up to Financial Close, or, if not complied with (excluding non-compliance by Project Co and Project Co Parties), that any non-compliance does not materially interfere with the use of the Lands for the purposes of the Works;
- (x) zoning (including, without limitation, airport zoning regulations), land use, property standards and building by-laws and ordinances, and federal, provincial or municipal by-laws and regulations;
- (xi) minor imperfections of title;
- (xii) statutory exceptions to title and any rights reserved to or vested in any person by any statutory provision;
- (xiii) the right of any prior owner, occupant or tenant of any portion of the Lands to occupy any portion of the Lands or to remove buildings, fixed machinery, equipment, fittings or other fixtures located on such portion of the Lands; and
- (xiv) the rights of any person entitled to any portion of the Lands through length of adverse possession or prescription.

B. Specific Encumbrances

[REDACTED]

**SCHEDULE 17
ENVIRONMENTAL OBLIGATIONS**

[REDACTED]

SCHEDULE 18
COMMUNICATIONS AND STAKEHOLDER ENGAGEMENT OBLIGATIONS

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PART 1 DEFINITIONS

- 1.1** “**Construction Activities Incident**” has the meaning given in Section 5.1(e)
- 1.2** “**Complaints Protocol**” has the meaning given in Section 4.16.
- 1.3** “**Communications Performance Report**” has the meaning given in Section 4.17(a).
- 1.4** “**Communications and Stakeholder Engagement Objectives**” has the meaning given in Section 2.2(a).
- 1.5** “**Communications and Stakeholder Engagement Plan**” has the meaning given in Section 3.3.
- 1.6** “**Communications and Stakeholder Engagement Plan – Maintenance Period**” has the meaning given in Section 3.3(e).
- 1.7** “**Communications and Stakeholder Engagement Working Group**” has the meaning given in Section 6.1.
- 1.8** “**Crisis Communication Plan**” has the meaning given in Section 4.3(a).
- 1.9** “**Crisis Communication Plan - Maintenance Period**” has the meaning given in Section 4.3(b).
- 1.10** “**Key Milestone Celebrations**” means celebrations and larger events with the objective of building momentum for the Project, recognizing project milestones and partners. These celebrations include groundbreakings, progress events, and substantial completion.
- 1.11** “**Project Co Communications and Stakeholder Engagement Team**” has the meaning given in Section 3.3(a)(xviii).
- 1.12** “**Stakeholder Relations**” has the meaning given in Section 2.2(a).

PART 2 PRINCIPLES OBJECTIVES AND SCOPE

2.1 Communications and Stakeholder Engagement Principles

- (a) The Project represents an important infrastructure commitment by the City. Comprehensive plans for communications and Stakeholder engagement are required to ensure Stakeholders are informed and engaged where necessary and to meet the City's communications and Stakeholder engagement requirements.
- (b) The City and Project Co shall work together to deliver these communications and Stakeholder engagement activities pursuant to the Project Agreement, including this Schedule 18.
- (c) The City will act as the public face of the project and lead on all Stakeholder Relations and communications activities.
- (d) Project Co acknowledges that:
 - (i) Project Co is the City's and the Stakeholders' primary source of information with respect to all matters within Project Co's control for the Project; and
 - (ii) The City, at all times during the Project Term, shall rely upon Project Co not only to anticipate matters which may be of interest and concern to Stakeholders during the Project Term (based on its experience as well as lessons learned during the course of the Project), but also to proactively organize and disseminate such information in accordance with its obligations in the Project Agreement so as to permit the Parties to perform their obligations hereunder.

2.2 Communications and Stakeholder Engagement Objectives

- (a) The “**Communications and Stakeholder Engagement Objectives**” of the Project are as follows:
 - (i) to engage with Stakeholders to provide targeted information to area residents and businesses on the Project design and Construction Activities and their potential impacts (“**Stakeholder Relations**”) by:
 - (A) communicating disruptions, such as detours, overnight work, traffic adjustments and beginning of construction, in an effective and timely manner;
 - (B) providing public information and consultation opportunities to ensure Stakeholders are informed and engaged throughout to minimize complaints and increase understanding of the Project;
 - (C) ensuring Stakeholder input is obtained in a timely manner so that it may be properly considered by the Parties; and
 - (D) continuing to work with established community working groups and other networks identified during the planning and Environmental Assessment phase.
 - (ii) to communicate in a manner that builds excitement and understanding of the Project by:

- (A) developing momentum building communications to promote the Project, including Key Milestone Celebrations, signage, hoarding, and advertising;
 - (B) developing resources and templates to effectively and consistently communicate with Stakeholders; and
 - (C) recognizing the contribution of the Parties in this Project Agreement and the City's funding partners.
- (iii) during the Maintenance Period to continue to engage in providing Communications and Stakeholder Engagement activities as detailed in this Schedule but at a scope reflective of the potential maintenance issues.

2.3 Communication and Stakeholder Engagement Scope

- (a) The scope of this Schedule 18 includes but is not limited to, all print, event and electronic communications and Stakeholder engagement related to: planning, design, Environmental Approvals, Construction Activities, Maintenance and Rehabilitation Activities, Project milestones, community and Stakeholder Relations, media relations, media and governmental events, other special events, public information meetings, branded products, the Project website, social media, complaints and issues related to the Project and any responses to such complaints or issues.

**PART 3 COMMUNICATIONS AND STAKEHOLDER ENGAGEMENT RESPONSIBILITIES
DURING THE PROJECT TERM**

3.1 City Responsibilities

- (a) The City will assume the lead communications and Stakeholder engagement role and will have the primary responsibility for all communications matters and Stakeholder Relations related to the Project. The City will:
- (i) develop a yearly updated Project Communications and Stakeholder Engagement Plan (the “**Communications and Stakeholder Engagement Plan**”) with input from Project Co;
 - (ii) develop and provide tools and templates for all communications and Stakeholder engagement Project materials unless otherwise specified in this Schedule 18;
 - (iii) develop and maintain a website, with input from Project Co;
 - (iv) provide identified, dedicated lead communications and Stakeholder engagement contacts;
 - (v) act as the primary media contact for the Project;
 - (vi) provide final review and approval of all communications and Stakeholder engagement materials;
 - (vii) communicate promptly with all relevant parties on Project issues; and
 - (viii) provide coordinated updates to Stakeholders.

3.2 Project Co Communications Responsibilities

- (a) Project Co shall:
- (i) carry out all activities required to fulfill all of Project Co’s communications and Stakeholder obligations in accordance with this Schedule 18;
 - (ii) along with the City participate in the development of Communications and Stakeholder Engagement Plan, and develop the Crisis Communication Plan in consultation with the City and Stakeholders and in accordance with this Schedule 18;
 - (iii) implement and comply with all plans, protocols and other documentation that have been reviewed and approved by the City and in accordance with this Schedule 18;
 - (iv) provide all information, materials and support to the City, as the City may reasonably require, in accordance with the requirements in the Communications and Stakeholder Engagement Plan and this Schedule 18;
 - (v) assist the City in responding to media, government and public enquiries related to the Project including but not limited to subject matter expertise, key facts and media questions and answers in accordance with the requirements in the Communications and Stakeholder Engagement Plan and this Schedule 18;

- (vi) provide, where required by the City, Project experts, to include but not be limited to design and construction engineers and environmental specialists to participate in special events, Stakeholder events and outreach meetings;
- (vii) in accordance with Part 5 of this Schedule, provide regular notifications to the City related to the management of local traffic during the Construction Period and ensure communication obligations in relation to the TTMP as detailed in Schedule 15-2, Part 7 – Traffic and Transit Management and Construction Access are fulfilled;
- (viii) attend special events, site tours and Stakeholder events and Stakeholder outreach meetings in accordance with Part 4 of this Schedule;
- (ix) work with the City to build and foster relationships with local businesses and the public in order to address the community's concerns about the Works;
- (x) make staff available to respond to enquiries from Stakeholders about the Works;
- (xi) support the City in providing regular updates to immediately affected property owners, tenants and neighbourhoods on Works related issues;
- (xii) support the City in notifying affected residents and businesses of Construction Activities in accordance with Part 5 of this Schedule;
- (xiii) provide any necessary information required to demonstrate compliance with and fulfillment of the consultation related provisions of the Environmental Assessments and any other Environmental Approvals as detailed in Schedule 17 – Environmental Obligations;
- (xiv) support the City in making communications materials accessible to the public by meeting the City's Accessibility Standards in compliance with the *Accessibility for Ontarians with Disabilities Act* (AODA) and in keeping with the City's Accessibility Policy and Procedures;
- (xv) support the City in making communications materials available in French and English where required by the City in compliance with the City's Bilingualism Policy;
- (xvi) work with all Project Co Parties, the City, and Project Stakeholders in carrying out Project Co's obligations as set out in this Schedule 18;
- (xvii) ensure that Project Co and Project Co Parties exhibit a high degree of professionalism and courteousness with respect to carrying out all of Project Co's obligations under this Schedule 18, including:
 - (A) attendance at City requested special events, site tours, Stakeholder events and Stakeholder outreach meetings;
 - (B) managing staff and contractor parking such that it does not negatively impact neighbourhood or business access;

- (C) not littering; and
 - (D) protecting and restoring any affected City and Third Party Facilities adjacent to the Works, in accordance with Schedule 15-2, Part 1, Article 4.1.
- (xviii) provide a description of Project Co's dedicated communications and Stakeholder engagement team (the "**Project Co Communications and Stakeholder Engagement Team**"), within 45 days of Financial Close, including the roles, responsibilities and experience of each team member and Project Co Party who will assist the implementation of this Schedule 18. The Project Co Communications and Stakeholder Engagement Team shall:
- (A) be led by a Director of Communications and Stakeholder Engagement who:
 - 1) shall have the qualifications set out in Schedule 9 – Key Individuals;
 - 2) is a member of Project Co's management team;
 - 3) is responsible for acting as the media spokesperson;
 - 4) [Intentionally Deleted]
 - 5) [Intentionally Deleted]
 - 6) possesses demonstrated relevant communications experience;
 - (B) provide sufficient other members of the team to meet the obligations of this Schedule who have relevant experience in communications writing, media relations, crisis communications, issues management, corporate and community relations;
 - (C) include at least one member acting as a Stakeholder outreach coordinator; and
 - (D) each member of the Project Co Communications and Stakeholder Engagement Team other than the Director shall possess a minimum of five years of transit or transportation construction-related communications experience.
- (b) Project Co acknowledges and agrees that, notwithstanding any other provision in this Schedule 18, the City will review and approve all communications and Stakeholder engagement materials with respect to the Project, and Project Co may not make any communications or disseminate any materials to Stakeholders with respect to the Project without the prior consent of the City.

3.3 Communications and Stakeholder Engagement Plan

- (a) The Project Co Communications and Stakeholder Engagement Team shall, no later than 60 days following Financial Close participate in the first Communications and Stakeholder Engagement Working Group meeting where the City will present an initial outline of the Project Communications and Engagement Plan.
- (b) Based on the outline of the Project Communications and Stakeholder Engagement Plan and in accordance with Schedule 18, Project Co will prepare a description of its communications and Stakeholder engagement requirements as part of the Communications and Stakeholder Engagement Plan no later than 90 days following Financial Close. This description will include the first submission of the first yearly construction schedule as detailed in Section 4.3.

- (c) Project Co shall participate with the City in a workshop to finalize the Communications and Stakeholder Engagement Plan. The City's communications and stakeholder engagement lead will organize and chair the workshop no later than 120 days following Financial Close.
- (d) Project Co shall participate with the City to update the Communications and Stakeholder Engagement Plan:
 - (i) on an annual basis; or
 - (ii) more frequently as may be requested by the City, or as may be required to account for any changes in the circumstances of or lessons learned with respect to the Project.
- (e) With respect to the Maintenance Period, the Project Co Communications and Stakeholder Engagement Team shall, no later than 60 days prior to Substantial Completion and prior to initiating any communications-related activity or disseminating any maintenance communications-related materials, participate as part of a Communications and Stakeholder Engagement Working Group meeting where the City will present the outline of the Communications and Stakeholder Engagement Plan for the Maintenance Period (the "**Communications and Stakeholder Engagement Plan – Maintenance Period**").
- (f) Based on the outline of the Project Communications and Stakeholder Engagement Plan – Maintenance Period and in accordance with Schedule 18, Project Co will prepare a description of its communications and Stakeholder engagement requirements as part of the Communications and Stakeholder Engagement Plan – Maintenance Period no later than 30 days prior to Substantial Completion. This description will include the first submission of the first yearly maintenance schedule as detailed in Section 4.3.

PART 4 COMMUNICATIONS AND STAKEHOLDER ENGAGEMENT ACTIVITIES

4.1 Communications Activities - General

- (a) Project Co shall support the following communication activities during the Project Term as requested by the City, including:
- (i) Project communications via the Project website and social media;
 - (ii) construction schedule for communications
 - (iii) crisis communications;
 - (iv) issues management;
 - (v) media relations;
 - (vi) government reporting;
 - (vii) special events, site tours and trade show;
 - (viii) Stakeholder events and Stakeholder outreach meetings
 - (ix) hoarding design, installation and maintenance during the Construction Period;
 - (x) signage and branding;
 - (xi) advertising communications and marketing;
 - (xii) Project identity and graphic design;
 - (xiii) photography and video;
 - (xiv) renderings; and
 - (xv) crisis management.

4.2 Communications via the Project Website and Social Media

- (a) Project Co shall support the City's social media strategy for the Project (which may include tools such as Twitter, Facebook, YouTube and Flickr) and the City's Project websites' static (written) and dynamic (multimedia) content, by providing, for review and approval by the City, where the quality of the photography and video is as described in Section 4.14.
- (i) During the Construction Period Project Co shall provide:
 - (A) a monthly feature web article highlighting, but not limited to, one aspect of the Project including, design, innovations on the Project, feature on local workers, general contractors or local companies, Construction Activities, or Project benefits,

- with a minimum length of 500 words, as well as two related Twitter posts for the Project's Twitter account;
- (B) a weekly construction update on Project construction that provides a recent summary of construction work completed and upcoming work along the alignment including high-quality representative professional photographs (see Section 4.14 for photo quality specifications);
 - (C) a weekly Twitter post with photograph(s) along with associated written description for the City's use including the Mayor;
 - (D) notifications of public consultations, consultation materials and post-consultation summaries;
 - (E) develop all photos for weekly construction updates for submission to and approval by the City;
 - (F) content for the interactive map(s) to be developed by the City that provide an overview of the extensions, along with information on key activities at each site (stations), which the City will regularly maintain and update monthly at a minimum;
 - (G) monthly short video clips for the purposes of social media; and
 - (H) up-to-date graphics, photos and video clips showcasing the design of each Station and progress of the Construction Activities.
- (ii) During the Maintenance Period Project Co shall provide:
- (A) a monthly maintenance update on the Project that provides a summary of recent maintenance work completed and upcoming maintenance work along the alignment including high quality representative professional photographs (see Section 4.14 for photo quality specifications) for submission to and approval by the City; and
 - (B) notifications of any public consultations if required including consultation materials and post-consultation summaries.
- (iii) provide drafts of proactive and reactive content for responses to crisis situations, immediate issues, public queries or complaints, no later than two hours after Project Co or the City becomes aware of any such crisis situation, immediate issue, public query or complaint; and
- (iv) provide draft advance notification for the purposes of website and social media updates for review and approval by the City with respect to meetings, events, initiatives, and Construction and Maintenance Activities that will have a direct impact on roads, traffic and/or transit; and
- (v) develop web content to support government Stakeholders web and social media communications needs for review and approval by the City.

4.3 Construction and Maintenance Schedule for Communications

- (a) During the Project Term Project Co shall prepare and submit for the City's review and approval the following schedule information. In advance of submitting the schedule information, Project Co shall also submit a template of each schedule for the City's review and approval:
- (i) during the Construction Period a yearly construction schedule and detour plan and during the Maintenance Period a yearly maintenance schedule in a format that is readily useable in communicating the Project milestones, to be updated on a yearly basis and no later than March 31st of each calendar year to the end of the Project Term. This yearly plan should come in the form of a report with a visual chart and accompanying wording that identifies and describes timing and impacts of major issues and disruptive activities, and the communications milestones for the upcoming year, as categorized below:
 - (A) final station designs;
 - (B) start/end of prescribed detours;
 - (C) start/end of station construction;
 - (D) start/end of roadway works, or other bundled projects and components of the Works;
 - (E) start/end of road closures;
 - (F) start/end of sidewalk and/or MUP realignments; and
 - (G) start/end of works impacting greenspaces and park areas.
 - (ii) a semi-annual construction schedule update for use in communicating project milestones, as well as a semi-annual project dashboard to support the City's communications and social media strategies that highlights key statistics and benefits of the project, including but not limited to the number of local firms employed, number of local jobs created and training through registered apprenticeship programs, subcontract value, kilometres of track laid, amount of concrete poured, level of completion of stations along the alignment extensions, to be updated no later than December 31st and June 30th of each calendar year;
 - (iii) a three-month look ahead calendar outlining construction and maintenance activities, including a description of scope and anticipated impacts, and any notification requirements as detailed in Part 5 of this Schedule and based on level of impact, and Project Co resources assigned, that will support the City's communications and social media strategies; and
 - (iv) a dashboard to provide regular weekly updates and bi-weekly look-aheads about Construction Activities, including statistics, amount of local investments, number of direct jobs and training through registered apprenticeship programs, schedule and other information that will support the City's communications and social media strategies.

4.4 Crisis Communication

- (a) Project Co shall develop in consultation with the City a Crisis Communication Plan that outlines the roles, responsibilities and contacts for Project Co in relation to the City and other partners as required with respect to crisis communications, and identify and rank a list of potential crisis issues that could develop during the performance of the Works (the “**Crisis Communication Plan**”). The Crisis Communication Plan shall comply with the City’s emergency communication

plan and include notification standards for media responses, as described in Section 4.5, and shall include a crisis communication protocol. The Crisis Communication Plan must be submitted to the City, in advance of any construction activities, for review and approval in accordance with Schedule 10 – Review Procedure.

- (b) The Crisis Communication Plan must be updated 30 days following a crisis event and 60 days prior to Substantial Completion Project Co shall update the Crisis Communication Plan for the Maintenance Period in consultation with the City (the “**Crisis Communication Plan - Maintenance Period**”);
- (c) During the Project Term, Project Co shall:
 - (i) provide ongoing assistance to the City in the City’s development and updates to the Crisis Communication Plan;
 - (ii) during a crisis situation, make available sufficient Project Co communications staff and Project resources in order to work effectively with the City to proactively manage and perform Project Co’s communications responsibilities as set out in this Schedule 18; and
 - (iii) during a crisis situation provide the City with holding lines within 15 minutes of the event occurring.

4.5 Issues Management

- (a) During the Project Term, Project Co shall consult with and provide reasonable assistance to the City with respect to:
 - (i) identifying issues and trends as they emerge and develop strategies for tracking, addressing, mitigating, and minimizing issues related to the Project;
 - (ii) developing messages and strategies to address issues and provide accurate and timely information to affected Stakeholders; and
 - (iii) sharing information about potential issues related to the Project with other partners.
- (b) Project Co shall respond to all issues identified by the City within a timeframe as determined by the City for each issue.

Project Co shall develop an issues management protocol to be reviewed and approved by the City.

4.6 Media Relations

- (a) During the Project Term, Project Co shall:
 - (i) direct all media enquiries and interview requests to the City’s lead communications contact, who will determine the organization that is most suitable to respond to the enquiry;
 - (ii) provide draft responses and messaging to the City, with respect to all media enquiries and

- interview requests in a timely manner and track each request that Project Co responds to in a media request log;
- (iii) support the City with respect to all media enquiries and interview requests;
 - (iv) provide designated media relations staff (with backup media trained personnel, as required) with 24/7 availability to monitor, draft messaging and prepare responses to enquiries as requested by the City, in accordance with its level of urgency, as per the categories listed in Part 4.6(vii) below;
 - (v) provide communications training to Project Co staff, including refresher training regarding the City's communication protocols and policies for handling media, public, and Stakeholder interaction;
 - (vi) make available a Project Co designated media relations staff member and construction manager, maintenance manager or similar expert for the purposes of responding to technical matters related to media requests and interview requests if required and as requested by the City;
 - (vii) provide the City with information as requested to respond to media inquiries and with the level of urgency defined by the City where the measure of the level of urgency and timelines is as detailed below:
 - (A) Crisis requires Project Co to provide a holding statement within 15 minutes, in line with the Crisis Communications Plan;
 - (B) Urgent is 1 hour;
 - (C) Medium is 6 hours; and
 - (D) Low is 24 hours; and
 - (viii) at least twice yearly, provide the City with a summary of key accomplishments in a media-ready format, that can be used by the City to approach media (summary of construction progress, benefits, local economic impacts, spotlight on innovation, look aheads, etc.).

4.7 Government Reporting

- (a) During the Project Term, Project Co shall:
 - (i) support the City in meeting the requirements of the Governmental Authorities funding agreements for the Project by providing information about the Project status, upcoming milestones, and issues that may affect the Project including the provision of appropriate signage for construction and special events; and
 - (ii) participate in meetings with the City and Governmental Authorities when requested by the City.

4.8 Special Events, Site Tours and Trade Show

- (a) The City and Project Co shall collaborate to develop, plan, and coordinate various special events during the Project Term.
- (b) During the Project Term, Project Co shall:
 - (i) at the City's request make Project sites available for governmental, public relations, media and public tours and events such that the City may, upon advance notice to, and in conjunction with Project Co, organize special events, including tours of the Site and Key Milestone Celebrations, costs of which will be borne by the City (excluding costs related to shutdown of the Project Operations or accommodations at the Site to organize such events, which shall be borne by Project Co). Project Co shall support any event described in this Section 4.8(b) as requested by the City, and provide a power source for communications equipment, and any other site costs.
 - (ii) ensure sufficient insurance and liability coverage is in place for any special events or venues, as required by the Project Agreement;
 - (iii) make Project Co staff available for events, tours of the Site, and provide support as may be required by the City;
 - (iv) develop content for events, as requested by the City, including but not limited to invitations, presentations, speaking notes, signage, high quality graphics and other visuals;
 - (v) support a minimum of two on-site full alignment tours (with Site access) and four special events per year during the Construction Period;
 - (vi) during the Construction Period and in consultation with the City, plan, organize and execute a trade show no later than 180 days following Financial Close. The City will develop templates for material to be used or displayed and will review and approve all materials to be distributed. The cost of the trade show will be borne by Project Co, including costs with respect to:
 - (A) renting the venue, tables, chairs;
 - (B) production of displays, invitations, signage and printed material;
 - (C) catering;
 - (D) print and radio advertising in trade and community and national media outlets as determined by the City;
 - (E) issuing invitations, tracking RSVPs and administering a survey;
 - (F) using best efforts to ensure a minimum attendance of 200 individuals, of which at least [REDACTED]% of attendees consist of industry vendors, suppliers and other

Works-related businesses and contacts;

- (G) providing overall event logistics and event production; and
- (H) production of post-event report to the City, the content of which may be posted publicly to the City's website.

4.9 Stakeholder Events and Stakeholder Outreach Meetings

- (a) Stakeholder events include public information sessions and public open houses, where information is shared with a group, or community feedback is solicited and presented back to the community, and invitations to the public or a larger group are issued. Project Co shall:
 - (i) hold, a minimum of four events during design (presentation of bid designs), 15 events during the Construction Period, and as is required during the Maintenance Period to communicate significant activities or changes and impacts, as requested by the City further to ongoing construction monitoring; and
 - (ii) during the Project Term and in consultation with the City, support and organize and execute ongoing and unplanned Stakeholder special events, the costs of which will be borne by Project Co, including costs with respect to:
 - (A) developing content for all materials including but not limited to high quality presentations, boards, invitations, handouts, post-event reports;
 - (B) developing high quality pop up displays that speak to general project details, benefits, and construction timelines that can be used at all Stakeholder events updated for consultation events during design phase and pre-construction and construction outreach;
 - (C) developing high quality community contact cards with information on project resources and key contacts during construction;
 - (D) covering the cost of print advertising in community newspapers, as described in this Schedule, and outlets as determined by the City; and
 - (E) at the City's discretion, distribute complete unaddressed mail drops to support these events.
- (b) Stakeholder meetings include community presentations and project presentations. These are targeted meetings for a variety of audiences to resolve issues, and communicate general and/or specific project information to a targeted audience. Project Co shall provide technical staff as required, and provide content as required including high quality graphics.

4.10 Signage and Branding - Construction and Promotional Signage

- (a) During the Project Term, Project Co shall:
 - (i) produce, print, install and remove signage, including wayfinding and business signage;

- (ii) prior to installation, provide to the City for approval stamped shop drawings of the sign fabrication and installation details, together with a mock-up of the signage, location and confirmation of the applicable Permits, Licences, Approvals and Authorizations;
- (iii) ensure appropriate signage is provided in a visible location for affected businesses to seek to ensure continuity of their business operations including compliance with the requirements of Schedule 15-2, Part 7, Article 6;
- (iv) ensure that Project Co and Project Co Parties comply with the construction and promotional signage requirements set out in the Project Agreement;
- (v) ensure the government Project signs are visibly displayed along the corridor throughout the Project Term;
- (vi) ensure that all signage is kept in good condition when installed and when not in use;
- (vii) replace any signage that is damaged by Project Co at Project Co's expense;
- (viii) provide screws, support posts and other fastening materials to install signage that are made of materials of good quality and durability;
- (ix) remove graffiti on temporary signage within 24 hours or, in the event that graffiti cannot be removed by means of normal cleaning methods, Project Co shall replace the damaged signage;
- (x) upon request from the City, Project Co shall design and provide dimensions of hoarding, fencing and barriers to support temporary signage provided by the City; and
- (xi) provide personnel to install, remove and relocate signage on an expedited basis if required by the City.

4.11 Signage and Branding - Hoarding

- (a) Project Co shall:
 - (i) during construction, develop a hoarding plan with the City that will respect various community contexts and build understanding and enhance the public image of the Project;
 - (ii) During the Maintenance Period, develop hoarding plans if required by the City for major maintenance work;
 - (iii) as part of the hoarding plan identify sites, for the City's review and acceptance, where decorative hoarding would be beneficial and context specific materials (scrim, metal sheets or plywood), and develop consistent hoarding design. Sites will include but are not limited to:
 - (A) high visibility and/or high traffic (pedestrian, cycling or car);

- (B) sites close to a community or greenspace being affected by Construction Activities; and
 - (C) sites in close proximity to businesses;
 - (iv) produce, print, install, remove and store decorative hoarding, including wayfinding and business signage;
 - (v) prior to installation, provide to the City for approval stamped shop drawings of the decorative hoarding, fabrication and installation details, together with a mock-up of the decorative hoarding, location and confirmation of the applicable Permits, Licences, Approvals and Agreements;
 - (vi) ensure that Project Co and Project Co Parties comply with the hoarding requirements set out in the Project Agreement;
 - (vii) ensure that all decorative hoarding is kept in good condition when installed;
 - (viii) replace any decorative hoarding that is damaged by Project Co at Project Co's expense; and
 - (ix) remove graffiti on decorative hoarding within 24 hours or, in the event that graffiti cannot be removed by means of normal cleaning methods, Project Co shall replace hoarding at sites, to a maximum of five hoarding panel replacements per year, within a reasonable time period or as otherwise required by Applicable Law;
- (b) The City shall develop the graphic design of the hoarding.

4.12 Advertising Communications and Marketing

- (a) During the Project Term, the City shall:
- (i) provide Project Co with its plan detailing advertisement and communications marketing strategies for the Project;
 - (ii) provide Project Co with templates for use in drafting public notices and advertisements including Stakeholder engagement opportunities and construction impacts; and
 - (iii) review and approve advertisements produced by Project Co about the Project's design and construction impacts and Stakeholder engagement opportunities related to the Project.
- (b) During the Project Term, Project Co shall:
- (i) support and contribute to the planning, development and execution of the City's public education and advertising campaigns related to the Works;
 - (ii) at Project Co's cost, plan, develop, and coordinate the placement of advertisements to communicate ongoing construction and maintenance impacts and to inform Stakeholders of engagement activities through a mix of media, including but not limited to, print daily,

community and commuter newspapers, radio, online media, multimedia and unaddressed mail in accordance with the following:

- (A) for each of the 15 Stakeholder events described in Part 4 of this Schedule, Project Co shall provide one insertion in a local community or daily newspaper (black and white, half page in size);
 - (B) for construction notices that indicate significant, long-term construction impacts of more than six months in duration, the frequency of the ads placed or notices issued will be based on the Construction Contractor's schedule and will include content for social media and City's regular communications channels (public service announcements, etc.), and could also include one local community or daily newspaper notice per major stage in work (black and white, quarter page in size); and
 - (C) for significant construction impacts (defined by the City in the traffic notification process) that have a significantly high impact on traffic and mobility, Project Co is responsible for the production of and cost to book regular 15 –second sponsor messages on weekdays, in the morning and afternoon peak commuter times. Radio ads will be played twice each hour between 6:00 a.m. and 10:00 a.m. in the morning and between 3:00 p.m. and 7:00 p.m. in the afternoon. Ads should appear on local radio stations of equal gross rating points to CFRB and/or CIHT (for radio).
- (iii) Project Co shall be responsible for the cost and coordination of Canada Post distribution of construction or major maintenance notices based on a 500 metre distribution area surrounding the area where the applicable impacts are occurring and shall:
- (A) provide content for public information and Stakeholder engagement materials;
 - (B) write content for monthly newsletters about the Project, for review and approval of the City;
 - (C) use hoarding and any other areas within the Lands for communication of the Project;
 - (D) not use, permit or authorize any third party to use any areas within the Lands for advertisement, without the prior written consent of the City, or as otherwise permitted in accordance with this Project Agreement;
- (iv) for clarity, Project Co shall submit all advertisements, insertions, construction notices, messages, and other associated documentation contemplated in this Section 4.10(b) for the City's review and approval prior to distributing, placing, posting, issuing, or producing any such advertisement, insertion, construction notice, maintenance notice, message or any other documentation.

4.13 Project Identity and Graphic Design

- (a) The City shall develop the brand identity for the Project and provide templates to Project Co as

required during the Project Term.

- (b) During the Project Term, Project Co shall:
- (i) apply the City's design templates for information related to the Project and comply with Project identity standards on all information materials; and
 - (ii) provide all content and design layout of communication and community engagement materials, including quarterly newsletters, advertisements, public notices, flyers and publications to the City for review and approval at least three weeks prior to distribution.

4.14 Photography and Video

- (a) For the purposes of record-keeping and demonstrating the progress of the Project during the Construction Period, Project Co shall engage a professional photographer or field staff with appropriate equipment and training:
- (i) during the Construction Period:
 - (A) on a regular basis and at least weekly, provide high quality photographs, graphics and images of the Project to the City for use in publications, presentations and on public websites, using a professional DSLR or mirrorless type camera. Photographs must be sharp, high-quality digital JPEG files at 300 DPI with an 8-bit colour depth, preferably converted from RAW image format;
 - (B) provide quality video clips of the Project to the City for use on Project websites and social media each month;
 - (C) develop a promotional video during the design phase that incorporates information and visuals of the complete extension, including but not limited to station designs. Video should incorporate key facts of the project, objectives, and connections provided by the extensions (educational institutions, cultural institutions, recreation, retail destinations, etc.) with project objectives, stations renderings, project details/connectivity etc.; and
 - (D) produce yearly, high quality video during construction that incorporates visuals provided to the City with the objectives of showing and highlighting construction progress.
 - (ii) Project Co will cause Project Co staff or Project Co Parties to provide consent to City respect to City's disclosure of photo and video content relating to the Project.
 - (iii) During the Project Term, Project Co shall, from time to time and as reasonably requested by the City, facilitate access for designated photographers and videographers.

4.15 Renderings

- (a) In addition to the renderings required in Schedule 10 – Review Procedure and Article 1 of Part 1 in Schedule 15-2, Part 4, Article 1, Project Co shall submit up to 10 additional photo realistic

renderings as requested by the City.

4.16 Complaints Protocols

- (a) During the Project Term, the City shall be responsible for approving all responses to complaints and enquiries relating to the Project, and will be the lead on their intake, and will lead on tracking.
- (b) During the Project Term, Project Co shall:
 - (i) provide to the City for incorporation into the Communications and Stakeholder Engagement Plan a complaints protocol addressing how Project Co will deal with and respond to enquiries, suggestions and complaints received with respect to the Project during the Project Term (the “**Complaints Protocol**”) in an appropriate and timely manner, and submit the Complaints Protocol to the City for review and approval under Schedule 10 – Review Procedure;
 - (ii) be responsible for maintaining a software system that will track all complaints, enquiries and suggestions received and responses received with respect to the Project;
 - (iii) provide monthly complaint reports to the City, including an analysis of the main areas of concern to complainants; and
 - (iv) coordinate Project Co’s complaint tracking and complaint reports with any internal complaint tracking or complaint reports established by the City with respect to the Project as requested by the City.
- (c) Project Co acknowledges and agrees that the Construction Complaints Protocol will be publicly available at the request of the City.

4.17 Communications Performance Monitoring and Auditing

- (a) Project Co shall prepare a communications performance report (“**Communications Performance Report**”) which shall be available for review each month in advance of the first Communications and Stakeholder Engagement Working Group weekly meeting for the month, as detailed in Section 6 of this Schedule. The Communications Performance Reports shall:
 - (i) be in a format agreed to by the City; and
 - (ii) summarize Project Co’s performance through the various communications activities in support of and execution of the protocols, strategies and plans developed for the Project.
- (b) Project Co shall develop an annual performance report, based on a template approved by the City, that summarizes the monthly reports and assesses DB Co’s overall compliance with Schedule 18 obligations. The annual yearly performance report shall be submitted to the City in accordance Schedule 10 – Review Procedure.

PART 5 NOTIFICATION

5.1 General

- (a) With respect to Project Activities that are reasonably anticipated to have a major impact on third party property owners, Project Co shall:
- (i) provide Notice to the City of such Project Activities at least two weeks prior to the commencement of such Project Activities;
 - (ii) provide a draft public notification at least two weeks prior to the commencement of such Project Activities to the City for review and approval; and
 - (iii) The draft notices provided by Project Co in accordance with this Section 5.1(a) shall include a comprehensive list of the elements owned by a third party which Project Co anticipates will have to be removed or relocated by the property owner, what elements can remain on the property, detailed drawings that describes the proposed Construction or Maintenance Activities (including new location of relocated items or impacts that might result from the Construction or Maintenance Activities and restoration plans), proposed timeline for the Construction or Maintenance Activities (including duration and anticipated completion), contact information to obtain additional information, and any updates or complaints relating to such Construction or Maintenance Activities.
- (b) With respect to Construction or Maintenance Activities that are reasonably anticipated to have a major impact on transit users, pedestrians, residents, traffic, and/or Stakeholders generally, Project Co shall:
- (i) provide Notice to the City of such Construction or Maintenance Activities at least 35 days prior to the commencement of such Construction or Maintenance Activities;
 - (ii) provide a draft public notification at least 35 days prior to the commencement of such Construction or Maintenance Activities to the City for review; and
 - (iii) For the purposes of this Section 5.1(b), “major impact” shall include but not be limited to overnight construction or maintenance, temporary Construction Activities, paving, commissioning activities, privately owned elements to be relocated or removed by Project Co, and transit stop relocations.
- (c) With respect to Construction or Maintenance Activities that are reasonably anticipated to have a medium impact on transit users, pedestrians, residents, traffic, and/or Stakeholders generally, Project Co shall:
- (i) provide Notice to the City of such Construction or Maintenance Activities at least 15 Business Days prior to the commencement of such Construction or Maintenance Activities;
 - (ii) provide a draft public notification at least 10 Business Days prior to the commencement of such Construction or Maintenance Activities to the City for review; and
 - (iii) For the purposes of this Section 5.1(c), “medium impact” shall include but not be limited

to, major intersection work, any disruption to water, gas and/or other utilities, and impacts from noise or dust. For clarity, the notification provided by Project Co pursuant to Section 5.1(c)(ii) shall be delivered by Project Co on behalf of the City to all affected properties and in consultation with Utility Companies, as applicable.

- (d) With respect to Construction or Maintenance Activities that are reasonably anticipated to have a minor impact on transit users, pedestrians, residents, traffic and/or Stakeholders generally, Project Co shall:
- (i) provide Notice to City of such Construction or Maintenance Activities at least five Business Days prior to the commencement of such Construction or Maintenance Activities;
 - (ii) provide a draft public notification at least 48 hours prior to the commencement of such Construction or Maintenance Activities to the City for review; and
 - (iii) For the purposes of this Section 5.1(d), “minor impact” shall include short-term lane closures, minor pedestrian detours, and access and driveway work. Project Co shall ensure that access is maintained to properties impacted by the Construction or Maintenance Activities at all times.
- (e) With respect to an incident related to Construction or Maintenance Activities that are reasonably anticipated to have an impact on Project Co employees and contractors, transit users, pedestrians, residents, traffic and/or Stakeholders generally, and with respect to which Project Co cannot reasonably provide advance notice of any kind to the City or the public (a “**Construction Activities Incident**”), Project Co shall:
- (i) immediately notify the City of such Construction or Maintenance Activities Incidents;
 - (ii) provide a draft public notification or messaging no later than 15 minutes following the commencement of such Construction or Maintenance Activities Incidents to the City for review;
 - (iii) be prepared to provide a public statement with respect to the Construction or Maintenance Activities Incidents at the request of the City;
 - (iv) be prepared to enact the Crisis Communications Plan in consultation with the City and to react quickly to provide an immediate response to all affected Stakeholders and;
 - (v) For the purposes of this Section 5.1(e), a Construction and Maintenance Activities Incident shall include but not be limited to an accident on site or a major catastrophe.
- (f) The notifications provided by Project Co pursuant to this Section 5.1, once finalized by the City, shall be delivered by Project Co on behalf of the City to all affected properties and in consultation with Utility Companies, as applicable.

PART 6 COMMUNICATIONS AND STAKEHOLDER ENGAGEMENT WORKING GROUP

6.1 Communications and Stakeholder Engagement Working Group

- (a) Project Co shall provide staff to support the communications and Stakeholder engagement activities related to the Project. These Project Co staff along with identified City communications and Stakeholder engagement staff, will form a Communications and Stakeholder Engagement Working Group (the “**Communications and Stakeholder Engagement Working Group**”).
- (b) The leads on the Communications and Stakeholder Engagement Working Group representing both the City and Project Co will be members of the Works Committee during construction to ensure that communications and Stakeholder relations issues as part of the Project are addressed in an efficient and effective manner.
- (c) The objective of the Communications and Stakeholder Engagement Working Group is for Project Co and the City to work together to develop and implement all communications plans and Stakeholder engagement and community engagement activities for the Project to:
 - (i) ensure timely, open, transparent, effective, consistent and proactive communications with Stakeholders and elected officials;
 - (ii) foster and maintain positive and constructive relationships with neighbourhoods, agencies and businesses that may be affected by decisions regarding the scope of the Project as well as Construction and Maintenance Activities; and
 - (iii) build trust and maximize Stakeholder understanding and support for the Project.
- (d) Project Co shall ensure that the Construction Manager, Design Manager and during the Maintenance Period the Maintenance Manager and any other staff from Project Co or any Project Co Party that the City may require, are made available to support the Communications and Stakeholder Engagement Working Group as required.
- (e) Within 60 days following Financial Close, the Communications and Stakeholder Engagement Working Group will convene to discuss the communications and Stakeholder engagement obligations and to identify the working relationships, roles, responsibilities, deliverables and review approvals processes for the Project.
- (f) The Communications and Stakeholder Engagement Working Group will meet once per week throughout the Construction Period, or less frequently as agreed to by the City, to plan and implement communications and Stakeholder engagement strategies for the Project, share information, discuss community relations updates, identify and plan for communications, Stakeholder engagement and Project milestones, manage issues and receive schedule updates.
- (g) The Communications and Stakeholder Engagement Working Group will meet every month throughout the Maintenance Period, or less frequently as agreed to by the City, to plan and implement communications and Stakeholder engagement strategies for the Project, share information, discuss community relations updates, identify and plan for communications, Stakeholder engagement and Project milestones, manage issues and receive schedule updates.

PART 7 PUBLIC DISCLOSURE AND MEDIA RELEASES

7.1 Public Disclosure and Media Releases

- (a) Neither Project Co nor any Project Co Parties shall issue or disseminate any media release, public announcement or public disclosure (whether for publication in the press, on the radio, television, internet or any other medium) relating to the Project, the Project Agreement, the City's activities or any related matters, without the prior written consent of the City.
- (b) Neither Project Co nor any Project Co Parties shall issue or disseminate any media release, public announcement or public disclosure (whether for publication in the press, on the radio, television, internet or any other medium) making any implicit or explicit reference to RTG whatsoever, without prior written consent from RTG.
- (c) Neither Party shall use the other Party's name or refer to the other Party, directly or indirectly, in any media release, public announcement or public disclosure (whether for publication in the press, on the radio, television, internet or any other medium) relating to the Project, the Project Agreement, the City's activities or any matter related thereto, without the prior written consent of the other Party.
- (d) Project Co shall comply and shall ensure that all Project Co Parties comply, at all times, with the City's media release and publicity protocols or guidelines, as such protocols and/or guidelines may be updated by the City from time to time.

PART 8 PERFORMANCE CRITERIA

8.1 Application of Performance Criteria

- (a) The Performance Criteria set out in Section 8.2 have been established in accordance with Schedule 20 – Construction Period Payments. Project Co shall achieve the Performance Criteria set out in Section 8.2 during the Construction Period.

8.2 Performance Criteria

- (a) Please refer to the following KPI's in Schedule 20 - Construction Period Payments for the performance criteria:

- (i) CPPC – 21.
(ii) CPPC – 22.

SCHEDULE 19

PAYMENT MECHANISM

PART A: DEFINITIONS

Section 1. Definitions

Any capitalized term not defined in this Schedule 19 shall have the meaning given to such term in the Project Agreement.

- 1.1 “**Aggregate Train Kilometres Availability Ratio**” is defined in Section 1.2 of Part D.
- 1.2 “**Annual Service Payment**” means the sum in Canadian dollars calculated in accordance with the provisions set out in Section 2 of Part B.
- 1.3 Not Used.
- 1.4 “**Annual Service Payment – Service Portion**” means the sum in Canadian dollars representing the service payment portion of the Annual Service Payment, as identified in Section 2 of Part B.
- 1.5 “**Annual Utilities Consumption Adjustment**” means the annual adjustment calculated in accordance with Section 6 of Part B of this Schedule 19.
- 1.6 “**Annual Utilities Consumption Adjustment Report**” means the annual report prepared by Project Co in accordance with Section 0 of Part B of this Schedule 19.
- 1.7 “**Annual Utilities Consumption Adjustment Review Meeting**” means an annual meeting of the Performance Review Panel for the purpose set out in Section 6.7 of Part B of this Schedule 19.
- 1.8 “**Auxiliary Facilities Occupants**” has the meaning given in Schedule 15-1 – Maintenance and Rehabilitation Requirements.
- 1.9 “**Availability Failure**” means a Train Kilometres Availability Failure.
- 1.10 “**Bedding-In Period**” means the first four Contract Months of the Maintenance Period and if applicable, the first four Contract Months following completion of Remaining Works. In respect of New Revenue Vehicles the Bedding-In Period shall be the first six Contract Months following introduction of such New Revenue Vehicles into Revenue Service.
- 1.11 “**Contract Month**” means a calendar month, except with respect to:
 - (a) the first Contract Month of the Maintenance Period, which runs from the Payment Commencement Date until the end of the calendar month in which such day falls; and
 - (b) the last Contract Month of the Maintenance Period, which runs from the first day of the calendar month in which the Expiry Date falls until the Expiry Date.
- 1.12 “**Contract Year**” means the period of 12 calendar months that commences on January 1st of each calendar year and ends on December 31st of the same calendar year, provided that:

- (a) the first Contract Year shall be such period that commences on the day following the Substantial Completion Date and ends on December 31st of the same calendar year; and
 - (b) the final Contract Year shall be such period that commences on January 1st that precedes the date on which the Project Agreement expires or is terminated, for whatever reason, and ends on the expiry or termination of the Project Agreement.
- 1.13 “**CPI-XFET**” means the Consumer Price Index excluding food, energy, and the effect of indirect taxes, as reported by Statistics Canada for Canada.
- 1.14 “**Daily Performance Report**” has the meaning given in Section 2.8 of Article 2 to Schedule 15-3 – Maintenance and Rehabilitation Requirements.
- 1.15 “**Deduction**” means a deduction made from a Monthly Service Payment in accordance with this Schedule 19.
- 1.16 “**Driver**” has the meaning given in Schedule 15 – Output Specifications.
- 1.17 “**Eligible Lifecycle Costs**” means incremental costs in respect of the replacement, refreshment and/or refurbishment during the Maintenance Period of System Infrastructure that may be reasonably attributed to a Service Level Increase.
- 1.18 “**Emergency**” has the meaning given in Schedule 1 – Definitions and Interpretation.
- 1.19 “**Escalation Factor**” means the escalation factor calculated in accordance with Section 4.1 of Part B.
- 1.20 “**Event**” means:
 - (a) a Train Kilometres Availability Failure;
 - (b) a Quality Failure; or
 - (c) an incident or state of affairs which does not meet or comply with the Performance Criteria, which is capable of becoming a Quality Failure or Service Failure.
- 1.21 “**Event of Vandalism**” has the meaning given in Appendix A, Attachment 5 to Schedule 15-3 – Maintenance and Rehabilitation Requirements.
- 1.22 “**Failure Points**” means points allocated to Project Co in respect of the occurrence of Availability Failures, Service Failures and Quality Failures which are determined by the provisions set out in Part G.
- 1.23 “**Group 1 Stations**” and “**Group 2 Stations**” are defined in Schedule 15 – Output Specifications.
- 1.24 “**Help Desk**” means the contact point established by Project Co pursuant to Appendix A – Attachment 11 of Schedule 15-3 – Maintenance and Rehabilitation Requirements for the notification of Events and other day to day matters arising during the Maintenance Period.
- 1.25 “**Inflation Base Date**” means January 1 of the year in which Financial Close takes place.

- 1.26 “**Insurance Adjustment**” means the adjustment calculated in accordance with Schedule 24 – Insurance and Performance Security Requirements.
- 1.27 “**Insurance Review Date**” has the meaning given in Schedule 24 – Insurance and Performance Security Requirements.
- 1.28 “**Joint Insurance Cost Report**” has the meaning given in Schedule 24 – Insurance and Performance Security Requirements.
- 1.29 “**Labour Industrial Aggregate Index**” means the industrial aggregate excluding unclassified businesses index for Canada, CANSIM 281-0063, as reported by Statistics Canada.
- 1.30 “**Lifecycle Escalation Factor**” means the escalation factor calculated in accordance with Section 4.2 of Part B.
- 1.31 “**Lifecycle Payment**” means the relevant amount for each Contract Month as represented in Table 3 in Appendix A in respect of the replacement, refreshment and/or refurbishment of the System Infrastructure during the Maintenance Period. For clarity, amounts identified in Column H of Table 3 in Appendix A shall be governed by Section 3.2 of Part B in this Schedule 19.
- 1.32 “**Major Quality Failure**” means a Quality Failure which has been designated in Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, Schedule 17 – Environmental Obligations, or this Schedule 19 as such.
- 1.33 “**Major Service Change**” has the meaning given in Schedule 15 – Output Specifications.
- 1.34 “**Major Service Failure**” means a Service Failure which has been designated in Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, Schedule 17 – Environmental Obligations, or this Schedule 19 as such.
- 1.35 “**Medium Quality Failure**” means a Quality Failure which has been designated in Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, Schedule 17 – Environmental Obligations, or this Schedule 19 as such.
- 1.36 “**Medium Service Failure**” means a Service Failure which has been designated in Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, Schedule 17 – Environmental Obligations, or this Schedule 19 as such.
- 1.37 “**Minor Quality Failure**” means a Quality Failure which has been designated in Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, Schedule 17 – Environmental Obligations, or this Schedule 19 as such.
- 1.38 “**Minor Service Failure**” means a Service Failure which has been designated in Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, Schedule 17 – Environmental Obligations, or this Schedule 19 as such.
- 1.39 “**Monthly Service Payment**” means the sum in Canadian Dollars payable by the City to Project Co in accordance with the Project Agreement, as calculated in Section 1.1 of Part B.

- 1.40 “**Monthly Service Payment – Capital Portion**” means the sum in Canadian dollars representing the capital payment portion of the Monthly Service Payment, as identified in Section 1.1 of Part B.
- 1.41 “**Monthly Utilities Consumption Report**” means a report to be prepared by Project Co setting out the actual Utilities consumption for the Contract Month and the cumulative Contract Year-to-date, as reported in the Performance Monitoring Report for the Contract Month.
- 1.42 “**Non-Project Co Cause**” has the meaning given in Section 2 of this Part A.
- 1.43 “**Off-Peak Period**” has the meaning given in Schedule 15-1 – Technical Terms and Reference Documents.
- 1.44 “**Off-Peak Period Train Kilometres Availability Ratio**” is defined in Section 1.5 of Part D.
- 1.45 “**Operations Service Plan**” has the meaning given in Attachment 1 of Appendix A to Schedule 15-3 – Maintenance and Rehabilitation Requirements.
- 1.46 “**Payment Commencement Date**” has the meaning given in Schedule 1 – Definitions and Interpretation.
- 1.47 “**Peak Period**” has the meaning given in Schedule 15-1 – Technical Terms and Reference Documents.
- 1.48 “**Peak Period Train Kilometres Availability Ratio**” is defined in Section 1.4 of Part D.
- 1.49 “**Performance Criteria**” means a description in Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, Schedule 17 – Environmental Obligations, or this Schedule 19 of the level of performance that Project Co must achieve to attain compliance with the relevant output specification.
- 1.50 “**Permanent Repair**” means Rectification where a Temporary Repair has been permitted and carried out pursuant to Section 3 of Part E.
- 1.51 “**Quality Failure**” means any failure by Project Co to provide the Maintenance and Rehabilitation Services in accordance with any Performance Criteria designated as Failure Type “QF” in Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, Schedule 17 – Environmental Obligations, or this Schedule 19, except where such failure is due to a Non-Project Co Cause.
- 1.52 “**Quality Failure Deduction**” means a Deduction which may be made in respect of a Quality Failure.
- 1.53 “**Rectification**” means, following the occurrence of an Event and where rectification is applicable in accordance with Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, Schedule 17 – Environmental Obligations, or this Schedule 19, making good the Event so that the subject matter of the Event complies with the levels of service required pursuant to the Project Agreement. Without prejudice to the generality of the foregoing this shall include (a) restoring any functional capability which has been disabled or is otherwise not in compliance with the relevant Schedule; (b) repairing any defect, hazard, or

other condition which was not in compliance with the relevant Schedule; and (c) formally notifying the Help Desk that Rectification has been completed; and “Rectify” or “Rectified” shall be construed accordingly.

- 1.54 **“Rectification Time”** means the period specified in Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, Schedule 17 – Environmental Obligations, or this Schedule 19 within which Rectification of the relevant Event must be completed, calculated from the time that such Event is reported to the Help Desk. For the avoidance of doubt, if no period for Rectification is specified in any of the above mentioned Schedules in respect of the relevant Event, no Rectification Time applies.
- 1.55 **“Remedial Period”** means the period allowed for remedying a Quality Failure in accordance with Section 1.3 of Part E.
- 1.56 **“Response”** means, following the notification of the occurrence of an Event and where response is applicable in accordance with Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, Schedule 17 – Environmental Obligations, or this Schedule 19, the following actions by Project Co:
- (a) establishing the location, investigating the nature and cause of the Event and attending the site if necessary;
 - (b) appointing a suitably qualified, experienced and accountable person to assess the situation who, within reasonable limits, is empowered to take or to authorize any required action;
 - (c) taking any necessary actions to make the non-compliant system or item safe and secure, thereby as a minimum fulfilling all health and safety requirements;
 - (d) when necessary, giving the City Representative an assessment of the problem, the action taken, details of any work required with timescales and any limitations that this may impose on the Project Co System Infrastructure and the Maintenance and Rehabilitation Services; and
 - (e) formally advising the Help Desk that the Response has been completed.
- 1.57 **“Response Time”** means the time required by Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, Schedule 17 – Environmental Obligations, or this Schedule 19 for Project Co to complete its Response measured from when an Event is reported to the Help Desk.
- 1.58 **“Revenue Service”** has the meaning given in Schedule 15-1 – Output Specifications: Technical Terms and Reference Documents.
- 1.59 **“Revenue Service Train Kilometres”** means the total distance travelled by Trains in Revenue Service during a Contract Month, measured in kilometres and reported in the Monthly Performance Monitoring Report for that Contract Month. For clarity, Revenue Service Train Kilometres exclude ad-hoc activities required by the Operator (for example, additional kilometers for training of Operator staff, including Drivers) but include distances travelled by Trains for the purposes of entering into or exiting from Revenue Service.

- 1.60 “**Revenue Vehicles**” has the meaning given in Schedule 15 – Output Specifications.
- 1.61 “**RVSC Warranty Failure**” means a failure in a New Revenue Vehicle(s) causing a Train Kilometres Availability Failure and which Project Co can demonstrate to the City has been agreed or determined to be the responsibility of the Vehicle Supplier under Section 14 of Part 1 of the Revenue Vehicle Supply Contract. To the extent any such agreement or determination only occurs after Deductions have been levied for a Contract Month and which would have affected the level of such Deductions, an appropriate reconciliation adjustment shall be made in the next Monthly Service Payment to occur.
- 1.62 “**Scheduled Revenue Service Train Kilometres**” means the total Revenue Service Train Kilometres required in a Contract Month by the City through the booking process set out in Article 4.4 of Appendix A to Schedule 15-3 – Maintenance and Rehabilitation Requirements, measured in kilometres and reported in the Monthly Performance Monitoring Report for that Contract Month.
- 1.63 “**Security Operations Office**” has the meaning given in Schedule 15-1 – Technical Terms and Reference Documents.
- 1.64 “**Service Failure**” means any failure by Project Co to provide the Maintenance and Rehabilitation Services in accordance with Performance Criteria designated Failure Type “SF” in Schedule 11 – Integrated Management System Requirements, Schedule 15-3 – Maintenance and Rehabilitation Requirements, or Schedule 17 – Environmental Obligations and which, where a Response Time or Rectification Time applies, has not been responded to or rectified (as the case may be) within the relevant time, except where such failure is due to a Non-Project Co Cause. For the avoidance of doubt, where no Response Time and/or Rectification Time applies (for example, in respect of scheduled activities) there shall be a Service Failure at the point at which the non-compliance occurred (for example, non-performance of the scheduled activity by the scheduled time).
- 1.65 “**Service Failure Deduction**” means a Deduction which may be made in respect of a Service Failure.
- 1.66 “**Service Level**” has the meaning given in Schedule 15-1 – Technical Terms and Reference Document.
- 1.67 “**Service Level Decrease**” means a circumstance in any Contract Year where Project Co is required to provide a Service Level less than the Service Level contemplated for that Contract Year by the Operations Service Plan in effect at Financial Close.
- 1.68 “**Service Level Increase**” means a circumstance in any Contract Year where Project Co is required, to provide a Service Level in excess of the Service Level contemplated for that Contract Year by the Operations Service Plan in effect at Financial Close.
- 1.69 “**Station**” has the meaning given in Schedule 1 – Definitions and Interpretation.
- 1.70 “**System Event**” means an event identified as such in Table 1 in Section 1.8 of Part D. For the avoidance of doubt, a System Event is classified as a Train Kilometres Availability Failure.

- 1.71 “**Target Utilities Consumption Rates**” means the consumption rates for each of the Utilities in Table 4 in Appendix A of this Schedule 19.
- 1.72 “**Temporary Repair**” means, in respect of the occurrence of an Event which results in a Service Failure, Quality Failure, or Availability Failure, works of a temporary nature that do not constitute Rectification but temporarily allow for safe use of the affected elements of the System Infrastructure and substantially make good the relevant Event for the period until a Permanent Repair can be undertaken.
- 1.73 “**Total Train Kilometres**” means the total distance travelled by Trains in Revenue Service and for ad-hoc activities required by the Operator, during a Contract Month, measured in kilometres and reported by the Monthly Performance Monitoring Report for that Contract Month.
- 1.74 “**Train**” has the meaning given in Schedule 15-1 – Technical Terms and Reference Document.
- 1.75 “**Train Kilometres Availability Failure**” means any failure of the System Infrastructure contributing to the inability to attain the Scheduled Revenue Service Train Kilometres for a Contract Month, other than by reason of a Non-Project Co Cause. For the avoidance of doubt, Train Kilometres Availability Failures include the occurrence of System Events.
- 1.76 “**Train Kilometres Availability Failure Deduction**” means a Deduction calculated in accordance with Section 1.1 of Part D.
- 1.77 “**Un-Adjusted Service Payment**” means the amount that would be calculated for the relevant Contract Month in accordance with the formula set out in Section 1.1 of Part B, without applying the sums represented by the symbols ΣD or AUA .
- 1.78 “**Utilities**” when used in this Schedule 19 only means metered electricity, natural gas, propane gas and potable water delivered to the Project during the Maintenance Period.
- 1.79 “**Utility Invoices**” are the invoices paid by the City to a Utility company for the consumption of Utilities for the Project during the Maintenance Period.
- 1.80 “**Weekday**” means Monday, Tuesday, Wednesday, Thursday, or Friday.

Section 2. Non-Project Co Causes

- 2.1 Subject to Sections 2.2(c) and 2.4 of this Part A, for the purposes of this Schedule 19, a Non-Project Co Cause is one of the following issues or events, to the extent that such issue or event causes a Train Kilometres Availability Failure, Quality Failure, or Service Failure:
 - (a) an action or order issued by the Operator or Governmental Authority, including:
 - (i) slowing down, re-routing or stopping a Train service from its schedule;
 - (ii) closing or partially closing a Station or Stop; and
 - (iii) any action or orders resulting from an Emergency;
 - (b) with regards to Passengers:

- (i) Passenger requests for emergency stops;
 - (ii) sick or injured Passengers requiring medical attention; or
 - (iii) attendance of Operator's security staff or Emergency Services to respond to Passenger actions;
 - (iv) Passengers holding open the doors of Revenue Vehicles at a platform beyond the scheduled dwell time provided that Project Co has not benefited from a relief under Part F of Section 4.1 of Schedule 19;
- (c) any blockage of the Guideway, including intersections, caused by:
- (i) a pedestrian, road or rail vehicle, vehicle loads (including spillages), failed traffic signal;
 - (ii) objects, except where those objects should have been identified by Project Co as part of its periodic inspection process and subsequently removed by Project Co;
- (d) Events of Vandalism;
- (e) the unlawful or negligent acts or omissions of System Users, Protesters and Trespassers subject to Section 9.7(c) of the Project Agreement, Governmental Authorities, Additional Contractors, Third Party Contractors, Operator or Auxiliary Facility Occupants; for the avoidance of doubt, in respect of this Section 2.1(e) these include:
- (i) any breach or failure to comply with by-laws applicable to System Users; and
 - (ii) failure by any person who is subject to the Standard Operating Procedures and/or Capital Railway Rules to act in accordance with the Standard Operating Procedures and/or Capital Railway Rules;
- (f) the actions of Additional Contractors, subject to Section 9.8 of the Project Agreement, provided that if the City has assigned certain responsibilities to Project Co in accordance with Section 9.8 of the Project Agreement, then a Non-Project Co Cause shall only apply where the City fails to carry out its responsibilities in Section 9.8(d) of the Project Agreement;
- (g) conditions exceeding the operating environmental parameters specified in Section 4.3(b) of Part 1 of Schedule 15-2 – Design and Construction Requirements that result in the degradation of the performance of the Revenue Vehicles;
- (h) interruption to the Operation, Maintenance and Rehabilitation Services caused by loss of utility service or electrical power outside the nominal range or lack of supply of diesel, including lawful imposition of restrictions by a Governmental Authority;
- (i) Train Kilometres Availability Failures caused by the City or the Operator in connection with Revenue Vehicle Final Acceptance Testing conducted during Revenue Service;

- (j) Train Kilometres Availability Failures caused by the Operator failing to implement a catch-up mode of operation in accordance with the schedule regulation protocol of the Standard Operating Procedures; and
 - (k) A Major Maintenance Shutdown, subject to Project Co receiving written approval from the City in accordance with Section 1.5(e) of Appendix A to Schedule 15-3 – Maintenance and Rehabilitation Requirements.
- 2.2 Project Co shall only be entitled to any relief and a Non-Project Co Cause shall only be applicable pursuant to this Section 2 to the extent that,
- (a) the issue or event described in Section 2.1 of this Part A,
 - (i) was not caused or contributed to by any act or omission of Project Co or any Project Co Party;
 - (ii) was not caused or contributed to by any Province Person acting in accordance with a written recommendation or instruction of Project Co or any Project Co Party; or
 - (iii) could not have been prevented or mitigated by the proper performance of Project Co's obligations under the Project Agreement;
 - (b) Project Co has taken, and continues to take, commercially-reasonable steps to mitigate the consequences of the Non-Project Co Cause, and, in respect of Section 2.1(g) of this Part A only, including implementation of commercially-reasonable advice from the Revenue Vehicle Manufacturer; and
 - (c) Project Co is not entitled to compensation payable pursuant to any insurance policy that clearly and expressly by the policy's terms reimburses Project Co for the Deductions that would be applied by the City in respect of such Non-Project Co Cause, or would have been entitled to recover under any insurance policy that clearly and expressly by the policy's terms reimburses Project Co for Deductions had it complied with the requirements of the Project Agreement in respect of insurance or the terms of any policy of insurance required under the Project Agreement
- 2.3 For clarity, if the issue or event described in Section 2.1 of this Part A entitles Project Co to relief and/or compensation under Sections 40, 41 or 42 of the Project Agreement, Project Co shall only be entitled to rely on Non-Project Co Causes to the extent that Sections 40, 41 or 42 of the Project Agreement do not apply.
- 2.4 Following an issue or event described in Section 2.1 of this Part A, Project Co shall resume performance of the Maintenance and Rehabilitation Services as soon as practicable.
- 2.5 For the avoidance of doubt, to the extent that an issue or event described in Section 2.1 of this Part A does not directly prevent Project Co's ability to respond to or rectify (as the case may be) an Event , Project Co shall not be relieved of any resulting Quality Failure or Service Failure by reason of any Non-Project Co Cause (as applicable).

PART B: CALCULATION OF SERVICE PAYMENTS

Section 1. Monthly Service Payment

- 1.1 The Monthly Service Payment shall be payable in respect of each Contract Month during the Maintenance Period. The Monthly Service Payment shall be calculated in accordance with the following formula:

$$MSP_n = \left(\frac{ASP_n}{12} \right) + MSPcap_n + LCP_n - \Sigma D \pm AUA$$

Where:

MSP_n Means the Monthly Service Payment for the Contract Month for which the formula is to be applied.

ASP_n Means the applicable Annual Service Payment for the Service Level in effect for the relevant Contract Year, calculated in accordance with the provisions set out in Section 2.1 of this Part B.

MSPcap_n Means the Monthly Service Payment – Capital Portion for the relevant Contract Month, as referenced in Column B of Table 1 in Appendix A

LCP_n Means the Lifecycle Payment for the relevant Contract Month, calculated in accordance with the provisions set out in Section 3.1 of this Part B.

ΣD Means the sum of Train Kilometres Availability Failure Deductions, Quality Failure Deductions, and Service Failure Deductions in respect of the relevant Contract Month.

AUA Means any applicable Annual Utility Adjustment arising pursuant to the terms of Section 6 of this Schedule 19.

- 1.2 If the calculation prescribed by Section 1.1 of Part B to this Schedule 19 yields an amount for a Contract Month which is a negative number, then the Monthly Service Payment for the relevant Contract Month shall be deemed to be zero (0).

Section 2. Annual Service Payment

- 2.1 The Annual Service Payment for any Contract Year shall be calculated in accordance with the following formula:

$$ASP_n = (ASP_{ser_o} * ESC_n) + ((SPV_1 + SPV_2) * ESC_n) + BRIC + IA$$

Where:

ASP_n Means the total, escalated Annual Service Payment for the relevant Contract Year.

<i>ASP_{ser}</i>	Means the un-escalated Annual Service Payment – Service Portion for the Service Level in effect during the relevant Contract Year, as referenced in Column B of Table 2 in Appendix A.
<i>ESC_n</i>	Means the Escalation Factor for the relevant Contract Year as calculated in accordance with Section 4.1 of this Part B.
<i>SPV₁</i>	Means for each Contract Month the amount referenced in Column C of Table 10 in Appendix A.
<i>SPV₂</i>	Means an amount equal to [\$REDACTED] for Contract Months 1 to 312, inclusive, and equal to [\$REDACTED] for all other Contract Months.
<i>BRIC</i>	Means the annual Base Relevant Insurance Cost as set out in the Financial Model being an amount equal to [\$REDACTED] for all Contract Years other than Contract Year 1 and Contract Year 28 for which this amount shall be equal to [\$REDACTED] .
<i>IA</i>	Means the Insurance Adjustment calculated in accordance with Section 2.2 and 2.3 of this Part B.

- 2.2 No later than 60 days prior to each Insurance Review Date, Project Co will require its insurance broker to prepare and submit to the City the Joint Insurance Cost Report. The City and Project Co, acting reasonably, will agree on the Insurance Adjustment to be applied to the Annual Service Payment for the next Contract Year.
- 2.3 The Insurance Adjustment will constitute an adjustment to the Annual Service Payment on the Payment Commencement Date and on each Insurance Review Date thereafter. The Insurance Adjustment will be applied in accordance with this Part B.

Section 3. Lifecycle Payment

- 3.1 The Lifecycle Payment applicable for any Contract Month *n* shall be calculated in accordance with the following formula:

$$LCP_n = (LCP_{Month\ n} * PESCLC * LCESC_n) + (LCP_{Month\ n} * (1 - PESC\ LC))$$

Where:

<i>LCP_n</i>	Means the total, escalated Lifecycle Payment applicable for the relevant Contract Month <i>n</i> ;
<i>LCP_{Month\ n}</i>	Means the Lifecycle Payment for the relevant Contract Month <i>n</i> as set out in Table 3 in Appendix A for the Service Level identified by the City prior to commencement of the Maintenance Period;
<i>PESCLC</i>	Means [REDACTED]% ; and

- LCESC_n* Means the Lifecycle Escalation Factor for the relevant Contract Year as calculated in accordance with Section 4.2 of this Part B.
- 3.2 Amounts for Lifecycle Payments identified in Column H of Table 3 in Appendix A shall apply irrespective of the Service Level in operations during the relevant Contract Months and shall only be payable by the City to Project Co in the event that works identified in Section 1.5(b) of Schedule 15-3 are undertaken by Project Co. In the event that such works are not required due to renewal of the AZR Exemption or otherwise, amounts identified in Column H of Table 3 in Appendix shall not be payable by the City.

Section 4. Escalation Factor

- 4.1 The Escalation Factor shall be calculated in accordance with the following formula:

$$ESC_n = \frac{(CPI_n * W_{CPI})}{(CPI_o)} + \frac{(Labour_n * W_L)}{(Labour_o)}$$

Where:

<i>ESC_n</i>	Means the Escalation Factor applicable to the relevant Contract Year <i>n</i> .
<i>CPI_n</i>	Means the value of CPI-XFET on January 1 of the relevant Contract Year “ <i>n</i> ”, to be determined by reference to the most recent available monthly data published by Statistics Canada for the relevant index, or failing such publication, such other index as the Parties may agree, or as may be determined in accordance with Schedule 26 – Dispute Resolution Procedure, which most closely resembles such index.
<i>CPI_o</i>	Means the value of CPI-XFET on the Inflation Base Date, to be determined by reference to the most recent available monthly data published by Statistics Canada for the relevant index at the Inflation Base Date.
<i>W_{CPI}</i>	Means [REDACTED] %.
<i>Labour_n</i>	Means the value of the Labour Industrial Aggregate Index on January 1 of the relevant Contract Year “ <i>n</i> ”, to be determined by reference to the most recent available monthly data published by Statistics Canada for the relevant index, or failing such publication, such other index as the Parties may agree, or as may be determined in accordance with Schedule 26 – Dispute Resolution Procedure, which most closely resembles such index.
<i>W_L</i>	Means [REDACTED] %.
<i>Labour_o</i>	Means the value of the Labour Industrial Aggregate Index on the Inflation Base Date, to be determined by reference to the most recent available monthly data published by Statistics Canada for the relevant index at the Inflation Base Date, or failing such publication, such other index as the Parties may agree, or as may be determined in accordance with Schedule 26 – Dispute Resolution Procedure,

which most closely resembles such index.

- 4.2 The Lifecycle Escalation Factor shall be calculated in accordance with the following formula:

$$LCESC_n = \frac{(CPI_n * WLC_{CPI})}{(CPI_o)} + \frac{(Labour_n * WLC_L)}{(Labour_o)}$$

Where:

$LCESC_n$	Means the Lifecycle Escalation Factor applicable to the relevant Contract Year n .
CPI_n	Means the value of CPI-XFET on January 1 of the relevant Contract Year “n”, to be determined by reference to the most recent available monthly data published by Statistics Canada for the relevant index, or failing such publication, such other index as the Parties may agree, or as may be determined in accordance with Schedule 26 – Dispute Resolution Procedure, which most closely resembles such index.
WLC_{CPI}	Means [REDACTED] %.
$Labour_n$	Means the value of the Labour Industrial Aggregate Index on January 1 of the relevant Contract Year “n”, to be determined by reference to the most recent available monthly data published by Statistics Canada for the relevant index, or failing such publication, such other index as the Parties may agree, or as may be determined in accordance with Schedule 26 – Dispute Resolution Procedure, which most closely resembles such index.
WLC_L	Means [REDACTED] %.
CPI_o	Means the value of CPI-XFET on the Inflation Base Date, to be determined by reference to the most recent available monthly data published by Statistics Canada for the relevant index at the Inflation Base Date, or failing such publication, such other index as the Parties may agree, or as may be determined in accordance with Schedule 26 – Dispute Resolution Procedure, which most closely resembles such index.
$Labour_o$	Means the value of the Labour Industrial Aggregate Index on the Inflation Base Date, to be determined by reference to the most recent available monthly data published by Statistics Canada for the relevant index at the Inflation Base Date, or failing such publication, such other index as the Parties may agree, or as may be determined in accordance with Schedule 26 – Dispute Resolution Procedure, which most closely resembles such index.

Section 5. Changes in Service Level and Partial Years

- 5.1 If the Service Level is changed during a Contract Year resulting in a change in the Annual Service Payment during such Contract Year, the formula in Section 2.1 of this Part B above shall be applied by pro-rating the Annual Service Payment for such Contract Year based on the number of days in the Contract Year each Service Level is in effect.
- 5.2 With respect to the Contract Months in which:
 - (a) the Payment Commencement Date, and
 - (b) the Expiry Date,

occur, unless such date falls on the first or last day of the Contract Month (respectively), a pro rata adjustment to the Monthly Service Payment shall be made to reflect the actual number of days in the relevant Contract Month.

Section 6. Annual Utility Adjustment

- 6.1 At the end of each Contract Year during the Maintenance Period Project Co shall calculate the Annual Utilities Consumption Adjustment in accordance with this Section 6. The Annual Utilities Consumption Adjustment shall be determined and applied to the Annual Service Payment for the next Contract Year to account for variations between actual Utilities consumption rates and Target Utilities Consumption Rates.
- 6.2 Where it is established in accordance with this Section 6 that an annual adjustment arises, the adjustment shall be given effect by way of an increase or decrease to the next Monthly Service Payment(s), as calculated in Section 1.1 of Part B of this Schedule 19. In the event that a relevant adjustment arises in respect of the final Contract Year, the adjustment shall be made pursuant to Sections 6.11 and 6.12 of this Schedule 19.
- 6.3 The Annual Utilities Consumption Adjustment shall be calculated as follows:

$$\begin{aligned} \text{Annual Utilities Consumption Adjustment} = & \\ \text{Annual Natural Gas Consumption Adjustment} + & \\ \text{Annual Electricity Consumption Adjustment} + & \\ \text{Annual Propane Gas Consumption Adjustment} + & \\ \text{Annual Potable Water Consumption Adjustment} \end{aligned}$$

- 6.4 Project Co shall prepare and maintain a Monthly Utilities Consumption Report that sets out the actual Utilities consumption for the relevant Contract Month and Contract Year-to-date and shall use the Monthly Utilities Consumption Report to calculate the Annual Utilities Consumption Adjustment, if any, following the end of each Contract Year.
- 6.5 Notwithstanding actual unit costs for Utilities applicable in a Contract Year, the Annual Utilities Consumption Adjustment shall be based on unit costs for Utilities as at Financial Close (indexed). For clarity, these unit costs are indicated in Table 5 of Appendix A to this Schedule 19. Project Co shall have the right to request information from the City, as may reasonably be required, on the calculation of the unit costs of each Utilities, as applicable.
- 6.6 Project Co shall provide the City with a draft Annual Utilities Consumption Adjustment Report, as per Table 6, Table 7, Table 8, and Table 9 provided in Appendix A of this Schedule 19, within

40 Business Days following the end of each Contract Year, which report shall include copies of all working papers to fully support the calculation of the Annual Utilities Consumption Adjustment for the relevant Contract Year.

- 6.7 As soon as practicable and in any event within 40 Business Days following the end of each Contract Year (or on such other date as may be agreed between the City and Project Co), Project Co and the City shall convene an Annual Utilities Consumption Adjustment Review Meeting to be attended by the City representatives and Project Co representatives. At the Annual Utilities Consumption Adjustment Review Meeting, Project Co shall present the draft Annual Utilities Consumption Adjustment Report to the City, and the City and Project Co shall discuss the Annual Utilities Consumption Adjustment, if any, for the preceding Contract Year.
- 6.8 Project Co shall assist the City representatives and afford the City representatives such information and access as may reasonably be required for the City representatives to confirm the draft Annual Utilities Consumption Adjustment Report.
- 6.9 The City shall promptly notify Project Co of the details of any disagreement of all or any aspect of the draft Annual Utilities Consumption Adjustment Report, and the Parties shall then seek to agree to any matters in dispute, but where matters cannot be resolved within a 20 Business Day period (or such other period as may be otherwise agreed between the City representatives and the Project Co representatives, acting reasonably) they shall be dealt with in accordance with the Dispute Resolution Procedure.
- 6.10 Subject to Section 6.9 of Part B of this Schedule 19, within 20 Business Days following each Annual Utilities Consumption Adjustment Meeting, or within such period as may be otherwise agreed between the City representatives and the Project Co representatives, acting reasonably:
 - (a) The City shall confirm its acceptance of all or any aspect of the Annual Utilities Consumption Adjustment Report; and
 - (b) Project Co and the City shall agree to any Annual Utilities Consumption Adjustment.
- 6.11 At the beginning of the final Contract Year, the City shall estimate, acting reasonably, the adjustments to the Monthly Service Payments for each Contract Month. The City may withhold the amounts that it has reasonably estimated for such adjustments from amounts paid to Project Co during each Contract Month of the final Contract Year.
- 6.12 Within 10 Business Days of receipt by the City of the applicable Annual Utilities Consumption Adjustment Report for the final Contract Year, the City Representative shall either:
 - (a) determine and advise Project Co that the Annual Utilities Consumption Adjustment Report is approved by the City and perform a reconciliation between the amount payable based on such Annual Utilities Consumption Adjustment Report and the amount(s) the City previously paid in respect of the final Contract Year. Based on such reconciliation, either the City or Project Co shall pay to the other Party the amount properly owing in accordance with such reconciliation; or
 - (b) if the City disputes Project Co's entitlement to any part of the amounts set out therein, notify Project Co in writing of that part of the amounts (insofar as at the time of such notice the City is reasonably able to quantify it) which the City disputes and submit to

Project Co such supporting documentation as is reasonably required to substantiate and confirm such claim. In such event, the City Representative shall perform a reconciliation between the undisputed amount payable based on such Annual Utilities Consumption Adjustment Report and the amount the City previously paid in respect of the final Contract Year. Based on such reconciliation, either the City or Project Co shall pay to the other Party the amount properly owing in accordance with such reconciliation, provided that the City shall withhold payment of any disputed amount pending agreement or determination of Project Co's entitlement to the disputed amount in accordance with Section 6.13 of this Schedule 19.

- 6.13 If the City, acting in good faith, disputes all or any part of an Annual Utilities Consumption Adjustment Report and/or the Monthly Service Payments payable thereunder, it shall notify Project Co in writing of that part of the amounts (insofar as at the time of such notice the City is reasonably able to quantify it) which the City disputes and submit to Project Co such supporting documentation as is reasonably required to substantiate and confirm such claim. The Parties shall use commercially reasonable efforts to resolve the dispute in question within 10 Business Days of the aforesaid notice of the dispute. If they fail to so resolve the dispute within such period, the Dispute may be referred for resolution in accordance with the Dispute Resolution Procedure. Following resolution of the dispute, any amount which has been paid by the City that is determined not to have been payable shall be paid forthwith by Project Co to the City and Project Co shall indemnify the City from and against any damages suffered or incurred resulting from such overpayment by the City on the basis that the due date was the date of the overpayment by the City. Following resolution of the dispute, any amount which has been withheld by the City that is determined to have been payable shall be paid forthwith by the City to Project Co and the City shall indemnify Project Co from and against any damages suffered or incurred resulting from such withholding by the City on the basis that the due date was the date upon which such amount became payable to Project Co.
- 6.14 Project Co may request an adjustment to any of the Target Utilities Consumption Rates on the following dates (“Target Utilities Consumption Rates Reset Milestone”):
 - (a) the first (1st) anniversary of the Payment Commencement Date;
 - (b) the sixth (6th) anniversary of the Payment Commencement Date;
 - (c) the eleventh (11th) anniversary of the Payment Commencement Date;
 - (d) the sixteenth (16th) anniversary of the Payment Commencement Date; and
 - (e) the twenty first (21st) anniversary of the Payment Commencement Date.
- 6.15 Each request for an adjustment to any of the Target Utilities Consumption Rates must be submitted in writing to the City no later than 10 days before a Target Utilities Consumption Rates Reset Milestone and must include a detailed description and sufficient documentation for the City to consider the request. Such evidence shall include, without being limited to, demonstration of consistent variations between actual Utilities consumption rates and Target Utilities Consumption Rates.

- 6.16 In no circumstance shall a request for an adjustment to any of the Target Utilities Consumption Rates include an increase of more than [REDACTED]% to the relevant Target Utilities Consumption Rate applicable at the time of the request.
- 6.17 A request for an adjustment to any of the Target Utilities Consumption Rates shall be reviewed by the City and shall only become effective with the City's written consent, which consent may not be unreasonably withheld.

Section 7. Interim Substantial Completion

- 7.1 As outlined in Section 25.15(b)(iv) of the Project Agreement, upon delivery by Project co of a valid Interim Substantial Completion Notice, the parties shall proceed to execute a Variation (“**Interim Maintenance Variation**”). The following key principles shall form the basis for such Interim Maintenance Variation:
 - (a) The Interim Maintenance Variation shall include a detailed schedule of activities, along with durations, start dates and end dates, required for completion of the Remaining Works;
 - (b) The Interim Maintenance Variation shall specify the period commencing at Interim Substantial Completion and ending upon completion of the Remaining Works (“**Interim Maintenance Period**”) during which Project Co’s Maintenance and Rehabilitation Services shall be based on Service Level 5 as defined in Attachment 2 in Appendix A to Schedule 15-3. Following conclusion of the Interim Maintenance Period, Project Co shall be responsible for undertaking the Maintenance and Rehabilitation Services for a period of 27 years with payments as outlined in this Schedule 19;
 - (c) The Parties shall agree in the Interim Maintenance Variation that payments to be made by the City to Project Co during the Interim Maintenance Period shall only include the following:
 - (i) Interim ASP – Service Portion: The magnitude of the Interim ASP – Service Portion amount to be paid to Project Co on a monthly basis shall be proportionally determined based on the Scheduled Revenue Service Train Kilometres to be operated during the Interim Maintenance Period relative to the Scheduled Revenue Service Train Kilometres contemplated for Service Level 1. In no event shall the Interim ASP – Service Portion exceed [REDACTED]% of the ASP – Service Portion associated with Service Level 1;
 - (ii) Interim ASP – Capital Portion: The amount and timing of the Interim ASP – Capital Portion shall be agreed to by the Parties and shall only include such amounts as necessary to maintain the Base Case Equity IRR when taking into consideration the Interim Maintenance Period and the ensuing 27-year period; and
 - (iii) Interim Lifecycle Payments: To the extent necessary, such amounts shall be agreed to by Project Co and the City upon development of the Interim Maintenance Variation only to the extent that the Interim Maintenance Period exceeds one year in duration. For clarity, for the first 12 months of the Interim Maintenance Period, no Interim Lifecycle Payments shall be made.

PART C: DEDUCTIONS FROM MONTHLY SERVICE PAYMENTS - GENERAL

Section 1. Entitlement to Make Deductions

- 1.1 If at any time during the Maintenance Period a Quality Failure, Service Failure or Availability Failure shall occur, the City shall be entitled to make a Deduction from the relevant Monthly Service Payment in respect of that Quality Failure, Service Failure or Availability Failure.
- 1.2 The maximum aggregate of all Deductions that the City can make from a Monthly Service Payment in respect of any Contract Month shall be the Un-adjusted Service Payment relating to that Contract Month.
- 1.3 During the Bedding-In Period, the amount of any Deductions in respect of Availability Failures occurring shall be reduced by [REDACTED]%. For the avoidance of doubt, there shall be no relief from Deductions in respect of Quality Failures and Service Failures or any Failure Points during the Bedding-In Period.

Section 2. Classification of Deductions

- 2.1 Subject to Section 2.2 of this Part C, the classification of an Event as a potential Quality Failure, Service Failure, or Availability Failure (or a combination thereof) shall be made at the time at which the occurrence of the Event is reported to the Help Desk. An Event which is incorrectly classified may be re-classified with the approval of the City Representative and the Project Co Representative, acting reasonably, in which case the applicable Monthly Performance Monitoring Report and Daily Performance Report will be revised accordingly.
- 2.2 A Train Kilometres Availability Failure is not required to be reported to the Help Desk. Train Kilometres Availability Failures will be determined through the Daily Performance Report process and summarized for Payment Mechanism calculation purposes in the Monthly Performance Monitoring Report.

PART D: DEDUCTIONS FOR VEHICLE UNAVAILABILITY

Section 1. Train Kilometres Availability Failure Deductions

- 1.1 The Train Kilometres Availability Failure Deduction in respect of a Contract Month n , shall be calculated in accordance with the following formula:

$$VKAFD_n = [VKDF_{A,n} * (USP_n)] + \sum SED$$

Where:

$VKAFD_n$	Means the Train Kilometres Availability Failure Deduction applicable to Contract Month n
$VKDF_{A,n}$	Means the Deduction Factor in respect of Train Kilometres Availability Failures during Contract Month n , determined in accordance with Section 1.2 of this Part D.
USP_n	Means the Un-Adjusted Service Payment for Contract Month n .
$\sum SED$	Means the sum of System Event Deductions applicable to Contract Month n , calculated in accordance with Section 1.7 and Section 1.10 of this Part D.

- 1.2 The Deduction Factor in respect of Train Kilometres Availability Failures during Contract Month n ($VKDF_n$) shall be determined by calculating the Aggregate Train Kilometres Availability Ratio for Contract Month n , in accordance with the formula set out below, and applying the corresponding Deduction Factor from Table 1 in Appendix B.

$$VKAR_{A,n} = (VKAR_{P,n} * 0.50) + (VKAR_{OP,n} * 0.50)$$

Where:

$VKAR_{A,n}$	Means the Aggregate Train Kilometres Availability Ratio during Contract Month n .
$VKAR_{P,n}$	Means the Peak Period Train Kilometres Availability Ratio during Contract Month n .
$VKAR_{OP,n}$	Means the Off-Peak Period Train Kilometres Availability Ratio during Contract Month n .

- 1.3 For the purposes of Section 1.2 of this Part D, when selecting a Deduction Factor from Table 1 in Appendix B, the Aggregate Train Kilometres Availability Ratio shall be rounded up to the nearest [REDACTED] %.
- 1.4 The Peak Period Train Kilometres Availability Ratio for Contract Month n shall be calculated in accordance with the formula set out below.

$$VKAR_{P,n} = \frac{(Rkm_{P,n} + NPCCkm_{P,n})}{Skm_{P,n}}$$

Where:

$VKAR_{P,n}$ Means the Peak Period Train Kilometres Availability Ratio during Contract Month n .

$Rkm_{P,n}$ Means the total amount of Revenue Service Train Kilometres during Peak Periods for Contract Month n .

$NPCCkm_{P,n}$ Means the number of Scheduled Revenue Service Train Kilometres which were “missed” or not achieved at Peak Periods during Contract Month n and which are attributed in the relevant Monthly Performance Monitoring Report as being due to a Non-Project Co Cause.

$Skm_{P,n}$ Means the total Scheduled Revenue Service Train Kilometres during Peak Periods for Contract Month n .

- 1.5 The Off-Peak Period Train Kilometres Availability Ratio for Contract Month n shall be calculated in accordance with the formula set out below.

$$VKAR_{OP,n} = \frac{(Rkm_{OP,n} + NPCCkm_{OP,n})}{Skm_{OP,n}}$$

Where:

$VKAR_{OP,n}$ Means the Off-Peak Period Train Kilometres Availability Ratio service during Contract Month n .

$Rkm_{OP,n}$ Means the total amount of Revenue Service Train Kilometres during Off-Peak Periods for Contract Month n .

$NPCCkm_{OP,n}$ Means the number of Scheduled Revenue Service Train Kilometres which were “missed” or not achieved at Off-Peak Periods during Contract Month n and which are attributed in the relevant Monthly Performance Monitoring Report as being due to a Non-Project Co Cause

$Skm_{OP,n}$ Means the total Scheduled Revenue Service Train Kilometres during Off-Peak Periods for Contract Month n .

- 1.6 In Contract Months where Train Kilometres Availability Failures arise in part due to RVSC Warranty Failures:

- (a) the Train Kilometres Availability Failure Deductions to be calculated in Section 1.1 shall be recalculated as follows:

$$RVKAFDn = (VKAfdn * WF\% * WFA) + (VKAfdFn * (1-WF\%))$$

Where:

<i>RVKAFD_n</i>	Means the recalculated Train Kilometres Availability Failure Deduction applicable to Contract Month <i>n</i> which will replace VKAFD _n in Section 1.1 of this Part D for Contract Month <i>n</i>
<i>VKAFD n</i>	Has the meaning given to it in Section 1.1 of this Part D
<i>WF%</i>	Means the percentage of the Train Kilometres Availability Failures for Contract Month <i>n</i> that have been agreed or determined to be caused by RVSC Warranty Failures
<i>WFA</i>	Means the RVSC Warranty Failure adjustment, being \$[REDACTED] (indexed) divided by the Un-Adjusted Service Payment for Contract Month <i>n</i> .

- 1.7 The following deductions (“**System Event Deductions**”) shall also apply in respect of Train Kilometres Availability Failures. The maximum aggregate amount of System Event Deductions to be applied in one day shall be \$[REDACTED]. To the extent that a System Event Deduction is applied, no directly corresponding Quality Failure Deduction or Service Failure Deduction shall be applied in addition to the System Event Deduction.

SYSTEM EVENT DEDUCTIONS - TABLE 1

System Event is triggered where	System Event Deduction Applied
On any single Weekday during a Contract Month, the Peak Period Train Kilometres Availability Ratio for either (a) morning Peak Period service or (b) afternoon Peak Period service is less than [REDACTED] %.	\$[REDACTED] per occurrence For clarity, each Peak Period which fails to meet the [REDACTED] % service standard shall result in the \$[REDACTED] System Event Deduction, such that Project Co could receive two such deductions in a single day, one in respect of morning Peak Period service and the second in respect of afternoon Peak Period service.
On any single day during a Contract Month, the Aggregate Train Kilometres Availability Ratio for that day is less than [REDACTED] %.	\$[REDACTED] per occurrence
On any single day during a Contract Month, an inability to provide train service to a terminal station (for clarity, this means Bayview Station, Limebank Station or Airport Station) for any duration that is in excess of a cumulative 36 minutes during that day, either on a continuous or	\$[REDACTED] per occurrence per Station In the event that the same failure results in a System Event Deduction due to this trigger as well as either of the aforementioned triggers outlined in this table, only the Deductions resulting from a System Event(s) due to the aforementioned triggers shall be applied.

intermittent basis.	
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- 1.8 The System Event Deductions and the maximum daily aggregate amount listed above, shall be index-linked using the Escalation Factor as referred to in Section 4.1 of Part B.
- 1.9 For clarity, and subject to Sections Part A2.2(c) and Part A2.4, System Event Deductions shall not be applied to the extent that the triggering System Event is directly caused by a Non-Project Co Cause as described in Section 2.1 of Part A.
- 1.10 In Contract Months where any System Event Deduction arises in part due to RVSC Warranty Failures:
 - (a) the System Event Deduction to be calculated in Section 1.7 shall be recalculated as follows:

$$RSEDn = (SEDn * WF\% * WFA) \text{ [the "Warranty Failure Component"]} + (SEDn * (1 - WF\%))$$

Where:

RSEDn Means the recalculated System Event Deduction applicable to Contract Month *n* which will replace the System Event Deduction otherwise applicable under Section 1.7 of this Part D for Contract Month *n*

SEDn Means the System Event Deduction otherwise applicable under Section 1.7 of this Part D to which this Section 1.10 applies

WF% Means the percentage responsibility for the occurrence of the System Event Deduction agreed or determined to be caused by RVSC Warranty Failures

WFA Means the RVSC Warranty Failure adjustment, being [REDACTED]%

- (b) where more than one System Event Deduction (to which paragraph (a) above applies) occurs in one day, the maximum aggregate amount that can be levied in respect of that day by way of Warranty Failure Components (as defined in the formula in paragraph (a) above) shall be \$[REDACTED] (indexed) and any amount otherwise calculated in excess of that shall be disregarded.

Section 2. Partial Availability

- 2.1 In respect of a Train Kilometres Availability Failure where the City exercises its discretion under Article 3 of Attachment 5 to Appendix A to Schedule 15-3 – Maintenance and Rehabilitation Requirements to permit a Vehicle which does not meet the Vehicle Availability Standard to be entered into Revenue Service as part of a Train, the Revenue Service Train Kilometres traveled by that Vehicle while it fails to meet such standard shall be deemed to be reduced by [REDACTED].

PART E: DEDUCTIONS FOR QUALITY FAILURES AND SERVICE FAILURES

Section 1. Amount of Deductions for Quality Failures

- 1.1 The amount of the Deduction in respect of a Quality Failure shall be as follows:
 - (a) in the case of a Minor Quality Failure, the sum of \$[REDACTED], index-linked using the Escalation Factor as referred to in Section 4.1 of Part B;
 - (b) in the case of a Medium Quality Failure, the sum of \$[REDACTED], index-linked using the Escalation Factor as referred to in Section 4.1 of Part B; and
 - (c) in the case of a Major Quality Failure, the sum of \$[REDACTED], index-linked using the Escalation Factor as referred to in Section 4.1 of Part B.
- 1.2 There are no Response Times or Rectification Times in respect of Quality Failures. The occurrence of a Quality Failure will result in a Quality Failure Deduction in respect of the Contract Month in which the Quality Failure occurred.
- 1.3 Following the occurrence of a Quality Failure, Project Co shall be allowed a Remedial Period. The length of the relevant Remedial Period shall be specified by the relevant Performance Criteria. If, before the expiry of the Remedial Period, Project Co demonstrates, to the reasonable satisfaction of the City Representative, that it has remedied the Quality Failure, no further Deduction shall be made in respect of the Quality Failure. Otherwise, a further Deduction shall be made of the appropriate amount (as described in Section 1.1 of this Part E) and a further Remedial Period or Remedial Periods of equal duration shall apply (and, if appropriate, Deductions shall continue to be made) until such time as Project Co shall demonstrate, to the reasonable satisfaction of the City Representative, that it has remedied the Quality Failure.

Section 2. Amount of Deductions for Service Failures

- 2.1 The amount of the Deduction in respect of a Service Failure shall be as follows:
 - (a) in the case of a Minor Service Failure, the sum of \$[REDACTED], index-linked using the Escalation Factor as referred to in Section 4.1 of Part B;
 - (b) in the case of a Medium Service Failure, the sum of \$[REDACTED], index-linked using the Escalation Factor as referred to in Section 4.1 of Part B; and
 - (c) in the case of a Major Service Failure, the sum of \$[REDACTED], index-linked using the Escalation Factor as referred to in Section 4.1 of Part B.
- 2.2 Where a Service Failure Performance Criteria has a Response Time or a Rectification Time, a Service Failure shall only occur if the Event in question has not been responded to within the applicable Response Time or rectified within the applicable Rectification Time.
- 2.3 Following the occurrence of a Service Failure, Project Co shall be allowed an additional Response Time or Rectification Time (as the case may be) equivalent to the original Response Time or Rectification Time. If, before the expiry of this additional period, Project Co demonstrates, to the reasonable satisfaction of the City Representative, that it has remedied the Service Failure, no further Deduction shall be made in respect of the Service Failure. Otherwise, a further Deduction shall be made of the appropriate amount (as described in Section 2.1 of this

Part E) and a further Response Time or Rectification Time of equal duration shall apply (and, if appropriate, Deductions shall continue to be made) until such time as Project Co shall demonstrate, to the reasonable satisfaction of the City Representative, that it has remedied the Service Failure.

- 2.4 The provisions of Section 2.3 of this Part E shall not apply to Service Failures where, if the response or rectification is not carried out within the Response Time or the Rectification Time, as applicable, the City Representative notifies the Project Co Representative that the City no longer requires Project Co to address such Service Failure.
- 2.5 Where a Service Failure Performance Criteria has no Response Time or Rectification Time, a Service Failure shall occur upon the occurrence of the Event in question and a Service Failure Deduction shall apply in accordance with Section 2.1 of this Part E.

Section 3. Temporary Repairs

- 3.1 If Project Co informs the City that it is unable to Rectify an Event within the specified Remedial Period or Rectification Time due to the need for specialized materials or personnel that are not, and cannot reasonably be expected to be, immediately available but that a Temporary Repair can be effected:
 - (a) the City may, in its discretion and acting reasonably, permit Project Co to carry out the Temporary Repair; and
 - (b) where a Temporary Repair is permitted, a deadline by which a Permanent Repair must be made shall be agreed to by the Parties, each acting reasonably, giving Project Co a reasonable period within which to carry out the Permanent Repair (the “**Permanent Repair Deadline**”).
- 3.2 If the Temporary Repair is effected within the specified Remedial Period and the Permanent Repair is effected by no later than the Permanent Repair Deadline, only the first Quality Failure will be deemed to have occurred, and a Quality Failure Deduction may be made in respect of the Event. If the Temporary Repair is effected within the specified Rectification Time and the Permanent Repair is effected by no later than the Permanent Repair Deadline, no Service Failure will occur, and no Service Failure Deduction may be made in respect of the Event.
- 3.3 If the Temporary Repair is not effected within the specified Remedial Period or Rectification Time, a Quality Failure or Service Failure (as applicable) shall be deemed to occur and the following provisions shall apply:
 - (a) there shall be a further period beginning at the expiry of the Remedial Period or Rectification Time and of a duration equal to that of the Remedial Period or Rectification Time;
 - (b) Project Co shall ensure that the Temporary Repair is successfully carried out prior to the expiry of the additional period referred to in Section 3.3(a) of this Part E;
 - (c) if the Temporary Repair is not successfully carried out prior to the expiry of the additional period referred to in Section 3.3(a) of this Part E, a further Quality Failure or

- Service Failure (as applicable) shall occur and a further additional period shall commence;
- (d) unless the Temporary Repair has been successfully carried out prior to the expiry of the additional period then a further Quality Failure or Service Failure (as applicable) shall occur until such time as the Temporary Repair shall have been successfully completed; and
- (e) if the Temporary Repair is not successfully carried out prior to the Permanent Repair Deadline, and no Permanent Repair has been successfully carried out, the right for Project Co to carry out a Temporary Repair pursuant to this Section 3 shall cease and Section 3.4 of this Part E shall apply.
- 3.4 If the Permanent Repair is not effected by the Permanent Repair Deadline, a Quality Failure or Service Failure (as applicable) shall be deemed to occur.
- (a) Following the occurrence of a Quality Failure per Section 3.4 of this Part E, Project Co shall be allowed a Remedial Period. The length of the relevant Remedial Period shall be specified by the relevant Performance Criteria. If, before the expiry of the Remedial Period, Project Co demonstrates, to the reasonable satisfaction of the City Representative, that it has remedied the Quality Failure, no further Deduction shall be made in respect of the Quality Failure. Otherwise, a further Deduction shall be made of the appropriate amount (as described in Section 1.1 of this Part E) and a further Remedial Period or Remedial Periods of equal duration shall apply (and, if appropriate, Deductions shall continue to be made) until such time as Project Co shall demonstrate, to the reasonable satisfaction of the City Representative, that it has remedied the Quality Failure.
- (b) Following the occurrence of a Service Failure per Section 3.4 of this Part E, Project Co shall be allowed an additional Response Time or Rectification Time (as the case may be) equivalent to the original Response Time or Rectification Time. If, before the expiry of this additional period, Project Co demonstrates, to the reasonable satisfaction of the City Representative, that it has remedied the Service Failure, no further Deduction shall be made in respect of the Service Failure. Otherwise, a further Deduction shall be made of the appropriate amount (as described in Section 2.1 of this Part E) and a further Response Time or Rectification Time of equal duration shall apply (and, if appropriate, Deductions shall continue to be made) until such time as Project Co shall demonstrate, to the reasonable satisfaction of the City Representative, that it has remedied the Service Failure.

PART F: REVIEW AND AMENDMENT OF PAYMENT MECHANISM

Section 1. Five Year Review

- 1.1 The amount of Deductions for Train Kilometres Availability Failures, Quality Failures and Service Failures, as well as the overall functioning of the Payment Mechanism shall be reviewed by the City and Project Co at any time if requested by either Party, up to a maximum of one review per Contract Year. In any event, a review shall be carried out at least once in every five Contract Years.
- 1.2 The City and Project Co shall act reasonably and diligently in carrying out the reviews.
- 1.3 For the avoidance of doubt, the Parties intend that any changes made as a result of such a review shall not alter the overall risk profile of the relevant Maintenance and Rehabilitation Services or the likely magnitude of Train Kilometres Availability Failures, Quality Failures and Service Failures. Where proposed changes would result in any such alteration, the matter shall be deemed to be a Variation and Schedule 21 – Variation Procedure shall apply.
- 1.4 Any agreed adjustment pursuant to a review shall be effective from the commencement of the Contract Year immediately following the relevant review carried out in accordance with Section 1.1 of this Part F.

Section 2. Peak Periods and Station Grouping

- 2.1 The City may change the hours within the definition of “Peak Period” within Article 1 (b) of Appendix A to Schedule 15-3 – Maintenance and Rehabilitation Requirements for the purposes of the Payment Mechanism, at its sole discretion at any time during the Maintenance Period by providing Project Co with sixty (60) days written Notice, provided that the total number of Peak Period hours in a week does not exceed thirty-five (35) hours, and the two daily peak periods are separated by a minimum of three (3) hours.
- 2.2 The City may, in its sole discretion, change the grouping of Stations (Group 1 Stations and Group 2 Stations), for the purposes of the Payment Mechanism, at any time during the Maintenance Period by providing Project Co with sixty (60) days written Notice, provided that:
 - (a) Group 1 shall not include more than seven (7) Stations; and
 - (b) if the change in the grouping causes a change in the overall risk profile of the relevant Maintenance and Rehabilitation Services, Project Co shall be entitled to a Variation and Schedule 21 – Variation Procedure shall apply.
- 2.3 The City may increase the total number of Peak Period hours per week and/or increase the number of Group 1 Stations, beyond the limits set out in 2.1 and 2.2, above, subject to agreement between the Parties on appropriate amendments to the Payment Mechanism in order to ensure there is no change in overall risk profile of the relevant Maintenance and Rehabilitation Services or the likely magnitude of Train Kilometres Availability Failures, Quality Failures and Service Failures. Where proposed changes would result in any such alteration in the risk profile, the matter shall be deemed to be a Variation and Schedule 21 – Variation Procedure shall apply.

Section 3. Lifecycle Payment Adjustment

- 3.1 In the event of a Service Level Increase, Project Co may request adjustments to the schedule of Lifecycle Payments set out in Table 3 of Appendix A, in accordance with the provisions of this Section 3 of this Part F.
- 3.2 Any adjustments to the schedule of Lifecycle Payments under this Section 3 of this Part F shall be limited to the introduction of new Lifecycle Payments in respect of Eligible Lifecycle Costs which, by virtue of a Service Level Increase, will either
 - (a) require an additional cycle of replacement, refreshment and/or refurbishment during the Maintenance Period which is over and above such cycles already scheduled in the Maintenance and Rehabilitation Plan; or
 - (b) reach the end of their lifecycle and require replacement, refreshment and/or refurbishment during the Maintenance Period where no such replacement, refreshment and/or refurbishment is scheduled in the then-prevailing Maintenance and Rehabilitation Plan.
- 3.3 Any adjustments to the schedule of Lifecycle Payments under this Section 3 of this Part F must be
 - (a) attributable by the quantity of service provided by Project Co, measured by Train Kilometres, and
 - (b) non-attributable to any Project Co failure to adhere to its Maintenance and Rehabilitation Plan,each supported by items 3.4(c) and 3.4(d) in the application process described below.
- 3.4 Project Co shall apply for an adjustment to the schedule of Lifecycle Payments as a Project Co Variation Notice in accordance with the provisions of Schedule 21 – Variation Procedure. In addition to the requirements of Schedule 21 – Variation Procedure, Project Co's application shall contain the following elements:
 - (a) Identify the components of the System Infrastructure and Eligible Lifecycle Costs which form the basis of the application;
 - (b) Identify the originally scheduled dates (if any) for replacement, refreshment and/or refurbishment of the relevant components of the System Infrastructure in the Maintenance and Rehabilitation Plan, and the proposed amended dates for such lifecycle works;
 - (c) Describe the rationale for the proposed amended dates for lifecycle works, with specific reference to the following:
 - (i) The number of Train Kilometres scheduled by the Operations Service Plan to have been provided at the originally scheduled date of lifecycle works;

- (ii) The number of Train Kilometres that will have been provided by Project Co at the proposed amended date of lifecycle works; and
 - (iii) Reference to manufacturer specifications or industry standards and the impact of the Service Level Increase in triggering a need for replacement, refreshment and/or refurbishment in accordance with these specifications or standards; and
- (d) Carry out an internal quality audit on Project Co's adherence to its Maintenance and Rehabilitation Plan for the relevant components of the System Infrastructure.
- 3.5 For greater certainty, where Project Co's application includes a request for introduction of new Lifecycle Payments in accordance with Section 3.2 of this Part F, then the amount of such new Lifecycle Payments shall be determined in accordance with the terms of Schedule 21 – Variation Procedure.

Section 4. Train Kilometres Availability Failure Deduction Adjustment

- 4.1 Project Co may request adjustments to the Aggregate Train Kilometres Availability Ratios and Deduction Factors in Table 1 of Appendix B, in accordance with the provisions of this Section 4 of Part F in the event of one of the following instances:
- (a) The following two events occur:
 - (i) Operator does not meet the scheduled dwell times at a specific Station for a morning or afternoon weekday Peak Period on average over six Contract Months; and
 - (ii) The relevant vehicle capacity standards are exceeded by Revenue Vehicles leaving that Station for a morning or afternoon weekday Peak Period on average over six Contract Months; or
 - (b) The following two events occur:
 - (i) Operator does not meet the scheduled dwell times at a specific Station for a morning or afternoon weekday Peak Period when averaged over six Contract Months; and
 - (ii) The level of demand set out in the Operations Service Plan for the Service Level in use is exceeded for a morning or afternoon weekday Peak Period when averaged over six Contract Months.
- 4.2 For the avoidance of doubt, Project Co and the City intend that any adjustments to the schedule of Aggregate Train Kilometres Availability Ratios and Deduction Factors in Table 1 of Appendix B shall not alter the overall risk profile or the likely magnitude of Train Kilometre Availability Failure Deductions. Further, adjustments must:
- (a) be directly attributable to one or more of the events listed in Section 4.1, and
 - (b) not be attributable to any Project Co inability to achieve satisfactory Aggregate Train Kilometres Availability Ratios.

- 4.3 If deemed appropriate based on the conditions set out in Section 4.1, Project Co shall apply for an adjustment to the Aggregate Train Kilometres Availability Ratios and Deduction Factors in Table 1 of Appendix B as a Project Co Variation Notice in accordance with the provisions of Schedule 21 – Variation Procedure. In addition to the requirements of Schedule 21 – Variation Procedure, Project Co's application shall contain the following elements as applicable:
- (a) Identify which Station(s) are impacted;
 - (b) Describe the rationale for the proposed amended Aggregate Train Kilometres Availability Ratios and Deduction Factors in Table 1 of Appendix B, with specific reference to the following:
 - (i) The number of Train Kilometres scheduled and to have been provided by the original Operations Service Plan;
 - (ii) The dwell times per impacted Station scheduled and to have been achieved based on the original Operations Service Plan; and
 - (iii) Reference to industry standards and the impact of the events listed in Section 4.1 in triggering a need for amendments to Train Kilometres Availability Ratios and Deduction Factors in Table 1 of Appendix B.
- 4.4 Project Co's application shall provide the City with at least three months of Notice in advance of any proposed amendment.
- 4.5 Project Co and the City shall work collaboratively to minimize the number of adjustments to the Aggregate Train Kilometres Availability Ratios and Deduction Factors in Table 1 of Appendix B, including:
- (a) wherever possible, agreeing upon adjustments to the Operations Service Plan or the vehicle capacity standards; and
 - (b) deferring adjustment to the Aggregate Train Kilometres Availability Ratios and Deduction Factors in Table 1 of Appendix B where the City, acting reasonably, believes that the event(s) listed in Section 4.1 is temporary and Service Levels will soon revert to or track the Operations Service Plan in effect at Financial Close, and there is no long term Train Kilometres Availability Failure Deduction impact to Project Co.

PART G: FAILURE POINTS

Section 1. Failure Points

- 1.1 Failure Points shall be awarded for every Quality Failure, Service Failure, and Availability Failure which occurs during the Maintenance Period, unless such Failure Points are cancelled pursuant to any other provision of the Project Agreement.
- 1.2 The number of Failure Points attributable to Quality Failures, Service Failures, System Events, and Availability Failures is set out in Appendix C.
 - (a) Failure Points in respect of System Events shall be awarded following the identification of each such System Event through the Daily Performance Report;
 - (b) Failure Points in respect of Train Kilometres Availability Failure shall be awarded for each Contract Month based on the relevant Aggregate Train Kilometres Availability Ratio calculated for that Contract Month, in accordance with Sections 1.1 and 1.2 of Appendix C; and
 - (c) Failure Points in respect of Quality Failures and Service Failures shall be awarded in respect of each Quality Failure and Service Failure, in accordance with Section 6 of Appendix D.
- 1.3 For the avoidance of doubt when awarding Failure Points, where a further Availability Failure, Quality Failure or Service Failure is deemed to have occurred in accordance with Section 1 of Part D or Section 2 to Section 3 of Part E, the appropriate number of Failure Points shall be awarded in respect of each such Availability Failure, Quality Failure and Service Failure, even though they arise from the same circumstances.

PART H: MONITORING AND REPORTING

Section 1. Sources of Information

- 1.1 The table below sets out the sources of the factual information regarding the performance of the Maintenance and Rehabilitation Services for the relevant Contract Month for the purposes of calculating the relevant Monthly Service Payment, the Deductions assessed and the number of Failure Points awarded.

Item	Source
Revenue Service Train Kilometres for Contract Month <i>n</i>	Monthly Performance Monitoring Report for Contract Month <i>n</i>
Scheduled Revenue Service Train Kilometres for Contract Month <i>n</i>	Monthly Performance Monitoring Report for Contract Month <i>n</i>
Number of Scheduled Revenue Service Train Kilometres which were “missed” or not traveled by Project Co due to a Non-Project Co Cause, for Contract Month <i>n</i>	Monthly Performance Monitoring Report for Contract Month <i>n</i>
System Events for Contract Month <i>n</i>	Monthly Performance Monitoring Report for Contract Month <i>n</i>
Quality Failures for Contract Month <i>n</i>	Monthly Performance Monitoring Report for Contract Month <i>n</i>
Service Failures for Contract Month <i>n</i>	Monthly Performance Monitoring Report for Contract Month <i>n</i>

Section 2. Failure by Project Co to Monitor or Report

- 2.1 If there shall be any error or omission in the Monthly Performance Monitoring Report for any Contract Month, Project Co and the City shall agree the amendment to the Monthly Performance Monitoring Report or, failing agreement within 10 days of notification of the error or omission which shall not be made more than 2 calendar months following the relevant Monthly Performance Monitoring Report, except in the circumstances referred to in Section 2.4 of this Part H either party may refer the matter to the Dispute Resolution Procedure.
- 2.2 If Project Co fails to monitor or accurately report any Availability Failure, Service Failure or Quality Failure then, without prejudice to the Deduction to be made in respect of the relevant Availability Failure, Service Failure or Quality Failure, the failure to monitor or report shall be deemed to be a new Quality Failure, and Project Co shall be awarded [REDACTED] Failure Points for each occurrence of such Quality Failure, unless the circumstances set out in Section 2.4 of this Part H apply, in which case Project Co shall be awarded [REDACTED] Failure Points for each such occurrence. No Deductions shall apply in respect of Quality Failures associated with Project Co’s failure to monitor or report as outlined in this Section 2.2.

- 2.3 In the event that any inspection or investigation by the City of records made available pursuant to the Project Agreement reveals any further matters of the type referred to in Sections 2.1 and 2.2 of this Part H, those matters shall be dealt with in accordance with Section 2.1 and 2.2 of this Part H, as appropriate, and the City shall, in addition, be entitled to make Deductions in respect of any Availability Failure, Service Failure or Quality Failure in the manner prescribed in Part C. Any such Deductions shall be made from the Monthly Service Payment, payable in respect of the Contract Month in which the relevant matters were revealed by the City's investigations or, to the extent that the City is unable to make any further deductions from the Monthly Service Payment in respect of that Contract Month by virtue of Section 1.2 of Part C, may be carried forward and deducted from Monthly Service Payments due in respect of subsequent Contract Months.
- 2.4 For the purposes of Sections 2.1 and 2.2 of this Part H the relevant circumstances are:
- (a) fraudulent action or inaction;
 - (b) deliberate misrepresentation; or
 - (c) gross misconduct or incompetence in each case on the part of Project Co or a Project Co Party.
- 2.5 The provisions of this Part H shall be without prejudice to any rights of the City pursuant to Sections 31, 43 and 58 of the Project Agreement.

APPENDIX A: ANNUAL SERVICE PAYMENT AND MONTHLY SERVICE PAYMENT INPUTS

Table 1

COLUMN A	COLUMN B	COLUMN A	COLUMN B
Contract Month	Monthly Service Payment – Capital Portion	Contract Month	Monthly Service Payment – Capital Portion
1	\$[REDACTED]	163	\$[REDACTED]
2	\$[REDACTED]	164	\$[REDACTED]
3	\$[REDACTED]	165	\$[REDACTED]
4	\$[REDACTED]	166	\$[REDACTED]
5	\$[REDACTED]	167	\$[REDACTED]
6	\$[REDACTED]	168	\$[REDACTED]
7	\$[REDACTED]	169	\$[REDACTED]
8	\$[REDACTED]	170	\$[REDACTED]
9	\$[REDACTED]	171	\$[REDACTED]
10	\$[REDACTED]	172	\$[REDACTED]
11	\$[REDACTED]	173	\$[REDACTED]
12	\$[REDACTED]	174	\$[REDACTED]
13	\$[REDACTED]	175	\$[REDACTED]
14	\$[REDACTED]	176	\$[REDACTED]
15	\$[REDACTED]	177	\$[REDACTED]
16	\$[REDACTED]	178	\$[REDACTED]
17	\$[REDACTED]	179	\$[REDACTED]
18	\$[REDACTED]	180	\$[REDACTED]
19	\$[REDACTED]	181	\$[REDACTED]
20	\$[REDACTED]	182	\$[REDACTED]

COLUMN A	COLUMN B	COLUMN A	COLUMN B
Contract Month	Monthly Service Payment – Capital Portion	Contract Month	Monthly Service Payment – Capital Portion
21	\$[REDACTED]	183	\$[REDACTED]
22	\$[REDACTED]	184	\$[REDACTED]
23	\$[REDACTED]	185	\$[REDACTED]
24	\$[REDACTED]	186	\$[REDACTED]
25	\$[REDACTED]	187	\$[REDACTED]
26	\$[REDACTED]	188	\$[REDACTED]
27	\$[REDACTED]	189	\$[REDACTED]
28	\$[REDACTED]	190	\$[REDACTED]
29	\$[REDACTED]	191	\$[REDACTED]
30	\$[REDACTED]	192	\$[REDACTED]
31	\$[REDACTED]	193	\$[REDACTED]
32	\$[REDACTED]	194	\$[REDACTED]
33	\$[REDACTED]	195	\$[REDACTED]
34	\$[REDACTED]	196	\$[REDACTED]
35	\$[REDACTED]	197	\$[REDACTED]
36	\$[REDACTED]	198	\$[REDACTED]
37	\$[REDACTED]	199	\$[REDACTED]
38	\$[REDACTED]	200	\$[REDACTED]
39	\$[REDACTED]	201	\$[REDACTED]
40	\$[REDACTED]	202	\$[REDACTED]
41	\$[REDACTED]	203	\$[REDACTED]
42	\$[REDACTED]	204	\$[REDACTED]
43	\$[REDACTED]	205	\$[REDACTED]

COLUMN A	COLUMN B	COLUMN A	COLUMN B
Contract Month	Monthly Service Payment – Capital Portion	Contract Month	Monthly Service Payment – Capital Portion
44	\$[REDACTED]	206	\$[REDACTED]
45	\$[REDACTED]	207	\$[REDACTED]
46	\$[REDACTED]	208	\$[REDACTED]
47	\$[REDACTED]	209	\$[REDACTED]
48	\$[REDACTED]	210	\$[REDACTED]
49	\$[REDACTED]	211	\$[REDACTED]
50	\$[REDACTED]	212	\$[REDACTED]
51	\$[REDACTED]	213	\$[REDACTED]
52	\$[REDACTED]	214	\$[REDACTED]
53	\$[REDACTED]	215	\$[REDACTED]
54	\$[REDACTED]	216	\$[REDACTED]
55	\$[REDACTED]	217	\$[REDACTED]
56	\$[REDACTED]	218	\$[REDACTED]
57	\$[REDACTED]	219	\$[REDACTED]
58	\$[REDACTED]	220	\$[REDACTED]
59	\$[REDACTED]	221	\$[REDACTED]
60	\$[REDACTED]	222	\$[REDACTED]
61	\$[REDACTED]	223	\$[REDACTED]
62	\$[REDACTED]	224	\$[REDACTED]
63	\$[REDACTED]	225	\$[REDACTED]
64	\$[REDACTED]	226	\$[REDACTED]
65	\$[REDACTED]	227	\$[REDACTED]
66	\$[REDACTED]	228	\$[REDACTED]

COLUMN A	COLUMN B	COLUMN A	COLUMN B
Contract Month	Monthly Service Payment – Capital Portion	Contract Month	Monthly Service Payment – Capital Portion
67	\$[REDACTED]	229	\$[REDACTED]
68	\$[REDACTED]	230	\$[REDACTED]
69	\$[REDACTED]	231	\$[REDACTED]
70	\$[REDACTED]	232	\$[REDACTED]
71	\$[REDACTED]	233	\$[REDACTED]
72	\$[REDACTED]	234	\$[REDACTED]
73	\$[REDACTED]	235	\$[REDACTED]
74	\$[REDACTED]	236	\$[REDACTED]
75	\$[REDACTED]	237	\$[REDACTED]
76	\$[REDACTED]	238	\$[REDACTED]
77	\$[REDACTED]	239	\$[REDACTED]
78	\$[REDACTED]	240	\$[REDACTED]
79	\$[REDACTED]	241	\$[REDACTED]
80	\$[REDACTED]	242	\$[REDACTED]
81	\$[REDACTED]	243	\$[REDACTED]
82	\$[REDACTED]	244	\$[REDACTED]
83	\$[REDACTED]	245	\$[REDACTED]
84	\$[REDACTED]	246	\$[REDACTED]
85	\$[REDACTED]	247	\$[REDACTED]
86	\$[REDACTED]	248	\$[REDACTED]
87	\$[REDACTED]	249	\$[REDACTED]
88	\$[REDACTED]	250	\$[REDACTED]
89	\$[REDACTED]	251	\$[REDACTED]

COLUMN A	COLUMN B	COLUMN A	COLUMN B
Contract Month	Monthly Service Payment – Capital Portion	Contract Month	Monthly Service Payment – Capital Portion
90	\$[REDACTED]	252	\$[REDACTED]
91	\$[REDACTED]	253	\$[REDACTED]
92	\$[REDACTED]	254	\$[REDACTED]
93	\$[REDACTED]	255	\$[REDACTED]
94	\$[REDACTED]	256	\$[REDACTED]
95	\$[REDACTED]	257	\$[REDACTED]
96	\$[REDACTED]	258	\$[REDACTED]
97	\$[REDACTED]	259	\$[REDACTED]
98	\$[REDACTED]	260	\$[REDACTED]
99	\$[REDACTED]	261	\$[REDACTED]
100	\$[REDACTED]	262	\$[REDACTED]
101	\$[REDACTED]	263	\$[REDACTED]
102	\$[REDACTED]	264	\$[REDACTED]
103	\$[REDACTED]	265	\$[REDACTED]
104	\$[REDACTED]	266	\$[REDACTED]
105	\$[REDACTED]	267	\$[REDACTED]
106	\$[REDACTED]	268	\$[REDACTED]
107	\$[REDACTED]	269	\$[REDACTED]
108	\$[REDACTED]	270	\$[REDACTED]
109	\$[REDACTED]	271	\$[REDACTED]
110	\$[REDACTED]	272	\$[REDACTED]
111	\$[REDACTED]	273	\$[REDACTED]
112	\$[REDACTED]	274	\$[REDACTED]

COLUMN A	COLUMN B	COLUMN A	COLUMN B
Contract Month	Monthly Service Payment – Capital Portion	Contract Month	Monthly Service Payment – Capital Portion
113	\$[REDACTED]	275	\$[REDACTED]
114	\$[REDACTED]	276	\$[REDACTED]
115	\$[REDACTED]	277	\$[REDACTED]
116	\$[REDACTED]	278	\$[REDACTED]
117	\$[REDACTED]	279	\$[REDACTED]
118	\$[REDACTED]	280	\$[REDACTED]
119	\$[REDACTED]	281	\$[REDACTED]
120	\$[REDACTED]	282	\$[REDACTED]
121	\$[REDACTED]	283	\$[REDACTED]
122	\$[REDACTED]	284	\$[REDACTED]
123	\$[REDACTED]	285	\$[REDACTED]
124	\$[REDACTED]	286	\$[REDACTED]
125	\$[REDACTED]	287	\$[REDACTED]
126	\$[REDACTED]	288	\$[REDACTED]
127	\$[REDACTED]	289	\$[REDACTED]
128	\$[REDACTED]	290	\$[REDACTED]
129	\$[REDACTED]	291	\$[REDACTED]
130	\$[REDACTED]	292	\$[REDACTED]
131	\$[REDACTED]	293	\$[REDACTED]
132	\$[REDACTED]	294	\$[REDACTED]
133	\$[REDACTED]	295	\$[REDACTED]
134	\$[REDACTED]	296	\$[REDACTED]
135	\$[REDACTED]	297	\$[REDACTED]

COLUMN A	COLUMN B	COLUMN A	COLUMN B
Contract Month	Monthly Service Payment – Capital Portion	Contract Month	Monthly Service Payment – Capital Portion
136	\$[REDACTED]	298	\$[REDACTED]
137	\$[REDACTED]	299	\$[REDACTED]
138	\$[REDACTED]	300	\$[REDACTED]
139	\$[REDACTED]	301	\$[REDACTED]
140	\$[REDACTED]	302	\$[REDACTED]
141	\$[REDACTED]	303	\$[REDACTED]
142	\$[REDACTED]	304	\$[REDACTED]
143	\$[REDACTED]	305	\$[REDACTED]
144	\$[REDACTED]	306	\$[REDACTED]
145	\$[REDACTED]	307	\$[REDACTED]
146	\$[REDACTED]	308	\$[REDACTED]
147	\$[REDACTED]	309	\$[REDACTED]
148	\$[REDACTED]	310	\$[REDACTED]
149	\$[REDACTED]	311	\$[REDACTED]
150	\$[REDACTED]	312	\$[REDACTED]
151	\$[REDACTED]	313	\$[REDACTED]
152	\$[REDACTED]	314	\$[REDACTED]
153	\$[REDACTED]	315	\$[REDACTED]
154	\$[REDACTED]	316	\$[REDACTED]
155	\$[REDACTED]	317	\$[REDACTED]
156	\$[REDACTED]	318	\$[REDACTED]
157	\$[REDACTED]	319	\$[REDACTED]
158	\$[REDACTED]	320	\$[REDACTED]

COLUMN A	COLUMN B	COLUMN A	COLUMN B
Contract Month	Monthly Service Payment – Capital Portion	Contract Month	Monthly Service Payment – Capital Portion
159	\$[REDACTED]	321	\$[REDACTED]
160	\$[REDACTED]	322	\$[REDACTED]
161	\$[REDACTED]	323	\$[REDACTED]
162	\$[REDACTED]	324	\$[REDACTED]
		325	\$[REDACTED]

Table 2

COLUMN A	COLUMN B
Service Level	Annual Service Payment – Service Portion (in Inflation Base Date prices)
Service Level 1	[\$REDACTED]
Service Level 2	[\$REDACTED]
Service Level 3	[\$REDACTED]
Service Level 4	[\$REDACTED]

Table 3

COLUMN A	COLUMN B	COLUMN C	COLUMN D	COLUMN E	COLUMN F	COLUMN G	COLUMN H
Contract Month	Period Start Date	Period End Date	Lifecycle Payment, Service Level 1 (in Inflation Base Date prices)	Lifecycle Payment, Service Level 2 (in Inflation Base Date prices)	Lifecycle Payment, Service Level 3 (in Inflation Base Date prices)	Lifecycle Payment, Service Level 4 (in Inflation Base Date prices)	Lifecycle Payments, Part B, Section 3.2 (in Inflation Base Date prices)
1	August 11, 2022	August 31, 2022	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
2	September 1, 2022	September 30, 2022	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
3	October 1, 2022	October 31, 2022	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
4	November 1, 2022	November 30, 2022	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
5	December 1, 2022	December 31, 2022	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
6	January 1, 2023	January 31, 2023	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
7	February 1, 2023	February 28,	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]

		2023					
8	March 1, 2023	March 31, 2023	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
9	April 1, 2023	April 30, 2023	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
10	May 1, 2023	May 31, 2023	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
11	June 1, 2023	June 30, 2023	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
12	July 1, 2023	July 31, 2023	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
13	August 1, 2023	August 31, 2023	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
14	September 1, 2023	September 30, 2023	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
15	October 1, 2023	October 31, 2023	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
16	November 1, 2023	November 30, 2023	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
17	December 1, 2023	December 31, 2023	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
18	January 1, 2024	January 31, 2024	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
19	February 1, 2024	February 29, 2024	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
20	March 1, 2024	March 31, 2024	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
21	April 1, 2024	April 30, 2024	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
22	May 1, 2024	May 31, 2024	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
23	June 1, 2024	June 30, 2024	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
24	July 1, 2024	July 31, 2024	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
25	August 1, 2024	August 31, 2024	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
26	September 1, 2024	September 30, 2024	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
27	October 1, 2024	October 31, 2024	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
28	November 1, 2024	November 30, 2024	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
29	December 1, 2024	December 31, 2024	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

30	January 1, 2025	January 31, 2025	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
31	February 1, 2025	February 28, 2025	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
32	March 1, 2025	March 31, 2025	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
33	April 1, 2025	April 30, 2025	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
34	May 1, 2025	May 31, 2025	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
35	June 1, 2025	June 30, 2025	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
36	July 1, 2025	July 31, 2025	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
37	August 1, 2025	August 31, 2025	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
38	September 1, 2025	September 30, 2025	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
39	October 1, 2025	October 31, 2025	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
40	November 1, 2025	November 30, 2025	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
41	December 1, 2025	December 31, 2025	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
42	January 1, 2026	January 31, 2026	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
43	February 1, 2026	February 28, 2026	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
44	March 1, 2026	March 31, 2026	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
45	April 1, 2026	April 30, 2026	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
46	May 1, 2026	May 31, 2026	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
47	June 1, 2026	June 30, 2026	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
48	July 1, 2026	July 31, 2026	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
49	August 1, 2026	August 31, 2026	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
50	September 1, 2026	September 30, 2026	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
51	October 1, 2026	October 31, 2026	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
52	November 1, 2026	November 30,	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

		2026					
53	December 1, 2026	December 31, 2026	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
54	January 1, 2027	January 31, 2027	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
55	February 1, 2027	February 28, 2027	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
56	March 1, 2027	March 31, 2027	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
57	April 1, 2027	April 30, 2027	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
58	May 1, 2027	May 31, 2027	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
59	June 1, 2027	June 30, 2027	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
60	July 1, 2027	July 31, 2027	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
61	August 1, 2027	August 31, 2027	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
62	September 1, 2027	September 30, 2027	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
63	October 1, 2027	October 31, 2027	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
64	November 1, 2027	November 30, 2027	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
65	December 1, 2027	December 31, 2027	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
66	January 1, 2028	January 31, 2028	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
67	February 1, 2028	February 29, 2028	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
68	March 1, 2028	March 31, 2028	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
69	April 1, 2028	April 30, 2028	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
70	May 1, 2028	May 31, 2028	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
71	June 1, 2028	June 30, 2028	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
72	July 1, 2028	July 31, 2028	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
73	August 1, 2028	August 31, 2028	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
74	September 1, 2028	September 30, 2028	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

75	October 1, 2028	October 31, 2028	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
76	November 1, 2028	November 30, 2028	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
77	December 1, 2028	December 31, 2028	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
78	January 1, 2029	January 31, 2029	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
79	February 1, 2029	February 28, 2029	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
80	March 1, 2029	March 31, 2029	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
81	April 1, 2029	April 30, 2029	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
82	May 1, 2029	May 31, 2029	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
83	June 1, 2029	June 30, 2029	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
84	July 1, 2029	July 31, 2029	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
85	August 1, 2029	August 31, 2029	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
86	September 1, 2029	September 30, 2029	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
87	October 1, 2029	October 31, 2029	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
88	November 1, 2029	November 30, 2029	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
89	December 1, 2029	December 31, 2029	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
90	January 1, 2030	January 31, 2030	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
91	February 1, 2030	February 28, 2030	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
92	March 1, 2030	March 31, 2030	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
93	April 1, 2030	April 30, 2030	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
94	May 1, 2030	May 31, 2030	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
95	June 1, 2030	June 30, 2030	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
96	July 1, 2030	July 31, 2030	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
97	August 1, 2030	August 31,	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

		2030					
98	September 1, 2030	September 30, 2030	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
99	October 1, 2030	October 31, 2030	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
100	November 1, 2030	November 30, 2030	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
101	December 1, 2030	December 31, 2030	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
102	January 1, 2031	January 31, 2031	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
103	February 1, 2031	February 28, 2031	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
104	March 1, 2031	March 31, 2031	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
105	April 1, 2031	April 30, 2031	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
106	May 1, 2031	May 31, 2031	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
107	June 1, 2031	June 30, 2031	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
108	July 1, 2031	July 31, 2031	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
109	August 1, 2031	August 31, 2031	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
110	September 1, 2031	September 30, 2031	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
111	October 1, 2031	October 31, 2031	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
112	November 1, 2031	November 30, 2031	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
113	December 1, 2031	December 31, 2031	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
114	January 1, 2032	January 31, 2032	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
115	February 1, 2032	February 29, 2032	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
116	March 1, 2032	March 31, 2032	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
117	April 1, 2032	April 30, 2032	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
118	May 1, 2032	May 31, 2032	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]

119	June 1, 2032	June 30, 2032	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
120	July 1, 2032	July 31, 2032	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
121	August 1, 2032	August 31, 2032	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
122	September 1, 2032	September 30, 2032	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
123	October 1, 2032	October 31, 2032	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
124	November 1, 2032	November 30, 2032	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
125	December 1, 2032	December 31, 2032	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
126	January 1, 2033	January 31, 2033	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
127	February 1, 2033	February 28, 2033	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
128	March 1, 2033	March 31, 2033	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
129	April 1, 2033	April 30, 2033	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
130	May 1, 2033	May 31, 2033	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
131	June 1, 2033	June 30, 2033	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
132	July 1, 2033	July 31, 2033	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
133	August 1, 2033	August 31, 2033	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
134	September 1, 2033	September 30, 2033	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
135	October 1, 2033	October 31, 2033	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
136	November 1, 2033	November 30, 2033	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
137	December 1, 2033	December 31, 2033	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
138	January 1, 2034	January 31, 2034	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
139	February 1, 2034	February 28, 2034	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
140	March 1, 2034	March 31, 2034	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

141	April 1, 2034	April 30, 2034	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
142	May 1, 2034	May 31, 2034	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
143	June 1, 2034	June 30, 2034	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
144	July 1, 2034	July 31, 2034	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
145	August 1, 2034	August 31, 2034	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
146	September 1, 2034	September 30, 2034	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
147	October 1, 2034	October 31, 2034	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
148	November 1, 2034	November 30, 2034	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
149	December 1, 2034	December 31, 2034	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
150	January 1, 2035	January 31, 2035	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
151	February 1, 2035	February 28, 2035	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
152	March 1, 2035	March 31, 2035	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
153	April 1, 2035	April 30, 2035	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
154	May 1, 2035	May 31, 2035	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
155	June 1, 2035	June 30, 2035	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
156	July 1, 2035	July 31, 2035	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
157	August 1, 2035	August 31, 2035	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
158	September 1, 2035	September 30, 2035	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
159	October 1, 2035	October 31, 2035	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
160	November 1, 2035	November 30, 2035	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
161	December 1, 2035	December 31, 2035	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
162	January 1, 2036	January 31, 2036	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
163	February 1, 2036	February 29,	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]

		2036					
164	March 1, 2036	March 31, 2036	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
165	April 1, 2036	April 30, 2036	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
166	May 1, 2036	May 31, 2036	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
167	June 1, 2036	June 30, 2036	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
168	July 1, 2036	July 31, 2036	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
169	August 1, 2036	August 31, 2036	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
170	September 1, 2036	September 30, 2036	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
171	October 1, 2036	October 31, 2036	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
172	November 1, 2036	November 30, 2036	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
173	December 1, 2036	December 31, 2036	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
174	January 1, 2037	January 31, 2037	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
175	February 1, 2037	February 28, 2037	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
176	March 1, 2037	March 31, 2037	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
177	April 1, 2037	April 30, 2037	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
178	May 1, 2037	May 31, 2037	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
179	June 1, 2037	June 30, 2037	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
180	July 1, 2037	July 31, 2037	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
181	August 1, 2037	August 31, 2037	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
182	September 1, 2037	September 30, 2037	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
183	October 1, 2037	October 31, 2037	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
184	November 1, 2037	November 30, 2037	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]
185	December 1, 2037	December 31, 2037	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]	[\$REDACTED]

186	January 1, 2038	January 31, 2038	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
187	February 1, 2038	February 28, 2038	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
188	March 1, 2038	March 31, 2038	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
189	April 1, 2038	April 30, 2038	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
190	May 1, 2038	May 31, 2038	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
191	June 1, 2038	June 30, 2038	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
192	July 1, 2038	July 31, 2038	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
193	August 1, 2038	August 31, 2038	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
194	September 1, 2038	September 30, 2038	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
195	October 1, 2038	October 31, 2038	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
196	November 1, 2038	November 30, 2038	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
197	December 1, 2038	December 31, 2038	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
198	January 1, 2039	January 31, 2039	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
199	February 1, 2039	February 28, 2039	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
200	March 1, 2039	March 31, 2039	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
201	April 1, 2039	April 30, 2039	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
202	May 1, 2039	May 31, 2039	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
203	June 1, 2039	June 30, 2039	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
204	July 1, 2039	July 31, 2039	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
205	August 1, 2039	August 31, 2039	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
206	September 1, 2039	September 30, 2039	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
207	October 1, 2039	October 31, 2039	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
208	November 1, 2039	November 30,	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

		2039					
209	December 1, 2039	December 31, 2039	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
210	January 1, 2040	January 31, 2040	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
211	February 1, 2040	February 29, 2040	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
212	March 1, 2040	March 31, 2040	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
213	April 1, 2040	April 30, 2040	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
214	May 1, 2040	May 31, 2040	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
215	June 1, 2040	June 30, 2040	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
216	July 1, 2040	July 31, 2040	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
217	August 1, 2040	August 31, 2040	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
218	September 1, 2040	September 30, 2040	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
219	October 1, 2040	October 31, 2040	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
220	November 1, 2040	November 30, 2040	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
221	December 1, 2040	December 31, 2040	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
222	January 1, 2041	January 31, 2041	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
223	February 1, 2041	February 28, 2041	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
224	March 1, 2041	March 31, 2041	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
225	April 1, 2041	April 30, 2041	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
226	May 1, 2041	May 31, 2041	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
227	June 1, 2041	June 30, 2041	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
228	July 1, 2041	July 31, 2041	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
229	August 1, 2041	August 31, 2041	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
230	September 1, 2041	September 30, 2041	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

231	October 1, 2041	October 31, 2041	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
232	November 1, 2041	November 30, 2041	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
233	December 1, 2041	December 31, 2041	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
234	January 1, 2042	January 31, 2042	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
235	February 1, 2042	February 28, 2042	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
236	March 1, 2042	March 31, 2042	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
237	April 1, 2042	April 30, 2042	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
238	May 1, 2042	May 31, 2042	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
239	June 1, 2042	June 30, 2042	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
240	July 1, 2042	July 31, 2042	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
241	August 1, 2042	August 31, 2042	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
242	September 1, 2042	September 30, 2042	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
243	October 1, 2042	October 31, 2042	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
244	November 1, 2042	November 30, 2042	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
245	December 1, 2042	December 31, 2042	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
246	January 1, 2043	January 31, 2043	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
247	February 1, 2043	February 28, 2043	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
248	March 1, 2043	March 31, 2043	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
249	April 1, 2043	April 30, 2043	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
250	May 1, 2043	May 31, 2043	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
251	June 1, 2043	June 30, 2043	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
252	July 1, 2043	July 31, 2043	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
253	August 1, 2043	August 31,	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

		2043					
254	September 1, 2043	September 30, 2043	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
255	October 1, 2043	October 31, 2043	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
256	November 1, 2043	November 30, 2043	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
257	December 1, 2043	December 31, 2043	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
258	January 1, 2044	January 31, 2044	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
259	February 1, 2044	February 29, 2044	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
260	March 1, 2044	March 31, 2044	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
261	April 1, 2044	April 30, 2044	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
262	May 1, 2044	May 31, 2044	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
263	June 1, 2044	June 30, 2044	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
264	July 1, 2044	July 31, 2044	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
265	August 1, 2044	August 31, 2044	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
266	September 1, 2044	September 30, 2044	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
267	October 1, 2044	October 31, 2044	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
268	November 1, 2044	November 30, 2044	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
269	December 1, 2044	December 31, 2044	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
270	January 1, 2045	January 31, 2045	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
271	February 1, 2045	February 28, 2045	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
272	March 1, 2045	March 31, 2045	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
273	April 1, 2045	April 30, 2045	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
274	May 1, 2045	May 31, 2045	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

275	June 1, 2045	June 30, 2045	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
276	July 1, 2045	July 31, 2045	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
277	August 1, 2045	August 31, 2045	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
278	September 1, 2045	September 30, 2045	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
279	October 1, 2045	October 31, 2045	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
280	November 1, 2045	November 30, 2045	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
281	December 1, 2045	December 31, 2045	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
282	January 1, 2046	January 31, 2046	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
283	February 1, 2046	February 28, 2046	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
284	March 1, 2046	March 31, 2046	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
285	April 1, 2046	April 30, 2046	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
286	May 1, 2046	May 31, 2046	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
287	June 1, 2046	June 30, 2046	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
288	July 1, 2046	July 31, 2046	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
289	August 1, 2046	August 31, 2046	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
290	September 1, 2046	September 30, 2046	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
291	October 1, 2046	October 31, 2046	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
292	November 1, 2046	November 30, 2046	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
293	December 1, 2046	December 31, 2046	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
294	January 1, 2047	January 31, 2047	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
295	February 1, 2047	February 28, 2047	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
296	March 1, 2047	March 31, 2047	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

297	April 1, 2047	April 30, 2047	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
298	May 1, 2047	May 31, 2047	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
299	June 1, 2047	June 30, 2047	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
300	July 1, 2047	July 31, 2047	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
301	August 1, 2047	August 31, 2047	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
302	September 1, 2047	September 30, 2047	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
303	October 1, 2047	October 31, 2047	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
304	November 1, 2047	November 30, 2047	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
305	December 1, 2047	December 31, 2047	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
306	January 1, 2048	January 31, 2048	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
307	February 1, 2048	February 29, 2048	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
308	March 1, 2048	March 31, 2048	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
309	April 1, 2048	April 30, 2048	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
310	May 1, 2048	May 31, 2048	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
311	June 1, 2048	June 30, 2048	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
312	July 1, 2048	July 31, 2048	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
313	August 1, 2048	August 31, 2048	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
314	September 1, 2048	September 30, 2048	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
315	October 1, 2048	October 31, 2048	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
316	November 1, 2048	November 30, 2048	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
317	December 1, 2048	December 31, 2048	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
318	January 1, 2049	January 31, 2049	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
319	February 1, 2049	February 28,	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

		2049					
320	March 1, 2049	March 31, 2049	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
321	April 1, 2049	April 30, 2049	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
322	May 1, 2049	May 31, 2049	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
323	June 1, 2049	June 30, 2049	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
324	July 1, 2049	July 31, 2049	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
325	August 1, 2049	August 10, 2049	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Table 4

Service Level	Target Utilities Consumption Rates			
	Natural Gas [m ³]	Electricity [kWh]	Propane Gas [m ³]	Potable Water [m ³]
Service Level 1	232,994.00	4,823,085.00	70.00	4,493.90
Service Level 2	232,994.00	4,864,407.24	70.00	4,493.90
Service Level 3	232,994.00	4,847,879.00	70.00	4,493.90
Service Level 4	232,994.00	4,880,477.00	70.00	4,493.90

Table 5

Utilities Unit Costs			
Natural Gas	Electricity	Propane Gas	Potable Water
[per m ³]	[per kWh]	[per L]	[per m ³]
\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

Table 6 (Annual Natural Gas Consumption Adjustment)

Item	Row Reference	Amounts
Target Consumption: Natural Gas ⁽¹⁾	[A]	•
Actual Consumption: Natural Gas ⁽²⁾	[B]	•
Variance	[C] [REDACTED]	•
Unit Cost(s) ⁽³⁾	[D]	\$•
Value of Variance	[E] = C * D	\$•
Annual Natural Gas Consumption Adjustment: Payment to Project Co	[F] [REDACTED]	\$•
Annual Natural Gas Consumption Adjustment: Credit to City	[F] [REDACTED]	\$•

- (1) As provided by Project Co based on Table 4 of Appendix A of this Schedule 19.
- (2) As provided by Project Co in the Monthly Utilities Consumption Reports.
- (3) As per Section 6.5 of Part B of this Schedule 19 and to include all different unit rates, to the extent applicable, to enable Project Co to calculate the value of the variance.

Table 7 (Annual Electricity Consumption Adjustment)

Item	Row Reference	Amounts
Target Consumption: Electricity ⁽¹⁾	[A]	•
Actual Consumption: Electricity ⁽²⁾	[B]	•
Variance	[C] [REDACTED]	•
Unit Cost(s) ⁽³⁾	[D]	\$•
Value of Variance	[E] = C * D	\$•
Annual Electricity Consumption Adjustment: Payment to Project Co	[F] [REDACTED]	\$•
Annual Electricity Consumption Adjustment: Credit to City	[F] [REDACTED]	\$•

(1) As provided by Project Co based on Table 4 of Appendix A of this Schedule 19.

(2) As provided by Project Co in the Monthly Utilities Consumption Reports.

(3) As per Section 6.5 of Part B of this Schedule 19 and to include all different unit rates, to the extent applicable, to enable Project Co to calculate the value of the variance.

Table 8 (Annual Propane Gas Consumption Adjustment)

Item	Row Reference	Amounts
Target Consumption: Propane Gas ⁽¹⁾	[A]	•
Actual Consumption: Propane Gas ⁽²⁾	[B]	•
Variance	[C] [REDACTED]	•
Unit Cost(s) ⁽³⁾	[D]	\$•
Value of Variance	[E] = C * D	\$•
Annual Propane Gas Consumption Adjustment: Payment to Project Co	[F] [REDACTED]	\$•
Annual Propane Gas Consumption Adjustment: Credit to City	[F] [REDACTED]	\$•

- (1) As provided by Project Co based on Table 4 of Appendix A of this Schedule 19.
- (2) As provided by Project Co in the Monthly Utilities Consumption Reports.
- (3) As per Section 6.5 of Part B of this Schedule 19 and to include all different unit rates, to the extent applicable, to enable Project Co to calculate the value of the variance.

Table 9 (Annual Potable Water Consumption Adjustment)

Item	Row Reference	Amounts
Target Consumption: Potable Water ⁽¹⁾	[A]	•
Actual Consumption: Potable Water ⁽²⁾	[B]	•
Variance	[C] [REDACTED]	•
Unit Cost(s) ⁽³⁾	[D]	\$•
Value of Variance	[E] = C * D	\$•
Annual Potable Water Consumption Adjustment: Payment to Project Co	[F] [REDACTED]	\$•
Annual Potable Water Consumption Adjustment: Credit to City	[F] [REDACTED]	\$•

- (1) As provided by Project Co based on Table 4 of Appendix A of this Schedule 19.
- (2) As provided by Project Co in the Monthly Utilities Consumption Reports.
- (3) As per Section 6.5 of Part B of this Schedule 19 and to include all different unit rates, to the extent applicable, to enable Project Co to calculate the value of the variance.

Table 10 (SPV₁ Costs for Calculation of Annual Service Payment)

COLUMN A	COLUMN B	COLUMN C
Contract Month (Start)	Contract Month (End)	Amount (in Inflation Base Date prices)
1	12	\$[REDACTED]
13	24	\$[REDACTED]
25	36	\$[REDACTED]
37	48	\$[REDACTED]

COLUMN A	COLUMN B	COLUMN C
Contract Month (Start)	Contract Month (End)	Amount (in Inflation Base Date prices)
49	60	\$[REDACTED]
61	72	\$[REDACTED]
73	84	\$[REDACTED]
85	96	\$[REDACTED]
97	108	\$[REDACTED]
109	120	\$[REDACTED]
121	132	\$[REDACTED]
133	144	\$[REDACTED]
145	156	\$[REDACTED]
157	168	\$[REDACTED]
169	180	\$[REDACTED]
181	192	\$[REDACTED]
193	204	\$[REDACTED]
205	216	\$[REDACTED]
217	228	\$[REDACTED]
229	240	\$[REDACTED]
241	252	\$[REDACTED]
253	264	\$[REDACTED]
265	276	\$[REDACTED]
277	288	\$[REDACTED]
289	300	\$[REDACTED]
301	312	\$[REDACTED]

COLUMN A	COLUMN B	COLUMN C
Contract Month (Start)	Contract Month (End)	Amount (in Inflation Base Date prices)
313	324	\$[REDACTED]

APPENDIX B: DEDUCTION FACTORS

TRAIN KILOMETRES AVAILABILITY FAILURE DEDUCTION - TABLE 1

Availability Ratio	Deduction Factor
100.00%	[REDACTED]%
99.90%	[REDACTED]%
99.80%	[REDACTED]%
99.70%	[REDACTED]%
99.60%	[REDACTED]%
99.50%	[REDACTED]%
99.40%	[REDACTED]%
99.30%	[REDACTED]%
99.20%	[REDACTED]%
99.10%	[REDACTED]%
99.00%	[REDACTED]%
98.90%	[REDACTED]%
98.80%	[REDACTED]%
98.70%	[REDACTED]%
98.60%	[REDACTED]%
98.50%	[REDACTED]%
98.40%	[REDACTED]%
98.30%	[REDACTED]%
98.20%	[REDACTED]%
98.10%	[REDACTED]%
98.00%	[REDACTED]%
97.90%	[REDACTED]%
97.80%	[REDACTED]%
97.70%	[REDACTED]%
97.60%	[REDACTED]%
97.50%	[REDACTED]%
97.40%	[REDACTED]%

Availability Ratio	Deduction Factor
97.30%	[REDACTED]%
97.20%	[REDACTED]%
97.10%	[REDACTED]%
97.00%	[REDACTED]%
96.90%	[REDACTED]%
96.80%	[REDACTED]%
96.70%	[REDACTED]%
96.60%	[REDACTED]%
96.50%	[REDACTED]%
96.40%	[REDACTED]%
96.30%	[REDACTED]%
96.20%	[REDACTED]%
96.10%	[REDACTED]%
96.00%	[REDACTED]%
95.90%	[REDACTED]%
95.80%	[REDACTED]%
95.70%	[REDACTED]%
95.60%	[REDACTED]%
95.50%	[REDACTED]%
95.40%	[REDACTED]%
95.30%	[REDACTED]%
95.20%	[REDACTED]%
95.10%	[REDACTED]%
95.00%	[REDACTED]%
94.90%	[REDACTED]%
94.80%	[REDACTED]%
94.70%	[REDACTED]%

Availability Ratio	Deduction Factor
94.60%	[REDACTED]%
94.50%	[REDACTED]%
94.40%	[REDACTED]%
94.30%	[REDACTED]%
94.20%	[REDACTED]%
94.10%	[REDACTED]%
94.00%	[REDACTED]%
93.90%	[REDACTED]%
93.80%	[REDACTED]%
93.70%	[REDACTED]%
93.60%	[REDACTED]%
93.50%	[REDACTED]%
93.40%	[REDACTED]%
93.30%	[REDACTED]%
93.20%	[REDACTED]%
93.10%	[REDACTED]%
93.00%	[REDACTED]%
92.90%	[REDACTED]%
92.80%	[REDACTED]%
92.70%	[REDACTED]%
92.60%	[REDACTED]%
92.50%	[REDACTED]%
92.40%	[REDACTED]%
92.30%	[REDACTED]%
92.20%	[REDACTED]%
92.10%	[REDACTED]%
92.00%	[REDACTED]%

TRAIN KILOMETRES AVAILABILITY FAILURE DEDUCTION - TABLE 1 (CONT'D)

Availability Ratio	Deduction Factor
91.90%	[REDACTED]%
91.80%	[REDACTED]%
91.70%	[REDACTED]%
91.60%	[REDACTED]%
91.50%	[REDACTED]%
91.40%	[REDACTED]%
91.30%	[REDACTED]%
91.20%	[REDACTED]%
91.10%	[REDACTED]%
91.00%	[REDACTED]%
90.90%	[REDACTED]%
90.80%	[REDACTED]%
90.70%	[REDACTED]%
90.60%	[REDACTED]%
90.50%	[REDACTED]%
90.40%	[REDACTED]%
90.30%	[REDACTED]%
90.20%	[REDACTED]%
90.10%	[REDACTED]%
90.00%	[REDACTED]%
89.90%	[REDACTED]%
89.80%	[REDACTED]%
89.70%	[REDACTED]%
89.60%	[REDACTED]%
89.50%	[REDACTED]%
89.40%	[REDACTED]%
89.30%	[REDACTED]%

Availability Ratio	Deduction Factor
89.20%	[REDACTED]%
89.10%	[REDACTED]%
89.00%	[REDACTED]%
88.90%	[REDACTED]%
88.80%	[REDACTED]%
88.70%	[REDACTED]%
88.60%	[REDACTED]%
88.50%	[REDACTED]%
88.40%	[REDACTED]%
88.30%	[REDACTED]%
88.20%	[REDACTED]%
88.10%	[REDACTED]%
88.00%	[REDACTED]%
87.90%	[REDACTED]%
87.80%	[REDACTED]%
87.70%	[REDACTED]%
87.60%	[REDACTED]%
87.50%	[REDACTED]%
87.40%	[REDACTED]%
87.30%	[REDACTED]%
87.20%	[REDACTED]%
87.10%	[REDACTED]%
87.00%	[REDACTED]%
86.90%	[REDACTED]%
86.80%	[REDACTED]%
86.70%	[REDACTED]%
86.60%	[REDACTED]%

Availability Ratio	Deduction Factor
86.50%	[REDACTED]%
86.40%	[REDACTED]%
86.30%	[REDACTED]%
86.20%	[REDACTED]%
86.10%	[REDACTED]%
86.00%	[REDACTED]%
85.90%	[REDACTED]%
85.80%	[REDACTED]%
85.70%	[REDACTED]%
85.60%	[REDACTED]%
85.50%	[REDACTED]%
85.40%	[REDACTED]%
85.30%	[REDACTED]%
85.20%	[REDACTED]%
85.10%	[REDACTED]%
85.00%	[REDACTED]%
84.90%	[REDACTED]%
84.80%	[REDACTED]%
84.70%	[REDACTED]%
84.60%	[REDACTED]%
84.50%	[REDACTED]%
84.40%	[REDACTED]%
84.30%	[REDACTED]%
84.20%	[REDACTED]%
84.10%	[REDACTED]%
84.00%	[REDACTED]%
83.90%	[REDACTED]%

TRAIN KILOMETRES AVAILABILITY FAILURE DEDUCTION - TABLE 1 (CONT'D)

Availability Ratio	Deduction Factor
83.80%	[REDACTED]%
83.70%	[REDACTED]%
83.60%	[REDACTED]%
83.50%	[REDACTED]%
83.40%	[REDACTED]%
83.30%	[REDACTED]%
83.20%	[REDACTED]%
83.10%	[REDACTED]%
83.00%	[REDACTED]%
82.90%	[REDACTED]%
82.80%	[REDACTED]%
82.70%	[REDACTED]%
82.60%	[REDACTED]%
82.50%	[REDACTED]%
82.40%	[REDACTED]%
82.30%	[REDACTED]%
82.20%	[REDACTED]%
82.10%	[REDACTED]%
82.00%	[REDACTED]%
81.90%	[REDACTED]%
81.80%	[REDACTED]%
81.70%	[REDACTED]%
81.60%	[REDACTED]%
81.50%	[REDACTED]%
81.40%	[REDACTED]%
81.30%	[REDACTED]%
81.20%	[REDACTED]%

Availability Ratio	Deduction Factor
81.10%	[REDACTED]%
81.00%	[REDACTED]%
80.90%	[REDACTED]%
80.80%	[REDACTED]%
80.70%	[REDACTED]%
80.60%	[REDACTED]%
80.50%	[REDACTED]%
80.40%	[REDACTED]%
80.30%	[REDACTED]%
80.20%	[REDACTED]%
80.10%	[REDACTED]%
80.00%	[REDACTED]%
79.90%	[REDACTED]%
79.80%	[REDACTED]%
79.70%	[REDACTED]%
79.60%	[REDACTED]%
79.50%	[REDACTED]%
79.40%	[REDACTED]%
79.30%	[REDACTED]%
79.20%	[REDACTED]%
79.10%	[REDACTED]%
79.00%	[REDACTED]%
78.90%	[REDACTED]%
78.80%	[REDACTED]%
78.70%	[REDACTED]%
78.60%	[REDACTED]%
78.50%	[REDACTED]%

Availability Ratio	Deduction Factor
78.40%	[REDACTED]%
78.30%	[REDACTED]%
78.20%	[REDACTED]%
78.10%	[REDACTED]%
78.00%	[REDACTED]%
77.90%	[REDACTED]%
77.80%	[REDACTED]%
77.70%	[REDACTED]%
77.60%	[REDACTED]%
77.50%	[REDACTED]%
77.40%	[REDACTED]%
77.30%	[REDACTED]%
77.20%	[REDACTED]%
77.10%	[REDACTED]%
77.00%	[REDACTED]%
76.90%	[REDACTED]%
76.80%	[REDACTED]%
76.70%	[REDACTED]%
76.60%	[REDACTED]%
76.50%	[REDACTED]%
76.40%	[REDACTED]%
76.30%	[REDACTED]%
76.20%	[REDACTED]%
76.10%	[REDACTED]%
76.00%	[REDACTED]%
75.90%	[REDACTED]%
75.80%	[REDACTED]%

TRAIN KILOMETRES AVAILABILITY FAILURE DEDUCTION - TABLE 1 (CONT'D)

Availability Ratio	Deduction Factor
75.70%	[REDACTED]%
75.60%	[REDACTED]%
75.50%	[REDACTED]%
75.40%	[REDACTED]%
75.30%	[REDACTED]%
75.20%	[REDACTED]%
75.10%	[REDACTED]%
75.00%	[REDACTED]%
74.90%	[REDACTED]%
74.80%	[REDACTED]%
74.70%	[REDACTED]%
74.60%	[REDACTED]%
74.50%	[REDACTED]%
74.40%	[REDACTED]%
74.30%	[REDACTED]%
74.20%	[REDACTED]%
74.10%	[REDACTED]%
74.00%	[REDACTED]%
73.90%	[REDACTED]%
73.80%	[REDACTED]%
73.70%	[REDACTED]%
73.60%	[REDACTED]%
73.50%	[REDACTED]%
73.40%	[REDACTED]%
73.30%	[REDACTED]%
73.20%	[REDACTED]%
73.10%	[REDACTED]%

Availability Ratio	Deduction Factor
73.00%	[REDACTED]%
72.90%	[REDACTED]%
72.80%	[REDACTED]%
72.70%	[REDACTED]%
72.60%	[REDACTED]%
72.50%	[REDACTED]%
72.40%	[REDACTED]%
72.30%	[REDACTED]%
72.20%	[REDACTED]%
72.10%	[REDACTED]%
72.00%	[REDACTED]%
71.90%	[REDACTED]%
71.80%	[REDACTED]%
71.70%	[REDACTED]%
71.60%	[REDACTED]%
71.50%	[REDACTED]%
71.40%	[REDACTED]%
71.30%	[REDACTED]%
71.20%	[REDACTED]%
71.10%	[REDACTED]%
71.00%	[REDACTED]%
70.90%	[REDACTED]%
70.80%	[REDACTED]%
70.70%	[REDACTED]%
70.60%	[REDACTED]%
70.50%	[REDACTED]%
70.40%	[REDACTED]%

Availability Ratio	Deduction Factor
70.30%	[REDACTED]%
70.20%	[REDACTED]%
70.10%	[REDACTED]%
70.00%	[REDACTED]%

APPENDIX C: FAILURE POINTS

Section 1. Failure Points Applicable to Train Kilometres Availability Failures

- 1.1 Failure Points shall be awarded in each Contract Month of the Maintenance Period based on the Aggregate Train Kilometres Availability Ratio calculated for that Contract Month, in accordance with the table, below. Failure Points shall not be awarded in respect of any Train Kilometres Availability Failures that are caused by NVSC Warranty Failures.

Aggregate Train Kilometres Availability Ratio for Contract Month <i>n</i>	Failure Points Awarded for Contract Month <i>n</i>
99.0% to 100.0%	[REDACTED]
98.5% to 98.9%	[REDACTED]
98.0% to 98.4%	[REDACTED]
97.5% to 97.9%	[REDACTED]
97.0% to 97.4%	[REDACTED]
96.5% to 96.9%	[REDACTED]
96.0% to 96.4%	[REDACTED]
95.5% to 95.9%	[REDACTED]
95.0% to 95.4%	[REDACTED]
94.5% to 94.9%	[REDACTED]
94.0% to 94.4%	[REDACTED]
93.5% to 93.9%	[REDACTED]
93.0% to 93.4%	[REDACTED]
92.5% to 92.9%	[REDACTED]
92.0% to 92.4%	[REDACTED]
91.5% to 91.9%	[REDACTED]
91.0% to 91.4%	[REDACTED]
90.5% to 90.9%	[REDACTED]
90.0% to 90.4%	[REDACTED]
89.9% or below	[REDACTED]

Section 2. Failure Points Applicable to System Events

- 2.1 Failure Points shall be awarded in each Contract Month based on any System Events occurring during that Contract Month, in accordance with the table, below.

System Event	Failure Points Applied
On any single Weekday during a Contract Month, the Peak Period Train Kilometres Availability Ratio for either (a) morning Peak Period service or (b) afternoon Peak Period service is less than [REDACTED]%.	[REDACTED] per occurrence For clarity, each Peak Period which fails to meet the [REDACTED]% service standard shall result in awarding [REDACTED] Failure Points, such that Project Co could be awarded [REDACTED] Failure Points in respect of morning Peak Period service and a further [REDACTED] Failure Points in respect of afternoon Peak Period service.
On any single day during a Contract Month, the Aggregate Train Kilometres Availability Ratio for that day is less than [REDACTED]%.	[REDACTED] per occurrence
On any single day during a Contract Month, an inability to provide train service to a terminal station (for clarity, this means Bayview Station, Limebank Station or Airport Station) for any duration that is in excess of a cumulative 36 minutes during that day, either on a continuous or intermittent basis.	[REDACTED] per occurrence per Station In the event that the same failure results in Failure Points applied due to this trigger as well as either of the aforementioned triggers outlined in this table, only the Failure Points resulting from a System Event(s) due to the aforementioned triggers shall be applied.

- 2.2 To the extent that Failure Points are awarded for System Events, no Failure Points for directly corresponding Quality Failures or Service Failures shall be awarded in addition to the Failure Points awarded for System Events. Failure Points shall not be awarded in respect of any System Events that are caused by NVSC Warranty Failures.

Section 3. Failure Points Applicable to Quality Failures and Service Failures

Category	Failure Points	Application
Minor Quality Failure	[REDACTED]	Per Quality Failure
Medium Quality Failure	[REDACTED]	
Major Quality Failure	[REDACTED]	
Minor Service Failure	[REDACTED]	Per Service Failure
Medium Service Failure	[REDACTED]	
Major Service Failure	[REDACTED]	

SCHEDULE 20

CONSTRUCTION PERIOD PAYMENTS

1. INTERPRETATION AND DEFINITIONS

1.1 Interpretation

- (a) In this Schedule 20, and for the purposes of all calculations pursuant to this Schedule 20, all amounts cited in respect of capital costs and/or costs in respect of the construction of the Works are amounts net of any CLA holdback.

1.2 Definitions

Any capitalized term not defined in this Schedule 20 shall have the meaning given to such term in the Project Agreement. In this Schedule 20, unless the context otherwise requires:

- (a) **“Actual Eligible Payment Period Amount”** means, for each Payment Period, an amount equal to (the Total Capital Cost Incurred to Date minus the Initial Capital Investment Amount).
- (b) **“Attachment A”, “Attachment B”, “Attachment C”, “Attachment D”, “Attachment E”, “Attachment F” and “Attachment G”** mean, respectively, Attachment A, Attachment B, Attachment C, Attachment D, Attachment E, Attachment F and Attachment G to this Schedule 20.
- (c) **“Capital Costs”** means costs incurred by Project Co in connection with the Project as reflected in the Financial Model that are not Project Co Soft Costs. For clarity, Capital Costs shall not include Revenue Vehicle Contract Costs.
- (d) **“Construction Period Deduction”** means a deduction made from the Substantial Completion Payment in accordance with Section 6.1.
- (e) **“Construction Period Event”** means an incident or state of affairs that does not meet or comply with the Construction Period Performance Criteria, which is capable of becoming a Construction Period Quality Failure.
- (f) **“Construction Period Failure Category”** means the failure category described in the fourth column of the tables in Attachment E.
- (g) **“Construction Period Failure Type”** means the failure type described in the third column of the tables in Attachment E.
- (h) **“Construction Period Month”** means a calendar month during the Construction Period, except that:
- (i) the first Construction Period Month of the Construction Period shall run from Financial Close until the end of the calendar month in which Financial Close occurs; and
 - (ii) the last Construction Period Month of the Construction Period shall run from the first day of the calendar month in which the Final Completion Date falls until the Final Completion Date.

- (i) “**Construction Period Payment**” means a payment, which shall be no more frequent than once a month, calculated in accordance with this Schedule 20.
- (j) “**Construction Period Payment Application**” has the meaning set out in Section 3.3(a).
- (k) “**Construction Period Performance Criteria**” means the level of performance (as set out in the column entitled “Requirements to be met” in Attachment E) that Project Co must achieve to avoid a Construction Period Event for a failure to achieve compliance with the applicable Project Agreement requirement.
- (l) “**Construction Period Quality Failure**” means any failure by Project Co to comply with the requirements set out in the column entitled “Requirements to be met” corresponding to the Construction Period Performance Criteria designated as Construction Period Failure Type “CPQF” in Attachment E.
- (m) “**Construction Period Quality Failure Deduction**” has the meaning given in Section 6.2(a).
- (n) “**Contested Non-Conforming Works**” means Works in respect of which the City has given Notice to Project Co, pursuant to Section 59 of the Project Agreement (but not a Non-Conformance Report initiated by the City pursuant to Schedule 11 – Integrated Management System Requirements), that, in the opinion of the City, such Works are not in accordance with the Project Agreement, and Project Co has asserted that, in Project Co’s opinion, such Works are in accordance with the Project Agreement.
- (o) “**Credit Rules**” means the rules set out in Attachment F.
- (p) “**Critical Construction Period Quality Failure**” means a Construction Period Quality Failure designated as a Construction Period Failure Category of “Critical” in Attachment E.
- (q) “**Critical Qualifying NCR**” means a Qualifying NCR raised by the City or Project Co on a Critical Non-Conformance that requires all or any portion of Project Co Accepted Works to be removed or repeated because such Project Co Accepted Works have, or would reasonably be expected to have, a significantly adverse or materially adverse impact on:
 - (i) the safety of the Project, the environment, System Users or the public;
 - (ii) statutory and regulatory requirements;
 - (iii) the quality of the Works; or
 - (iv) the durability of the Works.
- (r) “**Critical Qualifying Process NCR**” means a Qualifying Process NCR raised by the City or Project Co on a Non-Conformance that requires physical progress on the Works to be stopped for longer than twenty-four (24) hours.
- (s) “**Earned Value**” means the budgeted cost of work performed in respect of each Payment Period, measured using the Earned Value Measurement Techniques and Performance Measurement Baseline.
- (t) “**Earned Value Measurement Techniques**” means the techniques used to measure Earned Value established by Project Co and agreed with the Independent Certifier in accordance with the

“Practice Standard for Earned Value Management” (2nd Edition, published in 2011 by the Project Management Institute, Inc.).

- (u) “**Earned Value Progress Ratio**” means, as of a Payment Calculation Date, the aggregate total Earned Value achieved by Project Co and certified by the Independent Certifier divided by the Projected Earned Value (Cumulative).
- (v) “**Financing**” means the financing with the Lenders to finance the costs of the Project pursuant to the Lending Agreements.
- (w) “**Hold Point**” has the meaning given in Schedule 11 – Integrated Management System Requirements.
- (x) “**IC Construction Period Payment Authorization Certificate**” has the meaning set out in Section 3.3(c).
- (y) “**IC Initial Capital Investment Certificate**” has the meaning set out in Section 3.2(b)(iv).
- (z) “**Initial Capital Investment**” means the threshold point at which,
 - (i) the Initial Capital Investment Amount has been invested by Project Co in respect of the Project and has been advanced to Project Co either through sources of equity capital and/or the Financing; and
 - (ii) the sum of (A) the Earned Value of the Works achieved by Project Co and certified by the Independent Certifier in the Investment Certificate and (B) the Project Co Soft Costs incurred by Project Co are equal to or greater than the Initial Capital Investment Amount.
- (aa) “**Initial Capital Investment Amount**” means \$[REDACTED].
- (bb) “**Initial Capital Investment Date**” means the date on which the Initial Capital Investment is achieved, as certified by the Independent Certifier in the IC Initial Capital Investment Certificate.
- (cc) “**Initial Capital Investment Date Notice**” has the meaning set out in Section 3.2(a)(i).
- (dd) “**Lender Advance Confirmations**” has the meaning set out in Section 3.1(a).
- (ee) “**Lender Advances**” has the meaning set out in Section 3.1(a)(i).
- (ff) “**Maintained Private Capital**” means the Private Capital Invested that is unpaid following receipt by Project Co of the Substantial Completion Payment which shall be no less than \$[REDACTED].
- (gg) “**Medium Construction Period Quality Failure**” means a Construction Period Quality Failure designated as a Construction Period Failure Category of “Medium” in Attachment E.
- (hh) “**Medium Qualifying NCR**” means a Qualifying NCR raised by the City or Project Co on a Medium Non-Conformance for all or any portion of Project Co Accepted Works that is not a Critical Qualifying NCR.

- (ii) “**Medium Qualifying Process NCR**” means a Qualifying Process NCR raised by the City or Project Co on a Non-Conformance that requires changes to a Works Submittal being used by Project Co in its delivery of the Works that is not a Critical Qualifying NCR.
- (jj) “**Minor Construction Period Quality Failure**” means a Construction Period Quality Failure designated as a Construction Period Failure Category of “Minor” in Attachment E.
- (kk) “**Minor Construction Period Quality Failure Tolerance**” has the meaning given in Section 6.3(a).
- (ll) “**Minor Qualifying NCR**” means a Qualifying NCR raised by the City on a Non-Conformance on all or any portion of the Works that have been inspected and tested and approved by Project Co at a Witness Point or Hold Point, pursuant to the relevant Inspection and Test Plan, but are not yet Project Co Accepted Works. For clarity, a Minor Qualifying NCR does not mean a Qualifying NCR raised by Project Co.
- (mm) “**Minor Qualifying Process NCR**” means a Qualifying Process NCR raised by the City on a Minor Non-Conformance that is not a Critical Qualifying Process NCR or Medium Qualifying Process NCR. For clarity, a Minor Qualifying Process NCR does not mean a Qualifying Process NCR raised by Project Co.
- (nn) “**Mobilization Credit**” has the meaning given in Section 1.3(e) of Attachment F.
- (oo) “**Monthly Non-Conformance Report**” means the monthly report to be submitted by Project Co in accordance with Section 2.11 of Schedule 11 – Integrated Management System Requirements.
- (pp) “**NCR**” means a Non-Conformance Report.
- (qq) “**Non-Conformance**” has the meaning given in Schedule 11- Integrated Management System Requirements.
- (rr) “**Non-Conformance Report**” has the meaning given in Schedule 11 – Integrated Management System Requirements.
- (ss) “**Payment Application Requirements**” has the meaning set out in Section 3.3(a).
- (tt) “**Payment Calculation Date**” means the date set out in Column 2 of Table A that is the date to be used as the “Payment Calculation Date” for the applicable Construction Period Payment, subject to Section 2.2(a)(iii).
- (uu) “**Payment Period**” means the payment period(s) identified in Column 1 of Table A.
- (vv) “**Performance Measurement Baseline**” is the cost loaded Works Schedule, at detailed activity level, that has achieved “NO COMMENT” or “MINOR COMMENT” status in accordance with Section 22 of the Project Agreement, as amended from time to time by the parties in accordance with Section 22 of the Project Agreement.
- (ww) “**Private Capital Invested**” means the total amount of Financing and equity capital advanced and utilized in the Project to fund the Works, comprising the aggregate of all Project Co Funding Amounts and the Initial Capital Investment Amount.

- (xx) “**Project Co Accepted Works**” means all physical elements of the Works that have been accepted by Project Co as meeting its acceptance criteria for those Works, pursuant to its Inspection and Test Plan.
- (yy) “**Project Co Construction Period Payment Documentation**” has the meaning set out in Section 3.1(c).
- (zz) “**Project Co Funding Amount**” means, for each Payment Period, an amount equal to [REDACTED]% of the Actual Eligible Payment Period Amount for the applicable Payment Period.
- (aaa) “**Project Co Officer Construction Period Payment Certificate**” has the meaning set out in Section 3.1(d).
- (bbb) “**Project Co Officer Initial Capital Investment Certificate**” means the officer certificate referenced in Section 3.2(a)(iv).
- (ccc) “**Project Co Soft Costs**” means the special purpose vehicle costs, accounting, tax, audit costs, rating agency fees, bid fee cost, independent certifier costs, pre-construction costs (e.g. bid pursuit costs, financial advisor, legal advisor, insurance advisor), other ancillary fees, interest and fees paid in connection with the Financing, in each case, in accordance with and as reflected in the Financial Model and incurred by Project Co in connection with the Project (or with respect to the interest or fees paid in connection with the Financing for purposes of calculating the Actual Eligible Payment Period Amount or certifying the Initial Capital Investment, actually incurred by Project Co and verified pursuant to the Lender Advance Confirmations).
- (ddd) “**Projected Capital Costs**” means, in respect of each Payment Period, the amount set out in Column 3A of Table A.
- (eee) “**Projected Construction Period Payment**” means, in respect of each Construction Period Payment, the amount set out in Column 9 of Table A, which shall equal [REDACTED]% of the Projected Eligible Construction Period Payment for the applicable Payment Period.
- (fff) “**Projected Construction Period Payment (Cumulative)**” means, in respect of each Construction Period Payment, the amount set out in Column 10 of Table A.
- (ggg) “**Projected Earned Value**” means, in respect of each Construction Period Payment, the amount set out in Column 3B of Table A.
- (hhh) “**Projected Eligible Construction Period Payment**” means, in respect of each Construction Period Payment, the amount set out in Column 4 of Table A, which shall be the sum of the Projected Project Co Soft Costs and Projected Capital Costs calculated cumulatively less the Initial Capital Investment Amount.
- (iii) “**Projected Eligible Construction Period Payment (Cumulative)**” means, in respect of each Construction Period Payment, the amount set out in Column 5 of Table A.
- (jjj) “**Projected Project Co Funding Amount**” means, in respect of each Payment Period, the amount set out in Column 6 of Table A, which shall equal [REDACTED]% of the Projected Eligible Construction Period Payment for the applicable Payment Period.

- (kkk) “**Projected Project Co Funding Amount (Cumulative)**” means, in respect of each Payment Period, the amount set out in Column 7 of Table A.
- (lll) “**Projected Project Co Soft Costs**” means, in respect of each Payment Period, the amount set out in Column 3 of Table A.
- (mmm) “**Projected Total Capital Cost Incurred to Date**” means, in respect of each Payment Period, the amount set out in Column 8 of Table A which shall be the sum of Projected Project Co Soft Costs and Projected Capital Costs.
- (nnn) “**Qualifying NCR**” means a Non-Conformance Report in accordance with Schedule 11 – Integrated Management System Requirements regarding any Non-Conformance discovered in the physical elements of any of the Works:
 - (i) for which Project Co has continued, or has stated the intention to continue, construction of the Works past the relevant Witness Point or Hold Point in contravention of the Inspection and Test Plan; or
 - (ii) following Project Co’s stated completion of a task or component and Project Co’s statement that the requirements for Design and Construction Certification have been met in respect of such Works and such Works have been inspected and tested by Project Co pursuant to the Inspection and Test Plan,
- and shall include “Critical Qualifying NCR”, “Medium Qualifying NCR” or “Minor Qualifying NCR”.
- (ooo) “**Qualifying Process NCR**” means a Non-Conformance Report in accordance with Schedule 11 – Integrated Management System Requirements regarding any Non-Conformance discovered in the Works that is not a physical element of the Works as described in Attachment E, and shall include “Critical Qualifying Process NCR”, “Medium Qualifying Process NCR” or “Minor Qualifying Process NCR”.
- (ppp) “**Remedial Period**” means the period allowed for remedying a Construction Period Quality Failure in accordance with the fifth column of the tables in Attachment E.
- (qqq) “**Repeated Minor Construction Period Quality Failure**” has the meaning set out in Section 6.3(c).
- (rrr) “**Request for Payment**” has the meaning set out in Section 3.3(a)(i).
- (sss) “**Scheduled Initial Capital Investment Date**” means June 30, 2019.
- (ttt) “**Supplementary Payment Calculation Date**” has the meaning set out in Section 2.3(a).
- (uuu) “**Table A**” means the Table A set out in Attachment A.
- (vvv) “**Total Capital Cost**” means \$[REDACTED] (and shall exclude Revenue Vehicle Contract Costs)
- (www) “**Total Capital Cost Incurred to Date**” means the cumulative amount of the Total Capital Cost determined as of each Payment Calculation Date as the sum of:

- (i) the cumulative aggregate of Capital Costs up to, and including, the Payment Period as set out in Table A, multiplied by the Earned Value Progress Ratio; and
 - (ii) the cumulative aggregate of Project Co Soft Costs up to, and including, the Payment Period as set out in Table A.
- (xxx) “**Unpaid Construction Period Payment**” means any portion of the Projected Eligible Construction Period Payment (Cumulative) set out in Table A that is unpaid after the last Construction Period Payment set out in Table A.
- (yy) “**Witness Point**” has the meaning given in Schedule 11 – Integrated Management System Requirements.

2. PAYMENTS BY THE CITY

2.1 Obligation to Pay

(a) The City shall pay to Project Co:

- (i) the Construction Period Payments; and
- (ii) the Substantial Completion Payment,

in accordance with the Project Agreement and this Schedule 20.

2.2 Calculation of the Construction Period Payments

(a) Each Construction Period Payment shall be calculated in accordance with the following:

- (i) the City shall not be obliged to make any Construction Period Payment until Project Co has achieved the Initial Capital Investment, as certified by the Independent Certifier;
- (ii) subject to Section 2.2(a)(iii) and Section 2.3, the number of Construction Period Payments to be paid by the City is set out in Table A;
- (iii) notwithstanding the first Payment Calculation Date set out in Table A, the first actual Payment Calculation Date shall be the later of,
 - (A) the first Payment Calculation Date set out in Table A; or
 - (B) the first Payment Calculation Date set out in Table A that occurs on or after the Initial Capital Investment Date,

and each Payment Calculation Date thereafter shall occur on the applicable Payment Calculation Date set out in Table A;

(iv) each Construction Period Payment shall equal the lesser of:

- (A) the Projected Construction Period Payment (Cumulative) set out in Table A for the applicable Payment Period less the total value of all Construction Period Payments made by the City prior to the date of calculation; or
- (B) the Actual Eligible Payment Period Amount minus the Project Co Funding Amount prior to and including the applicable Payment Period less the total value of all Construction Period Payments made by the City prior to the date of calculation.

2.3 Payment of Unpaid Construction Period Payment Prior to Substantial Completion

(a) After the expiration of all Payment Calculation Dates set out in Column 2 of Table A, Project Co may identify additional Payment Calculation Dates (each a “**Supplementary Payment Calculation Date**”) for the purposes of seeking payment of any Unpaid Construction Period Payment, or any portion thereof, in accordance with the following:

- (i) Project Co shall provide at least 30 days' Notice to the City of each Supplementary Payment Calculation Date;
- (ii) All provisions of this Schedule 20 with respect to the application for, and calculation and Independent Certifier review of, a Construction Period Payment shall apply mutatis mutandis to an application for, and calculation and Independent Certifier review of, a payment pursuant to this Section 2.3;
- (iii) Each Supplementary Payment Calculation Date shall occur no more than once a month; and
- (iv) any Unpaid Construction Period Payment, or any portion thereof, not paid pursuant to this Section 2.3 shall be paid in accordance with Section 4.2.

2.4 [Intentionally Deleted].

2.5 Calculation of the Substantial Completion Payment

- (a) Subject to Section 2.3, the payment to be made by the City following Substantial Completion or Interim Substantial Completion, as the case may be, shall be calculated in accordance with the following:
 - (i) The payment made following Substantial Completion shall equal,
 - (A) the Substantial Completion Payment; plus
 - (B) any Unpaid Construction Period Payment as of the date of payment of the Substantial Completion Payment.
 - (ii) Notwithstanding anything else to the contrary in the Project Agreement, Project Co shall retain Maintained Private Capital of no less than \$[REDACTED] subject only to the permitted reduction of the Maintained Private Capital during the Maintenance Period.

3. CONSTRUCTION PERIOD PAYMENTS

3.1 Information to be Provided by Project Co –Lender Advance Confirmations and Project Co Construction Period Payment Documentation

- (a) In order to enable the City and the Independent Certifier to calculate and verify Earned Value, the progress of the Works, the Capital Costs, Project Co Soft Costs and the Construction Period Payments, Project Co shall deliver to the City Representative and the Independent Certifier:
 - (i) evidence of all Private Capital Invested, to the extent of Project Co Funding Amounts made from sources other than by Lender Advances; and
 - (ii) evidence of all Private Capital Invested from sources other than as set out in Section 3.1 (a) (i) above, including copies of all draw requests, reports, information, and documentation supporting, or required to be submitted to the Lenders, the Lenders' technical advisor and/or the Lenders' Agent, as the case may be, in respect of Project Co's applications for advances, draws, releases of funds or payments by the Lenders under the Lending Agreements ("Lender Advances") and all payment or advance confirmations issued by or on behalf of the Lenders including, for clarity, issued by the

Lenders' technical advisor,

(items in Section 3.1(a)(ii) collectively referred to as "**Lender Advance Confirmations**"). Acceptable forms of confirmation would include such proof as wire transfer statements and/or bank statements and any other evidence as agreed between the City and Project Co.

- (b) Project Co shall acquire, from the Lenders or the Lenders' Agent, as part of the Financing and in a form and content acceptable to the City Representative, the right for Project Co to receive, and to deliver to the City and the Independent Certifier, copies of all Lender Advance Confirmations. Project Co shall deliver to the City Representative and the Independent Certifier, copies of all Lender Advance Confirmations within two Business Days following receipt of each Lender Advance by Project Co.
- (c) In order to enable the City and the Independent Certifier to calculate and verify progress of the Earned Value of the Works, the Capital Costs, the Project Co Soft Costs and the Construction Period Payments, Project Co shall submit, to the Independent Certifier,
 - (i) all information required by Schedule 31 – Works Reports Requirements and Schedule 12 – Works Scheduling Requirements; and
 - (ii) any other information reasonably required by the Independent Certifier to allow the Independent Certifier to assess the Earned Value, the Capital Costs, the Project Co Soft Costs and the payment to be made under Section 2.2(a)(iv)(B) and to assess the Total Capital Cost Incurred to Date,(collectively, the "**Project Co Construction Period Payment Documentation**").

- (d) Prior to the issuance of the Initial Capital Investment Date Notice, and thereafter in conjunction with all Construction Period Payment Applications, Project Co shall complete and deliver to the City Representative and the Independent Certifier a Project Co officer certificate in substantially the form set out in Attachment C confirming the information set out therein ("**Project Co Officer Construction Period Payment Certificate**").

3.2 Achieving the Initial Capital Investment

- (a) Once Project Co believes that it has achieved the Initial Capital Investment, it shall deliver to the City Representative and the Independent Certifier,
 - (i) a notice (the "**Initial Capital Investment Date Notice**") indicating that all requirements necessary to the achievement of the Initial Capital Investment have been met and the date on which Project Co believes such requirements were met;
 - (ii) except to the extent already delivered to the City, all Lender Advance Confirmations as of the date of the Initial Capital Investment Date Notice;
 - (iii) except to the extent already delivered to the City, all Project Co Construction Period Payment Documentation as of the date of the Initial Capital Investment Date Notice; and
 - (iv) a Project Co officer certificate, in the form attached as Attachment G to this Schedule 20, certifying that the Initial Capital Investment has been achieved.

- (b) The Independent Certifier shall, within five Business Days after receipt of the Initial Capital Investment Date Notice, and associated materials, review and fully assess,
- (i) the Project Co Construction Period Payment Documentation and the Lender Advance Confirmations;
 - (ii) the documentation submitted by Project Co with the applicable Initial Capital Investment Date Notice; and
 - (iii) the Project Co officer certificate submitted pursuant to Section 3.2(a)(iv),
- and shall provide to the City and Project Co either,
- (iv) a notice that all requirements to achieve the Initial Capital Investment have been met by Project Co (the “**IC Initial Capital Investment Certificate**”); or
 - (v) a report explaining the Independent Certifier’s reasons for not issuing an IC Initial Capital Investment Certificate and detailing the information that the Independent Certifier requires from Project Co to enable the Independent Certifier to issue an IC Initial Capital Investment Certificate.
- (c) If the Independent Certifier has issued a report in accordance with Section 3.2(b)(v), Project Co shall, within five Business Days after receipt of such report, provide the Independent Certifier and the City Representative with all documents required to fulfill the requirements that the Independent Certifier considers are necessary to be met by Project Co to achieve the Initial Capital Investment and, thereafter, Project Co may give a further Initial Capital Investment Date Notice and the requirements of Sections 3.2(a) and 3.2(b) shall be repeated until the Independent Certifier issues the IC Initial Capital Investment Certificate.
- (d) For clarity, the City acknowledges that,
- (i) Project Co may share the IC Initial Capital Investment Certificate with the Lenders’ Agent or Lenders’ technical advisor; and
 - (ii) subject to Section 3.2(e), if Project Co achieves the Initial Capital Investment prior to the Scheduled Initial Capital Investment Date, the Independent Certifier shall complete the process set out in this Section 3.2, but Project Co’s early achievement of the Initial Capital Investment shall not change the first Payment Calculation Date which shall remain the same, notwithstanding Project Co’s early achievement of the Initial Capital Investment.
- (e) If Project Co,
- (i) achieves the Initial Capital Investment; and
 - (ii) the Independent Certifier has issued the IC Initial Capital Investment Certificate,
- prior to the Scheduled Initial Capital Investment Date, Project Co may apply to the City to revise the first Payment Calculation Date to an earlier date. The City may grant or refuse to grant a revision to the first Payment Calculation Date in their sole discretion.

3.3 Submission and Review of Project Co Construction Period Payment Applications

- (a) No later than five days after each Payment Calculation Date, Project Co shall prepare, complete and deliver an application for payment of the applicable Construction Period Payment (a “**Construction Period Payment Application**”) to the City Representative and the Independent Certifier. Each Construction Period Payment Application shall consist of,
- (i) a request for payment substantially in the form attached as Attachment B, including all documents contemplated in the request for payment pursuant to Attachment B (each, a “**Request for Payment**”);
 - (ii) except to the extent already delivered to the City, the Lender Advance Confirmations;
 - (iii) except to the extent already delivered to the City, the Project Co Construction Period Payment Documentation; and
 - (iv) a Project Co Officer Construction Period Payment Certificate certifying the amount of Total Capital Cost Incurred to Date, as of the applicable Payment Calculation Date.
- (collectively, (i) – (iv), the “**Payment Application Requirements**”).
- (b) Project Co shall cooperate with the City Representative and the Independent Certifier to permit the Independent Certifier’s review and assessment of the Project Co Construction Period Payment Documentation, the Lender Advance Confirmations and all other documentation submitted with the Construction Period Payment Application. Such cooperation shall include responding to inquiries by the Independent Certifier so that the Independent Certifier can verify any and all matters related to the Project Co Construction Period Payment Documentation and the Lender Advance Confirmations, and the statements contained therein, to the reasonable satisfaction of the Independent Certifier.
- (c) Within five Business Days after the receipt by the Independent Certifier of a duly completed Construction Period Payment Application, the Independent Certifier shall review the Total Capital Cost Incurred to Date claimed in the Construction Period Payment Application and shall perform such inquiries, investigations and inspections as are necessary for the Independent Certifier to be able to verify Earned Value and Total Capital Cost Incurred To Date and shall provide a certificate (an “**IC Construction Period Payment Authorization Certificate**”) to the City Representative and the Project Co Representative setting out:
- (i) a certification to the City of the Actual Eligible Payment Period Amount, in accordance with the Works Report; and
 - (ii) a calculation of the Construction Period Payment pursuant to Section 2.2, and a calculation of the corresponding Project Co Funding Amount for such Payment Period.
- (d) The City shall, subject to and in accordance with Section 32 of the Project Agreement and no later than five Business Days after the date of the IC Construction Period Payment Authorization Certificate, pay the applicable Construction Period Payment to Project Co.
- (e) Project Co covenants and agrees that Project Co shall,

- (i) carry out the Works and make all payments due and payable to the Construction Contractor in respect of the Works and to the applicable recipients of the Project Co Soft Costs without further payments from the City other than Construction Period Payments and the Substantial Completion Payment as set out in this Schedule 20; and
 - (ii) continue to comply with the provisions of the Project Agreement and the CLA including complying with all holdback and trust obligations from its own resources, if necessary, and as required under the CLA.
- (f) For clarity, Project Co may deliver the Construction Period Payment Application in respect of the first Payment Calculation Date to the City Representative and the Independent Certifier concurrently with the Initial Capital Investment Date Notice.

4. SUBSTANTIAL COMPLETION PAYMENT

4.1 Substantial Completion Payment

- (a) Once Project Co believes that it has satisfied all requirements for Substantial Completion, it shall deliver the Substantial Completion Notice contemplated in Section 25.3 of the Project Agreement.
- (b) The City shall, once all preconditions to eligibility for payment have been satisfied in accordance with the provisions of the Project Agreement, including that the provisions of Section 2.5(a)(ii) have been satisfied, and subject to Article 32 of the Project Agreement, pay to Project Co, upon issuance of the Substantial Completion Certificate, the Substantial Completion Payment plus, for clarity, applicable HST, less any unremedied Construction Period Deductions and Lane Closure Adjustment on the Substantial Completion Payment Commencement Date.

4.2 Payment of Remaining Unpaid Construction Period Payments

- (a) Subject to Section 2.3, once Project Co believes that it has satisfied all requirements for Substantial Completion, it shall deliver an application for payment of any remaining Unpaid Construction Period Payments, to the City Representative and the Independent Certifier substantially in the form attached as Attachment D (the “**Unpaid Construction Period Payment Application**”) which shall provide all documentation in respect of the Unpaid Construction Period Payments. Once all of the conditions for payment of the Substantial Completion Payment have been satisfied by Project Co, the City shall pay or cause to be paid to Project Co, provided that the provisions of Section 2.5(a)(ii) have been satisfied, all Unpaid Construction Period Payments.

5. GENERAL

- (a) Project Co shall provide direction to the City as to a bank account with a Schedule 1 Bank in Canada or an alternative bank in Canada provided such bank is permitted under the Lending Agreements, where each Construction Period Payment, the Substantial Completion Payment and any Unpaid Construction Period Payments, together with applicable HST, are to be deposited.
- (b) Project Co acknowledges and agrees that payment by the City of Construction Period Payments, the Substantial Completion Payment and the Unpaid Construction Period Payments in accordance with this Schedule 20 constitutes payment by the City to Project Co in satisfaction of the City’s obligation to pay Construction Period Payments and the Substantial Completion Payment, as

applicable, to Project Co under the Project Agreement and in satisfaction of any trust obligation of the City with respect to such payments under Section 7 of the CLA pursuant to Section 10 of the CLA.

- (c) Project Co shall provide to the City, from time to time and no later than 5 Business Days after a request from the City, such information and documentation as the City may require (including certification in writing by a Project Co officer addressed to the City and the Independent Certifier, to demonstrate that the proceeds of the Construction Period Payments and the Substantial Completion Payment are being used to pay duly authorized costs of the Works, special purpose vehicle costs, Financing costs, and other costs incurred to complete the Works) to verify that all amounts due and payable in respect of the costs of the Works, special purpose vehicle costs, Financing costs and other costs incurred to complete the Works for the applicable period in excess of the applicable Construction Period Payment or Substantial Completion Payment are being satisfied and to satisfy all holdback and trust obligations owed to the Construction Contractor and other Subcontractors from time to time under the CLA.
- (d) Notwithstanding anything to the contrary in this Schedule 20 or the Project Agreement (including achieving the Initial Capital Investment),
 - (i) the City is not obligated to make any payment to Project Co (including for clarity, any Construction Period Payments or the Substantial Completion Payment) unless all conditions precedent applicable to such payment pursuant to this Schedule 20 have been satisfied by Project Co; and
 - (ii) the City are not obligated to make payment to Project Co if, in connection with the Works, the City is or becomes aware,
 - (A) that a claim for lien under the CLA has been registered against the Lands; or
 - (B) that a notice of lien or claim for lien under the CLA has been made against or in respect of the Lands or the holdbacks required to be maintained under the CLA; or
 - (C) that there has been a failure by Project Co or any Project Co Party to comply with the requirements of the CLA, including a failure to satisfy the statutory holdbacks under the CLA in respect of the Works,
- (e) No Construction Period Payment or Substantial Completion Payment or partial or entire use or occupancy of the System Infrastructure, the New Municipal Infrastructure, or the Lands shall constitute acceptance by the City of the Works in accordance with the Project Agreement.
- (f) If the City or Project Co, acting in good faith, dispute a determination of the Independent Certifier made pursuant to this Schedule 20, the City shall pay the amounts in dispute in accordance with the determination of the Independent Certifier and the Party that wishes to dispute the decision of

the Independent Certifier may refer such Dispute for resolution in accordance with Schedule 27 – Dispute Resolution Procedure.

- (g) Sections 32.1, 32.7, 32.10, 32.11, 32.13 and 32.14 of the Project Agreement apply to Construction Period Payments; and Sections 32.1, 32.7, 32.10, 32.11, 32.12, 32.13 and 32.14 of the Project Agreement apply to the Substantial Completion Payment.
- (h) Notwithstanding anything to the contrary in the Project Agreement, the City shall not make any deduction, set-off or withholding from any Construction Period Payment or Unpaid Construction Period Payment other than in accordance with this Schedule 20.

6. CONSTRUCTION ENFORCEMENT DEDUCTIONS

6.1 Construction Period Deductions

- (a) If, at any time prior to Substantial Completion, Project Co commits a Construction Period Quality Failure, the City may, in its sole discretion, assess and accumulate a Construction Period Deduction, and deduct the total of all Construction Period Deductions from the Substantial Completion Payment.

6.2 Calculation of the Construction Period Deductions

- (a) Each Construction Period Deduction shall be calculated in accordance with the following formula:

$$TCPD_n = \sum CPD_n$$

Where:

$TCPD_n$ means the Total Construction Period Deduction applicable to Payment Period n; and

$\sum CPD_n$ means the sum of Construction Period Deductions in respect of the relevant Payment Period in relation to Construction Period Quality Failures calculated in accordance with this Schedule 20 (the “**Construction Period Quality Failure Deduction**”)

- (b) The deduction attributable to each Construction Period Quality Failure shall be as follows:
 - (i) in the case of a Minor Construction Period Quality Failure for a Non-Conformance Report initiated by Project Co, there shall be no deduction;
 - (ii) in the case of a Medium Construction Period Quality Failure for a Non-Conformance Report initiated by Project Co, each deduction shall equal \$[REDACTED];
 - (iii) in the case of a Minor Construction Period Quality Failure for a Non-Conformance Report initiated by the City:
 - (A) the first deduction shall equal \$[REDACTED]; and
 - (B) each subsequent deduction arising from a failure to remediate prior to the expiration of the applicable Remedial Period, shall be [REDACTED] per cent of

- the immediately previous deduction but shall not exceed [REDACTED] per cent of the first deduction;
- (iv) in the case of a Medium Construction Period Quality Failure for a Non-Conformance Report initiated by the City:
- (A) the first deduction shall equal \$[REDACTED]; and
- (B) each subsequent deduction arising from a failure to remediate prior to the expiration of the applicable Remedial Period shall equal [REDACTED] per cent of the immediately previous deduction but shall not exceed [REDACTED] per cent of the first deduction; and
- (v) in the case of a Critical Construction Period Quality Failure for a Non-Conformance Report initiated by either Party:
- (A) the first deduction shall equal \$[REDACTED]; and
- (B) each subsequent deduction arising from a failure to remediate prior to the expiration of the applicable Remedial Period shall equal [REDACTED] per cent of the immediately previous deduction but shall not exceed [REDACTED] per cent of the first deduction.
- (c) For clarity, subject to Project Co's right to Dispute the Construction Period Quality Failure, the occurrence of a Construction Period Quality Failure will immediately give rise to a right, on behalf of the City, to apply a Construction Period Quality Failure Deduction against the Substantial Completion Payment, irrespective of the Remedial Period permitted.
- (d) After the occurrence of a Construction Period Quality Failure, Project Co shall remediate the Construction Period Quality Failure prior to the expiration of the applicable Remedial Period set out in Attachment E. If, prior to the expiration of the applicable Remedial Period, Project Co demonstrates to the satisfaction of the City Representative, acting reasonably, that it has remedied the Construction Period Quality Failure, no further Construction Period Deduction shall be made in respect of that Construction Period Quality Failure. If Project Co fails to remediate a Construction Period Quality Failure prior to the expiration of the applicable Remedial Period, the City, may, in their sole discretion, apply a further Construction Period Deduction, calculated in accordance with this Section 6.2, and a further Remedial Period (or Remedial Periods) of the same duration shall be deemed to have commenced. The City may, in their sole discretion, apply the applicable Construction Period Deduction each time Project Co fails to remediate a Construction Period Quality Failure prior to the expiration of the applicable Remedial Period until such time as Project Co demonstrates, to the satisfaction of the City Representative, acting reasonably, that it has remediated the applicable Construction Period Quality Failure.
- (e) For the purposes of calculating the Construction Period Deductions in accordance with this Schedule 20, the Parties shall have regard to Sections 38.2(k) and 42.2(e) of the Project Agreement.

6.3 Tolerances for Minor Construction Period Quality Failures for Non-Conformance Reports Initiated by the City

- (a) The City shall assess Construction Period Quality Failures on a Construction Period Month by Construction Period Month basis. Except as provided in Section 6.3(c), the City shall not apply a Construction Period Deduction due to a Minor Construction Period Quality Failure for a Non-Conformance Report initiated by the City in respect of any Construction Period Month in which the total number of Minor Construction Period Quality Failures for Non-Conformance Reports initiated by the City for that Construction Period Month is less than or equal to [REDACTED] (the “**Minor Construction Period Quality Failure Tolerance**”).
- (b) If the Minor Construction Period Quality Failure Tolerance is exceeded, the City may, in their sole discretion, apply a Construction Period Deduction for each Minor Construction Period Quality Failure for a Non-Conformance Report initiated by the City in excess of the Minor Construction Period Quality Failure Tolerance during the applicable Construction Period Month.
- (c) If, in any Construction Period Month, a Minor Construction Period Quality Failure for a Non-Conformance Report initiated by the City is due to circumstances that are substantively the same cause as a previous Minor Construction Period Quality Failure for a Non-Conformance Report initiated by the City (within the same Construction Period Month or in a different Construction Period Month) (a “**Repeated Minor Construction Period Quality Failure**”), then a Construction Period Deduction shall be made in respect of the third and each subsequent Repeated Minor Construction Period Quality Failure, irrespective of the Minor Construction Period Quality Failure Tolerance.

6.4 Administration of Construction Period Quality Failures and Construction Period Deductions

- (a) Subject to Sections 6.4(b) to 6.4(e) inclusive, the City shall use the Monthly Non-Conformance Report produced by Project Co for the purposes of calculating the relevant Construction Period Deductions.
- (b) If either Party believes that there is an error or omission in a Monthly Non-Conformance Report, that Party shall promptly provide Notice to the other Party of such error or omission. Immediately after a Notice given pursuant to this Section 6.4(b), Project Co and the City shall attempt to resolve or clarify the error or omission and amend the applicable Monthly Non-Conformance Report, to their mutual satisfaction, acting reasonably. Subject to Section 6.4(e), if the Parties fail to resolve or clarify the error or omission within ten Business Days after a Notice given pursuant to this Section 6.4(b), either Party may refer the matter to the Dispute Resolution Procedure. Subject to Section 6.4(d) and Section 6.4(e), the Parties are prohibited from giving Notice of an error or omission pursuant to this Section 6.4(b) after the expiration of 60 days after the date of the applicable Monthly Non-Conformance Report.
- (c) Subject to Section 6.4(e), if Project Co fails to monitor or accurately report a Construction Period Event or Construction Period Quality Failure then, in addition to the Construction Period Deduction to be made in respect of the relevant Construction Period Quality Failure (if any), a failure to monitor or report a Construction Period Event or a Construction Period Quality Failure shall be deemed to be a Minor Construction Period Quality Failure.
- (d) In the event that any inspection or investigation by the City or Project Co pursuant to the Project Agreement reveals new errors, omissions or failures of the type referred to in Section 6.4(b) or

Section 6.4(c), such errors, omissions or failures shall be dealt with in accordance with Section 6.4(b) or Section 6.4(c), as applicable, and, for clarity, the City may, in its sole discretion, apply Construction Period Deductions in respect of any Construction Period Quality Failures discovered pursuant to this Section 6.4(d) in the manner set out in Section 6.2. Any such Construction Period Deductions shall be made from the Substantial Completion Payment. For clarity, the 60 day deadline set out in Section 6.4(b) shall not apply to errors, omissions or failures revealed pursuant to this Section 6.4(d).

- (e) For the purposes of Sections 6.4(b), 6.4(c) and 6.4(d), if Project Co or a Project Co Party has engaged in fraudulent action or inaction, deliberate misrepresentation, or gross misconduct or incompetence,
 - (i) in the preparation of the Monthly Non-Conformance Report; or
 - (ii) in carrying out the Work resulting in Construction Period Quality Failures,then,
 - (iii) the 60 day deadline set out in Section 6.4(b) shall not apply; and
 - (iv) a failure to monitor or accurately report a Construction Period Event or Construction Period Quality Failure pursuant to Section 6.4(c) shall be deemed to be a Critical Construction Period Quality Failure.
- (f) For clarity, if Construction Period Performance Criteria are based upon Non-Conformance Reports, no Construction Period Deductions shall be made for a Non-Conformance Report which is subject to an objection by Project Co, a Notice of objection by Project Co or Dispute Resolution Process, pursuant to Part 7 of Schedule 11 – Integrated Management System Requirements.

6.5 Additional Requirements for Tracking and Reporting

- (a) In addition to the requirements of Section 7.2 of Part 7 to Schedule 11 – Quality Management, the Non Conformance Tracking System shall record Construction Period Quality Failure Deductions pursuant to this Schedule 20.
- (b) In addition to the requirements of Section 7.2 of Part 7 to Schedule 11 – Quality Management, the Monthly Non-Conformance Report shall contain:
 - (i) the number of Construction Period Quality Failure Deductions in each Construction Period Failure Category accrued within the last Construction Period Month pursuant to this Schedule 20; and
 - (ii) summary statistics and historic trends since Financial Close for the number of Construction Period Quality Failure Deductions in each Construction Period Failure Category each Construction Period Month pursuant to this Schedule 20.

6.6 Disputing a Non-Conformance Report During the Construction Period

- (a) In respect of the following circumstances, the Parties shall be subject to the binding determination of the Independent Certifier pursuant to Section 4.3 and 4.4 of Schedule 26 – Dispute Resolution

Procedure and the Independent Certifier's decision shall be final and shall not be subject to Dispute Resolution Procedure:

- (i) a Notice of objection to a Non-Conformance Report has not been resolved by mutual agreement between the City and Project Co within five Business Days after the delivery of a Notice of the objection pursuant to Section 7.1(a)(v) and Section 7.1(a)(vii) of Part 7 to Schedule 11 – Integrated Management System Requirements; and
- (ii) the Non-Conformance Report referred to in Section 6.6(a)(i) would have been a Construction Period Quality Failure with a Construction Period Failure Category of “Minor” if the Notice of objection referred to in Section 6.6(a)(i) had not been issued.

ATTACHMENT A

Table A: Payment Calculation Dates and Projected Construction Period Payments

Payment Period (Column 1)	Payment Calculation Date (Column 2)	Projected Project Co Soft Costs (Column 3)	Projected Capital Costs (Column 3A)	Projected Earned Value (Cumulative) (Column 3B)	Projected Eligible Construction Period Payment (Column 4)	Projected Eligible Construction Period Payment (Cumulative) (Column 5)	Projected Project Co Funding Amount (Column 6)	Projected Project Co Funding Amount (Cumulative) (Column 7)	Projected Total Capital Cost Incurred to Date (Column 8)	Projected Construction Period Payment (Column 9)	Projected Construction Period Payment (Cumulative) (Column 10)
1.	30-Jun-19	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
2.	01-Jul-19	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
3.	01-Aug-19	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
4.	01-Sep-19	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
5.	01-Oct-19	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
6.	01-Nov-19	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
7.	01-Dec-19	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
8.	01-Jan-20	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
9.	01-Feb-20	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
10.	01-Mar-20	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
11.	01-Apr-20	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
12.	01-May-20	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
13.	01-Jun-20	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]
14.	01-Jul-20	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]	\$[REDACTED]

36.	01-May-22	\$[REDACTED]										
37.	01-Jun-22	\$[REDACTED]										
38.	01-Jul-22	\$[REDACTED]										
39.	10-Aug-22	\$[REDACTED]										

ATTACHMENT B

Form of Request for Payment

TO: City of Ottawa AND TO: [Independent Certifier]	BY: [Project Co Name] (“Project Co”)
Construction Period Payment No:	Project: Trillium Line Extension (“Project”)
Date: [Date]	Project Agreement dated _____ (“Project Agreement”)

1. Project Co hereby makes application for payment in the amount of _____ [**insert amount in words**] Dollars (\$[**insert amount in numbers**]) which is in respect of Payment Period No. ___ in Table A. This payment is for a portion of the Total Capital Costs pursuant to the terms of the Project Agreement and Schedule 20 – Construction Period Payments. Capitalized terms used and not defined herein shall have the same meaning given to them in the Project Agreement.
2. Attached to this Request for Payment is a Project Co Officer Construction Period Payment Certificate in respect of this Payment Period No. ___ [**Note: Use the form of certificate set out in Attachment C of this Schedule 20.**];
3. Project Co hereby certifies that the Earned Value and the Total Capital Cost Incurred to Date for the applicable Payment Period qualifies Project Co for the Construction Period Payment being requested herein.
4. Attached hereto as Appendix 1 are the Lender Advance Confirmations for the period covered by this Request for Payment.
5. Attached hereto as Appendix 2 is a current Workplace Safety and Insurance Board Clearance Certificate for Construction Contractor evidencing full compliance by **[Project Co/Construction Contractor]** with the requirements of the *Workplace Safety and Insurance Act, 1997* (Ontario).
6. Attached hereto as Appendix 3 is a Statutory Declaration by Project Co on CCDC Form 9A (2001) evidencing compliance by Project Co with the holdback requirements of the CLA.

The information and calculations contained herein and on the attachments hereto are certified to be true, accurate and complete.

Dated at [City], [Province] this [day] day of [month], 20 [•].

[Project Co]

per: _____

Appendix 1

Summary of any Lender Advance Confirmations for the Period

Appendix 2

Current Workplace Safety and Insurance Board Clearance Certificate

Appendix 3

Statutory Declaration by Project Co on CCDC Form 9A (2001)

ATTACHMENT C

Form of Project Co Officer Construction Period Payment Certificate

TO: City of Ottawa AND TO: [Independent Certifier]	BY: [Project Co Name] ("Project Co")
Progress Certificate/Construction Period Payment No: _____	Project: Trillium Line Extension ("Project")
Date: [Date]	Project Agreement dated _____ ("Project Agreement")
	Request for Payment dated _____ ("Request for Payment")

I, _____, the [insert title] of [Project Co] hereby certify for and on behalf of Project Co without incurring personal liability and confirm that the same be relied upon by the City of Ottawa and the Independent Certifier without further enquiry as of _____ [insert date] that:

1. I am a duly authorized **[signing officer of][signatory for]** Project Co, am familiar with the provisions of Project Agreement and have made reasonable investigations of corporate records and inquiries of other officers and senior personnel of Project Co in certifying the information set out below. Terms defined in the Project Agreement have the same meanings when used in this certificate.
2. No Project Co Event of Default has occurred and is continuing under the Project Agreement.
3. Project Co has available to it sufficient funds to achieve Substantial Completion in accordance with the Project Agreement subject to Project Co continuing to meet its obligations under the Project Agreement and in receipt of Construction Period Payments from the City.
4. All funds received and disbursed by Project Co in connection with the Project prior to the date of this Certificate have been used solely in respect of the payment of Total Capital Costs properly due and payable.
5. The requested Construction Period Payment amount to which this Certificate is attached does not exceed the Projected Eligible Construction Period Payment (Cumulative) set out in Table A applicable to the period to which this Certificate applies.
6. Project Co has complied with all requirements of Applicable Law in connection with the Project, including without limitation, all requirements under the *Workplace Safety and Insurance Act, 1997* (Ontario) and the CLA. No claims for lien or notices of lien under the CLA have been received by Project Co or any Project Co Party which have not been duly released, discharged or vacated in accordance with the requirements of the CLA, if applicable. Any notice of lien or claim for lien identified in the Request for Payment to which this Certificate is attached has been released, discharged or vacated in accordance with the requirements of the CLA.

Dated this _____ day of _____, 20____.

Name: _____
Title: _____

Appendix 1 to Attachment C

Copies of any Lender Advance Confirmations (before Initial Capital Investment Date)

ATTACHMENT D

Form of Substantial Completion Payment Application

TO: City of Ottawa AND TO: [Independent Certifier]	BY: [Project Co Name] ("Project Co")
Substantial Completion Payment Application	Project: Trillium Line Extension ("Project")
Date: [Date]	Project Agreement dated _____ ("Project Agreement")

1. Project Co hereby makes application for the Substantial Completion Payment and Unpaid Construction Period Payments in the amount of [insert amount in words] Dollars (\$[insert amount in numbers]) pursuant to the terms of Section 25.3 of the Project Agreement and Schedule 20 – Construction Period Payments. Capitalized terms used and not defined herein shall have the same meaning given to them in the Project Agreement.
2. No Project Co Event of Default has occurred and is continuing under the Project Agreement..
3. Project Co has complied with all requirements of Applicable Law in connection with the Project, including without limitation, all requirements under the *Workplace Safety and Insurance Act, 1997* (Ontario) and the CLA. No claims for lien or notices of lien under the CLA have been received by Project Co or any Project Co Party which have not been duly released, discharged or vacated in accordance with the requirements of the CLA.
4. Attached hereto as Appendix 1 is a current Workplace Safety and Insurance Board Clearance Certificate for Project Co evidencing full compliance by [Project Co/Construction Contractor] with the requirements of the *Workplace Safety and Insurance Act, 1997* (Ontario), as amended.
5. Attached hereto as Appendix 2 is a Statutory Declaration by Project Co on CCDC Form 9A (2001) evidencing compliance by Project Co with the holdback requirements of the CLA.
6. Attached hereto as Appendix 3 is a sub-search of the title to the Lands against which a claim for lien under the CLA could be registered, if applicable. Any notice of lien or claim for lien identified in such Appendix 4 has been released, discharged or vacated in accordance with the requirements of the CLA.

The information and calculations contained herein and on the attachments hereto are certified to be true, accurate and complete.

Dated at [City], [Province] this [day] day of [month], 20 [•].

[Project Co]

per: _____

Appendix 1 to Attachment D
Workplace Safety and Insurance Board Clearance Certificate

Appendix 2 to Attachment D
Statutory Declaration by Project Co on CCDC Form 9A (2001)

Appendix 3 to Attachment D
Sub-search of the Title to the Lands

ATTACHMENT E

CONSTRUCTION PERIOD PERFORMANCE CRITERIA

Non-Conformances Discovered in Physical Elements of the Works

Table 1

Reference	Requirement to be met	Construction Period Failure Type	Construction Period Failure Category	Remedial Period
CPPC-01: Schedule 20 – Construction Period Payments	Physical elements of the Works shall meet the requirements of the Project Agreement, such that: (a) a Critical Qualifying NCR with a ‘Pending Status’ does not occur; or (b) Project Co Accepted Works are not Contested Non-Conforming Works.	CPQF	Critical	The first Remedial Period shall be equal to the time set out in NCR to resolve the Non-Conformance; thereafter, the Remedial Period shall be the lesser of 20 Business Days (or such longer period as may be approved by the City in its sole discretion) and the first Remedial Period.
CPPC-02: Schedule 20 – Construction Period Payments	Physical elements of the Works shall meet the requirements of the Project Agreement, such that a Medium Qualifying NCR with a ‘Pending Status’ does not occur.	CPQF	Medium	The first Remedial Period shall be equal to the time set out in Non-Conformance Report to remedy the Non-Conformance; thereafter, the Remedial Period shall be the lesser of twenty (20) Business Days (or such longer period as may be approved by the City in its sole discretion) and the first Remedial Period.
CPPC-03: Schedule 20 – Construction Period Payments	Physical elements of the Works shall meet the requirements of the Project Agreement, such that a Minor Qualifying NCR with a ‘Pending Status’ does not occur.	CPQF	Minor	The first Remedial Period shall be equal to the time set out in Non-Conformance Report to remedy the Non-Conformance; thereafter, the Remedial Period shall be the lesser of twenty (20) Business Days (or such longer period as may be approved by the City in its sole discretion) and the first Remedial Period.

Non-Conformances that are not physical elements of the Works

Table 2

Reference	Requirement to be met	Construction Period Failure Type	Construction Period Failure Category	Remedial Period
CPPC-04: Schedule 20 – Construction Period Payments	Works that are not physical elements of the Works shall meet the requirements of the Project Agreement, such that a Critical Qualifying Process NCR with a ‘Pending Status’ does not occur	CPQF	Critical	The first Remedial Period shall be equal to the time set out in NCR to resolve the Non-Conformance; thereafter, the Remedial Period shall be the lesser of 20 Business Days (or such longer period as may be approved by the City in its sole discretion) and the first Remedial Period.
CPPC-05: Schedule 20 – Construction Period Payments	Works that are not physical elements of the Works shall meet the requirements of the Project Agreement, such that a Medium Qualifying Process NCR with a ‘Pending Status’ does not occur.	CPQF	Medium	The first Remedial Period shall be equal to the time set out in Non-Conformance Report to remedy the Non-Conformance; thereafter, the Remedial Period shall be the lesser of twenty (20) Business Days (or such longer period as may be approved by the City in its sole discretion) and the first Remedial Period.
CPPC-06: Schedule 20 – Construction Period Payments	Works that are not physical elements of the Works shall meet the requirements of the Project Agreement, such that a Minor Qualifying Process NCR with a ‘Pending Status’ does not occur.	CPQF	Minor	The first Remedial Period shall be equal to the time set out in Non-Conformance Report to remedy the Non-Conformance; thereafter, the Remedial Period shall be the lesser of twenty (20) Business Days (or such longer period as may be approved by the City in its sole discretion) and the first Remedial Period.

Specific Non-Conformances

Table 3

For clarity a deduction under Table 3 is not subject to a deduction under Table 2.

Construction Period Failure Categories defined in Table 3 shall escalate for persistent, ongoing and repeated Non-Conformances.

Reference	Requirements to be met	Construction Period Failure Type	Construction Period Failure Category	Remedial Period
CPPC-07:	NOT USED			
CPPC-08: Project Agreement Section 21.1	Subject to Section 21.5(b) of the Project Agreement, Project Co shall provide access to the City, and the Government Entities and their respective representatives to the Lands, the New City Infrastructure, Existing Infrastructure or any workshop	CPQF	Minor	1 Business Day
CPPC-09: Project Agreement Section 21.5	Subject to Section 21.5(b) of the Project Agreement, Project Co shall provide access to the Independent Certifier, and all Other Contractors to the Lands, the New City Infrastructure, Existing Infrastructure or any workshop	CPQF	Minor	1 Business Day
CPPC-10: Project Agreement Section 27.4	Project Co shall ensure that there are sufficient numbers of competent staff, including all relevant grades of supervisory staff, engaged in the performance of the Works to ensure the proper performance of the Project Agreement	CPQF	Medium	20 Business Days
CPPC-11: Schedule 12 – Works Scheduling Requirements	Project Co shall prepare and submit PBS-1 at Financial Close.	CPQF	Critical	5 Business Days
CPPC-12: Schedule 12 – Works Scheduling Requirements	Project Co shall prepare and submit, within 180 days after Financial Close, PBS-2.	CPQF	Critical	5 Business Days
CPPC-13: Schedule 10 – Review Procedure	Works Schedules shall not receive consecutive ‘CRITICAL COMMENT’ or ‘MAJOR COMMENT’ from the City for the same reason	CPQF	Critical	n/a

Reference	Requirements to be met	Construction Period Failure Type	Construction Period Failure Category	Remedial Period
CPPC-14: Schedule 10 – Review Procedure	The following Works Submittals shall not receive a “MAJOR COMMENT” or “CRITICAL COMMENT” from the City more than two times in a row for the same reason: (a) Design Management Plan, Construction Management Plan, Traffic and Transit Management Plan, Environmental Management Plan, Design Certificates, Construction Certificates, from Appendix A to Schedule 10 – Review Procedure; and (b) the Geotechnical Instrumentation Monitoring Plan from Appendix A to Schedule 10 – Review Procedure.	CPQF	Medium	5 Business Days
CPPC-15: Schedule 17 – Environmental Obligations, Appendix B	Submission of Environmental Management Plan Updates	CPQF	Medium	5 Business Days
CPPC-16: Schedule 17 – Environmental Obligations, Appendix B	Submission of Annual Compliance Monitoring Report	CPQF	Medium	5 Business Days
CPPC-17: Schedule 17 – Environmental Obligations, Appendix B	Submission Independent Environmental Audit	CPQF	Medium	5 Business Days
CPPC-18: Schedule 17 – Environmental Obligations, Appendix B	Submission of Sustainability Annual Report Card	CPQF	Medium	5 Business Days
CPPC-19: Schedule 17 – Environmental Obligations, Appendix B	Submission Independent Environmental Audit	CPQF	Medium	5 Business Days

Reference	Requirements to be met	Construction Period Failure Type	Construction Period Failure Category	Remedial Period
CPPC-20: Schedule 17 – Environmental Obligations, Section 8.4	Project Co shall ensure during the Construction Period, air-borne and ground-borne noise and vibration impacts on Sensitive Receivers do not exceed the Applicable Noise and Vibration Requirements and Additional Sensitive Receiver Performance Requirements	CPQF	Critical	1 Business Day, or longer as agreed to by the City acting reasonably.
CPPC-21: Schedule 18 – Communications and Stakeholder Engagement Obligations, Part 4	Project Co shall deliver communications and stakeholder engagement activities in accordance with Schedule 18 Part 4	CPQF	Minor	1 Business Day
CPPC-22: Schedule 18 – Communications and Stakeholder Engagement Obligations, Section 5.1	Project Co shall provide Notification to the City and a draft public notification in accordance with the requirements of Schedule 18 Section 5.1	CPQF	Minor	1 Business Day
CPPC-23: Schedule 11 – Integrated Management System Requirements, Section 4.4	Project Co shall prepare and submit each Inspection and Test Plan in respect of the Works to the City pursuant to Schedule 10 - Review Procedure at least 15 Business Days prior to performing the relevant Works.	CPQF	Minor	1 Business Day
CPPC-24: Schedule 11 – Integrated Management System Requirements, Section 5.1(b)	Project Co shall provide an updated IMS Audit Plan at twelve month intervals following submission of the initial IMS Audit Plan.	CPQF	Medium	20 Business Days
CPPC-25: Schedule 11 – Integrated Management System Requirements, Section 5.1(b)	At each occurrence of Project Co failing to follow the IMS Audit Plan without the prior agreement in writing of the City	CPQF	Medium	20 Business Days

Reference	Requirements to be met	Construction Period Failure Type	Construction Period Failure Category	Remedial Period
CPPC-26: Schedule 11 – Integrated Management System Requirements, Section 5.2(c)	All IMS Non-Conformances identified by the Internal IMS Audits must be addressed and corrective measures implemented by Project Co. Project Co shall provide final audit reports to the City within 10 Business Days of the closing of the audits.	CPQF	Medium	1 Business Day
CPPC-27: Schedule 11 – Integrated Management System Requirements, Section 5.4(a)(ii)	Project Co shall prepare a Corrective Action plan, and submit it to the City within 20 Business Days of the closing of the City's IMS Audit. At each occurrence of Project Co failing to prepare a Corrective Action plan within the required time period.	CPQF	Minor	1 Business Day
CPPC-28: Schedule 11 – Integrated Management System Requirements, Section 7.3(a)	Project Co shall resolve Non Conformances within the response time specified on the Non Conformance Reports.	CPQF	Medium	20 Business Days
CPPC-29: Schedule 25 – Record Provisions, Section 1.1	Project Co shall keep and maintain records in accordance with Schedule 25 Section 1.1	CPQF	Minor	10 Business Days
CPPC-30: Schedule 17 – Environmental Obligations, Section 8.4	Project Co will be required to provide Tree replacement equivalent to 0.25:1 as detailed in Appendix A of Schedule 17.	CPQF	Minor	20 Business Days

ATTACHMENT F

CREDIT RULES

1. CREDIT RULES FOR THE EVALUATION OF EARNED VALUE

1.1 Purpose of Credit Rules

- (a) The Credit Rules set out requirements agreed between the City and Project Co for use and interpretation of the Earned Value Measurement Techniques, pursuant to this Schedule 20.

1.2 Change of Credit Rules

- (a) In the event that Project Co or the City propose a change to the Credit Rules, the Independent Certifier may agree to such proposed change to the Credit Rule, provided that:

- (i) any proposed change the Credit Rules will result in revised Credit Rules that:
 - (A) continue to meet the Earned Value Measurement Techniques; and
 - (B) follow the principles, guidance, and intent of the Credit Rules set out in this Attachment F, wherever possible;
- (ii) any proposed change to the Credit Rules is subject to consultation with the City and Project Co at least three months prior to the first Construction Period that uses those revised Credit Rules;
- (iii) the Independent Certifier considers any responses made by the City and Project Co to a proposed change to the Credit Rules and the Independent Certifier provides a report justifying its decision regarding acceptance or rejection of any proposal to change the Credit Rules; and
- (iv) prior to the start of the first Construction Period that is to use the revised Credit Rules for the evaluation of Earned Value:
 - (A) the proposed changes to the Credit Rules are agreed to by the Independent Certifier; and
 - (B) both the City and Project Co receive the revised Credit Rules from the Independent Certifier.

1.3 Selection of Measurement Methods

- (a) In principle, when selecting the appropriate measurement methods from the Earned Value Measurement Techniques, the following principles shall be applied:

- (i) for tangible work or tasks taking three Construction Periods or more to perform, the measurement methods shall be considered in the following decreasing order of preference:
 - (A) firstly, physical measurement;
 - (B) secondly, weighted milestone; and

- (C) thirdly, percent complete;
 - (ii) for tangible work or tasks taking one or two Construction Periods to perform, the measurement methods shall be considered in the following decreasing order of preference:
 - (A) fixed formula using the 0/100 method or 0/50/100 method; and
 - (iii) for intangible work or tasks, the measurement methods shall be considered in the following decreasing order of preference:
 - (A) firstly, apportioned effort; and
 - (B) secondly, only where apportioned effort is not possible, level of effort.
- (b) Table 1 sets out the measurement methods that shall be used from the Earned Value Measurement Techniques for specific cost categories, unless there are technical reasons preventing these measurement methods from being used. The specific cost categories in Table 1 are set out in ‘Standard Cost Codes for Capital Projects – Definitions’, US Federal Transportation Administration.

Table 1: Earned Value measurement methods for specific cost categories

Standard Cost Code	Description	Measurement Method from the Earned Value Measurement Techniques
10	Guideway	
10.01	Guideway: at-grade exclusive right-of-way (including trackwork)	Activity completion and physical measurement using the fixed formula 0/100 method
10.04	Guideway: aerial structure (including trackwork)	Activity completion and physical measurement using the fixed formula 0/100 method
10.05	Guideway: Built-up fill	Activity completion and physical measurement using the fixed formula 0/100 method
10.06	Guideway: underground cut & cover (including trackwork)	Activity completion and physical measurement using the fixed formula 0/100 method
10.07	Guideway: underground tunnel (including trackwork)	Activity completion and physical measurement using the fixed formula 0/100 method
10.09	Track: Direct fixation	Activity completion and physical measurement using the fixed formula 0/100 method
10.10	Track: Embedded	Activity completion and physical measurement using the fixed formula 0/100 method
10.11	Track: Ballasted	Activity completion and physical measurement using the fixed formula 0/100 method
10.12	Track: Special (switches, turnouts)	Activity completion and physical measurement using the fixed formula 0/100 method
20	Stations, Stops, Terminals, Intermodals	
20.01	At-grade station; stop; shelter; mall; terminal; platform	Activity completion and physical measurement using the fixed formula 0/100 method

Table 1: Earned Value measurement methods for specific cost categories		
Standard Cost Code	Description	Measurement Method from the Earned Value Measurement Techniques
20.03	Underground station; stop; shelter; mall; terminal; platform	Activity completion and physical measurement using the fixed formula 0/100 method
20.05	Joint development	Activity completion and physical measurement using the fixed formula 0/100 method
30	Support Facilities: Yards, Shops and Admin Buildings	
30.01	Administration Building: Office, sales, storage, revenue counting	Activity completion and physical measurement using the fixed formula 0/100 method
30.03	Heavy maintenance facility	Activity completion and physical measurement using the fixed formula 0/100 method
30.05	Yard and Yard Track	Activity completion and physical measurement using the fixed formula 0/100 method
40	Sitework and Special Conditions	
40.01	Demolition; clearing; earthwork	Activity completion and physical measurement using the fixed formula 0/100 method
40.02	Site utilities; utility relocation	Activity completion and physical measurement using the fixed formula 0/100 method
40.03	Hazardous material; contaminated soil mitigation; ground water treatments	Activity completion and physical measurement using the fixed formula 0/100 method
40.04	Environmental mitigation, e.g. wetlands, historic/archeologic, parks	Activity completion and physical measurement using the fixed formula 0/100 method
40.05	Site structures including retaining walls; sound walls and other structures	Activity completion and physical measurement using the fixed formula 0/100 method
40.06	Pedestrian and bike access and accommodation; landscaping	Activity completion and physical measurement using the fixed formula 0/100 method
40.07	Automobile; bus; van access ways including roads; parking lots	Activity completion and physical measurement using the fixed formula 0/100 method
40.08	Temporary facilities	Activity completion and physical measurement using the fixed formula 0/100 method
50	Systems	
50.01	Train control and signals	Activity completion and physical measurement using the fixed formula 0/100 method
50.02	Traffic signals and crossing protection	Activity completion and physical measurement using the fixed formula 0/100 method
50.03	Traction power supply and substations	Activity completion and physical measurement using the fixed formula 0/100 method
50.04	Traction power distribution and catenary	Activity completion and physical

Table 1: Earned Value measurement methods for specific cost categories		
Standard Cost Code	Description	Measurement Method from the Earned Value Measurement Techniques
		measurement using the fixed formula 0/100 method
50.05	Communications	Activity completion and physical measurement using the fixed formula 0/100 method
50.06	Fare collection system and equipment	Activity completion and physical measurement using the fixed formula 0/100 method
50.07	Central control	Activity completion and physical measurement using the fixed formula 0/100 method
80	Professional Services and Agency Costs	
80.01	Preliminary design	Weighted milestone
80.02	Final design	Weighted milestone
80.03	Project management for design and construction	Apportioned effort
80.04	Construction administration and management	Apportioned effort
80.05	Professional liability and other insurance costs	Weighted milestone
80.06	Legal; permits; review fees by other agencies, cities, etc;	Weighted milestone
80.07	Surveys, testing (quality related), investigation, inspection	Weighted milestone or apportioned effort
80.08	Start up; testing and commissioning	Weighted milestone or apportioned effort
Table 1: Earned Value measurement methods for specific cost categories		
Standard Cost Code	Description	Measurement Method from the Earned Value Measurement Techniques
10	Guideway	
10.01	Guideway: at-grade exclusive right-of-way (including trackwork)	Physical measurement
10.04	Guideway: aerial structure (including trackwork)	Physical measurement
10.06	Guideway: underground cut & cover (including trackwork)	Physical measurement
10.07	Guideway: underground tunnel (including trackwork)	Physical measurement
20	Stations, Stops, Terminals, Intermodals	
20.01	At-grade station; stop; shelter; mall; terminal; platform	Physical measurement
20.03	Underground station; stop; shelter; mall; terminal; platform	Physical measurement
30	Support Facilities: Yards, Shops and Admin Buildings	
30.03	Heavy maintenance facility	Physical measurement
40	Sitework and Special Conditions	
40.01	Demolition; clearing; earthwork	Physical measurement
40.02	Site utilities; utility relocation	Physical measurement
40.03	Hazardous material; contaminated soil mitigation; ground water treatments	Physical measurement or weighted milestone
40.05	Site structures including retaining walls; sound walls and other structures	Physical measurement
40.06	Pedestrian and bike access and accommodation; landscaping	Physical measurement or weighted milestone

Table 1: Earned Value measurement methods for specific cost categories		
Standard Cost Code	Description	Measurement Method from the Earned Value Measurement Techniques
40.07	Automobile; bus; van access ways including roads; parking lots	Physical measurement or weighted milestone
40.08	Temporary facilities	Physical measurement or weighted milestone
50	Systems	
50.01	Train control and signals	Physical measurement or weighted milestone
50.02	Traffic signals and crossing protection	Physical measurement or weighted milestone
50.03	Traction power supply and substations	Physical measurement or weighted milestone
50.04	Traction power distribution and catenary	Physical measurement or weighted milestone
50.05	Communications	Physical measurement or weighted milestone
50.06	Fare collection system and equipment	Physical measurement or weighted milestone
50.07	Central control	Physical measurement or weighted milestone
80	Professional Services and Agency Costs	
80.01	Preliminary design	Weighted milestone
80.02	Final design	Weighted milestone
80.03	Project management for design and construction	Apportioned effort
80.04	Construction administration and management	Apportioned effort
80.05	Professional liability and other insurance costs	Weighted milestone
80.06	Legal; permits; review fees by other agencies, cities, etc;	Weighted milestone
80.07	Surveys, testing (quality related), investigation, inspection	Weighted milestone or apportioned effort
80.08	Start up; testing and commissioning	Weighted milestone or apportioned effort

- (c) The measurement methods associated with procurement of materials shall be in accordance with the following principles:
 - (i) except as set out in Section 1.3(c)(ii), the costs of materials used in construction shall be included in the cost of each construction task and shall be evaluated for the purposes of Earned Value as part of each construction task using physical measurement; and
 - (ii) the costs of rail and large long-lead equipment manufactured off-site before installation, such as transformers and packaged air conditioning units, shall be evaluated for the purposes of Earned Value using the fixed formula measurement method, based on the payment terms of the supply contract, except that [REDACTED]% of any payments made by Project Co to the supplier will not be credited for the purposes of Earned Value until the rail or large equipment manufactured off-site is delivered to the Lands or a bonded warehouse.
- (d) The measurement methods associated with procurement of plant, such as cranes and road vehicles, shall be in accordance with the following principles:
 - (i) the costs of plant, such as cranes and road vehicles, shall be evaluated for the purposes of Earned Value using the fixed formula measurement method, based on the payment terms of the supply contract, except that [REDACTED]% of any payments made by Project Co to the supplier will not be credited for the purposes of Earned Value until the plant is delivered to the Lands or a bonded warehouse.
- (e) The measurement method to be used for the procurement of the Revenue Vehicles shall be evaluated and paid in accordance with Section 9.11 of the Project Agreement.

- (f) In order to make the measurement of Earned Value more efficient during mobilization, Project Co may choose to identify a tranche of its mobilization cost, the amount of which will be equal to the mobilization cost agreed to between DB Co and the Lenders or Lenders' Consultant of the Total Capital Cost that shall be automatically credited for the purposes of measuring Earned Value at Financial Close (the "**Mobilization Credit**"), where:
- (i) the sum of the costs identified to the Mobilization Credit and the costs identified to the cost codes from Table 1 shall remain equal to the Total Capital Cost;
 - (ii) the Mobilization Credit shall not include costs associated with the following cost codes from Table 1:
 - (A) 80.09 Other Transaction Costs during Bid and Construction Period; and
 - (B) 100.01 Financing Costs during Construction Period;
 - (iii) the scope of activity associated with the Mobilization Credit shall be documented by Project Co to the satisfaction of the Independent Certifier before the end of the first Construction Period Month in order to avoid double counting with the Earned Value for activities that are not included within the Mobilization Credit; and
 - (iv) the Earned Value for the activities included within the Mobilization Credit shall be credited as Earned Value without using a measurement method from the Earned Value Management Techniques.

ATTACHMENT G

Form of Project Co Officer Initial Capital Investment Certificate

TO: CITY OF OTTAWA AND TO: [Independent Certifier]	BY: [Project Co Name] Project: Trillium Line Extension	(“Project Co”) (“Project”)
Date: [Date]		Project Agreement dated _____ (“Project Agreement”)

I, _____, the [insert title] of [Project Co] hereby certify for and on behalf of Project Co without incurring personal liability and confirm that the same be relied upon by the City and the Independent Certifier without further enquiry as of _____ [insert date] that:

1. I am a duly authorized **[signing officer of][signatory for]** Project Co, am familiar with the provisions of Project Agreement and have made reasonable investigations of corporate records and inquiries of other officers and senior personnel of Project Co in certifying the information set out below. Terms defined in the Project Agreement have the same meanings when used in this certificate.
2. Project Co has performed, satisfied and is in compliance with all of its material obligations under the Project Agreement and the other Project Documents.
3. Project Co has available to it sufficient funds to achieve Substantial Completion in accordance with the Project Agreement subject to Project Co continuing to meet its obligations under the Project Agreement and in receipt of Construction Period Payments from the City.
4. The Initial Capital Investment has been achieved in accordance with the terms and conditions set out in the Project Agreement and the Initial Capital Investment Date is [●].
5. Project Co has complied with all requirements of Applicable Law in connection with the Project, including without limitation, all requirements under the *Workplace Safety and Insurance Act, 1997* (Ontario) and the CLA. No claims for lien or notices of lien under the CLA have been received by Project Co or any Project Co Party which have not been duly released, discharged or vacated in accordance with the requirements of the CLA, if applicable. Any notice of lien or claim for lien identified in paragraph 10 of the Request for Payment to which this Certificate is attached has been released, discharged or vacated in accordance with the requirements of the CLA.

Dated this _____ day of _____, 20____.

Name: _____
Title: _____

SCHEDULE 21
VARIATION PROCEDURE

1. VARIATIONS

1.1 Definitions

- (a) Any capitalized term not defined in this Schedule 21 shall have the meaning given to such term in the Project Agreement. The following terms shall have the following meanings:
- (i) “**City Work**” has the meaning given in Section 1.7(a).
 - (ii) “**Direct Cost**” has the meaning given in Appendix A.
 - (iii) “**Estimate**” has the meaning given in Section 1.4(a).
 - (iv) “**Overhead and Profit**” has the meaning given in Appendix B of this Schedule 21.
 - (v) “**Project Co Variation Notice**” has the meaning given in Section 2.1(a).
 - (vi) “**Variation**” means a variation, addition, reduction, substitution, omission, modification, deletion, removal or other change to the whole or any part of the Project Operations, including in relation to the whole or any part of the Works or the Maintenance and Rehabilitation Services.
 - (vii) “**Variation Confirmation**” has the meaning given in Section 1.8(a)(ii).
 - (viii) “**Variation Directive**” means a written instruction which is issued on a form designated as a “Variation Directive Form” and signed by the City Representative directing Project Co to immediately proceed with a Variation pending the finalization and issuance of a Variation Confirmation for that Variation.
 - (ix) “**Variation Enquiry**” has the meaning given in Section 1.3(a).
 - (x) “**Variation Procedure Meeting**” has the meaning given in Section 1.2(d) of this Schedule 21.

1.2 General

- (a) The City has the right from time to time to propose and require Project Co to carry out and implement a Variation, and any such Variation shall be subject to the provisions of this Schedule 21, provided that the City shall not be permitted to withdraw a Variation Enquiry (nor will a Variation Enquiry be deemed to have been withdrawn) with respect to those circumstances specified in the Project Agreement for which the City is obligated to proceed with a Variation.
- (b) The City shall be obligated to proceed with a Variation in certain circumstances specified in the Project Agreement, and any such Variation shall be subject to the provisions of this Schedule 21.

- (c) The total compensation or payment to which Project Co is entitled with any Variation shall be limited to, and shall only be, the Direct Costs and Overhead and Profit in respect of such Variation as calculated and substantiated in accordance with this Schedule 21. Project Co will not be entitled to any payment, compensation or extension of time for a Variation except to the extent provided in a Variation Confirmation or Variation Directive in accordance with this Schedule 21.
- (d) The Parties shall:
 - (i) within 30 days following Financial Close;
 - (ii) within 30 days following the Substantial Completion Date; and
 - (iii) within 10 days following written notice being given by the City to Project Co at any time during the Project Term, which notice may be given at any time by the City, acting reasonably,hold a meeting (the “**Variation Procedure Meeting**”) to assist the Parties by promoting cooperative and effective communication with respect to matters related to Variations.
- (e) Attendance at the Variation Procedure Meeting shall consist of:
 - (i) 3 representatives appointed by the City, including the City Representative and 2 other representatives appointed by the City;
 - (ii) prior to the Substantial Completion Date, 3 representatives appointed by Project Co, including the Project Co Representative, 1 representative of the Construction Contractor, and 1 representative of the Maintenance and Rehabilitation Contractor; and
 - (iii) after the Substantial Completion Date, 2 representatives appointed by Project Co, including the Project Co Representative and 1 representative of the Maintenance and Rehabilitation Contractor.
- (f) The Independent Certifier shall be entitled to, but not required to, attend the Variation Procedure Meeting.
- (g) The purpose of the Variation Procedure Meeting shall be to:
 - (i) provide the Parties with a general overview of the Variation Procedure and to promote cooperative and effective communication with respect to matters related to Variations;
 - (ii) review the Estimate requirements as outlined in Section 1.6 and the expectations of the City to promote timely completion of the Variation processes defined in this Schedule 21; and
 - (iii) review the City’s proposed form of template for the Estimate with Project Co.

1.3 Variation Enquiry

- (a) If the City proposes or is obligated pursuant to the terms of the Project Agreement or Applicable Law to initiate a Variation it shall deliver to Project Co a written Notice of the proposed Variation (a “**Variation Enquiry**”).
- (b) A Variation Enquiry shall:
 - (i) describe the proposed Variation with sufficient detail to enable Project Co to prepare a detailed Estimate;
 - (ii) in the event that the proposed Variation will require a Capital Expenditure, state whether the City intends to pay for the Variation by way of lump sum payment or payments, adjustment to the Monthly Service Payments (and, if applicable, with a request for Project Co to obtain financing for all or part of the Variation), or a combination thereof; and
 - (iii) provide a preliminary indication of any provisions of the Project Agreement (including the Output Specifications or the Project Co Proposal Extracts) that will be affected by the proposed Variation, as well as the amendments to the Project Agreement (including the Output Specifications or the Project Co Proposal Extracts) that may be necessary to accommodate the Variation.

1.4 Delivery of Estimate

- (a) As soon as practicable and in any event within 15 Business Days after receipt of a Variation Enquiry, or such longer period as the Parties agree acting reasonably, Project Co shall deliver its detailed breakdown, estimate and other information (an “**Estimate**”) prepared in accordance with and meeting the requirements of Section 1.6.

1.5 Project Co Grounds for Objection

- (a) Project Co may only refuse to deliver an Estimate if Project Co can demonstrate to the City’s satisfaction, acting reasonably, within the period for delivery of an Estimate specified or agreed pursuant to Section 1.4(a), that:
 - (i) the implementation of the Variation would materially and adversely affect the health and safety of any person;
 - (ii) the implementation of the Variation would:
 - (A) infringe Applicable Law;
 - (B) cause to be revoked any of the existing Permits, Licenses, Approvals and Authorizations required by Project Co to perform the Project Operations, and any such Permit, License, Approval and Authorization is not, using commercially reasonable efforts, capable of amendment or renewal; or

- (C) require any new Permits, Licenses, Approvals or Authorizations for Project Co to perform the Project Operations, any of which will not, using commercially reasonable efforts by Project Co or the City, as applicable, be obtainable;
- (iii) the proposed Variation would have a material and adverse effect on performance of the Project Operations (except those Project Operations which have been specified as requiring amendment in the Variation Enquiry) in a manner not compensated pursuant to this Schedule 21;
- (iv) the implementation of the Variation would be a departure from Good Industry Practice;
- (v) the City does not have the legal power or capacity to require the Variation to be implemented or to do anything envisaged by this Schedule 21 in respect of or in connection with the Variation;
- (vi) the Variation would, if implemented, result in a change in the essential nature of the Project;
- (vii) the Variation Enquiry does not comply with the requirements of Section 1.3 (including a failure to include adequate information therein to enable Project Co to prepare an Estimate in respect thereof);
- (viii) in the case of a Variation relating to the Works, the time specified for commencement and/or completion of such Variation cannot be achieved by Project Co despite commercially reasonable efforts; or
- (ix) in the case of a Variation relating to the Maintenance and Rehabilitation Services, the time specified for implementation of such Variation cannot be achieved by Project Co despite commercially reasonable efforts.
- (b) If Project Co refuses to provide an Estimate on the grounds set out in Section 1.5(a), Project Co shall, within the period for delivery of an Estimate specified or agreed pursuant to Section 1.4(a), deliver to the City a written Notice specifying the grounds upon which Project Co rejects the Variation and the details thereof.

1.6 Estimate Requirements

- (a) Unless the City in a Variation Enquiry requires only specified limited information, each Estimate shall include the following information, sufficient to demonstrate to the City's reasonable satisfaction:
- (i) the steps Project Co will take to implement the Variation, in such detail as is reasonable and appropriate in the circumstances;
- (ii) any impact on the Construction Period Payments, or the Scheduled Substantial Completion Date, and any other schedule impact on the provision of the System Infrastructure and completion of the Works (including for certainty, any impact of the proposed Variation after taking into consideration other Variations);

- (iii) any impact on the performance of the Project Operations and any other impact on the Project Agreement (including for certainty, any impact of the proposed Variation after taking into consideration other Variations);
- (iv) any impact on expected usage of utilities, including those identified in Schedule 19 – Payment Mechanism, for the current Contract Year and subsequent Contract Years;
- (v) any amendments to the Project Agreement (including Schedule 19 – Payment Mechanism) or any Project Document required as a consequence of the Variation, the objective of such amendments being to ensure that (save for the obligation of the City to make payments or altered payments in respect of the Variation) the Parties are in no better and no worse position in relation to the Project than they would have been in if the Variation had not been implemented and, in particular, that there will be no material adverse change to the risk profile of the Project as a result of the Variation;
- (vi) any impact on the Direct Costs of Project Co and each Subcontractor, including:
 - (A) any Capital Expenditure and costs relating to or associated with the Maintenance and Rehabilitation Services that will be incurred, reduced or avoided and the impact on Project Co's cash flows from incurring, reducing or avoiding such costs (whether financed by Project Co or the City); and
 - (B) any other costs that will be incurred, reduced or avoided and the impact on Project Co's cash flows from incurring, reducing or avoiding such costs;with the presentation of impact on Project Co's cash flows from incurring, reducing or avoiding such Direct Costs contemplated Sections 1.6(a)(vi)(A) and 1.6(a)(vi)(B) being made on a nominal cash flow and real cash flow basis;
- (vii) either, subject to Section 1.9:
 - (A) a confirmation that the proposed Variation will not affect Project Co's existing financing or that Project Co's existing financing is adequate to implement the Variation; or
 - (B) if new or additional financing is required to implement the Variation, an indication as to the availability of such new or additional financing and the cost and terms of such new or additional financing;
- (viii) Project Co's confirmation that the projected internal rate of return on any additional equity capital required to finance the Variation will be the Base Case Equity IRR;
- (ix) Project Co's preliminary indication of the potential increase or decrease, if any, of the Monthly Service Payments, with such amount calculated by reference to the relevant parts of the Financial Model to demonstrate the impact of the proposed Variation;
- (x) any Permits, Licenses and Approvals that must be obtained or amended for the Variation to be implemented, and the latest date by which Project Co must receive a Variation

Confirmation and Project Co or the City, as applicable, must obtain or amend such Permits, Licenses and Approvals for the Estimate to remain valid; and

- (xi) the proposed methods of certification of any construction or operational aspect of the Project Operations required by the Variation if not covered by the provisions of the Project Agreement;

in each case, together with such supporting information and justification as is reasonably required.

- (b) In preparing its Estimate, Project Co shall include sufficient information to demonstrate to the City's satisfaction, acting reasonably, that:

- (i) Project Co has used or has obliged each Subcontractor (or will oblige any Subcontractor not yet selected) to use commercially reasonable efforts, including the use of competitive quotes or tenders (if appropriate or required by Sections 1.6(c) and 1.6(e)), to minimize any increase in costs and to maximize any reduction in costs;
- (ii) except as otherwise set out herein, all costs of Project Co and each Subcontractor are limited to Direct Costs;
- (iii) Project Co, the Construction Contractor and the Maintenance and Rehabilitation Contractor shall charge overhead and profit as set out in Appendix B hereto (such amounts calculated on the basis of the applicable Direct Costs so that no mark-up of Project Co, the Construction Contractor or the Maintenance and Rehabilitation Contractor is calculated on any other mark-up of Project Co, the Construction Contractor or the Maintenance and Rehabilitation Contractor), and Project Co, the Construction Contractor and the Maintenance and Rehabilitation Contractor, as applicable, shall not charge any other amounts, margins or mark-ups;
- (iv) the overhead and profit as set out in Appendix B hereto as applicable to Project Co's Direct Costs shall only be chargeable on Direct Costs of Project Co, such that Project Co shall not charge any mark-ups on any amounts charged by any Subcontractor;
- (v) all costs of providing Project Operations, including Capital Expenditures, reflect:
- (A) labour rates applying in the open market to providers of services similar to those required by the Variation;
- (B) any and all changes in the Output Specifications arising out of the proposed Variation; and
- (C) any and all changes in risk allocation;
- (vi) the full amount of any and all expenditures that have been reduced or avoided (including for any Capital Expenditure) and that all such expenditures, including all applicable Overhead and Profit anticipated to be incurred but for the Variation, have been taken into account and applied in total to reduce the amount of all costs;

- (vii) Project Co has mitigated or will mitigate the impact of the Variation, including on the Works Schedule, the performance of the Project Operations, the expected usage of utilities, and the Direct Costs to be incurred;
 - (viii) any impact of the Variation on the Maintenance and Rehabilitation Services has been detailed through an updated staffing plan, updated Maintenance Plan and updated versions of any other documentation reasonably requested by the City; and
 - (ix) if applicable, the Variation can be completed without any adjustment to the Monthly Service Payments.
- (c) Project Co will use commercially reasonable efforts to obtain the best value for money when procuring any work, services, supplies, materials or equipment required by the Variation and will comply with all Good Industry Practice in relation to any such procurement, to a standard no less than Project Co would apply if all costs incurred were to its own account without recourse to the City, including using commercially reasonable efforts to mitigate such costs.
- (d) As soon as practicable, and in any event not more than 15 Business Days after the City receives an Estimate, Project Co and the City shall discuss and seek to agree on the Estimate, including any amendments to the Estimate agreed to by the Parties.
- (e) If the City would be required by Applicable Law or any policy applicable to the City to competitively tender any contract in relation to the proposed Variation, the City may require Project Co to seek and evaluate competitive tenders for the proposed Variation in accordance with such Applicable Law or policy.
- (f) The City may modify a Variation Enquiry in writing at any time for any matter relating to the Estimate or the discussions in relation thereto, in which case Project Co shall, as soon as practicable and in any event not more than 10 Business Days after receipt of such modification, notify the City in writing of any consequential changes to the Estimate.
- (g) If the Parties cannot agree on an Estimate pursuant to Section 1.6(d), then any Dispute will be determined in accordance with Schedule 26 – Dispute Resolution Procedure.

1.7 City's Right to Perform

- (a) In respect of the System Infrastructure, after Substantial Completion, the City shall have the right to perform the subject matter of a proposed Variation (“**City Work**”) itself, or through others contracting directly with the City, without compensation to Project Co, except as specifically stated in this Project Agreement.
- (b) The City shall indemnify and save Project Co harmless from and against any and all loss or expense which may be suffered, sustained or incurred by Project Co as a direct result of, in respect of, or arising out of the performance by the City, or any third party, of City Work, including any loss or expense related to any adverse impacts on the Project Operations.

1.8 Variation Confirmation

- (a) As soon as practicable, and in any event within 15 Business Days after the later of the date the Estimate was delivered and the date the Estimate was either agreed to or any Dispute in respect thereof was determined in accordance with Schedule 26 – Dispute Resolution Procedure, the City shall either:
- (i) subject to Section 1.2(b) and Section 1.8(e), withdraw the Variation Enquiry by written Notice to Project Co; or
 - (ii) issue a written confirmation (the “**Variation Confirmation**”) of the Estimate, including any agreed modifications thereto or any modifications resulting for the determination of a Dispute in respect thereof, which Variation Confirmation may be subject to Project Co obtaining financing pursuant to Section 1.9.
- (b) If the City does not issue a Variation Confirmation within such 15 Business Days, then, subject to Section 1.2(b) and Section 1.8(e), the Variation Enquiry shall be deemed to have been withdrawn.
- (c) Upon the Variation Confirmation being issued, and if applicable upon Project Co obtaining financing pursuant to Section 1.9:
- (i) the Parties shall as soon as practicable thereafter do all acts and execute all documents to amend the Project Agreement necessary to implement the Variation, including in respect of any required extension of time and including provision for payment to Project Co as provided in Section 1.10;
 - (ii) Project Co shall implement the Variation as provided for in the Variation Confirmation, and subject to amendments pursuant to Section 1.8(c)(i), all provisions of the Project Agreement applicable to the Project Operations shall apply to the Project Operations as thereby changed and no additional claim with respect to the Variation or Variation Confirmation will be considered; and
 - (iii) payment in relation to the Variation shall be as provided for in Section 1.10 and pursuant to any amendments pursuant to Section 1.8(c)(i).
- (d) If a Variation Confirmation is subject to Project Co obtaining financing pursuant to Section 1.9, then the Variation Confirmation shall not be effective until:
- (i) Project Co obtains such financing acceptable to the City in its sole discretion; or
 - (ii) the City in its sole discretion waives such requirement.
- (e) Except as hereinafter provided, until a Variation Confirmation has been issued:
- (i) the determination of whether or not to proceed with a Variation shall at all times be at the City’s sole discretion, despite any Dispute or any other matter in relation to a Variation being referred to or determined in accordance with Schedule 26 – Dispute Resolution Procedure; and

- (ii) the City may at any time withdraw a Variation Enquiry and, subject to Section 1.8(f), the City shall not be obligated to Project Co in respect of a Variation until such time as the City in its sole discretion issues a Variation Confirmation and, if applicable, Project Co has obtained the financing requested by the City or the City has waived such requirement,

provided that the City may not withdraw (or be deemed to have withdrawn) a Variation Enquiry in circumstances where the City is obligated pursuant to the terms of the Project Agreement to proceed with a Variation. In such circumstances Schedule 26 – Dispute Resolution Procedure shall be employed to finalize any aspects of the Variation which cannot otherwise be agreed to in accordance with the terms of this Schedule 21.

- (f) If a Variation Confirmation is not issued for any Variation Enquiry in respect of which Project Co has used commercially reasonable efforts to produce a fair and accurate Estimate, the City shall reimburse Project Co for all Direct Costs reasonably and properly incurred by Project Co in connection with preparing the Estimate.

1.9 Financing

- (a) If Project Co in its Estimate confirms that existing financing is not available to pay for the proposed Variation and if the City requests Project Co to obtain financing for a Variation, then a Variation Confirmation may be issued subject to Project Co obtaining financing. In such event, Project Co shall use commercially reasonable efforts to obtain the requested financing on terms satisfactory to Project Co, the Lenders and the City, provided that, prior to the Substantial Completion Date, Project Co shall not be required to seek financing from any source other than the Lenders.
- (b) If Project Co has used commercially reasonable efforts to obtain the requested financing but has been unable to obtain an offer of financing on terms reasonably satisfactory to Project Co and the City within 60 days of the date that the City issues the Variation Confirmation, then Project Co shall have no further obligation to obtain financing for the Variation and any Variation Confirmation subject to financing shall no longer have any effect unless the City, in its sole discretion, waives the requirement for financing or unless the City is obligated to proceed with the Variation pursuant to the terms of the Project Agreement.
- (c) If Project Co obtains an offer of financing on terms reasonably satisfactory to Project Co, Project Co shall provide the City with details of such financing, and the City shall, in its sole discretion, determine whether Project Co should proceed with such financing. If the City determines that Project Co should not proceed with such financing, then Project Co shall have no further obligation to obtain financing for the Variation and any Variation Confirmation subject to financing shall no longer have any effect unless the City, in its sole discretion, waives the requirement for financing or unless the City is obligated to proceed with the Variation pursuant to the terms of the Project Agreement.
- (d) The City may at any time withdraw the requirement for Project Co to use commercially reasonable efforts to obtain financing, after which Project Co shall have no further obligation to obtain financing for the Variation and any Variation Confirmation subject to financing shall no longer have any effect unless the City in its sole discretion waives the requirement for financing or unless the City is obligated to proceed with the Variation pursuant to the terms of the Project Agreement.

- (e) If the City waives the requirement for financing or if Project Co has no further obligation to obtain financing for the Variation pursuant to Sections 1.9(b), 1.9(c) or 1.9(d) then Project Co shall proceed with the Variation as set out in the Variation Confirmation and the City shall pay for the Variation as provided for in Section 1.10(a)(ii).

1.10 Payment

- (a) If a Variation Confirmation has been issued and is not subject to financing, or if the requirement for financing has been satisfied by Project Co or has been waived by the City, a price adjustment for the Variation, as set out in the Estimate and as adjusted and confirmed by the Variation Confirmation, shall be made as follows:
- (i) the Monthly Service Payments shall be adjusted as set out in the Variation Confirmation; and
- (ii) payment for Capital Expenditures as set out in the Variation Confirmation and not financed by Project Co shall be paid as follows:
- (A) the City shall pay such Capital Expenditures plus applicable HST in lump sum payments based on a payment schedule agreed by the City and Project Co, acting reasonably, to reflect the amount and timing of the Capital Expenditures to be incurred by Project Co in carrying out the Variation to the extent borne by the City; and
- (B) where payment for part of the Variation reflects the carrying out of, or specific progress towards, an element within the Variation, Project Co shall provide satisfactory evidence confirming that the part of the Variation corresponding to each occasion when payment is due under the payment schedule has been duly carried out.

In the event the City and Project Co fail to agree as to the terms of the payment schedule, the payment schedule shall be determined in accordance with Schedule 26 – Dispute Resolution Procedure, provided that, where all or any part of the Variation is being carried out by a third party under a contract with Project Co, subject to the terms of any contract between Project Co and that third party in relation to the implementation of the Variation having been approved by the City (such approval not to be unreasonably withheld or delayed), the process under Schedule 26 – Dispute Resolution Procedure shall determine a payment schedule which would enable Project Co to be funded by the City in time to make payments to that third party in accordance with its contract with Project Co.

- (b) The City shall make payment to Project Co within 20 Business Days of receipt by the City of invoices presented to the City in accordance with the agreed payment schedule accompanied (where applicable) by the relevant evidence that the relevant part of the Variation has been carried out.
- (c) Payments by the City in respect of a Variation shall be subject to applicable holdback provisions of the *Construction Lien Act* (Ontario), as applicable.

- (d) Project Co shall not be entitled to any amount in excess of the amount of the Estimate confirmed in the Variation Confirmation.
- (e) Upon request by Project Co, the City shall provide to Project Co copies of any consent or approval issued by the City in connection with a proposed Variation.

1.11 Reduction in Project Operations

- (a) If a Variation involves any reduction in Project Operations which results in savings in Direct Costs to Project Co, such savings shall result in a reduction in the compensation payable to Project Co under the Project Agreement in an amount equal to such reduction in Direct Costs, and Project Co shall compensate the City by way of a reduction in the Monthly Service Payments (expressed in Inflation Base Date dollar amounts using the Escalation Factor as the discount rate) so as to place Project Co in no better no worse position that it would have been in had such Variation not occurred.

1.12 Variation Directive

- (a) If an Estimate is not promptly agreed upon by the City and Project Co or if there is a Dispute in relation thereto or if the City, in its sole discretion, requires a Variation to be implemented prior to issuing a Variation Confirmation, then the City may issue a Variation Directive and, following receipt of the Variation Directive:
 - (i) Project Co shall promptly proceed with the Variation;
 - (ii) the determination of the valuation and time extensions, if any, required in connection with such Variation, shall be made as soon as reasonably possible after commencement of the implementation of the Variation; and
 - (iii) pending final determination of the valuation and time extensions, if any, required in connection with such Variation, the Independent Certifier (if such Variation is in respect of matters prior to Final Completion), acting reasonably, shall determine the valuation in accordance with Appendices A and B hereto, with any Dispute to be determined in accordance with Schedule 26 – Dispute Resolution Procedure,

provided that, the City shall fund all Variations implemented by way of a Variation Directive as provided for in Section 1.10(a)(ii).

2. PROJECT CO VARIATIONS

2.1 General

- (a) Project Co shall deliver to the City a written Notice (a “**Project Co Variation Notice**”) for each Variation proposed by Project Co.

2.2 Project Co Variation Notice

- (a) A Project Co Variation Notice shall:

- (i) set out details of the proposed Variation in sufficient detail to enable the City to evaluate it in full;
 - (ii) specify Project Co's reasons for proposing the Variation;
 - (iii) indicate all reasonably foreseeable implications of the Variation, including:
 - (A) costs or cost savings to the City;
 - (B) adjustments to any payments under the Project Agreement, including the Monthly Service Payments;
 - (C) schedule impact on the provision of any phase of the Works, or completion of the Works;
 - (D) any impact on the performance of the Project Operations; and
 - (iv) indicate the latest date by which a Variation Enquiry must be issued.
- (b) If the City, in its sole discretion, elects to consider the Variation proposed by Project Co, the City may issue to Project Co a Variation Enquiry and the procedure set out in Section 1 will apply.
- (c) Project Co shall, promptly upon demand, reimburse the City for all out-of-pocket costs and expenses reasonably incurred by the City in connection with the City's consideration of any Variation proposed by Project Co pursuant to Section 2 of this Schedule 21, including, without limitation, legal and consulting fees and disbursements, regardless of whether (i) a Variation Enquiry or Estimate is issued in connection therewith or (ii) such Variation is implemented.

3. SMALL WORKS

3.1 General

- (a) After the Substantial Completion Date, with respect to the System Infrastructure, Project Co shall carry out all Small Works requested by the City.
- (b) If Small Works are requested by the City, Project Co shall, within 10 Business Days of each such request and prior to carrying out the Small Works, provide the City with a price for carrying out the Small Works.
- (c) If Project Co's price is accepted by the City, in its sole discretion, Project Co shall carry out the Small Works for such price.
- (d) The City may at any time, in its sole discretion, including if the City does not accept the price proposed by Project Co pursuant to Section 3.1(b), issue a Variation Enquiry or Variation Directive in respect of such Small Works, in which event the provisions of this Schedule 21, other than this Section 3, shall apply.
- (e) Project Co's price shall include only its Direct Costs, as calculated in accordance with Appendix A, together with applicable margins as set out in Appendix B.

3.2 Project Co to Minimize Inconvenience

- (a) Project Co shall notify the City of the estimated duration of any Small Works so that the City and Project Co can agree upon a convenient time for carrying out the same, so as to minimize and mitigate inconvenience and disruption to the City. Project Co shall use commercially reasonable efforts to minimize the duration of any Small Works.

APPENDIX A

1. CALCULATION OF DIRECT COSTS

- 1.1 Subject to Section 1.2 of this Appendix A, the term “Direct Cost” means the cumulative total, without duplication, of only the following amounts, as paid or incurred by Project Co or each Subcontractor, as applicable, to the extent that they specifically relate to, and are attributable to, the Variation under which Project Co is expressly entitled to its Direct Cost and would not otherwise have been incurred by Project Co or the Subcontractors, as applicable, in respect of or in relation to the Project:
- (i) wages and benefits paid for labour in the direct employ of Project Co or each Subcontractor while performing that part of the Project Operations on the Lands;
 - (ii) salaries, wages and benefits of Project Co’s or each Subcontractor’s personnel when stationed at the office on the Lands in whatever capacity employed, or personnel engaged at shops or on the road, in expediting the production or transportation of materials or equipment;
 - (iii) salaries, wages and benefits of Project Co’s or each Subcontractor’s office personnel engaged in a technical capacity;
 - (iv) without limiting Sections 1.1(i), 1.1(ii) and 1.1(iii) of this Appendix A, contributions, assessments or taxes incurred for such items as employment insurance, provincial health insurance, workers’ compensation, and Canada Pension Plan, insofar as such costs are based on the wages, salaries, or other remuneration paid to Project Co or any Subcontractor, as applicable, for employees pursuant to Sections 1.1(i), 1.1(ii) and 1.1(iii) of this Appendix A, but excluding for certainty all income taxes on such wages, salaries and other remuneration;
 - (v) the cost of materials, products, supplies and equipment that are consumed in the performance of the Variation;
 - (vi) the rental costs of all tools (excluding hand tools which have a retail value of \$[REDACTED] or less), machinery, and equipment used in the performance of the Variation, whether rented from or provided by Project Co or others, including installation, minor repair and replacement, dismantling, removal, transportation and delivery costs thereof;
 - (vii) deposits lost;
 - (viii) except as otherwise set out in this Schedule 21, a reasonable amount of profit consistent with prevailing market rates that is charged by any Subcontractor, other than the Construction Contractor, the Maintenance Contractor and any entity not at arms-length from Project Co or any Equity Provider;
 - (ix) the amount paid for any design services;
 - (x) the cost of third party quality assurance required by the City, such as independent inspection and testing services;

- (xi) charges levied by Governmental Authorities, but excluding fines or penalties not related to the implementation of the Variation;
- (xii) subject to Section 1.1(iv) of this Appendix A, Taxes (and without limiting the obligation of the City to pay HST payable by it under the Project Agreement), but excluding:
 - (A) HST;
 - (B) taxes imposed on Project Co or a Subcontractor based on or measured by income or profit or otherwise imposed under the *Income Tax Act* (Canada), the *Income Tax Act* (Ontario) or any similar statute in any other jurisdiction;
 - (C) capital taxes based on or measured by the capital of Project Co or a Subcontractor;
 - (D) taxes relating to withholdings on any payments by Project Co or a Subcontractor; and
 - (E) taxes relating to any business or activity other than the business or activities related to, and conducted for, the purposes of the Project Operations;
- (xiii) the cost of removal and disposal of contaminants, hazardous substances, waste products and debris for which Project Co is not responsible under the Project Agreement;
- (xiv) termination payments which are required under Applicable Law to be made to employees of Project Co, Maintenance and Rehabilitation Contractor or Construction Contractor reasonably and properly incurred by Project Co, Maintenance and Rehabilitation Contractor or Construction Contractor arising as a direct result of any Variation reducing the scope of the Project Operations, except to the extent that such termination payments are provided for in contracts of employment, agreements or arrangements that were not entered into in the ordinary course of business and on commercial arm's length terms;
- (xv) the cost of Project Co obtaining financing in respect of the subject Variation as determined pursuant to Section 1.9, including additional financing costs related to any delay caused by the implementation of such Variation;
- (xvi) the cost of any additional insurance or performance security required or approved by the City;
- (xvii) the cost of obtaining all Project Co Permits, Licenses and Approvals;
- (xviii) the costs associated with the changes in the Project Co Services as identified in the updated staffing plan, updated Maintenance Plan and other documentation reasonably requested by the City;
- (xix) the cost of competitively tendering any contract in relation to the proposed Variation that is required by Contracting Authority, including as a result of any Applicable Law or any policy applicable to Contracting Authority; and

- (xx) except as specified in Section 1.2(vii), reasonable fees and disbursements of Project Co's legal advisors.
- 1.2 The Direct Cost otherwise payable shall be subject to and limited by the following:
- (i) the Direct Cost shall be net of all discounts, rebates and other price reductions and benefits, which relate to the Direct Cost incurred;
 - (ii) the amount paid for materials, products, supplies and equipment incorporated into the Project Operations as a result of the Variation shall not exceed commercially competitive rates available in the Province of Ontario for such materials, products, supplies and equipment from arms-length third party suppliers;
 - (iii) the amount paid for any design services included in the Direct Cost, whether provided by Project Co's personnel, consultants, manufacturers or manufacturers' consultants, for hourly paid personnel shall not exceed two times the actual salary received by those personnel (actual salary to be inclusive of all benefits, statutory remittances and holidays), and for salaried personnel, the actual salary per hour shall be calculated by dividing the annual salary (inclusive of all benefits, statutory remittances and holidays) by [REDACTED] hours;
 - (iv) the amount paid for machinery and equipment rental costs shall not exceed the prevailing competitive commercial rate for which such equipment or machinery can be obtained in the City of Ottawa;
 - (v) the amount paid for wages, salaries and Subcontracts with Subcontractors shall generally reflect commercially competitive rates available in the City of Ottawa;
 - (vi) the Direct Cost shall not include any cost incurred due to the failure on the part of Project Co or any Project Co Party to exercise reasonable care and diligence in its attention to the execution of that part of the Project Operations (including any cost due to any negligence, improper work, deficiencies or breaches of contract by Project Co and/or any Project Co Party);
 - (vii) the Direct Cost shall not include any reasonable fees and disbursements of Project Co's legal advisors incurred in connection with Small Works or the preparation of the Estimate; and
 - (viii) Direct Costs shall be quantifiable and supported by evidence and proper documentation such as invoices, proof of payments, and detailed hourly rate information as required by the City. Any Direct Cost item claimed as a percentage of other Direct Costs will not be permissible, unless approved by the City in writing.

APPENDIX B

APPLICABLE MARGINS

Party	Total Overhead and Profit Margin (as % of Direct Cost)		
	For Variations under \$[REDACTED]	For Variations between \$[REDACTED] and \$[REDACTED]	For Variations over \$[REDACTED]
Project Co (Own Work)	[REDACTED]%	[REDACTED]%	[REDACTED]%
Construction Contractor (Own Work)	[REDACTED]%	[REDACTED]%	[REDACTED]%
Construction Contractor (Subcontracted Work)	[REDACTED]%	[REDACTED]%	[REDACTED]%
Maintenance and Rehabilitation Contractor (Own Work)	[REDACTED]%	[REDACTED]%	[REDACTED]%
Maintenance and Rehabilitation Contractor (Subcontracted Work)	[REDACTED]%	[REDACTED]%	[REDACTED]%
Project Co and Construction Contractor re: Cash Allowance Items	[REDACTED]%	[REDACTED]%	[REDACTED]%

SCHEDULE 22

COMPENSATION ON TERMINATION

1. DEFINITIONS

1.1 Definitions

Any capitalized term not defined in this Schedule 22 shall have the meaning given to such term in the Project Agreement. The following terms shall have the following meanings:

- (a) “**Adjusted Estimated Fair Value**” means the Estimated Fair Value adjusted as follows:
- (i) where, in respect of any Payment Period or part of a Payment Period from the Termination Date to the Compensation Date, the Post Termination Service Amount is a negative number, the aggregate amount by which all such negative Post Termination Service Amounts are negative shall be set off against and shall reduce the Estimated Fair Value (whether or not such amounts have been set off by the City pursuant to Section 3.3(f));
 - (ii) the aggregate of the following amounts shall be deducted, without duplication, from the Estimated Fair Value:
 - (A) the Post Termination Service Amounts actually paid by the City to Project Co prior to the Compensation Date;
 - (B) the Tender Costs; and
 - (C) amounts that the City is entitled to set off or deduct; and
 - (iii) the aggregate of the following amounts shall be added, without duplication, to the Estimated Fair Value:
 - (A) all credit balances on any bank accounts held by or on behalf of Project Co on the date that the Estimated Fair Value is calculated; and
 - (B) any insurance proceeds and other amounts owing to Project Co (and which Project Co is entitled to retain), to the extent not included in Section 1.1(a)(iii)(A),
 - to the extent that:
 - (C) Sections 1.1(a)(iii)(A) and 1.1(a)(iii)(B) have not been directly taken into account in calculating the Estimated Fair Value; and
 - (D) the City has received such amounts in accordance with the Project Agreement.

- (b) “**Adjusted Highest Qualifying Tender Price**” means the price offered by the Qualifying Tenderer (if any) with the highest tender price, adjusted as follows:
- (i) where, in respect of any Payment Period or part of a Payment Period from the Termination Date to the Compensation Date, the Post Termination Service Amount is a negative number, the aggregate amount by which all such negative Post Termination Service Amounts are negative shall be set off against and shall reduce such highest tender price (whether or not such amounts have been set off by the City pursuant to Section 3.3(f));
 - (ii) the aggregate of the following amounts shall be deducted, without duplication, from such highest tender price:
 - (A) the Post Termination Service Amounts actually paid by the City to Project Co prior to the Compensation Date;
 - (B) the Tender Costs; and
 - (C) amounts that the City is entitled to set off or deduct; and
 - (iii) the aggregate of the following amounts shall be added, without duplication, to such highest tender price:
 - (A) all credit balances on any bank accounts held by or on behalf of Project Co on the date that the highest priced Qualifying Tender is received; and
 - (B) any insurance proceeds and other amounts owing to Project Co (and which Project Co is entitled to retain), to the extent not included in Section 1.1(b)(iii)(A),
 - to the extent that:
 - (C) Sections 1.1(b)(iii)(A) and 1.1(b)(iii)(B) have not been directly taken into account in that Qualifying Tender; and
 - (D) the City has received such amounts in accordance with the Project Agreement.
- (c) “**Breach of Refinancing Termination Sum**” has the meaning given to it in Section 6.1(b) of this Schedule 22.
- (d) “**City Default Termination Sum**” has the meaning given in Section 2.1(b) of this Schedule 22.
- (e) “**Compensation Date**” means either:
- (i) if Section 3.3 applies, the earlier of:
 - (A) the date that the New Agreement is entered into; and
 - (B) the date on which the City pays the Adjusted Highest Qualifying Tender Price to Project Co; or

- (ii) if Section 3.4 applies, the date that the Adjusted Estimated Fair Value has been agreed or determined.
- (f) **“Debt Amount”** means at any time, the then outstanding principal amount of debt funded under the terms of the Lending Agreements by the Lenders to Project Co, together with all interest accrued thereon at that time, provided that at any time where any portion of the interest payable to the Lenders is subject to the Hedging Agreement(s), accrued interest in respect of such portion of the interest payable to the Lenders shall be calculated based on the fixed rate payable by Project Co under the Hedging Agreement(s) without regard to whether such fixed rate is payable directly to a Lender or to the Hedge Provider(s) under the Hedging Agreement(s) and all references to interest payable to the Lenders under the Project Agreement shall be construed accordingly. For greater certainty, the Debt Amount excludes the Debt Makewhole.
- (g) **“Debt Makewhole”** means, (i) at any time, any amount (other than the Debt Amount) then due and payable to the Lenders under the Lending Agreements with respect to the Debt Amount, including any “make whole” payments, breakage costs (less any breakage benefits) and all other fees, costs and expenses reasonably and properly incurred which Project Co is obligated to pay to the Lenders pursuant to the Lending Agreements with respect to the Debt Amount; and (ii) any swap breakage costs (less breakage benefits), if any, then due and payable to the Hedge Provider(s) under the Hedging Agreement(s) entered into with respect to the Debt Amount.
- (h) [REDACTED]
- (i) **“Discount Rate”** means a rate equal to $((A + B) / C) + D$, where:
- A = the product of the outstanding principal amount of debt funded under the Lending Agreements on the date of calculation and the rate of interest applicable to such amount as shown in the Financial Model at Financial Close.
- B = the product of the Equity Capital as at Financial Close and the Base Case Equity IRR.
- C = the sum of the outstanding principal amount of debt funded under the Lending Agreements on the date of calculation and the Equity Capital as at Financial Close.
- D = the yield to maturity on a benchmark Government of Canada bond of the same maturity as the average life of the outstanding principal amount of debt funded under the Lending Agreements on the date of calculation, minus the yield to maturity on a benchmark Government of Canada bond of the same maturity as the average life of the outstanding principal amount of debt funded under the Lending Agreements as shown in the Financial Model at Financial Close.
- (j) **“Employee Termination Payments”** means termination payments which are required under Applicable Law to be made to employees of Project Co or any Project Co Party as a direct result of terminating the Project Agreement (provided that Project Co or the relevant Project Co Party shall take commercially reasonable steps to mitigate its loss) and provided that, in calculating such amount, no account should be taken of any liabilities and obligations of Project Co or the relevant Project Co Party arising out of:
- (i) contracts of employment or other agreements or arrangements entered into by Project Co or the relevant Project Co Party to the extent that such contracts of employment, agreements or arrangements were not entered into in connection with the Project; or

- (ii) contracts of employment or other agreements or arrangements entered into by Project Co or the relevant Project Co Party other than in the ordinary course of business and on commercial arm's length terms, save to the extent that amounts would have arisen if such contracts or other agreements or arrangements had been entered into in the ordinary course of business and on commercial arm's length terms.
- (k) "**Estimated Fair Value**" means the amount determined in accordance with Section 3.4.
- (l) "**Invoice Date**" means the date that is the later of:
 - (i) the date on which the City receives an invoice from Project Co for the relevant termination sum; and
 - (ii) the date on which the City receives the supporting evidence required pursuant to Section 8.1(a).
- (m) "**Liquid Market**" means that there are 2 or more willing parties (each of whom is capable of being a Suitable Substitute and of meeting the Qualification Criteria) in the market for agreements in Canada for the provision of maintenance and rehabilitation services (and if the Termination Date occurs prior to Substantial Completion, design and construction services) to light rail transit systems under an alternative financing and procurement or similar model (where such agreements are the same as or similar to the Project Agreement) such that the retendering process in Section 3.3 can reasonably be expected to result in a highest Qualifying Tender price broadly in the range of values that would reasonably be expected to be achieved calculating the Estimated Fair Value under Section 3.4.
- (n) "**Market Value Availability Deduction Amount**" means for any Payment Period or part of a Payment Period, an amount equal to the Deductions for Availability Failures that were made from the Monthly Service Payment under the Payment Mechanism in the Payment Period immediately preceding the Termination Date which were unavailable at the Termination Date but which have subsequently become available, whether as a result of the City incurring Rectification Costs or otherwise.
- (o) "**Maximum Service Payment**" means the Monthly Service Payments payable at any time before any Deductions under the Payment Mechanism but allowing for indexation under the Payment Mechanism.
- (p) "**New Agreement**" means an agreement on substantially the same terms and conditions as the Project Agreement as at the Termination Date, but with the following amendments:
 - (i) if the Project Agreement is terminated prior to the Substantial Completion Date, then the Longstop Date shall be extended by a period to allow a New Project Co to achieve Substantial Completion prior to such extended Longstop Date;
 - (ii) any accrued Failure Points shall be cancelled;
 - (iii) the term of such agreement shall be equal to the term from the Termination Date until the Expiry Date; and
 - (iv) any other amendments which do not adversely affect Project Co.

- (q) “**New Project Co**” means the person who has entered or who will enter into the New Agreement with the City.
- (r) “**No Default Payment Compensation Amount**” means, with respect to an amount and a specified period of time, such amount multiplied by (i) such period of time in days divided by the actual number of days in the current year multiplied by (ii) the rate of interest per annum in effect on each such day quoted by the National Bank of Canada from time to time as its reference rate for Canadian Dollar demand loans made to its commercial customers in Canada and which it refers to as its “prime rate”, as such rate may be changed by it from time to time.
- (s) “**Non-Default Termination Sum**” has the meaning given in Section 4.1(b).
- (t) “**Post Termination Service Amount**” means, for the purposes of Section 3.3, for the whole or any part of a Payment Period for the period from the Termination Date to the Compensation Date, an amount equal to the Maximum Service Payment which would have been payable under the Project Agreement had the Project Agreement not been terminated, less an amount equal to the aggregate (without double counting) of:
 - (i) the Market Value Availability Deduction Amount for that Payment Period; and
 - (ii) the Rectification Costs incurred by the City in that Payment Period.
- (u) “**Qualification Criteria**” means the criteria that the City requires tenderers to meet as part of the Tender Process, which (subject to compliance with Applicable Law) shall include the following:
 - (i) that the tenders confirm acceptance of the New Agreement terms;
 - (ii) that the tenderers have, and are able to demonstrate on an indicative basis on request, the financial ability to pay the lump sum tendered;
 - (iii) that tenderers may only bid on the basis of a single lump sum payment to be paid by the tenderer;
 - (iv) that the tenderer is experienced in performing the Maintenance and Rehabilitation Services or similar services;
 - (v) that the technical solution proposed by the tenderers is capable of delivery and the tenderer is technically capable of delivery of the Project Operations; and
 - (vi) any other tender criteria established by the City, acting reasonably.
- (v) “**Qualifying Tender**” means a tender that meets all of the Qualification Criteria.
- (w) “**Qualifying Tenderer**” means a tenderer who submits a Qualifying Tender.
- (x) “**Rectification Costs**” means, for the purposes of any Termination Date that occurs after the Substantial Completion Date, an amount equal to the reasonable and proper costs incurred by the City in a particular Payment Period or part of a Payment Period in ensuring that the Maintenance and Rehabilitation Services are carried out.

(y) “**Subcontractor Losses**” means, subject to Project Co’s obligations under the Project Agreement to limit any compensation to Subcontractors:

- (i) the amount reasonably and properly payable by Project Co to the Construction Contractor under the terms of the Construction Contract as a direct result of the termination of the Project Agreement (including any reasonable commercial breakage fee), provided that such amount shall be reduced to the extent that Project Co or any Subcontractors fail to take commercially reasonable steps to mitigate such amount; and
- (ii) the amount reasonably and properly payable by Project Co to the Maintenance and Rehabilitation Contractor under the terms of the Maintenance and Rehabilitation Contract as a direct result of the termination of the Project Agreement (including any reasonable commercial breakage fee), provided that such amount shall be reduced to the extent that Project Co or the Subcontractors fail to take commercially reasonable steps to mitigate such amount,

provided that, in both cases, no account should be taken of any liabilities and obligations of Project Co to the Subcontractors arising out of:

- (iii) any loss of overhead or profit of such Subcontractor relating to any period or costs after the Termination Date (save to the extent the same are properly included in any reasonable commercial breakage fee set out in any of the Ancillary Documents);
 - (iv) agreements or arrangements entered into by Project Co or the Subcontractors to the extent that such agreements or arrangements were not entered into in connection with those parties’ obligations in relation to the Project; or
 - (v) agreements or arrangements entered into by Project Co or the Subcontractors other than in the ordinary course of business and on commercial arm’s length terms, save to the extent that amounts would have arisen if such agreements or arrangements had been entered into in the ordinary course of business and on commercial arm’s length terms.
- (z) “**Tender Costs**” means the reasonable and proper costs of the City incurred in carrying out the Tender Process or in connection with any calculation of the Estimated Fair Value.

(aa) “**Tender Process**” means the process by which the City requests tenders from any parties interested in entering into a New Agreement, evaluates the responses from those interested parties and enters into a New Agreement with a new Project Co, in accordance with Section 3.3.

(bb) “**Tender Process Monitor**” has the meaning given in Section 3.3(g).

2. COMPENSATION ON TERMINATION FOR CITY DEFAULT OR CONVENIENCE

2.1 Compensation

(a) If Project Co terminates the Project Agreement pursuant to Section 44.2(a)(ii) of the Project Agreement or the City terminates the Project Agreement pursuant to Section 45.3 of the Project Agreement, the City shall pay to Project Co the City Default Termination Sum.

(b) The “**City Default Termination Sum**” shall be an amount equal to the aggregate of:

- (i) the sum of the Debt Amount and the Debt Makewhole;
- (ii) [REDACTED];
- (iii) any amount payable by the City to Project Co in accordance with Sections 41.2(b) and 42.2(b) of the Project Agreement;
- (iv) the Employee Termination Payments and the Subcontractor Losses;
- (v) Construction Period Payments payable by the City in accordance with Schedule 20 on or prior to the Termination Date;
- (vi) any reasonable costs properly incurred by Project Co to wind up its operations; and
- (vii) an amount which, if paid on the Termination Date and taken together with all dividends and other Distributions paid on or made in respect of the Equity Capital on or before the Termination Date and taking account of the actual timing of all such payments, but, in any event, excluding all amounts (whether for costs, overhead, profit or otherwise) after the Termination Date, gives a nominal internal rate of return to the Termination Date equal to the Base Case Equity IRR on the amount paid for the Equity Capital (to the extent that such Equity Capital has been applied by Project Co for the purposes of the Project);

LESS, the aggregate (without double counting) of the following, to the extent it is a positive amount:

- (viii) all credit balances on any bank accounts held by or on behalf of Project Co on the Termination Date and the value of any insurance proceeds due to Project Co or to which Project Co would have been entitled had insurance been maintained in accordance with the requirements of the Project Agreement (save where such insurance proceeds are to be applied in reinstatement, restoration or replacement, or, in the case of third party legal liability, in satisfaction of the claim, demand, proceeding or liability or where the City is required to procure insurances and to make proceeds available to Project Co under the Project Agreement and it has failed to do so) or sums due and payable from third parties other than sums wholly unrelated to the Project Operations, the Project and the Project Agreement (but only when received from third parties) but excluding any claims under any Subcontracts or claims against other third parties which have not been determined or have been determined but not yet paid, provided that, in such case, Project Co shall assign any such rights and claims under the Subcontracts or claims against other third parties (other than claims against other third parties wholly unrelated to the Project Operations, the Project and the Project Agreement) to the City and, at no additional cost to Project Co, give the City reasonable assistance in prosecuting such claims;
- (ix) to the extent realized before the Invoice Date, the market value of any other assets and rights of Project Co (other than those transferred to the City pursuant to the Project Agreement) less liabilities of Project Co properly incurred in carrying out its obligations under the Project Agreement as at the Termination Date, provided that no account should be taken of any liabilities and obligations of Project Co arising out of:

- (A) agreements or arrangements entered into by Project Co to the extent that such agreements or arrangements were not entered into in connection with Project Co's obligations in relation to the Project; or
 - (B) agreements or arrangements entered into by Project Co other than in the ordinary course of business and on commercial arm's length terms, save to the extent that liabilities and obligations would have arisen if such agreements or arrangements had been entered into in the ordinary course of business and on commercial arm's length terms; and
 - (x) amounts which the City is entitled to set off pursuant to Section 32.12(a)(i) of the Project Agreement,
- provided that the City Default Termination Sum shall never be less than the aggregate of the Debt Amount and the Debt Makewhole.
- (c) To the extent that such assets and rights referred to in Section 2.1(b)(ix) are not realized and applied pursuant thereto, Project Co shall, on payment of the City Default Termination Sum, assign such assets and rights to the City.
 - (d) The City shall pay the City Default Termination Sum in accordance with Section 8.

3. COMPENSATION FOR PROJECT CO DEFAULT

3.1 Compensation

- (a) If the City terminates the Project Agreement pursuant to Section 43 of the Project Agreement (including, without limitation, as a result of a Project Co Event of Default for failing to comply with Section 58 of the Project Agreement), the City shall pay to Project Co either the Adjusted Highest Qualifying Tender Price according to the retendering procedure set out in Section 3.3 or the Adjusted Estimated Fair Value according to the no retendering procedure set out in Section 3.4, as applicable.

3.2 Retendering Election

- (a) The City shall be entitled to retender the provision of the remaining Project Operations to be performed under a proposed New Agreement in accordance with Section 3.3 and the provisions thereof shall apply if:
 - (i) the City notifies Project Co on or before the date falling 30 days after the Termination Date; and
 - (ii) there is a Liquid Market,

but, otherwise, the City shall require a determination in accordance with the no retendering procedure set out in Section 3.4 and the provisions thereof shall apply.

- (b) Until it is determined that the basis for determining the compensation to Project Co will be the no retendering procedure set out in Section 3.4, Project Co shall continue to perform the

Maintenance and Rehabilitation Services and the City shall pay Project Co in accordance with Section 3.3(e).

3.3 Retendering Procedure

- (a) The objective of the Tender Process shall be to enter into a New Agreement with a Qualifying Tenderer.
- (b) The City shall commence the Tender Process promptly after delivering the notice pursuant to Section 3.2(a) and use commercially reasonable efforts to complete the Tender Process as soon as practicable.
- (c) The City shall, as soon as reasonably practicable, notify Project Co of the Qualification Criteria and the other requirements and terms of the Tender Process, including the timing of the Tender Process and shall act reasonably in setting such requirements and terms.
- (d) Project Co authorizes the release of any information by the City under the Tender Process which would otherwise be prevented under Section 50 of the Project Agreement that is reasonably required as part of the Tender Process.
- (e) Project Co shall continue to perform the Maintenance and Rehabilitation Services, and, for all or any part of a Payment Period falling within the period from the Termination Date to the Compensation Date, the City shall pay to Project Co:
 - (i) the Post Termination Service Amount for each completed Payment Period, on or before the date falling 20 Business Days after the end of that Payment Period; and
 - (ii) the Post Termination Service Amount for the period from the end of the last completed Payment Period until the Compensation Date, on or before the date falling 30 days after the Compensation Date.
- (f) If any Post Termination Service Amount is negative, then the amount by which the Post Termination Service Amount is negative shall be carried forward and may be set off against any future positive Post Termination Service Amounts.
- (g) Project Co may, at its own cost, appoint a person (the “**Tender Process Monitor**”) to monitor the Tender Process for the purpose of monitoring and reporting to Project Co on the City’s compliance with the Tender Process. The Tender Process Monitor shall enter into a confidentiality agreement with the City in a form acceptable to the City and shall be entitled to attend all meetings relating to the Tender Process, inspect copies of all the tender documentation and bids and make representations to the City as to compliance with the Tender Process. The City shall not be bound to consider or act upon such representations. The Tender Process Monitor will not disclose confidential information to Project Co but shall be entitled to advise Project Co on whether it considers that the City has acted in accordance with the Tender Process and correctly determined the Adjusted Highest Qualifying Tender Price.
- (h) As soon as practicable after tenders have been received, the City shall, acting reasonably, review and assess the Qualifying Tenders and shall notify Project Co of the Adjusted Highest Qualifying Tender Price.

- (i) If Project Co refers a Dispute relating to the Adjusted Highest Qualifying Tender Price to dispute resolution in accordance with Schedule 26 – Dispute Resolution Procedure, the City shall, irrespective of such Dispute, be entitled to enter into a New Agreement.
- (j) The City shall pay the Adjusted Highest Qualifying Tender Price in accordance with Section 8.
- (k) The City may elect, by Notice to Project Co at any time prior to the City ascertaining the Adjusted Highest Qualifying Tender Price, to follow the no retendering procedure set out in Section 3.4. In addition, the City shall follow such no retendering procedure if:
 - (i) only one Qualifying Tender is received; or
 - (ii) a New Agreement has not been entered into and compensation paid under Section 8.2 on or before the date falling 18 months after the Termination Date.
- (l) Project Co may give written Notice to the City at any time after the Termination Date and prior to the date for receipt of Qualifying Tenders that a Liquid Market does not exist (or shall not exist on the date for receipt of Qualifying Tenders). If the City is in agreement with such Notice, the provisions of Section 3.4 shall apply. If the City provides a written response within 10 Business Days of receipt of such Notice stating that it is in disagreement with that Notice or if no written response is provided by the City within such 10 Business Day period, the matter shall be referred for determination in accordance with Schedule 26 – Dispute Resolution Procedure.

3.4 No Retendering Procedure

- (a) Subject to Section 3.4(b), if the provisions of this Section 3.4 apply, Project Co shall not be entitled to receive any Post Termination Service Amount.
- (b) If the City elects to require a determination in accordance with this Section 3.4 after it has elected to follow the procedure set out in Section 3.3, then the City shall continue to pay to Project Co each Post Termination Service Amount until the Compensation Date in accordance with Section 3.3.
- (c) In determining the Estimated Fair Value, the Parties shall be obliged to follow the principles set out below:
 - (i) All forecast amounts should be calculated in nominal terms as at the Termination Date. Where relevant, adjustments for forecast inflation between the date of calculation and the forecast payment date(s), as set out in the Project Agreement, will be made and, if made, will use an assumed inflation rate of [REDACTED]% per annum.
 - (ii) The Estimated Fair Value shall be calculated using the following formula (without double counting):
$$(A - B - C) - D$$

Where:

A = the present value of the following payments to the extent that, as at the Termination Date, such payments have not yet been paid and are forecast to be made from the Termination Date to the Expiry Date, assuming that no Deductions will be made over that

period, discounted at the Discount Rate: the Monthly Service Payments, the Substantial Completion Payment and the Construction Period Payments

B = a contingency amount based on a reasonable risk assessment of any cost overruns that may reasonably arise (including in respect of any matter referred to in this Section 3.4(c)(ii)) whether or not forecast in the relevant base case and represented in the Financial Model as of the date of Financial Close, discounted at the Discount Rate

C = the present value of the costs of obtaining or performing the Maintenance and Rehabilitation Services reasonably forecast to be incurred by the City from the Termination Date to the Expiry Date to the standard required, discounted at the Discount Rate

D = any rectification costs (including Rectification Costs) that would not arise at the time or in the future had the termination not occurred, and that are reasonably required to deliver the Project Operations to the standard required, including, if applicable, to complete the Works, any costs reasonably forecast to be incurred by the City for up-front finance fees and related costs (excluding principal and interest payments), and any other additional operating costs required to restore operating services standards less (to the extent that such sums are included in any calculation of rectification costs (including Rectification Costs) for the purposes of this item D), the aggregate of:

- (A) any insurance proceeds received or which will be received pursuant to policies maintained in accordance with Schedule 24 – Insurance and Performance Security Requirements; and
- (B) amounts payable by the City in respect of Capital Expenditures under the Project Agreement which have not been paid,

discounted at the Discount Rate.

- (iii) The amount of (A – B – C) as defined in Section 3.4(c)(ii) shall be no greater than the Non-Default Termination Sum.
 - (iv) All costs referred to in Section 3.4(c)(ii) are to be forecast at a level that will deliver the Maintenance and Rehabilitation Services and other Project Operations to the standards required by the Project Agreement and to achieve the full Monthly Service Payments (without Deductions).
 - (v) The calculation will take into consideration the obligations of the Parties with respect to allowances and payments under the Project Agreement.
- (d) If the Parties cannot agree on the Estimated Fair Value, then the Estimated Fair Value shall be determined in accordance with Schedule 26 – Dispute Resolution Procedure.
- (e) The City shall pay the Adjusted Estimated Fair Value in accordance with Section 8.

4. CONSEQUENCES OF NON-DEFAULT TERMINATION AND TERMINATION BY CONTRACTING AUTHORITY FOR RELIEF EVENT

4.1 Consequences

- (a) If the City terminates the Project Agreement pursuant to Section 45.1 of the Project Agreement or if either of the Parties terminate the Project Agreement pursuant to Section 45.2 of the Project Agreement, the City shall pay to Project Co the Non-Default Termination Sum.
- (b) The “**Non-Default Termination Sum**” shall be an amount equal to the aggregate of, but without duplication:
- (i) the Debt Amount and the Debt Makewhole;
 - (ii) [REDACTED];
 - (iii) any amount payable by the City to Project Co in accordance with Sections 41.2(b) and 42.2(b) of the Project Agreement;
 - (iv) the Employee Termination Payments and the Subcontractor Losses (but excluding therefrom any claims for loss of profit relating to any period or costs after the Termination Date);
 - (v) Construction Period Payments, Substantial Completion Payment and Monthly Service Payments payable by the City in accordance with Schedule 19, Schedule 20 and Schedule 21, as applicable, on or prior to the Termination Date, in each case to the extent not included in the Debt Amount Subcontractor Losses or Equity Capital amount pursuant to Sections 4.1(b)(i), (ii), (iv) or (vi); and
 - (vi) an amount equal to the Equity Capital as at Financial Close, less all dividends and other Distributions paid on or made in respect of the Equity Capital on or before the Termination Date, provided that where such amount is negative, it shall be deemed instead to be zero;
- LESS, the aggregate (without double counting) of the following, to the extent it is a positive amount:
- (vii) all credit balances on any bank accounts held by or on behalf of Project Co on the Termination Date and the value of any insurance proceeds due to Project Co or to which Project Co would have been entitled had insurance been maintained in accordance with the requirements of the Project Agreement (save where such insurance proceeds are to be applied in reinstatement, restoration or replacement, or, in the case of third party legal liability, in satisfaction of the claim, demand, proceeding or liability or where the City is required to procure insurances and to make proceeds available to Project Co under the Project Agreement and it has failed to do so) or sums due and payable from third parties other than sums wholly unrelated to the Project Operations, the Project and the Project Agreement (but only when received from third parties) but excluding any claims under any Subcontracts or claims against other third parties which have not been determined or have been determined but not yet paid, provided that, in such case, Project Co shall assign any such rights and claims under the Subcontracts or claims against other third

- parties (other than claims against other third parties wholly unrelated to the Project Operations, the Project and the Project Agreement) to the City and, at no additional cost to Project Co, give the City reasonable assistance in prosecuting such claims; and
- (viii) to the extent realized before the Invoice Date, the market value of any other assets and rights of Project Co (other than those transferred to the City pursuant to the Project Agreement) less liabilities of Project Co properly incurred in carrying out its obligations under the Project Agreement as at the Termination Date, provided that no account should be taken of any liabilities and obligations of Project Co arising out of:
- (A) agreements or arrangements entered into by Project Co to the extent that such agreements or arrangements were not entered into in connection with Project Co's obligations in relation to the Project; or
- (B) agreements or arrangements entered into by Project Co other than in the ordinary course of business and on commercial arm's length terms, save to the extent that liabilities and obligations would have arisen if such agreements or arrangements had been entered into in the ordinary course of business and on commercial arm's length terms; and
- (ix) amounts which the City is entitled to set off pursuant to Section 32.12(a)(i) of the Project Agreement,

provided that the Non-Default Termination Sum shall never be less than the aggregate of the Debt Amount and the Debt Makewhole.

- (c) To the extent that such assets and rights referred to in Section 4.1(b)(viii) are not realized and applied pursuant thereto, Project Co shall, on payment of the Non-Default Termination Sum, assign such assets and rights to the City.

- (d) The City shall pay the Non-Default Termination Sum in accordance with Section 8.

5. INTENTIONALLY DELETED

6. CONSEQUENCES OF TERMINATION FOR BREACH OF REFINANCING

6.1 Consequences

- (a) If the City terminates the Project Agreement as a result of a Project Co Event of Default for failing to comply with Section 7.3 of the Project Agreement or Schedule 27 – Refinancing or the Lenders assign, transfer or otherwise dispose of any right, title or interest they may have in, or obligations they may have pursuant to, the Security Documents in breach of the Lenders' Direct Agreement, the City shall pay to Project Co the Breach of Refinancing Termination Sum.
- (b) The “**Breach of Refinancing Termination Sum**” shall be an amount equal to the aggregate of:
- (i) the Debt Service Amount and the Debt Makewhole;
- (ii) any amount payable by the City to Project Co in accordance with Sections 41.2(b) and 42.2(b) of the Project Agreement;

- (iii) Construction Period Payments payable by the City in accordance with Schedule 20 on or prior to the Termination Date; and
- (iv) the following amounts calculated in respect of the Construction Contractor and the Maintenance and Rehabilitation Contractor which Project Co can demonstrate will be paid directly to such persons:
 - (A) the Employee Termination Payments; and
 - (B) as applicable, the Construction Contractor's and the Maintenance and Rehabilitation Contractor's out-of-pocket costs incurred as a direct result of termination of the Project Agreement (excluding any breakage fees and overhead and profit of the Construction Contractor and the Maintenance and Rehabilitation Contractor, as applicable);

LESS, the aggregate (without double counting) of the following, to the extent it is a positive amount:

- (v) all credit balances on any bank accounts held by or on behalf of Project Co on the Termination Date and the value of any insurance proceeds due to Project Co or to which Project Co would have been entitled had insurance been maintained in accordance with the requirements of the Project Agreement (save where such insurance proceeds are to be applied in reinstatement, restoration or replacement, or, in the case of third party legal liability, in satisfaction of the claim, demand, proceeding or liability or where the City is required to procure insurances and to make proceeds available to Project Co under the Project Agreement and it has failed to do so) or sums due and payable from third parties other than sums wholly unrelated to the Project Operations, the Project and the Project Agreement (but only when received from third parties) but excluding any claims under any Subcontracts or claims against other third parties which have not been determined or have been determined but not yet paid, provided that, in such case, Project Co shall assign any such rights and claims under the Subcontracts or claims against other third parties (other than claims against other third parties wholly unrelated to the Project Operations, the Project and the Project Agreement) to The City and, at no additional cost to Project Co, give the City reasonable assistance in prosecuting such claims;
- (vi) to the extent realized before the Invoice Date, the market value of any other assets and rights of Project Co (other than those transferred to the City pursuant to the Project Agreement) less liabilities of Project Co properly incurred in carrying out its obligations under the Project Agreement as at the Termination Date, provided that no account should be taken of any liabilities and obligations of Project Co arising out of:
 - (A) agreements or arrangements entered into by Project Co to the extent that such agreements or arrangements were not entered into in connection with Project Co's obligations in relation to the Project; or
 - (B) agreements or arrangements entered into by Project Co other than in the ordinary course of business and on commercial arm's length terms, save to the extent that liabilities and obligations would have arisen if such agreements or arrangements had been entered into in the ordinary course of business and on commercial arm's length terms; and

- (vii) amounts which the City is entitled to set off pursuant to Section 32.12(a)(i) of the Project Agreement.
- (c) To the extent that such assets and rights referred to in Section 6.1(b)(vi) are not realized and applied pursuant thereto, Project Co shall, on payment of the Breach of Refinancing Termination Sum, assign such assets and rights to The City.
- (d) The City shall pay such termination sum in accordance with Section 8 of this Schedule 22.

7. CONSEQUENCES OF TERMINATION BY PROJECT CO FOR RELIEF EVENT

7.1 Consequences

- (a) If Project Co terminates the Project Agreement pursuant to Section 45.1 of the Project Agreement, the City shall pay to Project Co a termination sum equivalent to the greater of (i) Non-Default Termination Sum and (ii) the Adjusted Estimated Fair Value calculated in accordance with this Schedule 22.

- (b) The City shall pay such termination sum in accordance with Section 8.1 or 8.3, as applicable.

8. GENERAL

8.1 Payment and Interest Following Non-Project Co Default Termination

- (a) In respect of the termination payments to be made pursuant to any of Sections 2, 4 or 6, as soon as practicable after, and, in any event, within 30 days after, the Termination Date, Project Co shall give to the City an invoice for the relevant termination sum and sufficient supporting evidence, reasonably satisfactory to the City, justifying the amount of the relevant termination sum including a detailed breakdown of each of the individual items comprising such sum.

- (b) The City shall:

- (i) pay to Project Co the relevant termination sum within 60 days after the Invoice Date; and
- (ii) indemnify Project Co as provided in Section 54.2(c) of the Project Agreement in respect of any damages suffered or incurred as a result of the relevant termination sum (or any part of such sum that remains outstanding) not being received on the Termination Date:
 - (A) in an amount equivalent to the No Default Payment Compensation Amount for the period from (but excluding) the Termination Date to (and including) the date which is 60 days after the Invoice Date; and
 - (B) thereafter, in an amount equivalent to the Payment Compensation Amount until the date of payment.

- (c) In respect of the termination payments to be made pursuant to any of Sections 4 or 6, if the applicable termination sum is negative, the City shall have no obligation to make any payment to Project Co and Project Co shall also thereafter indemnify the City as provided in Section 54.1(e) of the Project Agreement in respect of any damages suffered or incurred on such amount on the basis that the due date for the payment of the negative termination sum amount was the date 60

days after the Invoice Date until the date of payment in an amount equivalent to the Payment Compensation Amount.

8.2 Payment and Interest Following Project Co Default - Retendering Procedure

- (a) Following the retendering procedure set out in Section 3.3, the City shall pay to Project Co the Adjusted Highest Qualifying Tender Price no later than the date falling 30 days after the later of:
- (i) the date on which the City enters into the New Agreement with the New Project Co; and
 - (ii) if Project Co has, pursuant to Section 3.3(i), referred a Dispute relating to the Adjusted Highest Qualifying Tender Price to be resolved in accordance with Schedule 26 – Dispute Resolution Procedure, the date on which the Dispute is finally determined, provided that the City shall pay the undisputed amount on the date referred to in Section 8.2(a)(i),
- and the City shall indemnify Project Co as provided in Section 56.2(c) of the Project Agreement on the Adjusted Highest Qualifying Tender Price on the basis that the due date for the payment of the Adjusted Highest Qualifying Tender Price was the date on which the City enters into the New Agreement with the New Project Co:
- (iii) in an amount equivalent to the No Default Payment Compensation Amount from the due date up to (and including) the date following 30 days from after the later of the dates determined under Section 8.2(a)(i) and (ii) above (and for clarity, on such portions of the Adjusted Highest Qualifying Tender Price in the circumstance described in paragraph (ii) above); and
 - (iv) thereafter, in an amount equivalent to the Payment Compensation Amount until the date of payment.

- (b) If the Adjusted Highest Qualifying Tender Price is negative, the City shall have no obligation to make any payment to Project Co and Project Co shall, on the date of the New Agreement, pay the City the amount by which such termination sum is negative, failing which Project Co shall also thereafter indemnify the City as provided in Section 56.1(e) of the Project Agreement in respect of any damages suffered or incurred on such amount on the basis that the due date for the payment of the negative termination sum amount was the date of the New Agreement in an amount equivalent to the Payment Compensation Amount until the date of payment.

8.3 Payment and Interest Following Project Co Default - No Retendering Procedure

- (a) If the City follows the no retendering procedure set out in Section 3.4, the City shall pay to Project Co the Adjusted Estimated Fair Value no later than the date falling 60 days after the date on which the Adjusted Estimated Fair Value has been agreed or determined in accordance with Section 3.4, together with interest on such amount calculated in accordance with Section 8.1(b)(ii).
- (b) If the Adjusted Estimated Fair Value is negative, the City shall have no obligation to make any payment to Project Co and Project Co shall, on the Compensation Date, pay the City the amount by which the Adjusted Estimated Fair Value is negative, failing which Project Co shall also thereafter indemnify the City as provided in Section 54.1(e) of the Project Agreement in respect

of any damages suffered or incurred on such amount on the basis that the due date for payment of the negative Adjusted Estimated Fair Value was the date of the New Agreement in an amount equivalent to the Payment Compensation Amount until the date of payment.

8.4 Costs

- (a) The costs and expenses to be taken into account in the calculation of all termination sums due pursuant to this Schedule 22 shall only be such costs and expenses to the extent that they are reasonable and proper in quantum and shall have been or will be reasonably and properly incurred.

8.5 Undisputed Amounts

- (a) If the calculation of any termination amount is disputed then any undisputed amount shall be paid in accordance with this Section 8 and the disputed amount shall be dealt with in accordance with Schedule 26 – Dispute Resolution Procedure.

8.6 Outstanding Debt Amount

- (a) Subject to Section 8.5 of this Schedule 22, the City shall be entitled to rely on a certificate of the Lenders' Agent as conclusive evidence as to the Debt Amount and Debt Makewhole, as applicable, outstanding or payable at any relevant time.
- (b) If a receipt or other acknowledgement is given by the Lenders' Agent acknowledging or otherwise confirming receipt of payment or payments in respect of the Debt Amount or Debt Makewhole, as applicable, such receipt or other acknowledgement shall discharge City's obligation to pay such portion of compensation due to Project Co that is equal to the amount acknowledged or confirmed.

8.7 Set-off

- (a) City shall be entitled to set off against the Non-Default Termination Sum or the City Default Termination Sum, such amounts not already taken into account in calculating the relevant Compensation Payment that City is entitled to set off or withhold pursuant to the Project Agreement, provided that the amount paid to Project Co on account of the Non-Default Termination Sum or City Default Termination Sum, as the case may be, shall never be less than the aggregate of the Debt Amount and the Debt Makewhole Amount.

SCHEDULE 23

EXPIRY TRANSITION PROCEDURE

1. Independent Inspector

- 1.1 Not less than 126 months prior to the Expiry Date, the Parties shall agree upon and, in accordance with the City's procurement policies, engage an independent and suitably qualified and experienced person (the "**Independent Inspector**") to carry out inspections of the System Infrastructure pursuant to this Schedule 23.
- 1.2 Project Co and the City shall share equally the responsibility for the payment of all fees and costs of the Independent Inspector.
- 1.3 In the event of the Independent Inspector's engagement being terminated otherwise than for full performance, the Parties shall liaise and cooperate with each other in order to appoint a replacement as soon as reasonably practicable, and in any event within 10 Business Days of the termination of the last Independent Inspector's engagement.
- 1.4 In the event the Parties fail to agree upon the identity of the Independent Inspector either pursuant to Section 1.1 or Section 1.3 by the specified deadline, then the Independent Inspector shall be selected as follows:
 - (a) each Party shall within 10 Business Days thereafter select three independent and suitably qualified and experienced persons that would be acceptable to that Party as the Independent Inspector, and shall provide Notice thereof to the other Party; and
 - (b) if the Parties have both selected a common person, then such common person shall be the Independent Inspector; or
 - (c) if the Parties have not selected a common person, then the Independent Inspector shall be selected in accordance with Schedule 26 – Dispute Resolution Procedure.

2. Condition of the System Infrastructure on Expiry

- 2.1 Subject to the exception specified in Section 2.2, on the Expiry Date:

- (a) each element of the System Infrastructure (including, for the avoidance of doubt, the lands identified in the reference plan of survey produced by the post-completion survey set out in Section 25.12 of the Project Agreement and the ground soil located on those lands) shall be in a condition which is consistent with due performance by Project Co of its obligations under the Project Agreement and, in particular, is consistent with the System Infrastructure having been maintained in accordance with the Maintenance and Rehabilitation Requirements, and, with respect to the lands and the ground soil located on the lands, does not deviate from the Pre-Existing Environmental Site Conditions by reason of any Contamination for which Project Co is responsible pursuant to the Project Agreement;

- (b) each element of the System Infrastructure shall,
 - (i) be in good operating order (normal wear and tear excepted);
 - (ii) be capable of performing in accordance with the requirements set out in the Output Specifications; and
 - (iii) successfully complete a system performance demonstration that is substantially the same as the highest capacity Service Level (the “**System Infrastructure Performance Demonstration**”); and
 - (c) each element of the System Infrastructure shall comply with Appendix C of the Maintenance and Rehabilitation Requirements,
- (collectively, the “**Expiry Transition Requirements**”).

2.2 For greater certainty, this Schedule 23 shall not apply to any New Municipal Infrastructure.

3. System Infrastructure Inspections and Performance Demonstrations

3.1 Project Co shall carry out a System Infrastructure Performance Demonstration,

- (a) 162 months following Substantial Completion;
- (b) not more than 126 months and not less than 121 months prior to the Expiry Date;
- (c) annually, no later than 90 days prior to the anniversary of the date of the System Infrastructure Condition Report (as such term is defined in Section 3.2); and
- (d) 90 days prior to the anticipated date of delivery of the Final System Infrastructure Condition Report (as such term is defined in Section 6.1).

During each System Infrastructure Performance Demonstration, Project Co shall use reasonable efforts to minimize any disruption to the Maintenance and Rehabilitation Services. For clarity, all costs and expenses related to each System Infrastructure Performance Demonstration shall be borne by Project Co.

3.2 The Parties shall cause the Independent Inspector to perform an inspection of the System Infrastructure and assess the results of the System Infrastructure Performance Demonstration that Project Co is required to carry out pursuant to Section 3.1(b), and to produce and deliver to each of the Parties a written report (a “**System Infrastructure Condition Report**”) not less than 120 months prior to the Expiry Date that:

- (a) identifies the condition of the System Infrastructure and each element of the System Infrastructure in relation to the Expiry Transition Requirements, and identify whether the System Infrastructure has failed the System Infrastructure Performance Demonstration;
- (b) assesses Project Co’s Expiry Transition Process Asset Preservation Work Schedule with the requirements defined in the Output Specifications;

- (c) identifies any works required to ensure the System Infrastructure and each element of the System Infrastructure will meet the Expiry Transition Requirements on the Expiry Date (the “**Expiry Transition Works**”), and specifying the Contract Year in which each of those Expiry Transition Works would be required;
- (d) specifies the Independent Inspector’s estimate of the costs that would be required to perform the Expiry Transition Works (the “**Expiry Transition Works Costs**”); and
- (e) details how the Expiry Transition Works Costs were calculated.
- 3.3 The Parties shall cause the Independent Inspector to perform another inspection of the System Infrastructure and produce and deliver to each of the Parties an updated System Infrastructure Condition Report (each a “**Revised System Infrastructure Condition Report**”) on each anniversary of the date of the System Infrastructure Condition Report prepared in accordance with Section 3.2. At any time Project Co shall have the right to request that the Independent Inspector conduct the inspection described in Section 3.2 above, by delivering written notice to the City (each such additional test, an “**Additional Look-Forward Test**”) designating an additional testing date. Each Additional Look-Forward Test shall be conducted at the sole cost of Project Co. Project Co shall only be permitted to request three Additional Look-Forward Tests in aggregate.
- 3.4 The Asset Management Plan shall be amended and updated annually or more frequently as the City may reasonably request to include all Expiry Transition Works and all Expiry Transition Works Costs identified in either the System Infrastructure Condition Report or any Revised System Infrastructure Condition Report not already included in the then current Asset Management Plan.
- 3.5 Project Co shall carry out the Expiry Transition Works at its own cost notwithstanding that the actual cost of the Expiry Transition Works may be higher than the Expiry Transition Works Costs.
- 3.6 Either Party may dispute the System Infrastructure Condition Report or any Revised System Infrastructure Condition Report, including the Expiry Transition Works and the Expiry Transition Works Costs, in accordance with Schedule 26 – Dispute Resolution Procedure. In the event that a final determination in accordance with Schedule 26 – Dispute Resolution Procedure specifies Expiry Transition Works or Expiry Transition Works Costs which are different than those set out in either the System Infrastructure Condition Report or any Revised System Infrastructure Condition Report, then either the System Infrastructure Condition Report or any Revised System Infrastructure Condition Report, as the case may be, shall be deemed to be amended accordingly, as amended pursuant to Section 3.4, and all deductions and payments permitted or required by Section 3.7, shall be adjusted accordingly.
- 3.7 No later than 30 days following completion of the System Infrastructure Performance Demonstration contemplated in Section 3.1(a), Project Co shall provide the City with a report outlining the results of such performance demonstration (“**System Mid-Life Infrastructure Condition Report**”). The System Mid-Life Infrastructure Condition Report shall, to the extent applicable, be in conformance with the requirements of the System Infrastructure Condition Report as outlined in Section 3.2.

4. Payments To and From Escrow Account

- 4.1 Following the date for delivery of the System Infrastructure Condition Report, for the purposes of Section 4.2, the Parties shall review the amount of the Expiry Transition Works Costs and the level of capital expenditure Project Co has allocated to spend in the same period pursuant to the Financial Model (the “**Expiry Rehabilitation Costs**”). Where the Expiry Transition Works Costs are greater than the Expiry Rehabilitation Costs, and the difference exceeds a threshold equal to [REDACTED]% ([REDACTED] percent) of the value of the then-current Expiry Rehabilitation Costs (the “**Expiry Rehabilitation Costs Threshold**”) the difference between the Expiry Transition Works Costs amounts exceeding the Expiry Rehabilitation Costs Threshold shall be apportioned equally over the Payment Periods from the date the System Infrastructure Condition Report is to be delivered hereunder to the Expiry Date (each installment being the “**Expiry Transition Amount**”). If the System Infrastructure Condition Report is delivered after the date for delivery hereunder, then the first installment to be paid shall also include the amounts to be paid under the installments that would have been payable prior to the date the System Infrastructure Condition Report is delivered. Where the Expiry Transition Works Costs are amended pursuant to Section 3.4 or 3.6, the Parties agree that the Expiry Transition Amount shall be adjusted accordingly.
- 4.2 Subject to Sections 4.3 and 4.5, the City may deduct the Expiry Transition Amount from each Monthly Service Payment, and pay into a separate interest bearing bank account, upon escrow terms acceptable to the Parties or in trust (the “**Escrow Account**”), the Expiry Transition Amount. If in any Payment Period, the Expiry Transition Amount is greater than the relevant Monthly Service Payment, the City may deduct the difference between the Expiry Transition Amount and the Monthly Service Payment from the next Monthly Service Payment or from such other Payment Period as otherwise agreed between the Parties.
- 4.3 The City shall not deduct any amount from a Monthly Service Payment as contemplated in Section 4.2 if, at such time, the funds in the Escrow Account exceed the value (based on the Expiry Transition Works Costs) of all or any part of the Expiry Transition Works (as amended) yet to be performed.
- 4.4 Project Co may from time to time, but not more often than once in any month, make written request for release of funds from the Escrow Account. The City shall consider such request within 10 Business Days and if the funds in the Escrow Account exceed the value (based on the Expiry Transition Works Costs) of all or any part of the Expiry Transition Works (as amended) yet to be performed, then the City shall pay the excess to Project Co from the Escrow Account within 10 Business Days thereafter, together with any interest that has accrued on such amount. Project Co shall include with its request all information reasonably required by the City to evaluate such request.
- 4.5 Following the date of any Revised System Infrastructure Condition Report, the Expiry Transition Amount shall be recalculated and if the amount in the Escrow Account (being the deductions of the Expiry Transition Amount made since the System Infrastructure Condition Report) together with the deductions scheduled to be made from the remaining Monthly Service Payments in accordance with Section 4.2 (and in accordance with any previous application of this Section 4.5) is less than the revised Expiry Transition Amount, then the City may deduct such shortfall, in equal installments, from each remaining Monthly Service Payment until the Expiry Date, and pay each installment into the Escrow Account and Section 4.4 shall continue to apply until the Expiry Date.

4.6 As an alternative to the deductions permitted by Sections 4.2 and 4.5 or the retention of any amount in the Escrow Account pursuant to the foregoing provisions of this Section 3.7, Project Co may (and if, at any time, the amounts which the City is permitted to deduct pursuant to Sections 4.2 and 4.5 is greater than the remaining Monthly Service Payments, Project Co shall), within 5 Business Days of a written request from the City, provide a bond or letter of credit (the “**Expiry Transition Security**”) in favour of the City in an amount equal to the amounts which the City is permitted to deduct pursuant to Sections 4.2 and 4.5, in a form and from a surety or bank, as applicable, acceptable to the City.

5. Project Co Not Relieved of Obligations

5.1 Notwithstanding:

- (a) any agreement of the City to any Expiry Transition Works, Expiry Transition Works Costs or Expiry Transition Security;
- (b) any participation of the City in any inspection under this Schedule 23; and
- (c) the complete or partial carrying out of the Expiry Transition Works,

Project Co shall not be relieved or absolved from any obligation to conduct any other inspection or to perform any other works to the extent otherwise required by the Project Agreement, including the Output Specifications.

6. Final System Infrastructure Condition Report

- 6.1 The Parties shall cause the Independent Inspector to perform an inspection of the System Infrastructure and assess the results of the System Infrastructure Performance Demonstration that Project Co is required to carry out pursuant to Section 3.1, and to produce and deliver to each of the Parties a System Infrastructure Condition Report within 30 Business Days after the Expiry Date (the “**Final System Infrastructure Condition Report**”) that documents whether the System Infrastructure met the Expiry Transition Requirements on the Expiry Date, as well as identifying any Expiry Transition Works and Expiry Transition Works Costs.
- 6.2 If the Final System Infrastructure Condition Report identifies any Expiry Transition Works, the City may withdraw from the Escrow Account or call upon the Expiry Transition Security an amount equivalent to such Expiry Transition Works Costs, and the City shall pay any remaining funds in the Escrow Account (including any interest accrued) to Project Co and return any remaining Expiry Transition Security to Project Co.
- 6.3 Provided that the funds in the Escrow Account and/or the Expiry Transition Security is adequate to meet Project Co’s obligations in respect of the Expiry Transition Works identified in the Final System Infrastructure Condition Report, following any withdrawal from the Escrow Account or call upon the Expiry Transition Security in accordance with Section 6.2, Project Co shall have no further liability with respect to such Expiry Transition Works.
- 6.4 If no Expiry Transition Works are identified in the Final System Infrastructure Condition Report, the City shall, within 20 Business Days of receipt by the City of the Final System Infrastructure Condition Report, pay the funds in the Escrow Account (including any interest accrued) to Project Co and return the Expiry Transition Security to Project Co, unless the City disputes the Final System Infrastructure Condition Report, in which case the Escrow Account and Expiry

Transition Security shall be dealt with as determined in accordance with Schedule 26 – Dispute Resolution Procedure.

SCHEDULE 24

**INSURANCE AND PERFORMANCE
SECURITY REQUIREMENTS**

**ARTICLE 1
CONSTRUCTION PERIOD INSURANCE COVERAGE**

- 1.1 Subject to Article 8, from and after execution of the Project Agreement and, until the Substantial Completion Date, Project Co shall, at its own expense, obtain and maintain, or cause to be obtained and maintained, exclusively through the City of Ottawa Construction Insurance Program (COCIP) the following insurances as further described in Appendix A to this Schedule 24:
 - (a) "All Risks" Course of Construction Property, including Boiler and Machinery;
 - (b) "Wrap-Up" Commercial General Liability and Non-Owned Automobile Liability;
 - (c) Project Specific Professional Liability; and
 - (d) Project Specific Pollution Liability (combined Contractors' Pollution Liability and Pollution Legal Liability).
- 1.2 Subject to Article 8, from and after execution of the Project Agreement, until the Substantial Completion Date, Project Co shall, at its own expense, obtain and maintain, or cause to be obtained and maintained, the following insurances as further described in Appendix A:
 - (a) Automobile Liability;
 - (b) Commercial General Liability and Non-Owned Automobile Liability (to be maintained by the Construction Contractor and each of the Subcontractors involved in the Design and Construction Works) with respect to off-site/Lands operations and activities;
 - (c) Aircraft and Watercraft Liability (if any exposure);
 - (d) "All Risks" Marine Cargo (if any exposure);
 - (e) "All Risks" Contractors' Equipment;
 - (f) Comprehensive Crime; and
 - (g) WSIB.

**ARTICLE 2
MAINTENANCE PERIOD INSURANCE COVERAGE**

- 2.1 Subject to Article 8, from and after the Substantial Completion Date and until the Termination Date, in respect of coverage for the Maintenance and Rehabilitation Services during the Maintenance Period Project Co shall, at its own expense, obtain and maintain, or cause to be obtained and maintained, the following insurances as further described in Appendix A:
 - (a) "All Risks" Property;

- (b) Boiler and Machinery;
- (c) Commercial General Liability and Non-Owned Automobile Liability;
- (d) Automobile Liability; and
- (e) WSIB.

**ARTICLE 3
NO LIMIT ON RECOVERY**

- 3.1 Notwithstanding any other provision of the Project Agreement, it is hereby agreed that the limits of liability specified in this Schedule 24 for insurance policies, whether such policies are required to be obtained (or caused to be obtained) by the City or by Project Co, shall in no way limit Project Co's liability or obligations to the City or the City's liability or obligations to Project Co, as applicable.

**ARTICLE 4
ADDITIONAL COVER**

- 4.1 Without prejudice to the other provisions of this Schedule 24, the City and Project Co shall, at all relevant times and at their own expense, obtain and maintain, or cause to be obtained and maintained, those insurances which they are required to obtain and maintain, or cause to be obtained and maintained, by Applicable Law, or that they consider necessary.
- 4.2 the City reserves the right to require Project Co to purchase such additional insurance coverage as the City may reasonably require. the City also reserves the right to request such higher or lower limits of insurance or otherwise alter the types of coverage requirements, their minimum amounts and deductibles (taking into consideration such matters as the nature of the Project Operations, contract value, industry standards, and availability of insurance) as the City may reasonably require from time to time. Any additional costs of such additional and/or amended insurance shall be borne by the City and any cost savings resulting from the implementation of such additional and/or amended insurance shall be for the account of the City.

**ARTICLE 5
RESPONSIBILITY FOR DEDUCTIBLES**

- 5.1 The Party responsible for the matter giving rise to a claim, to the extent responsible therefor, shall be responsible and liable for the payment of deductibles under any policy of insurance under which it is an insured party or under any policy of insurance Project Co is required to maintain (or cause to be maintained) under this Schedule 24. In the event that responsibility for the matter giving rise to the claim is indeterminable, the First Named Insured under the policy of insurance is responsible and liable for the payment of deductibles.

**ARTICLE 6
COOPERATION WITH INSURER'S CONSULTANT**

- 6.1 If an insurer or an insurer's appointed consultant, for underwriting purposes or as a term of an insurance policy, needs to review any part of the performance of the Project Agreement, then the City and Project Co shall, and shall require the City Parties and the Project Co Parties to:

- (a) cooperate with the insurer and its consultant, including providing them with such information and documentation as they may reasonably require; and
- (b) allow the insurer and its consultant to attend meetings between Project Co and the City (or, as applicable, and if reasonably required by the insurer, between Project Co and those engaged by or through Project Co).

ARTICLE 7

BENCHMARKING OF INSURANCE COSTS

7.1 For purposes of this Article 7, the following terms shall have the following meanings:

- (a) **“Actual Relevant Insurance Cost”** means the aggregate of (i) the annual insurance premiums reasonably incurred by Project Co to maintain (or cause to be maintained) the Relevant Insurance at the Relevant Insurance Inception Date and during the Insurance Review Period, but excluding Taxes and all broker’s fees and commissions.
- (b) **“Adjusted Base Relevant Insurance Cost”** means, if the Actual Relevant Insurance Cost exceeds the Base Relevant Insurance Cost for a given Insurance Review Period, an amount, based on the Joint Insurance Cost report, that represents the Base Relevant Insurance Cost as adjusted to take into consideration any portion of the difference between the Actual Relevant Insurance Cost and the Base Relevant Insurance Cost that is attributable solely to Project Co having underpriced the Base Relevant Insurance Cost in Project Co’s proposal in response to the Request for Proposals. For greater certainty, the Base Relevant Insurance Cost will be increased by any amount by which Project Co underpriced the Base Relevant Insurance Cost for the given Insurance Review Period.
- (c) **“Base Relevant Insurance Cost”** means the aggregate of the annual insurance premiums which were projected (as set out in the Financial Model) to be incurred by Project Co to maintain (or cause to be maintained) the Relevant Insurance during the Insurance Review Period, which amounts exclude Taxes and all broker’s fees and commissions.
- (d) **“Insurance Cost Differential”** means an amount, based on the Joint Insurance Cost Report, equal to $(\text{ARIC} - \text{ABRIC}) \pm \text{PIC}$ where:
 - ARIC is the Actual Relevant Insurance Cost;
 - ABRIC is the Adjusted Base Relevant Insurance Cost; and
 - PIC is any Project Insurance Change.

For the purpose of determining the Insurance Cost Differential, in the event that there is a net increase in the ARIC relative to the ABRIC, the Project Insurance Change shall have a negative value and, in the event that there is a net decrease in the ARIC relative to the ABRIC, the Project Insurance Change shall have a positive value.

- (e) **“Insurance Review Date”** means the Relevant Insurance Inception Date and thereafter each anniversary of the Relevant Insurance Inception Date, except where such date lies beyond the end of the Project Term, in which case the Insurance Review Date shall be the last renewal date of the Relevant Insurance prior to the Expiry Date.

- (f) “**Insurance Review Period**” means a one year period from the Relevant Insurance Inception Date and each subsequent one year period commencing on the Relevant Insurance Inception Date, except where the end of such period lies beyond the end of the Project Term, in which case the Insurance Review Period shall be the period from the end of the penultimate Insurance Review Period to the last day of the Project Term.
- (g) “**Project Insurance Change**” means any net increase or net decrease in the Actual Relevant Insurance Cost relative to the Base Relevant Insurance Cost, arising from:
- (i) other than in respect of claims or re-ratings arising out of acts or omissions of the City, an City Party, an Operator or a System User, the claims history or re-rating of Project Co or any Project Co Party;
 - (ii) the effect of any change in deductible unless:
 - (1) such change is attributable to circumstances generally prevailing in the worldwide insurance market; and
 - (2) in respect of the Relevant Insurance, such change is not attributable to claims made as the result of acts or omissions of Project Co or any Project Co Party; and
 - (iii) any other issue or factor other than circumstances generally prevailing in the worldwide insurance market.

For greater certainty, any amount by which Project Co underpriced the Base Relevant Insurance Cost in its proposal in response to the Request for Proposals shall not be considered a Project Insurance Change.

- (h) “**Relevant Insurance**” means all policies of insurance to be obtained (or caused to be obtained) by Project Co in accordance with Article 2.
- (i) “**Relevant Insurance Inception Date**” means the date on which the Relevant Insurance is first providing active insurance cover to Project Co and the City being a date no earlier than the Substantial Completion Date.

7.2 No later than 60 days prior to each Insurance Review Date, Project Co’s insurance broker shall, at Project Co’s sole cost and expense, prepare a report on behalf of both Project Co and the City (the “**Joint Insurance Cost Report**”), which contains the following information at the Relevant Insurance Inception Date, and thereafter for the relevant Insurance Review Period:

- (a) a full breakdown of the Actual Relevant Insurance Cost;
- (b) the Base Relevant Insurance Cost;
- (c) an assessment and quantification of each Project Insurance Change, together with the reasons therefor;
- (d) the opinion of Project Co’s insurance broker as to the reasons why the Actual Relevant Insurance Cost has varied from the Base Relevant Insurance Cost, specifying the impact

- of each of the factors and quantifying the amount attributable to each factor along with an assessment of the Adjusted Base Relevant Insurance Cost;
- (e) the calculation of the Insurance Cost Differential; and
 - (f) evidence satisfactory to the City, acting reasonably, of any changes to circumstances generally prevailing in the worldwide insurance market that are claimed to account for the Insurance Cost Differential.
- 7.3 The Monthly Service Payment will be subject to an adjustment in the amount of the Insurance Cost Differential (the “**Insurance Adjustment**”) in accordance with Schedule 19 – Payment Mechanism.
- ## ARTICLE 8 UNINSURABLE RISKS
- 8.1 The term “**Uninsurable Risk**” means a risk, or any component of a risk, against which Project Co is required to insure pursuant to this Schedule 24 and for which, at any time after the date of the Project Agreement, either:
- (a) the insurance required pursuant to this Schedule 24 (including the terms and conditions specified for such insurance herein) is not available in relation to that risk:
 - (i) where Applicable Laws require that the insurer must be licensed in the Province of Ontario to insure such a risk, by insurers licensed in the Province of Ontario; or
 - (ii) where Applicable Laws do not require that the insurer must be licensed in the Province of Ontario to insure such a risk, by any insurer otherwise permitted under the terms of the Project Agreement; or
 - (b) the insurance premium payable or the terms and conditions for insuring that risk are such that the risk is not generally being insured against in the worldwide insurance market.
 - (c) Project Co has the onus of demonstrating, to the City’s reasonable satisfaction that the foregoing definition applies to a particular risk.
- 8.2 Project Co shall notify the City as soon as possible and, in any event, within 15 Business Days of becoming aware of same, that a risk, or any component of a risk, has become an Uninsurable Risk, and shall provide the City with all relevant details in relation to such risk, including a copy of the relevant insurance policy.
- 8.3 Project Co and the City shall, as soon as possible following the provision of the notice referred to in Section 8.2, meet to discuss, in good faith, the appropriate means by which the Uninsurable Risk should be managed and, if Project Co and the City are able to agree to alternative arrangements, the Uninsurable Risk shall be managed in accordance with such alternative arrangements.
- 8.4 In the event that Project Co and the City, each acting in good faith, are unable to agree to alternative arrangements with respect to the management of an Uninsurable Risk within 15

Business Days of the expiry of the period referred to in Section 8.2, the City may, in its absolute discretion, either:

- (a) elect to assume responsibility for the Uninsurable Risk and, in respect of the year in which the relevant risk becomes an Uninsurable Risk and every year thereafter, withhold, in equal instalments over the course of such year, from the payment or payments otherwise due to Project Co an amount equal to the annual premium (index linked) relating to the Uninsurable Risk as was current on the date immediately prior to the date on which the relevant risk became an Uninsurable Risk, in which case the Project Agreement shall continue in full force and effect; or
- (b) terminate the Project Agreement in accordance with Section 47.2 of the Project Agreement as if such termination had occurred as a result of the Parties having failed to reach agreement in accordance with Section 47.2 of the Project Agreement following the occurrence of an event of Force Majeure, and, in accordance with the provisions of Schedule 23 – Compensation on Termination, pay to Project Co an amount equal to the Non-Default Termination Sum.

8.5 On the occurrence of an Uninsurable Risk, the City may, in its absolute discretion, either:

- (a) pay to Project Co an amount equal to the insurance proceeds that would have been payable to Project Co in connection with such Uninsurable Risk had the relevant insurance continued to be available, in which case the Project Agreement shall continue in full force and effect; or
- (b) terminate the Project Agreement in accordance with Section 45.2 of the Project Agreement as if such termination had occurred as a result of the Parties having failed to reach agreement in accordance with Section 45.2 of the Project Agreement following the occurrence of an event of Force Majeure, and, in accordance with the provisions of Schedule 23 – Compensation on Termination, pay to Project Co an amount equal to the Non-Default Termination Sum.

8.6 With respect to any Uninsurable Risk:

- (a) Project Co shall continue to approach the insurance market on a regular basis and, in any event, at intervals of not less than 180 days and use reasonable efforts to obtain (or cause to be obtained) insurance to cover as much or all of the Uninsurable Risk as can be insured in the available insurance market from time to time; and
- (b) Subject to Section 8.6(a), Project Co shall be relieved of its obligation to maintain (or cause to be maintained) insurance in respect of the Uninsurable Risk.

8.7 Where a risk which was previously an Uninsurable Risk ceases to be so, Project Co shall, at its own expense, obtain and maintain, or cause to be obtained and maintained, insurance in accordance with the requirements of this Schedule 24 in respect of the risk and the provisions of this Section 8 shall no longer apply to such risk.

8.8 From and after the Substantial Completion Date, the Parties shall meet on an annual basis to review the scope of insurance coverage and deductibles provided in this Schedule 24, and may make mutually agreed changes thereto.

**ARTICLE 9
DAMAGE OR DESTRUCTION**

- 9.1 In the event of damage to, or destruction of, all or any part of the System Infrastructure for which there is coverage under an insurance policy, any insurance proceeds received by Project Co shall first be applied so as to ensure the performance by Project Co of its obligations under the Project Agreement, including, where appropriate, the reinstatement, restoration or replacement of the System Infrastructure or any other assets, materials or goods necessary or desirable for the carrying out of the Project Operations, all in accordance with the terms of the Insurance Trust Agreement provided that, in respect of a Revenue Vehicle, this Section 9.1 shall not apply, and the provisions of Sections 9.2, 20.1 and 20.2 shall apply.
- 9.2 In respect of insurance proceeds received by the City under the provisions of Section 20.2, the City shall make such insurance proceeds available to Project Co, to be solely applied by Project Co in the reinstatement, restoration or replacement of the Revenue Vehicles necessary for the carrying out of the Project Operations.

**ARTICLE 10
SUBCONTRACTORS**

- 10.1 Project Co shall require that all Subcontractors are covered by, or obtain, the insurance described in this Schedule 24, provided that Project Co shall determine the applicable limits to be obtained for such insurance. Project Co shall be solely responsible and liable for any damages which the City may suffer as a direct result of Project Co's failure to comply with the foregoing.
- 10.2 If Project Co receives notice that any Subcontractor employed by or through Project Co is not covered by any insurance required by this Schedule 24 to be obtained (or caused to be obtained) by Project Co, Project Co shall:
 - (a) ensure that such insurance coverage is put in place;
 - (b) remove the Subcontractor from the Lands and ensure that such Subcontractor does not perform any further part of the Project Operations until after such insurance coverage is put in place; or
 - (c) if the Subcontractor cannot be covered by a particular policy as required by this Schedule 24, replace the Subcontractor with a new Subcontractor who can be covered by insurance required by this Schedule 24 or who can obtain the required insurance coverage; it being acknowledged by Project Co that the requirements and restrictions set forth in the Project Agreement regarding new and replaced Subcontractors shall be complied with.

**ARTICLE 11
RENEWAL**

- 11.1 Project Co shall provide to the City, at least 5 Business Days prior to the expiry date of any policy of insurance required to be obtained (or caused to be obtained) by Project Co pursuant to this Schedule 24, evidence of the renewal of each such policy satisfactory to the City, acting reasonably.

**ARTICLE 12
NAMED AND ADDITIONAL INSUREDS AND WAIVER OF SUBROGATION**

- 12.1 All insurance provided by Project Co, shall:
- (a) include Project Co, Project Co Parties, the City, City Parties, and any other party specified in Appendix A as Named Insureds to the extent specified in Appendix A or as required pursuant to any agreement relating to the Project to which Project Co is a party;
 - (b) include the City, City Parties, Project Co and any other party specified in Appendix A as Additional Insureds, or loss payees (as applicable) to the extent of their respective insurable interests to the extent specified in Appendix A or as required pursuant to any agreement relating to the Project to which Project Co is a party;
 - (c) except with respect to the Project Specific Professional Liability specified in Part 1 of Appendix A and Automobile Liability, Comprehensive Crime and WSIB specified in Parts 1 and 2 of Appendix A, contain a waiver of subrogation as against the City, City Parties, and their respective shareholders, officials, directors, officers, employees, servants, consultants (other than design consultants) and agents;
 - (d) with respect to the “All Risk” Course of Construction Property, including Boiler and Machinery and “All Risk” Property, contain a waiver of subrogation as against Project Co, and its shareholders, officers, directors, officers, employees, servants, consultants (other than design consultants and agents);
 - (e) contain a breach of warranty provision whereby a breach of a condition by Project Co will not eliminate or reduce coverage for any other insured; and
 - (f) be primary insurance with respect to any similar coverage provided by any insurance obtained by or available to the City and City Parties without any right of contribution of any insurance carried by the City and City Parties.

**ARTICLE 13
CERTIFICATES OF INSURANCE AND CERTIFIED COPIES OF POLICIES**

- 13.1 Prior to the execution of the Project Agreement, Project Co will provide the City with certified copies of policies, confirming that the insurances specified in Section 1.1 have been obtained and are in full force and effect.
- 13.2 Prior to the execution of the Project Agreement, Project Co will provide the City with certificates of insurance or certified copies of policies, confirming that the insurances specified in Section 1.2 have been obtained and are in full force and effect. If certificates of insurance are provided, certified copies of the entire contents of all relevant insurance policies will be subsequently provided to the City no later than 90 days after execution of the Project Agreement.
- 13.3 Prior to the commencement of any part of the Maintenance and Rehabilitation Services, Project Co will provide the City with certificates of insurance or certified copies of policies, confirming that the insurances specified in Section 2.1 have been obtained and are in full force and effect. If certificates of insurance are provided, certified copies of the entire contents of all relevant insurance policies will subsequently be provided to the City no later than 90 days after the

Substantial Completion Date; however specimen wordings of all such insurance policies, along with the corresponding summary of coverage, limits and deductibles, must be provided to the City no later than 90 days prior to the Substantial Completion Date.

- 13.4 Project Co may utilize blanket corporate policies to satisfy the Maintenance Period insurance requirements, provided that all the needs, scope of coverage and limits of the City have been met to their sole satisfaction having regard to the requirements of this Schedule 24.

**ARTICLE 14
FAILURE TO MEET INSURANCE REQUIREMENTS**

- 14.1 If Project Co fails to obtain or maintain, or cause to be obtained and maintained, the insurance required by this Schedule 24, fails to furnish to the City a certified copy of each policy required to be obtained by this Schedule 24 or if, after furnishing such certified copy, the policy lapses, is cancelled, or is materially altered, then the City shall have the right, without obligation to do so, to obtain and maintain such insurance itself in the name of Project Co, and the cost thereof shall either, at the City's option, be payable by Project Co to the City on demand or be deducted by the City from the next payment or payments otherwise due to Project Co.
- 14.2 If coverage under any insurance policy required to be obtained (or caused to be obtained) by Project Co should lapse, be terminated or be cancelled, then, if directed by the City, all work by Project Co shall immediately cease until satisfactory evidence of renewal is produced.

**ARTICLE 15
MODIFICATION OR CANCELLATION OF POLICIES**

- 15.1 Except as noted in Appendix A, all insurance provided by Project Co shall contain endorsements confirming that the policy will not be cancelled, adversely reduced, adversely materially altered or adversely materially amended without the insurer(s) giving at least ninety (90) days prior written notice by registered mail, at the addresses specified, to the City, City Parties, the Lenders and the Lenders' Agent. For greater certainty, the terms "adversely reduced", "adversely materially altered" and "adversely materially amended" as used in this provision shall mean any decrease or reduction in policy limits, aggregate limits or sub-limits (other than as a result of claims under the policy), any increase in any policy deductible or self-insured retention, any reduction in the policy coverage period, cancellation or suspension of coverage with respect to any insured parties from the time the policy was issued for that policy period, addition of any exclusions or restrictions from the time the policy was issued for that policy period and any reduction or restriction in the scope of coverage provided under the policy, in all cases when such adverse reduction, adverse material alteration or adverse material amendment is initiated by the insurer.
- 15.2 All insurance provided by Project Co shall contain endorsements confirming that, in the event of cancellation for non-payment of premium, the insurer(s) will give at least fifteen (15) days prior written notice by registered mail, at the addresses specified, to the City, City Parties, the Lenders and the Lenders' Agent.
- 15.3 With respect to Maintenance Period insurance, only notice of cancellation will be required for the Automobile Liability and Comprehensive Crime described in Part 2 of Appendix A.

- 15.4 With respect to insurance described in Section 1.1(a), (b) and (d), Section 1.2(d) and Section 2.1(a), (b) and (c), breach of any of the terms or conditions of the policies required to be provided by Project Co, or any negligence or wilful act or omission or false representation by an Insured under these policies, shall not invalidate the insurance with respect to the City, City Parties, the Lenders or any other Named Insured or additional Insured, but only to the extent that such breach is not known to these parties.

ARTICLE 16 INSURERS

- 16.1 All policies of insurance to be obtained (or caused to be obtained) by Project Co in accordance with this Schedule 24 shall be issued by financially sound insurers acceptable to the City and the Lenders, acting reasonably, and, where required by statute, be licensed to insure such risk in the Province of Ontario.
- 16.2 To be eligible to provide insurance, an insurer must have the capacity to provide the particular insurance and shall have current ratings from time to time of either:
- (a) a Financial Strength Rating of not lower than “A-” for three out of the previous five years but not lower than “B” at any time during those five years, and a Financial Size Category not lower than VII, such ratings being those established by A. M. Best Company (Best); or
 - (b) a Long-Term Financial Strength Rating of not lower than “A-” for three out of the past five years but not less than “BBB” at any time during those five years, a Short-Term Financial Strength Rating of not lower than “A-3” for three out of the previous five years and a Financial Enhancement Rating of not lower than “A-” for three out of the previous five years but not less than “BB+” at any time during those five years, such ratings being those established by Standard and Poor’s (S&P); or
 - (c) if the insurer is not rated by Best or S&P, an insurer that is acceptable to the City and Lenders, acting reasonably, with respect to the insurances required by this Schedule 24.

ARTICLE 17 POLICY TERMS AND CONDITIONS

- 17.1 All policies of insurance to be obtained (or caused to be obtained) by Project Co in accordance with this Schedule 24 shall be in form and substance satisfactory to the City and its insurance advisors, acting reasonably.
- 17.2 To achieve the minimum limits for any type of insurance required under Appendix A, it is permissible to arrange the insurance under a single policy, or by a combination of primary, umbrella and/or excess policies.

ARTICLE 18 FAILURE TO COMPLY

- 18.1 Neither failure to comply with nor full compliance by Project Co with the insurance provisions of this Schedule 24 shall relieve Project Co of its liabilities and obligations under the Project Agreement.

**ARTICLE 19
PERFORMANCE SECURITY REQUIREMENTS**

[REDACTED]

**ARTICLE 20
INSURANCE TRUST AGREEMENT**

- 20.1 Prior to the transfer of ownership in respect of a Vehicle from the Revenue Vehicle Supplier to the City, all losses under (i) the “All Risks” Course of Construction Property Insurance policy, including Boiler & Machinery Insurance carried by Project Co prior to Substantial Completion; (ii) the “All Risks” Property Insurance carried by Project Co after Substantial Completion; and (iii) the Boiler & Machinery Insurance carried by Project Co after Substantial Completion, which in each case, relate to a Vehicle, shall, in each case, be payable solely to the Revenue Vehicle Supplier, and such losses shall not be payable to the Account Trustee or distributed pursuant to the Insurance Trust Agreement.
- 20.2 After the transfer of ownership in respect of a Vehicle from the Revenue Vehicle Supplier to the City, all losses under (i) the “All Risks” Course of Construction Property Insurance policy, including Boiler & Machinery Insurance carried by Project Co prior to Substantial Completion; (ii) the “All Risks” Property Insurance carried by Project Co after Substantial Completion; and (iii) the Boiler & Machinery Insurance carried by Project Co after Substantial Completion, which, in each case, relate to a Revenue Vehicle or related equipment in respect of a Vehicle, shall be paid solely to the City and such losses shall not be payable to the Account Trustee or distributed pursuant to the Insurance Trust Agreement.

Appendix A – Insurance Requirements

Construction Period Insurance – Trillium Line Extension Project From execution of the Project Agreement until the Substantial Completion Date

Insurances to be provided, or caused to be provided, by Project Co and arranged through the COCIP program

Type	Amount	Maximum Deductibles	Principal Cover
“All Risks” Course of Construction Property, including Boiler and Machinery	<p>Limit of liability of \$[REDACTED], including Property of every description including Revenue Vehicles and Vehicle Equipment supplied by the City for incorporation into the Project.</p> <p>For clarity, Project Co’s obligation to insure Revenue Vehicles and Vehicle Equipment commences once the Revenue Vehicle and Vehicle Equipment is delivered at New Walkley Yard or other location on Lands.</p> <p>Delay in Start-up \$[REDACTED], covering a 21 month indemnity period, including Contingent Delayed Start-Up related to losses at Suppliers’ premises or other temporary storage locations (\$[REDACTED] sub-limit)</p> <p>Soft Costs \$[REDACTED] (representing [REDACTED]% of Recurring / Continuing Soft Costs)</p> <p>Extra and Expediting Expense (minimum \$[REDACTED] sub-limit)</p> <p>Principal Extensions:</p> <ul style="list-style-type: none"> • Replacement Cost Valuation (Property) • Most Recent Technology Replacement Cost Valuation (Equipment or Machinery) • Flood (to policy limit with annual aggregate) • Natural or man-made earth movement, including earthquake, 	<p>[REDACTED]% of loss value / \$[REDACTED] minimum; \$[REDACTED] maximum Earthquake</p> <p>\$[REDACTED] Flood and water damage</p> <p>\$[REDACTED] Testing and Commissioning</p> <p>\$[REDACTED] All other losses</p> <p>30 day waiting period applicable to time element coverages, except 48 hour waiting period, off premises services</p>	<p>“All Risks” Course of Construction Property Insurance covering the insurable replacement cost of System Infrastructure, Revenue Vehicles and Vehicle Equipment based on the PML study, including cold and hot testing / commissioning of Equipment including HVAC, Delay in Start-Up, Soft Costs with no early occupancy restriction.</p> <p>This coverage shall be primary with respect to the Project without right of contribution of any insurance carried by the City, City Parties or the Lenders.</p>

Type	Amount	Maximum Deductibles	Principal Cover
	<p>landslide or subsidence (to policy limit with an annual aggregate)</p> <ul style="list-style-type: none"> • Electronic Data Processing equipment and media, including data restoration and re-creation costs • Transit • Unnamed locations • By-laws including Demolition, Increased Cost of Repairs and Replacement (subject to a \$[REDACTED] sub-limit only with respect to existing or renovated buildings) • Debris Removal (minimum \$[REDACTED] sub-limit) • Off Premises Services Interruption (minimum \$[REDACTED] sub-limit) • Professional Fees (minimum \$[REDACTED] sub-limit) • Fire Fighting Expenses (minimum \$[REDACTED] sub-limit) • Valuable Papers (minimum \$[REDACTED] sub-limit) • Accounts Receivable (minimum \$[REDACTED] sub-limit) • Green Building and LEED Upgrades (subject to a \$[REDACTED] sub-limit) • Defence Costs (subject to a \$[REDACTED] sub-limit) • Contamination Clean-up or Removal (minimum \$[REDACTED] sub-limit) • Ammonia Contamination (minimum \$[REDACTED] sub-limit) • LEED Rectification, Commissioning and Testing Expenses (subject to a \$[REDACTED] sub-limit) • Civil Authority Access Interruption (8 weeks) • Prevention of Ingress/Egress (8 weeks) • Permission for Partial Use or Occupancy prior to Substantial Completion 		

Type	Amount	Maximum Deductibles	Principal Cover
	<ul style="list-style-type: none"> • Cost of Carrying Project Financing (21 Months), included in Delayed Start-Up coverage • Margin of Profit Extension for Contractors • Radioactive contamination caused by sudden and accidental release of radioactive isotopes (resulting from an accident) • Testing and Commissioning – no time limitation, subject to receipt of testing and commissioning schedule <p>Permitted Exclusions:</p> <ul style="list-style-type: none"> • Cyber risk • Mould, fungi and fungal derivatives • Faulty workmanship, materials construction, or design but resultant damage to be insured to a minimum LEG 2 standard • War risk • Terrorism • Nuclear or radioactive contamination, except radioactive isotopes intended for scientific, medical, industrial or commercial use • Contractors' Equipment (unless values declared and risk accepted by insurers – Contractors' Equipment Endorsement noted) • Sanctions Clause • Latent defect or inherent vice with respect to Revenue Vehicles 		

Type	Amount	Maximum Deductibles	Principal Cover
<i>Comments</i>	<ul style="list-style-type: none"> • Named Insured includes Project Co, the City, City Parties, Lenders, Lender's Agent, the Construction Contractor, Revenue Vehicle Supplier, all subcontractors, sub-subcontractors, consultants and sub-consultants, as their respective interests may appear • No provision permitted allowing a coinsurance penalty • Insurance shall be primary without right of contribution of any other insurance carried by any Named Insured • Additional key extensions of coverage: <ul style="list-style-type: none"> • Underground services, temporary works involved in the Project such as scaffolding, hoarding, etc., site preparation, including excavation and associated improvements, landscaping and property of others used in the construction of the Project • Losses payable in accordance with the Insurance Trust Agreement and Section 20.1 and 20.2 of Schedule 24 – Insurance and Performance Security Requirements • Upon Substantial Completion, cover will cease and be replaced by All Risk Property and Boiler & Machinery Insurance – Maintenance Period • Waiver of Subrogation against all Named and Unnamed Insureds, including but not limited to Project Co, the City, City Parties, Revenue Vehicle Supplier, the project company appointed on the Trillium Line Extension project, the Construction Contractor, all subcontractors, professional consultants (other than for their professional liability), Lenders, Lenders' Agent, as well as officers, directors and employees, servants, and agents of the foregoing • Frost or freezing to concrete – but only resultant damage from a peril not otherwise excluded • Liberalization Clause • Errors and Omissions • Breach of Conditions • Interims Payments Clause 		
<i>Underwriters</i>	Principal underwriters in compliance with Article 16 of Schedule 24 – Insurance and Performance Security Requirements		

Construction Period Insurance – Trillium Line Extension Project
From execution of the Project Agreement until the Substantial Completion Date

Insurances to be provided, or caused to be provided, by Project Co and arranged through the COCIP program

Type	Amount	Maximum Deductibles	Principal Cover
"Wrap-Up" Commercial General Liability and Non-Owned Automobile Liability	<p>\$[REDACTED] each occurrence, and in the aggregate with respect to Broad Form Products and Completed Operations</p> <p>Sub-limits:</p> <ul style="list-style-type: none"> • \$[REDACTED] Non-Owned Automobile Liability • \$[REDACTED] Sudden and Accidental Pollution and Hostile Fire Pollution Liability • \$[REDACTED] "All Risks" Tenants' Legal Liability • \$[REDACTED] Prairie or Forest Fire Fighting Expenses • \$[REDACTED] Employee Benefits Administrative Errors and Omissions • \$[REDACTED] Contractors Rework • \$[REDACTED] Legal Liability for Damages to Non-Owned Automobiles (SEF 94) • \$[REDACTED] Medical Payments <p>Principal Extensions:</p> <ul style="list-style-type: none"> • Owner's and Contractor's Protective • Blanket Contractual (written and oral) • Direct and Contingent Employers Liability • Personal Injury (nil participation) • Cross Liability and Severability of Interest with respect to each insured party • Blasting / demolition / excavating / underpinning / pile driving / shoring / caisson work / work below ground surface / tunnelling / grading and similar operations associated with 	<p>\$[REDACTED] per occurrence</p> <p>\$[REDACTED] per claim with respect to Contractors Rework</p> <p>\$[REDACTED] per claim with respect to each of SEF 94, Tenants Legal Liability, Prairie or Forest Fire Fighting Expenses and Employee Benefits Administrative Errors and Omissions</p>	<p>Wrap-Up Commercial General Liability and Non-Owned Automobile Liability insurance covering construction operations in connection with System Infrastructure, Revenue Vehicles and Vehicle Equipment on an occurrence basis against claims for bodily injury (including death), personal injury, property damage (including Loss of Use), and including products and completed operations liability, extended for a period of not less than 24 months, effective from the Substantial Completion Date.</p> <p>Coverage shall be maintained continuously from the execution of the Project Agreement to the Substantial Completion Date, at which time the Products and Completed Operations extension will take effect.</p> <p>Pollution Liability – sudden and accidental and hostile fire pollution coverage to be not less than IBC 2313 form (240 hours detection/240 hours' notice coverage structure).</p> <p>This coverage shall be primary with respect to the Project without right of contribution of any insurance carried by the City, City Parties or the Lenders.</p>

Type	Amount	Maximum Deductibles	Principal Cover
	<ul style="list-style-type: none"> all construction works, as applicable • Elevator and Hoist Collision Liability • Liberalized Notice of Claim Requirement, i.e., requirement to report will commence when knowledge is held by a designated project person(s) – to be identified by Project Co • Non-Owned Automobile Liability • Tenants' Legal Liability (All Risks) <ul style="list-style-type: none"> – subject to sub-limit • Medical Expenses – subject to sub-limit • Prairie or Forest Fire Fighting Expenses – subject to sub-limit • Sudden and Accidental Pollution and Hostile Fire Pollution Liability <ul style="list-style-type: none"> – subject to sub-limit • Employee Benefits Administrative Errors and Omissions – subject to sub-limit • Contractors' Rework Coverage – subject to sub-limit • Permission for Unlicensed Vehicles (partial road use) • Unlicensed Equipment • Loss of Use Without Property Damage • Loading and Unloading of Automobiles • Broad Form Property Damage • Broad Form Completed Operations • Intentional Injury, committed to Protect Persons or Property • Accident Benefits • Worldwide Territory, subject to suits being brought in Canada or the US <p>Permitted Exclusions:</p> <ul style="list-style-type: none"> • Injury to employees, where WSIB provides valid coverage • Property in the care, custody or 		

Type	Amount	Maximum Deductibles	Principal Cover
	control of the insured, except during the Broad Form Products and Completed Operations extension period <ul style="list-style-type: none">• Operation of licensed motor vehicles, other than attached machinery, while used for its purpose or at the site• Physical damage to the Project, except during Broad Form Products and Completed Operations extension period• Cyber risk• Mould, fungi and fungal derivatives• Professional liability of engineers, architects and other professional consultants• Nuclear or radioactive contamination, except release radioactive isotopes intended for scientific, medical, industrial or commercial use• Sanctions Clause		

Type	Amount	Maximum Deductibles	Principal Cover
<i>Comments</i>			<ul style="list-style-type: none"> • Named Insured includes Project Co and its affiliates, the City, City Parties, the Lenders, Lenders' Agent, Project Co Parties involved in the Works, including the Construction Contractor, all subcontractors, sub-subcontractors, suppliers while working on the Lands, tradesmen while working on the Lands, engineers, architects, consultants and sub-consultants (other than for professional liability), others as Additional Insureds, as may be required from time to time, arising from all operations and activities pertaining to the Works and the control and use of the Lands • Directors, officers, shareholders, employees of the insured parties involved in the Works are covered as Additional Insureds • Insurance is primary without right of contribution of any other insurance carried by any Named Insured • Aggregate limits will be permitted for Products and Completed Operations, Prairie and Forest Fire Fighting Expenses, Sudden and Accidental Pollution and Hostile Fire Pollution Liability and Employee Benefits Administrative Errors & Omissions Liability; no policy general aggregate will be permitted • Professional service activities integral to the Project, but not covering engineers, architects or other professional consultants, i.e., incidental professional liability risk of a Named Insured and their employed professionals is to be covered, but not the professional liability of independent fee-for-service professional consultants, architects or engineers • Waiver of subrogation of insurers' rights of recovery against all Named and/or Additional Insureds, including Project Co, the City, City Parties, the Construction Contractor, all subcontractors, sub-subcontractors, professional consultants, engineers and architects (other than for their professional liability), Lenders, Lenders' Agent, as well as officers, directors, employees, servants and agents of the foregoing
<i>Underwriters</i>			Principal underwriters in compliance with Article 16 of Schedule 24 – Insurance and Performance Security Requirements

Construction Period Insurance – Trillium Line Extension Project

From execution of the Project Agreement until the Substantial Completion Date

Insurances to be provided, or caused to be provided, by Project Co and arranged through the COCIP program

Type	Amount	Maximum Deductibles	Principal Cover
Project Specific Professional Liability	\$[REDACTED] minimum per claim / \$[REDACTED] in the aggregate (inclusive of defense and related costs and supplementary payments)	\$[REDACTED] per claim with respect to Mitigation losses \$[REDACTED] per claim, all other losses	Project Specific Professional Liability Insurance in connection with the System Infrastructure, Revenue Vehicles and Vehicle Equipment beginning of first design, through the entire construction period, to the Substantial Completion Date plus coverage for an extended reporting period of not less than 36 months. This coverage shall be primary with respect to the Project without right of contribution of any insurance carried by the City, City Parties or the Lenders.

Type	Amount	Maximum Deductibles	Principal Cover
	<ul style="list-style-type: none"> • Faulty workmanship, construction or work which is alleged or in fact not constructed in accordance with the design of the Project or the construction documents • Design or manufacture of any good or products sold or supplied by the Named Insured • Terrorism • Nuclear Liability • Judgments and awards deemed uninsurable by law • Liability assumed under design contract, unless such liability would have attached to the Named Insured by law in the absence of such agreement • Punitive or exemplary damages, fines, penalties or interest or liquidated punitive or exemplary damages or fees • Refusal to employ, termination of employment, humiliation or discrimination on any basis or other employment related practices or policies • Sanctions Clause 		
Comments	<ul style="list-style-type: none"> • Named Insured: Construction Contractor (as appropriate), all engineers, architects, and other professional consultants that provide professional design services in connection with the Project • Professional services covered: All architectural, engineering, land surveying, environmental, landscape architectural, interior design/space planning, soil and material testing services, geotechnical services and procurement services, including their replacements and/or sub-consultants of any tier • Retroactive Date: Full retroactive coverage from date of first design activity • Policy to be non-cancellable except for premium non-payment, material misrepresentation or concealment of facts or a material breach of any condition of the policy 		
Underwriters	Principal underwriters in compliance with Article 16 of Schedule 24 – Insurance and Performance Security Requirements		

Construction Period Insurance – Trillium Line Extension Project

From execution of the Project Agreement until the Substantial Completion Date

Insurances to be provided, or caused to be provided, by Project Co and arranged through the COCIP program

Type	Amount	Maximum Deductibles	Principal Cover
Project Specific Pollution Liability (combined Contractors' Pollution Liability and Pollution Legal Liability – Claims Made)	\$[REDACTED] minimum per claim / \$[REDACTED] in the aggregate (inclusive of defense and related costs and supplementary payments) Principal Extensions: <ul style="list-style-type: none">• Hazardous Substances occurring at or emanating from the System, the Public Infrastructure or the Lands during the Policy Period• Microbial Matter (including Fungus/Mould)• Underground / above ground storage tanks• First Party Restoration and Clean-up Costs• Disposal Site System, including Transportation (reporting required)• Duty to Defend• Canada and US Territory• Contractual Liability• Emergency Response Costs Permitted Exclusions: <ul style="list-style-type: none">• Terrorism• War• Intentional Non-compliance• Prior Knowledge / Known Condition / Pre-Existing Condition (exception for exacerbation, aggravation, worsening)• WSIB• Employers' Liability• Professional Liability• Nuclear Liability• Property Damage to Motor Vehicles during Transportation	\$[REDACTED] per claim inclusive of defense and all costs and expenses	Pollution Liability insurance covering third party bodily injury, property damage consequential loss or damage, including clean-up and restoration costs, both at the Lands and Off-Site, as required. Extended Reporting Period: Minimum of 36 months after the Substantial Completion Date. This coverage shall be primary with respect to System Infrastructure, Revenue Vehicles and Vehicle Equipment without right of contribution of any insurance carried by the City, City Parties or the Lenders.

Type	Amount	Maximum Deductibles	Principal Cover
<i>Comments</i>	<ul style="list-style-type: none">• Named Insured will include Project Co, its Affiliates, Project Co Parties and all other parties engaged in the Works, including the Construction Contractor, all subcontractors, sub-subcontractors, consultants, and sub-consultants• The City, City Parties, Lenders and Lenders' agent will be identified as Additional Insureds• The directors, officers, shareholders, and employees of the foregoing shall be Additional Insureds		
<i>Underwriters</i>	Principal underwriters in compliance with Article 16 of Schedule 24 – Insurance and Performance Security Requirements		

Construction Period Insurance – Trillium Line Extension Project

From execution of the Project Agreement until the Substantial Completion Date

Insurances to be provided, or caused to be provided, by Project Co

Type	Amount	Maximum Deductibles	Principal Cover
Automobile Liability	<p>\$[REDACTED] (Minimum) for Project Co and Project Co's Construction Contractor vehicles</p> <p>\$[REDACTED] (Minimum) for vehicles of any other contractor, subcontractors, sub-subcontractors, consultants, and sub-consultants, and workmen, tradesmen, or other persons working on or at the Lands</p>		<p>Standard Ontario Owners Form For all vehicles operated by Project Co, the Construction Contractor, all subcontractors, sub-subcontractors, consultants and sub-consultants, operated in connection with the Project.</p> <p>Business Automobile Liability insurance covering third party property damage and bodily injury liability (including accident benefits) arising out of any licensed vehicle.</p> <p>Policies shall be endorsed to preclude cancellation, except upon 60 days prior written notice provided to the City, City Parties or the Lenders</p>
Commercial General Liability and Non-Owned Automobile Liability	<p>\$[REDACTED] each occurrence, and in the annual aggregate with respect to Broad Form Products and Completed Operations for Project Co and Project Co's Construction Contractor</p> <p>\$[REDACTED] each occurrence, and in the annual aggregate with respect to Broad Form Completed Operations for any other contractor, subcontractors, sub-subcontractors, consultants, and sub-consultants, and workmen, tradesmen, or other persons involved in the Works</p>		<p>Commercial General Liability insurance covering all operations on an occurrence basis against claims for Bodily Injury (including Death), Broad Form Property Damage (including Loss of Use), and including Broad Form Products and Completed Operations Liability.</p> <p>This Commercial General Liability Insurance will cover off-site activities connected to the project and Products and Completed Operations Liability beyond the "Wrap-Up" Commercial General Liability Insurance policy's Products and Completed Operations extension period.</p> <p>Policies shall be endorsed to preclude cancellation, except upon 90 days prior written notice provided to the City, City Parties or the Lenders</p>
For Project Co, the Construction Contractor, all subcontractors, sub-subcontractors, consultants and sub-consultants, including Direct and Contingent Employers Liability, Products and Completed Operations Liability, and Owner's and Contractor's Protective extensions	<p>In both instances, limits of liability may be structured as any combination of Primary plus supplementary layers and Umbrella and/or Excess, or Primary plus Umbrella and/or Excess</p> <p>Sub-limits (Project Co and Project Co's Construction Contractor):</p> <ul style="list-style-type: none"> • Full policy limits with respect to 		

Type	Amount	Maximum Deductibles	Principal Cover
	<p>Non-Owned Automobile Liability</p> <ul style="list-style-type: none"> • \$[REDACTED] Prairie or Forest Fire Fighting Expenses <p>Principal Extensions (required to be provided by the Project Co and its Construction Contractor and shall be endeavoured to be provided by any other contractor, subcontractors, sub-subcontractors, consultants, and sub-consultants, and workmen, tradesmen, or other persons involved in the Works):</p> <ul style="list-style-type: none"> • Owner's and Contractor's Protective • Blanket Contractual (written) • Direct and Contingent Employers Liability • Personal Injury (nil participation) • Cross Liability and Severability of Interest with respect to each insured party • Blasting / demolition / excavating / underpinning / pile driving / shoring / caisson work / work below ground surface / tunnelling/grading and similar operations associated with the Works • Elevator and Hoist Collision Liability • Non-Owned Automobile Liability • Prairie or Forest Fire Fighting Expenses – subject to sub-limit • Permission for Unlicensed Vehicles' (partial road use) • Unlicensed Equipment • Loss of Use Without Property Damage • Loading and Unloading of Automobiles • Broad Form Property Damage • Broad Form Completed Operations • Intentional Injury, committed to Protect Persons or Property • Worldwide Territory, subject to 		

Type	Amount	Maximum Deductibles	Principal Cover
	suits being brought in Canada or the US		
	Permitted Exclusions:		
<ul style="list-style-type: none"> • Injury to employees, where WSIB provides valid coverage • Property in the care, custody or control of the insured, except as provided under Broad Form Products and Completed Operations • Operation of licensed motor vehicles, other than attached machinery, while used for its purpose or at the Lands • Cyber risk • Mould, fungi and fungal derivatives • Professional liability of engineers, architects and other professional consultants • Nuclear or radioactive contamination, except release of radioactive isotopes intended for scientific, medical, industrial or commercial use 			
Comments	<ul style="list-style-type: none"> • The City, City Parties, the Lenders and Lenders' Agent will be identified as Additional Insureds 		
Underwriters	Principal underwriters in compliance with Article 16 of Schedule 24 – Insurance and Performance Security Requirements		

Construction Period Insurance – Trillium Line Extension Project

From execution of the Project Agreement until the Substantial Completion Date

Insurances to be provided, or caused to be provided, by Project Co

Type	Amount	Maximum Deductibles	Principal Cover
Aircraft and Watercraft Liability	Minimum \$[REDACTED] inclusive, including \$[REDACTED] passenger hazard – Owned Aircraft	To be determined	Policies shall be endorsed to preclude cancellation, except upon 90 days prior written notice provided to the City, City Parties, or the Lenders
(If any exposure)	Minimum \$[REDACTED] inclusive – Non-Owned Aircraft		
	Minimum \$[REDACTED] inclusive Owned or Non-Owned Watercraft		
Comments	<ul style="list-style-type: none"> The City, City Parties, the Lenders and Lenders' Agent will be identified as Additional Insureds 		

"All Risks" Ocean Marine Cargo (if any exposure)	[REDACTED]% Replacement Cost Valuation basis	\$[REDACTED] per claim	Property of every description destined for incorporation into the System during marine transit, on a full replacement value basis, with no co-insurance provision. This coverage shall be primary with respect to System Infrastructure without right of contribution of any insurance carried by the City, City Parties or the Lenders.
Comments	<ul style="list-style-type: none"> Named Insured includes Project Co, the City, City Parties, Lenders, Lender's Agent, the Construction Contractor, all subcontractors, sub-subcontractors, consultants and sub-consultants as their respective interests may appear 		
"All Risks" Contractors' Equipment To cover Project Co, the Construction Contractor, subcontractors, sub-subcontractors consultants and sub-consultants	If Site equipment is three years old or less, the sum insured shall be equal to [REDACTED]% of the replacement value of all contractors equipment used at the project. If Site equipment is more than three years old, actual cash value basis of loss settlement is acceptable. This requirement does not apply to equipment specifically insured under the "All Risks" Course of Construction Property, including Boiler and Machinery policy		All Risks coverage on all owned, rented, leased or borrowed contractors' equipment, used at the Lands.
Comments	<ul style="list-style-type: none"> Waiver of Subrogation rights against Project Co, the City, City Parties, the Construction Contractor, all subcontractors, sub-subcontractors, consultants, sub-consultants, Lenders, Lenders' Agent, as well as officers, directors, shareholders and employees of the foregoing 		

Type	Amount	Maximum Deductibles	Principal Cover
Employee Dishonesty (Crime)	\$[REDACTED] per loss		<p>Employee Dishonesty insurance against the fraudulent/dishonest acts of employees of Project Co and its Affiliates including additional coverage for Broad Form Money and Securities, Money Orders and Counterfeit Paper, Depositors' Forgery, Computer Fraud and Funds Transfer Fraud, Audit Expenses and Credit Card Forgery.</p> <p>Insurance primary without right of contribution of any other insurance carried by the City, City Parties or the Lenders.</p>
<i>Underwriters (All non-IOCIP insurance to be provided or caused to be provided by Project Co)</i>	Principal underwriters in compliance with Article 16 of Schedule 24 – Insurance and Performance Security Requirements		
WSIB	In accordance with Ontario Act's established benefits and schedules	Not Applicable	<p>(i) Project Co and its affiliates shall obtain and maintain at Project Co's expense, WSIB Insurance, in accordance with the Province of Ontario requirements.</p> <p>(ii) Project Co shall ensure that satisfactory evidence of WSIB Insurance is provided by all Project Co Parties, including all other consultants, sub consultants, contractors, subcontractors, suppliers and tradesmen working at the Lands.</p> <p>Prior to commencement of the Project Operations, each of the foregoing shall provide satisfactory written confirmation of compliance, from the appropriate authority, including confirmation that all required assessments have been paid to date.</p> <p>Upon Substantial Completion, Project Co shall be provided with satisfactory written confirmation that all required assessments have been paid to date.</p> <p>On request, within 30 days of such request, Project Co shall deliver to the City evidence of the workers compensation coverage maintained by any person involved in the Project Operations, or confirmation of that person's exemption from workers compensation coverage.</p>

Maintenance Period Insurance – Trillium Line Extension Project

From Substantial Completion Date until Termination Date

Insurance to be provided, or caused to be provided, by Project Co

Type	Amount	Maximum Deductibles	Principal Cover
"All Risk" Property	As a minimum, a limit of liability of \$[REDACTED] for all Revenue Vehicles, Vehicle Equipment and New Walkley Yard Principal Extensions: <ul style="list-style-type: none">• Replacement Cost Valuation (Property)• Most Recent Technology Replacement Cost Valuation (Equipment or Machinery)• Flood (to policy limit with annual aggregate)• Natural or man-made earth movement, including earthquake, landslide or subsidence (to policy limit with annual aggregate)• Electronic Data Processing equipment and media, including data restoration and re-creation costs• Extra and Expediting Expenses (sub-limit)• Debris Removal (sub-limit)• Transit (sub-limit)• Unnamed locations (sub-limit)• Fire Fighting Expenses (sub-limit)• Contamination Clean-up or Removal (sub-limit)• By-Laws including demolition and increased replacement / repair costs (sub-limit)• Joint Loss Agreement (if separate "All Risk" Property and Boiler and Machinery policies are	[REDACTED]% of loss value / \$[REDACTED] minimum Earthquake \$[REDACTED] Flood \$[REDACTED] All other losses	"All Risks" Property Insurance covering the insurable replacement cost of all Revenue Vehicles, Vehicle Equipment and New Walkley Yard. Coverage shall be maintained continuously from and after the Substantial Completion Date and at all times thereafter until the Termination Date. Such insurance will include By-Laws and Off Premises coverage. This coverage shall be primary with respect to the Project without right of contribution of any insurance carried by the City, City Parties or the Lenders.

Type	Amount	Maximum Deductibles	Principal Cover
	arranged)	Permitted Exclusions: <ul style="list-style-type: none"> • Cyber risk • Mould, fungi and fungal derivatives • Faulty workmanship, materials construction, design or latent defects but resultant damage to be insured • War risk • Terrorism • Nuclear or radioactive contamination, except radioactive isotopes intended for scientific, medical, industrial or commercial use • Sanctions Clause 	
Comments		<ul style="list-style-type: none"> • Named Insured will include the City, City Parties, Revenue Vehicle Supplier (if the transfer of ownership to the City of any Revenue Vehicle will occur after the Substantial Completion Date) and the Lenders • Losses payable in accordance with the Insurance Trust Agreement and Section 20.1 and 20.2 of Schedule 24 – Insurance and Performance Security Requirements. • No provision allowing a coinsurance penalty • Waiver of Subrogation against all Named Insureds, including but not limited to Project Co, the City, City Parties, Revenue Vehicle Supplier (if the transfer of ownership to the City of any Revenue Vehicle will occur after the Substantial Completion Date), the Lenders, Lenders' Agent as well as officers, employees, servants and agents of the foregoing 	
Underwriters		Principal underwriters in compliance with Article 16 of Schedule 24 – Insurance and Performance Security Requirements	

Maintenance Period Insurance –Trillium Line Extension Project

From Substantial Completion Date until Termination Date

Insurance to be provided, or caused to be provided, by Project Co

Type	Amount	Maximum Deductibles	Principal Cover
Boiler & Machinery	<p>As a minimum, a limit of liability of \$[REDACTED] for all Revenue Vehicles, Vehicle Equipment and New Walkley Yard</p> <p>Sub-limits acceptable with respect to:</p> <ul style="list-style-type: none"> • Ammonia Contamination • Bylaws • Errors and Omissions • Expediting Expenses • Extra Expense • Hazardous Substances • Water Damage 	<p>\$[REDACTED] per claim, Direct Damage</p> <p>Business Interruption – Maximum 60 day Waiting Period</p>	<p>Boiler & Machinery insurance on a Comprehensive Policy Form basis on a full replacement cost basis, including Expediting and Extra Expense coverage.</p> <p>Coverage shall be maintained continuously from and after the Substantial Completion Date or activation, whichever shall first occur, and at all times thereafter until the Termination Date.</p> <p>Boiler and Machinery Insurance may be arranged on a combined Property/Boiler and Machinery basis, subject to the Boiler and Machinery section of such a policy being arranged on a Comprehensive Form basis.</p> <p>This coverage shall be primary with respect to the Project without right of contribution of any insurance carried by the City, City Parties or the Lenders.</p>
Comments	<ul style="list-style-type: none"> • Named Insured will include Project Co, Project Co, the City, City Parties, Revenue Vehicle Supplier (if the transfer of ownership of any Revenue Vehicle to the City will occur after the Substantial Completion Date) and the Lenders • Losses payable in accordance with the Insurance Trust Agreement and Section 20.1 and 20.2 of Schedule 24 – Insurance and Performance Security Requirements. <p>As nearly as possible, coverage will be structured to dovetail with the Property Insurance</p>		
Underwriters	Principal underwriters in compliance with Article 16 of Schedule 24 – Insurance and Performance Security Requirements		

Maintenance Period Insurance –Trillium Line Extension Project

From Substantial Completion Date until Termination Date

Insurance to be provided, or caused to be provided, by Project Co

Type	Amount	Maximum Deductibles	Principal Cover
Commercial General Liability and Non-Owned Automobile Liability	\$[REDACTED] each accident or occurrence and in the aggregate with respect to Products and Completed Operations	\$[REDACTED] per occurrence	<p>Commercial General Liability insurance covering all Maintenance and Rehabilitation Services on an occurrence basis against claims for personal injury (including bodily injury and death), Broad Form Property Damage (including Loss of Use), and including Broad Form Products and Completed Operation Liability insurance.</p> <p>Coverage shall be maintained continuously from and after the Substantial Completion Date and at all times thereafter until the Termination Date.</p> <p>Pollution Liability – Sudden and Accidental Pollution coverage to be not less than IBC 2313 form (120 hours detection/120 hours notice coverage structure).</p> <p>This coverage shall be primary with respect to the Project without right of contribution of any insurance carried by the City, City Parties or the Lenders.</p>

Type	Amount	Maximum Deductibles	Principal Cover
	<p>Risks) – subject to sub-limit</p> <ul style="list-style-type: none"> • Medical Expenses – subject to sub limit • Prairie or Forest Fire Fighting Expenses – subject to sub-limit • Sudden and Accidental Pollution and Hostile Fire Pollution – subject to sub-limit • Permission for unlicensed vehicles' partial road use • Unlicensed Equipment • Loss of Use Without Property Damage • Loading and Unloading of Automobiles • Broad Form Property Damage • Broad Form Completed Operations • Intentional Injury, committed to Protect Persons or Property • Voluntary Compensation • Worldwide Territory, subject to suits being brought in Canada or the US <p>Permitted Exclusions:</p> <ul style="list-style-type: none"> • Injury to employees, where WSIB provides valid coverage • Property in the care, custody or control of the insured, except as provided under Broad Form Products and Completed Operations • Operation of licensed motor vehicles, other than attached machinery, while used for its purpose or at the Maintenance and Rehabilitation Services work site • Cyber risk • Mould, fungi and fungal derivatives • Professional liability of engineers, 		

Type	Amount	Maximum Deductibles	Principal Cover
	architects and other professional consultants <ul style="list-style-type: none"> • Asbestos • Nuclear or radioactive contamination, except radioactive isotopes intended for scientific, medical, industrial or commercial use • Sanctions Clause 		
Comments		<ul style="list-style-type: none"> • Named Insured includes Project Co and its affiliates, the City, City Parties, the Lenders, Project Co Parties involved in the Maintenance and Rehabilitation Services, including all contractors, subcontractors, sub-subcontractors, suppliers while working on the Lands, tradesmen while working on the Lands, engineers, architects, consultants and sub consultants, (other than for professional liability) and others as Additional Insureds, as may be required from time to time, arising from all operations and activities pertaining to Maintenance and Rehabilitation Services and the control and use of the Lands • Directors, officers, shareholders, employees of the insured parties involved in the Maintenance and Rehabilitation Services are covered as Additional Insureds • Insurance primary without right of contribution of any other insurance carried by any Named Insured • Aggregate limits will be permitted for Products and Completed Operations, Prairie and Forest Fire Fighting Expenses, Sudden and Accidental Pollution and Hostile Fire Pollution Liability and Employee Benefits Administrative Errors & Omissions Liability; no policy general aggregate will be permitted • Professional service activities integral to the Maintenance and Rehabilitation Services, but not covering engineers, architects or other professional consultants, i.e., incidental professional liability risk of a Named Insured and their employed professionals is to be covered, but not the professional liability of independent fee-for-service professional consultants, architects or engineers • Waiver of subrogation of insurers' rights of recovery against all Named and/or Additional Insureds, including Project Co, the City, City Parties, the Construction Contractor, all subcontractors, sub-subcontractors, professional consultants, engineers and architects (other than for their professional liability), Lenders, Lenders' Agent, as well as officers, directors, employees, servants and agents of the foregoing 	
Underwriters	Principal underwriters in compliance with Article 16 of Schedule 24 – Insurance and Performance Security Requirements		

Maintenance Period Insurance –Trillium Line Extension Project

From Substantial Completion Date until Termination Date

Insurance to be provided, or caused to be provided, by Project Co

Type	Amount	Maximum Deductibles	Principal Cover
Automobile Liability	\$[REDACTED] (Minimum) for Project Co and Project Co's contractor vehicles \$[REDACTED] (Minimum) for vehicles of any other contractor, subcontractors, sub-subcontractors, consultants, and sub-consultants, and workmen, tradesmen, or other persons working on or at the Maintenance and Rehabilitation Services site or at the Operations Services site or the lands		Standard Ontario Owners Form For all vehicles operated by Project Co, all contractor, all subcontractors, sub-subcontractors, consultants, and sub-consultants operated in connection with the Maintenance and Rehabilitation Services. Coverage shall be maintained continuously from and after the Substantial Completion Date and at all times thereafter until the Termination Date. Business Automobile Liability insurance covering third party property damage and bodily injury liability (including accident benefits) arising out of any licensed vehicle. Policies shall be endorsed to preclude cancellation, except upon 60 days prior written notice provided to the City, City Parties or the Lenders.

Underwriters Principal underwriters in compliance with Article 16 of Schedule 24 – Insurance and Performance Security Requirements

Maintenance Period Insurance – Trillium Line Extension Project

From Substantial Completion Date until Termination Date

Insurance to be provided, or caused to be provided, by Project Co

Type	Amount	Maximum Deductibles	Principal Cover
WSIB	In accordance with Ontario Act's established benefits and schedules	Not Applicable	<p>(i) Project Co and its Affiliates shall obtain and maintain at Project Co's expense, WSIB Insurance, in accordance with the Province of Ontario requirements.</p> <p>(ii) Project Co shall ensure that satisfactory evidence of WSIB Insurance is provided by all Project Co Parties, including all consultants, sub consultants, contractors, subcontractors, suppliers and tradesmen working at locations where the Maintenance and Rehabilitation Services are being performed.</p> <p>Prior to commencement of the Maintenance and Rehabilitation Services, each of the foregoing shall provide satisfactory written confirmation of compliance, from the appropriate authority, including confirmation that all required assessments have been paid to date.</p> <p>Upon completion of the Maintenance and Rehabilitation Services, Project Co shall be provided with satisfactory written confirmation that all required assessments have been paid to date.</p> <p>On request, within 30 days of such request, Project Co shall deliver to the City evidence of the WSIB coverage maintained by any person involved in the Maintenance and Rehabilitation Services or confirmation of that person's exemption from WSIB coverage.</p>

SCHEDULE 25

RECORD PROVISIONS

1. General Requirements

- 1.1 Project Co shall prepare, retain and maintain, at its own expense, all the records (including superseded records) referred to in Section 2.1 of this Schedule 25, as follows:
- (a) in accordance with this Section 1;
 - (b) in accordance with the Project Agreement;
 - (c) in accordance with the requirements of Good Industry Practice;
 - (d) having due regard to the guidelines and policies of the Office of the Information and Privacy Commissioner of Ontario;
 - (e) in accordance with the most stringent of Project Co's and the Construction Contractor's normal business practices;
 - (f) in accordance with Canadian GAAP;
 - (g) in chronological order;
 - (h) in electronic format in accordance with the City's designated record keeping system;
 - (i) in sufficient detail, in appropriate categories and generally in such a manner as to enable Project Co to comply with Project Co's obligations under Section 35 of the Project Agreement; and
 - (j) in a form that is capable of audit.
- 1.2 Project Co shall retain and maintain all records on the Site in addition to retaining and maintaining records referred to in Section 2.1 in electronic format on the City's designated record keeping system.
- 1.3 Wherever practical, original records shall be retained and maintained in a hard copy form. Project Co may retain true copies of original records where it is not practical to retain original records.
- 1.4 Any drawings (including, without limitation, the as-built drawings and the Record Drawings) required to be made or supplied pursuant to the Project Agreement on the most updated version of the applicable software and editable in updated base software format, and when printed, be of a size appropriate to show the detail to be depicted clearly without magnifying aids, shall be consistent in size and format to drawings previously submitted by Project Co to the City, and shall conform to the Output Specifications, Good Industry Practice, and the CAD Standards. All drawings are to be submitted via the City's electronic control management system, with one hard copy provided to the City. Project Co shall make or supply drawings and other documents in such

form as has been agreed by the Parties and shall include secure back up facilities. The City shall provide Project Co access to the City's electronic control management system.

- 1.5 Records shall be stored in electronic format within the City's electronic control management system where Project Co shall have access thereto and will continue to have access thereto, such that City will be able to read, copy, download, and search same without licence or payment.
- 1.6 Subject to Sections 1.7 and 1.8, Project Co shall retain and maintain in safe storage, at its expense, all records referred to in Section 2.1 of this Schedule 25 for a minimum period of at least 7 years or such longer period as required by Applicable Law.
- 1.7 Project Co shall notify City if Project Co wishes to destroy any records referred to in this Schedule 25, or in respect of which the required period Section 1.6 or under Applicable Law for their retention has expired. The Parties agree that:
 - (a) within 60 days of such notice, City may elect to require Project Co to deliver such records to City, in which case Project Co shall, at the expense of City, deliver such records (with the exception of Sensitive Information) to City in the manner and to the location as City shall specify; or
 - (b) if City fails to notify Project Co of its election pursuant to Section 1.7(a) within such 60 day period, Project Co may, at its expense, destroy such records.
- 1.8 In the event of a termination of this Project Agreement in accordance with its terms, Project Co shall deliver all records that Project Co retains and maintains pursuant to this Schedule 25 to City in the manner and to the location that City shall reasonably specify. City shall make available to Project Co all the records Project Co delivers pursuant to this Section 1.8 subject to prior reasonable notice. Project Co may deliver true copies of original records required by:
 - (a) statute to remain with Project Co; or
 - (b) Project Co in connection with its fulfilment of any outstanding obligations under this Project Agreement.
- 1.9 Where the termination of the Project Agreement arises:
 - (a) as a result of a City Event of Default or pursuant to Section 43.3 of the Project Agreement, then the costs of delivering the records and the costs for retaining such records in safe storage will be borne by City; or
 - (b) for any other cause, then the costs of delivering the records and the costs for retaining such records in safe storage for a period of at least six years following the Final Completion Date or the Termination Date, as applicable (unless a longer period is required by Applicable Law), shall be borne by Project Co.
- 1.10 Within 30 days after the end of each Contract Year, Project Co shall deliver to City a report, as reasonably requested by City in connection with City's financial reporting, detailing to the best of Project Co's knowledge at the time of any such report any and all liabilities, claims and demands, including contingent liabilities, claims and demands, that Project Co has or may have against City or that may be owing by City to Project Co. The Parties acknowledge and agree that the contents

of any such report or the failure to mention any matter in any such report shall not limit either Party's rights or remedies against the other Party as contemplated by this Project Agreement.

- 1.11 Not later than 120 days after the end of each fiscal year of the Project Term, a copy of Project Co's annual audited financial statements, in respect of that period, prepared in accordance with Applicable Law and GAAP, together with a certificate of the auditors of Project Co setting forth that they have examined such statements and have conducted a general review of accounting procedures and such tests of accounting records and other supporting evidence as they consider necessary or advisable and confirming that in their opinion such statements present fairly the financial position of Project Co and the results of its operations for the fiscal year reported on and have been defined in accordance with GAAP (as defined in the Lending Agreements), all of which documents, whether or not marked or identified as confidential or proprietary but subject to the exceptions contained in Section 50 of the Project Agreement, shall be treated by the City as Confidential Information of Project Co.

2. Records To Be Kept

- 2.1 Without limiting any other requirement of the Project Agreement, and in addition to any other manuals, data, information and documents required to be maintained pursuant to Article 1.8 of Appendix A to Schedule 15-3 – Output Specifications: Maintenance and Rehabilitation Requirements, Project Co shall prepare, retain and maintain at its own expense:

- (a) the Project Agreement and the Project Documents, including all amendments to such agreements;
- (b) all records relating to the appointment and replacement of the City Representative and the Project Co Representative;
- (c) any documents, drawings (including, without limitation, the As-Built Drawings) or submissions in accordance with Schedule 10 - Review Procedure;
- (d) any documents relating to Development Approvals and other Project Co Permits, Licences, Approvals and Agreements, including any refusals and appeals relating to any applications;
- (e) all records relating to any statutory inspections of the Works or the Site, including any roadways;
- (f) a complete record of construction, including:
 - (i) Construction Access Management Plan and all sub-plans;
 - (ii) Traffic Management Plans and all sub-plans;
 - (iii) all records generated by the Geotechnical Instrumentation and Monitoring Plan (as described in Schedule 15 – Output Specifications), including (but not limited to) baseline readings, routine monitoring records, and tunnel construction monitoring records;

- (iv) records of all pre-construction inspections and post-construction inspections (as described in Schedule 15 – Output Specifications), including a log identifying corrective actions;
 - (v) records of all geotechnical and environmental investigations performed by Project Co (as described in Schedule 15 – Output Specifications), including (but not limited to) records pertaining to the decommissioning of any monitoring wells and the location of any well casings;
 - (vi) Works progress photography;
 - (vii) construction notices or other communications with adjacent businesses, property owners or tenants;
 - (viii) planned and unplanned interruptions of Utility Infrastructure;
 - (ix) a complaints log including responses and any corrective action;
 - (x) any other items as requested by the City from time to time; and
 - (xi) piling inspection and testing results for structural construction.
- (g) any notices, reports, results and certificates relating to Substantial Completion and Final Completion and completion of the Project Co Commissioning;
 - (h) all operation and maintenance manuals;
 - (i) any documents relating to events of Force Majeure, Delay Events, Compensation Events, and Relief Events;
 - (j) all documents submitted in accordance with Schedule 21 - Variation Procedure;
 - (k) any documents related to decisions resulting from the Dispute Resolution Procedure;
 - (l) any documents related to a Project Co Change in Ownership or Change in Control;
 - (m) any documents relating to any Refinancing;
 - (n) all accounts for Taxes and transactions relating to Taxes, including in relation to HST applicable to the Project, but excluding any records for:
 - (i) Project Co's liabilities or payments under the *Income Tax Act* (Canada), the *Income Tax Act* (Ontario) or any similar statute in any other jurisdiction;
 - (ii) Project Co's liabilities or payments for capital taxes based on or measured by the capital of Project Co;
 - (iii) the withholdings of any payments by Project Co; or
 - (iv) any business or activity in addition to the business or activities related to, and conducted for, the purpose of the Project;

- (o) the financial accounts of Project Co referred to in Section 1.11 above;
 - (p) [not used];
 - (q) all records required by Applicable Law (including in relation to health and safety matters) to be maintained by Project Co with respect to the Works;
 - (r) any documents relating to insurance and insurance claims;
 - (s) all Jointly Developed Materials; and
 - (t) all other records, documents, information, notices or certificates expressly required to be produced or maintained by Project Co pursuant to this Project Agreement.
- 2.2 Either Party may review the documents required to be prepared, retained and maintained by Project Co pursuant to Section 2.1.

SCHEDULE 26

DISPUTE RESOLUTION PROCEDURE

1. General

- 1.1 All disputes, controversies, or claims arising out of or relating to any provision of the Project Agreement, or the alleged wrongful exercise or failure to exercise by a Party of a discretion or power given to that Party under the Project Agreement, or the interpretation, enforceability, performance, breach, termination, or validity of the Project Agreement, including this Schedule 26, or any matter referred to for resolution pursuant to this Schedule 26 (collectively and individually, a “**Dispute**”) shall be resolved in accordance with the provisions of this Schedule 26.
- 1.2 The Parties agree that at all times, both during and after the Project Term, each of them will make bona fide efforts to:
 - (a) resolve by amicable negotiations any and all Disputes arising between them on a without prejudice basis; and
 - (b) have all Disputes resolved at the lowest level of management before engaging the dispute resolution processes described in Sections 2 to 10.
- 1.3 If the Parties are unable to resolve a Dispute at the lowest level of management pursuant to Section 1.2(b), either Party may deliver to the City Representative or the Project Co Representative, as applicable, a written Notice of dispute (the “**Notice of Dispute**”), which Notice of Dispute shall, subject to the terms of this Schedule 26 requiring resolution of a Dispute pursuant to a specific dispute resolution process set forth in this Schedule 26, initiate the dispute resolution process described in Sections 2 to 10, as applicable, as more particularly described in this Schedule 26. To be effective, the Notice of Dispute must expressly state that it is a notice of dispute, set out the particulars of the matter in dispute, describe the remedy or resolution sought by the Party issuing the Notice of Dispute and be signed by the City Representative, if given by the City, or by the Project Co Representative, if given by Project Co.

2. Amicable Resolution by Party Representatives

- 2.1 On receipt of a Notice of Dispute, the City Representative and the Project Co Representative (collectively “**Party Representatives**” and individually “**Party Representative**”) shall each promptly and diligently make all reasonable bona fide efforts to resolve the Dispute. Each Party Representative shall provide to the other, on a without prejudice basis, frank, candid and timely disclosure of relevant facts, information and documents (except such documentation that is subject to legal privilege) as may be required or reasonably requested by the other to facilitate the resolution of the Dispute.

3. Amicable Resolution by Senior Officers of each Party

- 3.1 If, following the process referred to in Section 2 (or as otherwise agreed to in writing by the Parties pursuant to Section 14.6), a Dispute is not resolved by the Party Representatives within 10 Business Days after receipt by a Party of the applicable Notice of Dispute, or within such longer period of time as the Party Representatives may both expressly agree, then at any time after the

expiry of such period of time either Party Representative may, by Notice in writing to the other, refer the Dispute to an executive of a Party who:

- (a) is in a position of authority above that of the City Representative or the Project Co Representative, as the case may be; and
- (b) subject only to approval of the board of directors or similar governing body of the Party, has full authority to resolve and settle the Dispute.

3.2 Once a Dispute is referred to them, the executive of each Party shall promptly and diligently make all reasonable bona fide efforts to resolve the Dispute. All discussions and negotiations, and all documents exchanged, between them related to the Dispute shall be on a without prejudice basis to facilitate the resolution of the Dispute.

4. Independent Certifier

4.1 This Section 4 applies to all Disputes that fall within the description of Section 4.2 that cannot be resolved as provided in Sections 2 and 3 or as otherwise agreed to in writing by the Parties pursuant to Section 14.6.

4.2 All Disputes (other than Systems Integration Disputes which shall be resolved in accordance with Section 5 below) related to the Works and that:

- (a) arise prior to, or otherwise in relation to Substantial Completion;
- (b) relate to completion of Minor Deficiencies;
- (c) relate to whether any proposed work constitutes a Variation;
- (d) relate to a review of Estimates or any other matters relating to Variations as the Independent Certifier is entitled to review and determine pursuant to Section 37 of the Project Agreement;
- (e) are referred to in the Project Agreement for determination by the Independent Certifier; or
- (f) relate to the Certification Services or any Certification Services Variations (as those terms are defined in the Independent Certifier Agreement);

shall initially be submitted to the Independent Certifier for independent determination by the Independent Certifier within such period as may be specified in the Project Agreement, or if no period is specified, within 10 Business Days after submission to the Independent Certifier.

4.3 Without limiting any obligations of the Parties under the Independent Certifier Agreement, the Parties shall cooperate with the Independent Certifier and provide such information, records and documents as may be required by the Independent Certifier to make the determination within the period referred to in Section 4.2.

4.4 The Independent Certifier's decision to issue or not to issue a Substantial Completion Certificate shall be final and binding on the Parties solely in respect of determining the Substantial

Completion Payment Commencement Date, and a Dispute in relation to the Substantial Completion Payment Commencement Date shall not be subject to resolution pursuant to this Schedule 26. Save and except as aforesaid, the Independent Certifier's determinations are not binding on the Parties, and all Disputes in relation to the Independent Certifier's decisions shall be resolved pursuant to this Schedule 26, provided however that Sections 5, 6 and 7 shall not apply unless otherwise agreed by the Parties on terms acceptable to the Parties.

5. System Integration Verifier

- 5.1 This Section 5 applies to all Systems Integration Disputes, if the Parties fail to resolve such Systems Integration Dispute through the process referred to in Sections 2 and 3 of this Schedule 26 within 15 Business Days following referral of the Dispute to an executive in accordance with Section 3.1 (or such other period as may be agreed or expressly stipulated in respect of the relevant matter), or as otherwise agreed to in writing by the Parties pursuant to Section 14.6 of this Schedule 26.
- 5.2 All Systems Integration Disputes shall initially be submitted to the Systems Integration Verifier for independent determination by the Systems Integration Verifier within 10 Business Days after submission to the Systems Integration Verifier, or such other period of time as may be agreed by the Parties, acting reasonably.
- 5.3 The Parties shall cooperate with the Systems Integration Verifier and provide such information, records and documents as may be required by the Systems Integration Verifier to make the determination within the period referred to in Section 5.2 of this Schedule 26.
- 5.4 Where it is determined by the Systems Integration Verifier that:
- (a) corrective measures must be taken by Project Co to resolve a Systems Integration Dispute, those measures must be implemented by Project Co as soon as reasonably practical, without payment by the City unless (i) the Systems Integration Verifier determines otherwise; or (ii) that determination is subsequently reversed by a binding and final determination made in a subsequent proceeding;
 - (b) corrective measures are not required to be taken by Project Co to resolve a Systems Integration Dispute, the City may, at its option, require corrective measures to be taken forthwith by Project Co, in which case those measures must be implemented by Project Co as soon as reasonably practical provided that the City undertakes to pay Project Co for Direct Costs, plus reasonable overhead and profit incurred by Project Co as such costs are so incurred; provided that no such costs should exceed the amount Project Co is entitled to receive pursuant to Schedule 21 – Variation Procedure thereby incurred upon completion of those corrective measures, but any such undertaking and payment shall be without prejudice to the City's right to contest the determination made by the Systems Integration Verifier in a subsequent proceeding. The City shall provide Project Co such reasonable extensions of time in respect of Project Co's obligations under this Project Agreement necessary to allow Project Co to effect the corrective measures and such extension of time may be treated as a Delay Event if so determined by the Independent Certifier with input from the Systems Integration Verifier.
- 5.5 The Systems Integration Verifier's determinations are not binding on the Parties, and all Disputes in relation to the Systems Integration Verifier's determinations shall be resolved pursuant to this

Schedule 26, provided however that Section 7 of this Schedule 27 shall not apply unless otherwise agreed by the Parties on terms acceptable to the Parties.

6. Expert Determination

6.1 If, following the process referred to in Section 2 and 3 (or as otherwise agreed to in writing by the Parties pursuant to Section 14.6), any Dispute as to:

- (a) whether a Liquid Market exists;
- (b) whether amendments proposed by potentially Qualifying Tenders to the Project Agreement or other Project Documents are material;
- (c) the Adjusted Highest Qualifying Tender Price;
- (d) the determination of the Estimated Fair Value in accordance with Schedule 22 – Compensation on Termination of the Project Agreement, or
- (e) whether Project Co has achieved all necessary prerequisites, credits and points under the LEED Rating System in accordance with the specific requirements under the Project Agreement to achieve LEED Silver Rating,

has not been resolved within 10 Business Days after the date the Dispute was referred to the executives of the Parties for resolution by them, or within such longer period of time as the executives may expressly agree in writing in respect of a specific Dispute to allow them to continue their efforts to resolve the Dispute, then either Party may at any time thereafter, by written Notice signed by their Party Representative and delivered to the other Party Representative, require that the Dispute be resolved on an expedited basis by a qualified and experienced expert (the “Expert”).

6.2 The Expert shall be appointed as follows:

- (a) if the Parties agree on the Expert, the Parties shall jointly appoint the Expert as soon as possible and, in any event, within 5 Business Days after delivery of the Notice requiring that the Dispute be resolved by an Expert; and
- (b) if the Parties fail to agree or jointly appoint the Expert within such 5 Business Day period, either Party may apply to the Ontario Superior Court of Justice for appointment of the Expert, in which case the court shall appoint the Expert at the earliest opportunity from the list of potential Experts submitted by the Parties or, if either or both Parties fail to submit their list of potential Experts within 7 Business Days, the court may appoint such person as the Expert who meets the requirements set out in this Schedule 26 for qualifications and experience of the Expert.

6.3 No one shall be nominated or appointed to act as an Expert who is or was in any way interested, financially or otherwise, in the conduct of the Project Operations or in the business affairs of the City, Project Co, or any consultant, subconsultant or subcontractor of any of them.

- 6.4 Subject to the matters the Expert is authorized to determine pursuant to Section 6.1, the Expert will be appointed on a Dispute by Dispute basis, with each Expert having the qualifications and experience relevant to the issues in the particular Dispute for which the Expert is appointed.
- 6.5 The Expert shall determine the appropriate process for timely and cost effective resolution of the Dispute and, without limiting the generality of the foregoing, the Expert has discretion to, among other things:
 - (a) solicit submissions and documents from both Parties, and impose deadlines for the receipt of such submissions;
 - (b) require some or all of the evidence to be provided by affidavit;
 - (c) direct either or both Parties to prepare and provide the Expert with such documents, test results or other things as the Expert may require to assist the Expert in the resolution of the Dispute and rendering of a decision;
 - (d) require either Party to supply or prepare for examination by the Expert and the other Party, any document or information the Expert considers necessary;
 - (e) inspect the Project Operations, giving reasonable Notice to each Party of the time when, and the place where, the Expert intends to conduct any inspections;
 - (f) convene meetings of the Parties to have the Parties discuss the issues in Dispute in the presence of the Expert; and
 - (g) take, or require either or both Parties to take and provide to the Expert, such measurements, perform such tests, audit such processes and procedures, and take any and all such other measures and steps as the Expert considers necessary to make a final determination in the Dispute.
- 6.6 The Expert shall render a decision as soon as possible and, in any event, shall use all reasonable efforts to render a decision no later than 10 Business Days after the date of the appointment of the Expert, or such longer period of time as agreed to in writing by the Parties. The Expert shall give reasons or a summary of reasons for the Expert's decision.
- 6.7 The Expert shall keep all information about the Dispute confidential and shall not disclose such information to anyone other than the Parties.
- 6.8 Each Party shall bear its own costs of the process for resolution of the Dispute by the Expert. In addition, the costs of the Expert shall be borne equally by the Parties.
- 6.9 Subject to a right to require the Dispute to be arbitrated or litigated pursuant to Sections 8, 9 and 10 by giving the required Notices to arbitrate or litigate within the time periods specified therein, the Parties agree that the Expert's determination shall be final and binding on both Parties and not subject to appeal, adjudication, arbitration, litigation or any other dispute resolution process, and both Parties expressly waive all rights of appeal in connection with the Expert's determination. For greater certainty, the final determination by the Expert shall not be referred to an Adjudicator (as defined below) for determination under Section 7.

7. Adjudication

- 7.1 If, the Parties fail to resolve any Dispute through the process referred to in Section 2 and 3 within 15 Business Days following referral of the Dispute to an executive in accordance with Section 3.1 (or such other period as may be agreed or expressly stipulated in respect of the relevant matter), it is not a Dispute referred to in Sections 4.2 or 6.1, a Systems Integration Dispute, or a Dispute referred to arbitration or litigation pursuant to Sections 4.4 or 6.9 (except as otherwise agreed to in writing by the Parties pursuant to Section 14.6), either Party may, by written notice signed by their Party Representative and delivered to the other Party Representative, refer the Dispute to a single adjudicator selected in accordance with Section 7.2 (the “**Adjudicator**”).
- 7.2 The Adjudicator nominated by the Party issuing the Notice of Dispute shall be agreed between the Parties or, failing agreement, shall be determined by the Ontario Superior Court of Justice (following an application thereto by the Party issuing the Notice of Dispute) and shall:
- (a) be independent of and at arm’s length to Project Co, the City and any other person having an interest in the Project Operations or any of the Project Documents;
 - (b) if the Dispute arises during the Project Term, be familiar with the construction, operation and management of rail transportation projects; and
 - (c) be a person who has the qualifications and experience with respect to the particular issues in Dispute.
- 7.3 The Adjudicator shall resolve the Dispute in accordance with the United Kingdom Construction Industry Council’s *Model Adjudication Procedure: Fourth Edition* the terms of which are incorporated herein by reference, subject to the following modifications:
- (a) notwithstanding paragraph 14 of the *Model Adjudication Procedure*, within 7 Business Days of appointment in relation to a particular Dispute, the Adjudicator shall require the Parties to submit in writing their respective arguments; provided that, where necessary, the onus of proving that the Project was designed and constructed in accordance with all relevant specifications and requirements set forth in the Project Agreement is on Project Co. The Adjudicator shall, in his absolute discretion, determine the procedure of the adjudication proceedings including whether a hearing is necessary in order to resolve the Dispute;
 - (b) notwithstanding paragraphs 16 and 24 of the *Model Adjudication Procedure*, in any event, and subject to Section 7.4, the Adjudicator shall provide to both Parties his written decision on the Dispute, within 10 Business Days of appointment (or within such other period as the Parties may agree after the reference). The Adjudicator shall give detailed reasons for the Adjudicator’s decision. The Adjudicator shall be entitled to award compensation to a Party and shall be entitled to state the relief for such Party, which may include deeming the occurrence of any Relief Event, Delay Event, Compensation Event and/or Excusing Cause. Unless otherwise provided for in this Schedule 26, the Adjudicator’s decision shall be binding on the Parties, but not final;
 - (c) notwithstanding paragraphs 29 and 30 of the *Model Adjudication Procedure*, the Adjudicator’s costs, including any legal fees, of any reference shall be borne as the Adjudicator shall specify or in default, equally by the Parties. In no circumstances shall

the Adjudicator be entitled to order a successful or partially successful Party in an adjudication to pay more than one half of the Adjudicator's fees. Each Party shall bear its own costs arising out of the reference, including legal costs and the costs and expenses of any witnesses;

- (d) the Adjudicator shall be deemed not to be an arbitrator but shall render his decision as an expert and the provisions of the *Arbitration Act, 1991* (Ontario) and the law relating to arbitration shall not apply to the Adjudicator or his determination or the procedure by which he reached his determination;
- (e) notwithstanding paragraph 26 of the *Model Adjudication Procedure*, the Adjudicator shall act impartially and may take the initiative in ascertaining the facts and the law. Unless otherwise expressly provided in the Project Agreement, the Adjudicator shall have the power to open up, review and revise any opinion, certificate, instruction, determination or decision of whatever nature given under the Project Agreement. For greater certainty, the Independent Certifier's decision to issue or not to issue a Substantial Completion Certificate shall be final and binding solely in respect of determining the Substantial Completion Payment Commencement Date, and a Dispute in relation to the Substantial Completion Payment Commencement Date shall not be subject to resolution pursuant to this Schedule 26;
- (f) the Adjudicator shall execute a non-disclosure agreement (the "**Non-Disclosure Agreement**") in a form satisfactory to the Parties, providing that, among other things, all information, data and documentation disclosed or delivered by a Party to the Adjudicator in consequence of or in connection with his appointment as the Adjudicator shall be treated as confidential and without prejudice to any potential litigation proceedings. The Adjudicator shall not, save except as expressly permitted by the Non-Disclosure Agreement, disclose to any person any such information, data or documentation, and all such information, data or documentation shall remain the property of the Party disclosing or delivering the same and all copies shall be returned to such Party on completion of the Adjudicator's mandate with respect to the Dispute; and
- (g) notwithstanding paragraph 34 of the *Model Adjudication Procedure*, the Adjudicator shall not be liable for anything done or omitted to be done in the discharge or purported discharge of his functions as Adjudicator unless the act or omission is in bad faith. Any employee or agent of the Adjudicator is similarly protected from liability.

7.4 Where it is determined by the Adjudicator that:

- (a) corrective measures must be taken by Project Co to resolve a Dispute, those measures must be implemented by Project Co as soon as reasonably practical, without payment by the City unless (i) the Adjudicator determines otherwise; or (ii) that determination is subsequently reversed by a binding and final determination made in a court proceeding; and
- (b) corrective measures are not required to be taken by Project Co to resolve a Dispute, the City may, at its option, require corrective measures to be taken forthwith by Project Co, in which case those measures must be implemented by Project Co as soon as reasonably practical provided that the City undertakes to pay Project Co for Direct Costs, plus reasonable overhead and profit incurred by Project Co as such costs are so incurred;

provided that no such costs should exceed the amount Project Co is entitled to receive pursuant to Schedule 21 – Variation Procedure thereby incurred upon completion of those corrective measures, but any such undertaking and payment shall be without prejudice to the City's right to contest the determination made by the Adjudicator in a subsequent proceeding. The City shall provide Project Co such reasonable extensions of time in respect of Project Co's obligations under this Agreement necessary to allow Project Co to effect the corrective measures and such extension of time may be treated as a Delay Event or an Excusing Cause, as applicable, if so determined by the Adjudicator.

- 7.5 Subject to a right to require the Dispute to be arbitrated or litigated pursuant to Sections 8, 9 and 10 by giving the required Notices to arbitrate or litigate within the time periods specified therein, the Parties agree that the Adjudicator's determination is final and binding and not subject to appeal, arbitration, litigation or any other dispute resolution process, and both Parties expressly waive all rights of appeal in connection with the Adjudicator's determination.

8. Referral of Disputes to Arbitration or Litigation

- 8.1 If:
- (a) the amount awarded by the Expert to a Party pursuant to Section 6 or by the Adjudicator pursuant to Section 7 is more than \$[REDACTED] (index linked) in the aggregate or \$[REDACTED] (index linked) in any one year;
 - (b) the Dispute involves issues other than monetary claims by one Party against the other Party and which a Party reasonably believes are material and significant to that Party;
 - (c) a Notice of Dispute has been issued for a Dispute in relation to the Independent Certifier's decisions for which Section 4.4 provides that Sections 5, 6 and 7 shall not apply to resolve such Dispute; or
 - (d) a Notice of Dispute has been issued for a Systems Integration Dispute in relation to the Systems Integration Verifier's decisions for which Section 5.5 of this Schedule 26 provides that Section 7 of this Schedule 27 shall not apply to resolve such Dispute,

then, subject to the right of a Party to require litigation of the Dispute pursuant to Section 10.1 or a consolidation of proceedings pursuant to Section 12, either Party may, by written Notice signed by their Party Representative, request that the Dispute be resolved by arbitration pursuant to Section 9 upon the written consent of the other Party. Such Notice will not be effective unless it indicates it is a Notice to arbitrate, is signed by the Party Representative and is delivered to the other Party Representative within 15 Business Days after receipt of the Expert's determination, the Adjudicator's decision or the Notice of Dispute referred to in Section 8.1(c), as applicable, and provided further that such Notice expressly identifies the specific Dispute and determination of the Expert, decision of the Adjudicator or the Independent Certifier, as applicable, that is to be the subject of the arbitration.

- 8.2 If a Party is entitled to refer a Dispute to which Sections 6 or 7 apply to arbitration or litigation pursuant to Sections 8.1 or 10.1 then, unless the Parties otherwise expressly agree in writing, all information, documents and submissions prepared by a Party for the Expert or the Adjudicator which are not business records that would otherwise be kept in the normal course of business by the Party for its business purposes, and all decisions and determinations by the Expert or the

Adjudicator, shall be confidential and inadmissible in any arbitration or litigation proceeding. For greater certainty, neither the Expert nor the Adjudicator shall be called as a witness by either party in any arbitration or litigation proceeding.

9. Resolution by Arbitration

9.1 Upon the mutual written consent of the Parties,

- (a) where the Parties fail to resolve a Dispute through the process set out in Sections 2, 3, 4, 5, 6 and 7 (to the extent required); and
- (b) all other requirements set out in this Schedule 26 have been satisfied,

such Dispute may be referred to arbitration in accordance with the *Arbitration Act, 1991* (Ontario) and this Section.

9.2 Disputes referred to arbitration shall be resolved by a single arbitrator unless one of the Parties, by Notice in writing delivered to the other Party within 5 Business Days after a Notice to arbitrate pursuant to Section 8.1 has been delivered, expressly requires that the Dispute that is the subject of that Notice to arbitrate be resolved by a three person arbitration tribunal, in which case that particular Dispute shall be resolved by a three person arbitration tribunal.

9.3 If the arbitration tribunal is comprised of a single arbitrator, the arbitrator shall be appointed as follows:

- (a) if the Parties agree on the arbitrator, the Parties shall jointly appoint the arbitrator as soon as possible and in any event within 5 Business Days after delivery of the Notice to arbitrate pursuant to Section 8; and
- (b) if the Parties fail to agree or jointly appoint the arbitrator within such 5 Business Day period, either Party may apply to the Ontario Superior Court of Justice for appointment of the arbitrator, in which case the court shall appoint the arbitrator at the earliest opportunity in accordance with the following:
 - (i) from the lists of potential arbitrators submitted to the court by the Parties, provided that potential arbitrators meeting the necessary qualifications and experience set out in this Schedule 26 are on the list; or
 - (ii) if one Party fails to submit its list of potential arbitrators to the court within 5 Business Days of a request from the court to submit a list, from the list submitted by the other Party provided that potential arbitrators meeting the necessary qualifications and experience set out in this Schedule 26 are on the list of that other Party; or
 - (iii) if no list is submitted by either Party, or if the list or lists submitted do not include potential arbitrators with the necessary qualifications and experience, the court shall be entitled at its sole discretion to appoint anyone who meets the requirements set out in this Schedule 26 for the qualifications and experience of the arbitrator.

9.4 If the arbitration tribunal is comprised of three arbitrators:

- (a) the arbitrators shall be appointed as follows:
 - (i) each Party shall appoint one arbitrator no later than 5 Business Days after delivery of the Notice to arbitrate pursuant to Section 8;
 - (ii) if a Party fails to appoint an arbitrator within 5 Business Days after delivery of the Notice to arbitrate, the other Party is entitled to apply to the Ontario Superior Court of Justice to appoint that arbitrator, in which case the court shall appoint that arbitrator at the earliest opportunity using a comparable process to that described in Section 9.3(b);
 - (iii) the arbitrators appointed in accordance with the foregoing shall, within 5 Business Days after their appointment, jointly appoint a third arbitrator who shall also act as the chair of the arbitration tribunal and who, in addition to all other required qualifications, shall have experience in arbitration or judicial processes and procedures; and
 - (iv) if the two arbitrators appointed by the Parties fail to appoint a third arbitrator within the required time, either of the other two arbitrators may apply to the Ontario Superior Court of Justice for appointment of the third arbitrator, in which case the court shall appoint the third arbitrator at the earliest opportunity using a comparable process to that described in Section 9.3(b); and
- (b) the arbitrators appointed by the Parties shall at all times be neutral and act impartially and shall not act as advocates for the interests of the Party who appointed them.

9.5 All arbitrators must have qualifications and experience relevant to the issues in the Dispute and also have qualifications and experience as arbitrators.

9.6 No one shall be nominated or appointed to act as an arbitrator who is or was in any way interested, financially or otherwise, in the conduct of the Project Operations or in the business affairs of the City, Project Co, or any consultant, subconsultant or subcontractor of any of them.

9.7 The arbitrator(s) shall have the jurisdiction and power to:

- (a) amend or vary any and all rules under the *Arbitration Act, 1991* (Ontario), including rules relating to time limits, either by express agreement of the Parties or, failing such agreement, as the arbitrator(s) consider appropriate and necessary in the circumstances to resolve the Dispute and render an award;
- (b) require some or all of the evidence to be provided by affidavit;
- (c) hold a hearing at which evidence and submissions are presented by the Parties;
- (d) direct either or both Parties to prepare and provide the arbitrator(s) with such documents, test results or other things as the arbitrator(s) may require to assist them in the resolution of the Dispute and rendering of an award;

- (e) require either Party to supply or prepare for examination by the arbitrator(s) and the other Party, any document or information the arbitrator(s) considers necessary;
 - (f) inspect the Project Operations, giving reasonable Notice to each Party of the time when, and the place where, the arbitrator(s) intend(s) to conduct any inspections;
 - (g) award any remedy or relief that a court or judge of the Ontario Superior Court of Justice could order or grant subject to and in accordance with the Project Agreement, including interim orders, interim and permanent injunctions, and specific performance; and
 - (h) require either or both Parties to take and provide to the arbitrator(s) such measurements, perform such tests, perform such audits, or take any and all such other measures or steps as the arbitrator(s) consider necessary or desirable to aid them in making a fair and reasonable award.
- 9.8 The place of arbitration shall be Ottawa, Ontario. The language of the arbitration shall be English.
- 9.9 The costs of an arbitration are in the discretion of the arbitrator(s) who, in addition to any jurisdiction and authority under applicable law to award costs, has the jurisdiction and authority to make an order for costs on such basis as the arbitrator(s) considers appropriate in the circumstances, including to award actual legal fees and disbursements and expert witness fees, and to specify or order any or all of the following:
- (a) the Party entitled to costs;
 - (b) the Party who must pay the costs;
 - (c) the amount of the costs or how that amount is to be determined; and
 - (d) how all or part of the costs must be paid.
- 9.10 In exercising discretion to award costs, however, the arbitrator(s) will take into account the desire of the Parties that costs should generally be awarded to each Party in proportion to the relative success that each Party has in the arbitration.
- 9.11 The award of the arbitrator(s) shall be final and binding upon both Parties, and both Parties expressly waive all rights of appeal in connection with the award of the arbitrator(s). Judgment may be entered upon the award in accordance with Applicable Law in any court having jurisdiction.
- 9.12 The Parties agree to and shall co-operate fully with the arbitrator(s) and proceed with the arbitration expeditiously, including in respect of any hearing, in order that an award may be rendered as soon as practicable by the arbitrator(s), given the nature of the Dispute. The arbitrator(s) shall render a decision as soon as possible and, in any event, shall use all reasonable efforts to render a decision no later than 20 Business Days after the date of the hearing, or such longer period of time as agreed to in writing by the Parties. If the arbitration tribunal is comprised of three arbitrators, the decision of a majority of the arbitration tribunal shall be deemed to be the decision of the arbitration tribunal, and where there is no majority decision, the

decision of the chair of the arbitration tribunal shall be deemed to be the decision of the arbitration tribunal.

- 9.13 The Project Agreement, including this Schedule 26, constitutes an agreement to arbitrate that shall be specifically enforceable.
- 9.14 Any arbitrator appointed pursuant to this Section 9 shall keep all information about the Dispute confidential and shall not disclose such information to anyone other than the Parties.

10. Litigation

- 10.1 Notwithstanding that a Notice to arbitrate has been delivered pursuant to Section 8.1, following receipt of the Expert's award or determination pursuant to Section 6, or of the Adjudicator's award or determination pursuant to Section 7, or if applicable a Notice of Dispute has been issued following receipt of a decision of the Independent Certifier if the Dispute is a Dispute in relation to the Independent Certifier's decisions for which Section 4.4 provides that Sections 5 and 7 shall not apply, or if applicable a Notice of Dispute has been issued following receipt of a determination of the Systems Integration Verifier if the Dispute is a Systems Integration Dispute in relation to the Systems Integration Verifier's determination for which Section 5.5 of this Schedule 26 provides that Section 6 of this Schedule 26 shall not apply, if one or more of the following apply then either Party may elect, by written Notice signed by their Party Representative, to require that the Dispute be referred to and resolved solely by litigation in the Ontario Superior Court of Justice, and both Parties agree to attorn to the exclusive jurisdiction of the courts of the Province of Ontario in respect of the Dispute:
 - (a) if the actual or potential total value or amount at issue in the Dispute (as determined by adding all claims and counterclaims) is more than \$[REDACTED] (index linked) in the aggregate or \$[REDACTED] (index linked) in any one year; or
 - (b) if the Dispute is considered by the City to involve material issues of public health or safety.

Such Notice will not be effective unless it indicates it is a Notice to submit the Dispute to litigation, is signed by the Party Representative and is delivered to the other Party Representative within 15 Business Days after receipt of the Expert's determination, the Adjudicator's determination, or the Notice of Dispute referred to in Section 8.1(c) or (d), as applicable, and provided further that such Notice expressly identifies the specific Dispute and determination of the Adjudicator, Expert, Independent Certifier, or Systems Integration Verifier, as applicable, that is to be the subject of the litigation.

- 10.2 If neither Party delivers a Notice of election to resolve a particular Dispute by litigation in the manner and within the time specified in Section 10.1 of this Schedule 26, then:
 - (a) provided that one Party has, in the manner and within the time period specified in Section 8.1, given Notice to the other Party of election to resolve that Dispute by arbitration, and subject to a consolidation of proceedings pursuant to Section 12, that Dispute shall be resolved only by arbitration pursuant to Sections 9.2 to 9.14 of this Schedule 26; and

- (b) subject to Section 10.2(a), where a Dispute was determined by the Expert, the Expert's determination is final and binding on both Parties and not subject to appeal, arbitration, litigation or any other dispute resolution process.

11. Consolidation of Project Agreement Adjudication, Arbitration and Litigation

11.1 For all Disputes that arise prior to Substantial Completion, unless:

- (a) both Parties otherwise agree; or
- (b) the issue in a particular Dispute arises in connection with the Review Procedure; or
- (c) the issue in a particular Dispute is such that waiting until after Substantial Completion to resolve that Dispute will cause irreparable harm to one of the Parties; or
- (d) the issue in a particular Dispute arises in connection with requirements of achieving or deficiencies in not achieving Substantial Completion; or
- (e) in respect to a particular Dispute, the Dispute is consolidated with Third Party Disputes (as hereinafter defined) pursuant to Section 12;

all adjudication, arbitral and litigation proceedings between the Parties prior to Substantial Completion shall be stayed and consolidated into, as applicable, a single adjudication, arbitration and a single litigation proceeding, with the adjudication, arbitration and, if applicable, litigation, proceeding promptly and expeditiously after Substantial Completion.

12. Consolidation with Third Party Disputes

12.1 Subject to Section 12.4, if either Party is involved in an arbitration in the Province of Ontario with a third party ("Third Party Arbitration"), and if such Third Party Arbitration involves common factual or legal issues (including common issues of damages) which are also the subject of a Dispute between the Parties for which a Notice of Dispute has been given, then any arbitration of the Dispute between the Parties which includes those common factual, legal or damages issues ("Project Agreement Arbitration") shall be stayed, consolidated or joined with the Third Party Arbitration(s) but only if the City, Project Co and the other parties all agree or, failing their agreement, if a court in the Province of Ontario on application considers it just and convenient in all the circumstances that the Project Agreement Arbitration should be stayed or consolidated or joined with the Third Party Arbitration.

12.2 Subject to Section 12.4, if either Party is involved in litigation in the Province of Ontario with a third party ("Third Party Litigation") and if:

- (a) such Third Party Litigation involves common factual or legal issues (including common issues of damages) which are the subject of a Project Agreement Arbitration; and
- (b) one of the Parties is brought directly into the Third Party Litigation as a party to that litigation,

then on the application of either Party to the court in the Province of Ontario having jurisdiction the court may, if it determines that it is just and convenient in all the circumstances, order a stay

of either or both the Project Agreement Arbitration proceeding and Third Party Litigation, or order a joinder of the Project Agreement Arbitration and the Third Party Litigation. If such joinder is ordered, the Project Agreement Arbitration and the Third Party Litigation ordered to be joined by the court shall be determined by that court or by another court in Ontario such that the Project Agreement Arbitration and the Third Party Litigation shall be resolved in one forum. For purposes of the foregoing, joinder of the Project Agreement Arbitration and the Third Party Litigation shall be construed to include stays and conditional stays of issues in the Project Agreement Arbitration pending the commencement and completion of third party proceedings by one or both of the Parties in the Third Party Litigation.

12.3 In considering whether to order a stay, consolidation or joinder of a Project Agreement Arbitration with a Third Party Arbitration or Third Party Litigation, the court will be entitled to give substantial weight to the desire by the Parties that all Disputes which are related to Third Party Arbitration or Third Party Litigation be resolved in a single forum to avoid multiplicity of proceedings and the potential for contradictory findings of fact, liability and quantum, and to ensure the arbitrator or court has the advantage of obtaining full evidence and disclosure from the Parties and from the other parties, as applicable and as required to resolve the Dispute and to make findings of fact, liability and quantum of damages and awards or judgments binding on the Parties based on all available evidence.

12.4 Sections 12.1 and 12.2 only apply:

- (a) if the Dispute between the Parties includes a claim by one Party against the other for contribution or indemnity for that Party's liability or potential liability to the third party where such liability results or will result from an award in the Third Party Arbitration or a judgment in the Third Party Litigation; and
- (b) to those specific issues that are common issues in the Project Agreement Arbitration, the Third Party Arbitration and the Third Party Litigation, such that all other issues in the Dispute shall continue to be resolved by Project Agreement Arbitration and shall not be consolidated with the Third Party Arbitration or Third Party Litigation.

13. [Intentionally Deleted]

14. Miscellaneous

14.1 Project Co and the City shall diligently carry out their respective obligations under the Project Agreement during the pendency of any Disputes, including adjudication proceedings, arbitration proceedings or litigation proceedings. If during the pendency of any Dispute it is considered necessary by either Party to proceed in respect of the matter that is in Dispute, then without prejudice to Project Co's rights in respect of the Dispute (including in respect of Delay Events, Compensation Events and Variations), Project Co shall proceed in accordance with the direction of the City, and in the event the matter in dispute is determined in favour of Project Co, then, to the extent that such Dispute affects the System Infrastructure, proceeding in accordance with the City's position (i) prior to Substantial Completion shall, subject to and in accordance with Section 40 of the Project Agreement, be treated as a Delay Event and, subject to and in accordance with Section 41 of the Project Agreement, be treated as a Compensation Event, and (ii) following Substantial Completion shall, subject to and in accordance with Schedule 21 – Variation Procedure, result in a Variation. For greater certainty:

- (a) in respect of any Dispute relating to the Works referred to in Section 4.2, the Independent Certifier shall be the decision maker of first instance and the Parties shall comply with the initial decision of the Independent Certifier unless and until it is overturned in a subsequent arbitration or litigation proceeding; and
 - (b) in respect of any Systems Integration Dispute, the Systems Integration Verifier shall be the decision maker of first instance and the Parties shall comply with the initial decision of the Systems Integration Verifier unless and until it is overturned in a subsequent arbitration or litigation proceeding.
- 14.2 Nothing contained in this Schedule 26 will prevent the Parties from seeking interim protection from the courts of the Province of Ontario, including seeking an interlocutory injunction where available pursuant to Applicable Law, if necessary to prevent irreparable harm to a Party.
- 14.3 The Parties shall indemnify each other in respect of any damages suffered or incurred on amounts agreed to be paid pursuant to resolution of a Dispute by the Party Representatives or by the executives of the Parties pursuant to Sections 2 and 3 and on the amount of any award or judgment as follows:
- (a) for amounts payable by Project Co to the City, Project Co shall indemnify the City as provided for at Section 54.1(e) of the Project Agreement from and against any damages suffered or incurred resulting from any overpayment to Project Co or, as applicable, any underpayment or non-payment by Project Co from the date of any overpayment to Project Co or, as applicable, from the date on which payment was due under the Project Agreement to the City until the date of payment; or
 - (b) for amounts payable by the City to Project Co, the City shall indemnify Project Co as provided for at Section 54.2(c) of the Project Agreement from and against any damages suffered or incurred resulting from any overpayment to the City or, as applicable, any underpayment or non-payment by the City from the date of any overpayment to the City or, as applicable, from the date on which payment was due under the Project Agreement to Project Co until the date of payment.
- 14.4 Project Co shall ensure that any and all documents and other information in the possession or control of any Project Co Party that are available to Project Co and that may be necessary for the resolution of a Dispute on an informed basis by the Party Representatives or by the executives of the Parties pursuant to Sections 2 and 3, or by an expert, the Systems Integration Verifier, an adjudicator, an arbitrator or court of competent jurisdiction, are made available in a timely manner to the City and the City Representative.
- 14.5 The City shall ensure that any and all documents and other information in the possession or control of any City Party that are available to the City and that may be necessary for the resolution of a Dispute on an informed basis by the Party Representatives or by the executives of the Parties pursuant to Sections 2 and 3, or by an expert, the Systems Integration Verifier, an adjudicator, an arbitrator or court of competent jurisdiction, are made available in a timely manner to Project Co and the Project Co Representative.
- 14.6 The Parties can, by written agreement, on a Dispute by Dispute basis:
- (a) extend any or all timelines set out in this Schedule 26;

- (b) agree to waive or by-pass any one or more of the Dispute resolution processes in Sections 2, 3, 4, 5, 6 and 7 and, instead, proceed directly to resolution of the Dispute by arbitration or litigation pursuant to Sections 8, 9 and 10;
 - (c) agree to (i) resolve a Dispute by litigation rather than adjudication or arbitration notwithstanding the requirements of Section 7 and Section 9, or (ii) agree to resolve a Dispute by arbitration rather than adjudication or litigation notwithstanding the requirements of Section 7 and Section 10, or (iii) agree to resolve a Dispute by adjudication rather than arbitration or litigation notwithstanding the requirements of Section 9 and Section 10; and
- agree to resolve a Dispute relating to the decision of an Expert by adjudication, arbitration or litigation, notwithstanding the provisions of Section 6.

SCHEDULE 27

REFINANCING

1. DEFINITIONS

1.1 In this Schedule 27 – Refinancing, unless the context indicates a contrary intention, terms which are defined in the Project Agreement (and not otherwise defined in this Schedule 27 – Refinancing) shall have meanings given to them in the Project Agreement and the following terms shall have the following meanings:

(a) **“Exempt Refinancing”** means:

- (i) a change in taxation or change in accounting treatment pursuant to a Change in Law or change in Canadian GAAP;
- (ii) the exercise of any right, the grant of any amendment, waiver or consent or any similar action under the Lending Agreements by the Lenders that does not provide for a financial benefit to Project Co under those agreements;
- (iii) any Qualifying Bank Transaction;
- (iv) any Rescue Refinancing;
- (v) any Refinancing that was approved by the City prior to the execution of the Project Agreement and occurs during the first six months following the date of the Project Agreement;
- (vi) any amendment, variation or supplement of any agreement approved by the City as part of any Variation under the Project Agreement;
- (vii) any sale of Equity Capital or securitization of the existing rights or interests attaching to such Equity Capital, unless such sale or securitization involves increasing the Debt Amount or amending the Debt Makewhole on terms more favourable to Project Co than contained in the Lending Agreements; or
- (viii) any Permitted Borrowing.

(b) **“Qualifying Bank”** means a lending institution that is:

- (i) a bank listed in Schedule I, II or III of the *Bank Act* (Canada); or
- (ii) a bank, life insurance company, pension fund or fund managed by a professional fund manager that controls, either directly or through its affiliates, funds in excess of \$[REDACTED],

provided such institution is not a Restricted Person or a person whose standing or activities compromise (i) the City’s reputation or integrity, or (ii) the nature of the public

transit system in the City of Ottawa so as to affect public confidence in the public transit system in the City of Ottawa or the Project.

- (c) **“Qualifying Bank Transaction”** means:
 - (i) the disposition by a Lender of any of its rights or interests in the Lending Agreements to a Qualifying Bank;
 - (ii) the grant by a Lender to a Qualifying Bank of any rights of participation in respect of the Lending Agreements; or
 - (iii) the disposition or grant by a Lender to a Qualifying Bank of any other form of benefit or interest in either the Lending Agreements or the revenues or assets of Project Co, whether by way of security or otherwise.
- (d) **“Qualifying Refinancing”** means any Refinancing that will give rise to a Refinancing Gain that is not an Exempt Refinancing.
- (e) **“Refinancing”** means:
 - (i) any amendment, variation, novation, supplement or replacement of any Lending Agreement;
 - (ii) the exercise of any right, or the grant of any waiver or consent, under any Lending Agreement;
 - (iii) the disposition of any rights or interests in, or the creation of any rights of participation in respect of, the Lending Agreements or the creation or granting of any other form of benefit or interest in either the Lending Agreements or the contracts, revenues or assets of Project Co whether by way of security or otherwise; or
 - (iv) any other arrangement put in place by Project Co or another person which has an effect which is similar to any of the foregoing provisions of this definition above or which has the effect of limiting Project Co’s ability to carry out any of the foregoing provisions of this definition.
- (f) **“Refinancing Financial Model”** means a comprehensive and detailed financial model satisfactory to the City, acting reasonably, prepared for the purpose of Section 2 of this Schedule 27, which financial model shall be similar in form and content to the Financial Model, suitable for the purposes for which it will be used in this Schedule 27, and shall take into account:
 - (i) cash flows for the entire remaining Project Term;
 - (ii) any changes in structure and funding since the date of the Project Agreement;
 - (iii) the performance of the Works to the date of the Refinancing;

- (iv) macroeconomic assumptions; and
 - (v) all other relevant factors.
- (g) “**Refinancing Gain**” means an amount equal to the greater of zero and (A - B), where:

A = the sum of the Debt Amount as projected to be outstanding at East Substantial Completion, West Substantial Completion or Highway Substantial Completion, as applicable, immediately prior to the Refinancing (using the Refinancing Financial Model but without taking into account the effect of the Refinancing).

B = the sum of the Debt Amount as projected to be outstanding at East Substantial Completion, West Substantial Completion or Highway Substantial Completion, as applicable, immediately prior to the Refinancing (using the Refinancing Financial Model and taking into account the effect of the Refinancing).

- (h) “**Rescue Refinancing**” means any Refinancing which takes place due to the failure or prospective failure of Project Co to comply with any material financial obligation under the Lending Agreements, or any of them, which does not increase any liability of the City, whether actual or potential.

2. **REFINANCING**

2.1 Project Co shall not carry out:

- (a) any Qualifying Refinancing unless Project Co has obtained the prior written consent of the City, which consent, subject to Section 2.2, shall not be unreasonably withheld or delayed; or
- (b) any Exempt Refinancing or any other Refinancing which does not result in a Refinancing Gain unless Project Co has delivered Notice of such Refinancing to the City before five Business Days of such Refinancing, except that such Notice shall not be required for a disposition by a Lender of its rights or participation in the Lending Agreements where such disposition is a trade of bonds issued as provided under a book-based system of a depository and pursuant to a trust indenture that comprises a portion of the Financing.

2.2 The City may withhold its consent to any Qualifying Refinancing, in its sole discretion:

- (a) where any person with whom Project Co proposes to carry out a Qualifying Refinancing is a Restricted Person;
- (b) if, at the time the Qualifying Refinancing is contemplated and effected, the Qualifying Refinancing will materially adversely affect the ability of Project Co to perform its obligations under the Project Documents or the Project Agreement; or
- (c) if, at the time the Qualifying Refinancing is contemplated and effected, the Qualifying Refinancing will have the effect of increasing any liability of the City, whether actual or contingent, present or future, known or unknown.

- 2.3 The City shall be entitled to receive:
- (a) a [REDACTED]% share of any Refinancing Gain arising from a Qualifying Refinancing, in respect of any Refinancing Gain up to (when considered in aggregate with all previous Qualifying Refinancings) a Refinancing Gain of \$[REDACTED];
 - (b) a [REDACTED]% share of any further Refinancing Gain arising from a Qualifying Refinancing, in respect of any Refinancing Gain in excess of \$[REDACTED] and up to (when considered in aggregate with all previous Qualifying Refinancings) a Refinancing Gain of \$[REDACTED]; and
 - (c) a [REDACTED]% share of any further Refinancing Gain arising from a Qualifying Refinancing.
- 2.4 Project Co shall promptly provide the City with full details of any proposed Qualifying Refinancing, including a copy of the proposed Refinancing Financial Model and the basis for the assumptions used in the proposed Refinancing Financial Model. The City shall (before, during and at any time after any Refinancing) have unrestricted rights of audit over the Refinancing Financial Model and any documentation (including any aspect of the calculation of the Refinancing Gain) used in connection with such Refinancing (whether or not such Refinancing is determined to be a Qualifying Refinancing). Project Co shall promptly, and, in any event, within five Business Days after receiving a written request from the City, provide any information in relation to a proposed Refinancing as the City may reasonably require. Project Co shall keep the City informed as to any changes to the material terms of the Refinancing. Both the City and Project Co shall at all times act in good faith with respect to any Refinancing.
- 2.5 The City's share of the Refinancing Gain shall be received as a reduction in the amount of the Substantial Completion Payment.
- 2.6 The City and Project Co will negotiate in good faith to agree upon the basis and method of calculation of the Refinancing Gain. If the parties fail to agree upon the basis and method of calculation of the Refinancing Gain or the payment of the City's share, the Dispute shall be determined in accordance with Schedule 26 - Dispute Resolution Procedure. Both the City and Project Co shall work collaboratively to establish the rate setting process required to complete the Refinancing.
- 2.7 The Refinancing Gain shall be calculated after taking into account the reasonable out-of-pocket costs that each Party directly incurs in relation to the Qualifying Refinancing and on the basis that, within 15 Business Days following any Qualifying Refinancing, Project Co will reimburse the City for all such reasonable out-of-pocket costs incurred by the City.

SCHEDULE 28

INSURANCE TRUST AGREEMENT

THIS AGREEMENT is made as of the 28th day of March, 2019

BETWEEN:

CITY OF OTTAWA

(the “**City**”)

AND:

[REDACTED]

(the “**Lenders’ Agent**”)

AND:

TRANSITNEXT GENERAL PARTNERSHIP, [REDACTED]

(“**Project Co**”)

AND:

[REDACTED]

(the “**Account Trustee**”)

WHEREAS:

- A. The City and Project Co have entered into the Project Agreement.
- B. The City, the Lenders’ Agent and Project Co have entered into the Lenders’ Direct Agreement.
- C. The City, the Lenders’ Agent and Project Co have agreed that all amounts from time to time contained in the Insurance Trust Account are to be held in trust by the Account Trustee in accordance with the terms of this Insurance Trust Agreement, and that no releases, distributions or transfers of any funds from the Insurance Trust Account shall be made other than in accordance with the terms of this Insurance Trust Agreement.

NOW THEREFORE in consideration of the mutual covenants and agreements of the Parties hereinafter contained and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties covenant and agree as follows:

1. DEFINITIONS

In this Insurance Trust Agreement, unless the context otherwise requires:

- (a) “**Account Trustee**” means **[REDACTED]**.
- (b) “**Bank**” means **[REDACTED]**.

- (c) “**Business Day**” has the meaning given in the Project Agreement.
- (d) “**Change of Authorization Event**” has the meaning given in Section 7(a).
- (e) “**Change of Authorization Notice**” has the meaning given in Section 7(b)(ii).
- (f) “**City Step-In Notice**” means written notice given by the City to the Account Trustee that the City has delivered a Step-In Notice pursuant to Section 6 of the Maintenance and Rehabilitation Contractor’s Direct Agreement.
- (g) “**Crown**” has the meaning given in the Project Agreement.
- (h) “**Default Notice**” means a written notice given by the Lenders’ Agent to the Account Trustee that an event of default under the Lending Agreements has occurred and is continuing.
- (i) “**Default Period**” means the period commencing on the date upon which the Account Trustee receives a Default Notice and ending on the date upon which the Account Trustee receives written notice from the Lenders’ Agent that the event of default which was the subject matter of the applicable Default Notice has been cured.
- (j) “**Governmental Authority**” has the meaning given in the Project Agreement.
- (k) “**City Event of Default**” has the meaning given in the Project Agreement.
- (l) “**Insurance Policies**” has the meaning given in Section 4(a).
- (m) “**Insurance Proceeds**” has the meaning given in Section 4(b).
- (n) “**Insurance Trust Account**” means Account No. [REDACTED] at [REDACTED].
- (o) “**Insurance Trust Agreement**” means this insurance trust agreement.
- (p) “**LC Beneficiary**” has the meaning given in Section 4(f).
- (q) “**Lenders**” has the meaning given in the Project Agreement.
- (r) “**Lenders’ Agent**” means [REDACTED], acting as agent for and on behalf of the Lenders.
- (s) “**Lenders’ Direct Agreement**” means the lenders’ direct agreement made on or about the date hereof between the City, Project Co and the Lenders’ Agent.
- (t) “**Maintenance and Rehabilitation Contractor’s Direct Agreement**” has the meaning given in the Project Agreement.
- (u) “**Maintenance LC**” has the meaning given in the Project Agreement.
- (v) “**Order**” has the meaning given in Section 6(k).
- (w) “**Party**” means any of the City, Project Co, the Lenders’ Agent or the Account Trustee, and “**Parties**” means all of the City, Project Co, the Lenders’ Agent and the Account Trustee.
- (x) “**Project**” has the meaning given in the Project Agreement.

- (y) “**Project Agreement**” means the project agreement made on or about March 28, 2019 between the City and Project Co.
- (z) “**Project Co**” means [REDACTED].
- (aa) “**Project Operations**” has the meaning given in the Project Agreement.
- (bb) “**System Infrastructure**” has the meaning given in the Project Agreement.
- (cc) “**Trust Property**” means all of the property held in trust by the Account Trustee pursuant to this Insurance Trust Agreement, including the Insurance Trust Account, and all amounts from time to time contained therein, the Insurance Policies and the Insurance Proceeds.

2. INTERPRETATION

This Insurance Trust Agreement shall be interpreted according to the following provisions, unless the context requires a different meaning:

- (a) The headings in this Insurance Trust Agreement are for convenience of reference only, shall not constitute a part of this Insurance Trust Agreement, and shall not be taken into consideration in the interpretation of, or affect the meaning of, this Insurance Trust Agreement.
- (b) Unless the context otherwise requires, references to specific Sections, Clauses, Paragraphs, Subparagraphs, and other divisions are references to such Sections, Clauses, Paragraphs, Subparagraphs, or divisions of this Insurance Trust Agreement and the terms “Section” and “Clause” are used interchangeably and are synonymous.
- (c) Words importing persons or parties are to be broadly interpreted and include an individual, corporation, firm, partnership, joint venture, trust, unincorporated organization, Governmental Authority, unincorporated body of persons or association and any other entity having legal capacity, and the heirs, beneficiaries, executors, administrators or other legal representatives of a person in such capacity.
- (d) Unless the context otherwise requires, wherever used herein the plural includes the singular, the singular includes the plural, and each of the masculine, feminine and neuter genders include all other genders.
- (e) References to any standard, principle, agreement or document include (subject to all relevant approvals and any other provisions of this Insurance Trust Agreement concerning amendments) a reference to that standard, principle, agreement or document as amended, supplemented, restated, substituted, replaced, novated or assigned.
- (f) The words in this Insurance Trust Agreement shall bear their natural meaning.
- (g) References containing terms such as:
 - (i) “hereof”, “herein”, “hereto”, “hereinafter”, and other terms of like import are not limited in applicability to the specific provision within which such references are set forth but instead refer to this Insurance Trust Agreement taken as a whole; and
 - (ii) “includes” and “including”, whether or not used with the words “without limitation” or “but not limited to”, shall not be deemed limited by the specific enumeration of items but

shall, in all cases, be deemed to be without limitation and construed and interpreted to mean “includes without limitation” and “including without limitation”.

- (h) In construing this Insurance Trust Agreement, the rule known as the *ejusdem generis* rule shall not apply nor shall any similar rule or approach apply to the construction of this Insurance Trust Agreement and, accordingly, general words introduced or followed by the word “other” or “including” or “in particular” shall not be given a restrictive meaning because they are followed or preceded (as the case may be) by particular examples intended to fall within the meaning of the general words.
- (i) Where this Insurance Trust Agreement states that an obligation shall be performed “no later than” or “within” or “by” a stipulated date or event which is a prescribed number of days after a stipulated date or event, the latest time for performance shall be 5:00 p.m. on the last day for performance of the obligation concerned, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
- (j) Where this Insurance Trust Agreement states that an obligation shall be performed “on” a stipulated date, the latest time for performance shall be 5:00 p.m. on that day, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
- (k) Any reference to time of day or date means the local time or date in Ottawa, Ontario.
- (l) Unless otherwise indicated, time periods will be strictly construed.
- (m) Whenever the terms “will” or “shall” are used in this Insurance Trust Agreement they shall be construed and interpreted as synonymous and to read “shall”.

3. INSURANCE TRUST ACCOUNT

- (a) Prior to the commencement of a Default Period, the Insurance Trust Account, and all amounts from time to time contained therein, including interest thereon, shall be held in trust by the Account Trustee for the benefit of Project Co. During a Default Period, the Insurance Trust Account, and all amounts from time to time contained therein, shall be held in trust by the Account Trustee for the benefit of the Lenders’ Agent and the Lenders, provided that, upon receipt by the Account Trustee of a Change of Authorization Notice, the Insurance Trust Account, and all amounts from time to time contained therein, shall be held in trust by the Account Trustee for the benefit of the City.
- (b) The Account Trustee shall not release, distribute or transfer any funds from the Insurance Trust Account other than in accordance with the terms of this Insurance Trust Agreement.
- (c) Notwithstanding any other provision of this Insurance Trust Agreement and subject to Section 3(d), the Lenders’ Agent, the City, and Project Co agree that, if any of them either receives any Insurance Proceeds from the Insurance Trust Account or has the right to direct the Account Trustee to advance funds in respect of any Insurance Proceeds from the Insurance Trust Account, such funds shall be directed, used or advanced only for one of the following purposes:
 - (i) the repair, reinstatement, restoration, rehabilitation or replacement of the System Infrastructure or any other assets, materials or goods necessary or desirable for the carrying out of the Project Operations in respect of which such Insurance Proceeds have been paid;

- (ii) the completion of the Project; or
- (iii) indemnification for any the City loss for which the subject Insurance Proceeds were paid under the Insurance Policies (as defined below).

For greater certainty, use of any Insurance Proceeds received in respect of a claim by Project Co under delay in start-up, soft costs or business interruption insurance shall be applied in accordance with the terms of the Lending Agreements so as to enable Project Co to carry out the Project Operations.

- (d) Notwithstanding anything in this Insurance Trust Agreement, if the City is entitled to indemnification under the Insurance Policies in respect of any loss incurred by the City, such related insurance proceeds are to be paid directly to the City by the insurer or the Account Trustee and shall not be Insurance Proceeds subject to Section 3(c)(i) or (ii). For greater certainty, it is understood and agreed that the City shall be required to use such proceeds for carrying out the purposes referred to in Sections 3(c)(i) and (ii) in respect of which such proceeds have been paid.

4. INSURANCE AND MAINTENANCE LC

- (a) Project Co shall deliver, or cause to be delivered, to the Account Trustee certified copies or originals of all property and asset related insurance policies that Project Co is required to maintain under the Project Agreement (collectively, the “**Insurance Policies**”), and the Account Trustee shall hold the Insurance Policies in trust for the benefit of each of the beneficiaries and loss payees, as the case may be, thereunder.
- (b) The Account Trustee shall distribute any proceeds of any Insurance Policy that are paid over to it by any insurer, Project Co, the Lenders’ Agent or the City (the “**Insurance Proceeds**”) as follows:
 - (i) subject to the last paragraph of Section 3(c), in the case of the all risks course of construction (builders’ risk), boiler and machinery insurance or property insurance policies that Project Co is required to maintain under the Project Agreement:
 - (A) if the Account Trustee has not received a Default Notice and:
 - (1) if the amount of such Insurance Proceeds, together with the aggregate of all Insurance Proceeds paid in respect of the same loss or claim, is less than \$[REDACTED], to Project Co to repair, restore or replace the assets in respect of which such Insurance Proceeds have been paid; or
 - (2) if the amount of such Insurance Proceeds, together with the aggregate of all Insurance Proceeds paid in respect of the same loss or claim, is equal to or greater than \$[REDACTED], to the Lenders’ Agent to reimburse Project Co for the costs of repairing, restoring or replacing the assets in respect of which such Insurance Proceeds have been paid; or
 - (B) if the Account Trustee has received a Default Notice, to the Insurance Trust Account to be distributed by the Account Trustee in such amounts and to such persons as the Lenders’ Agent may at any time or from time to time direct in writing, provided that, if the Account Trustee has received a Change of Authorization Notice, the Account Trustee shall release such Insurance Proceeds from the Insurance Trust Account in such amounts and to such parties as the City

may at any time or from time to time direct in writing, in each case, to repair, restore or replace the assets in respect of which such Insurance Proceeds have been paid; and

- (ii) in the case of any other Insurance Policies, to the Lenders' Agent, or, following receipt by the Account Trustee of a Change of Authorization Notice, to the City, to be distributed to the parties entitled thereto.
- (c) The Account Trustee shall distribute any excess Insurance Proceeds remaining after the distributions contemplated in Section 4(b)(ii) have been made, including any Insurance Proceeds held in the Insurance Trust Account:
 - (i) if the Account Trustee has not received a Default Notice, to Project Co; and
 - (ii) if the Account Trustee has received a Default Notice, to such persons as the Lenders' Agent, or, following receipt by the Account Trustee of a Change of Authorization Notice, the City, may at any time or from time to time direct in writing.
- (d) Upon Substantial Completion, Project Co shall deliver, or cause to be delivered, to the Account Trustee the original of the Maintenance LC, and the Account Trustee shall hold and release the Maintenance LC in accordance with Sections 4(e) through (i) trust for the benefit of each of the beneficiaries and loss payees, as the case may be, thereunder.
- (e) The Parties acknowledge that, pursuant to Section 4.2 of Schedule 4 – Funding Requirements, the required amount of the Maintenance LC may vary on an annual basis and, accordingly, Project Co may, from time to time, deliver, or caused to be delivered, to the Account Trustee replacement letters of credit or renewed letters of credit reflecting the required amount of the Maintenance LC at such time. The Account Trustee shall, concurrently with delivery to the Account Trustee of any replacement letter of credit or renewed letter of credit, release the original Maintenance LC then held by the Account Trustee to Project Co, and such replacement letter of credit or renewed letter of credit shall be deemed to be the Maintenance LC.
- (f) If the Account Trustee has not received a City Step-In Notice, the Maintenance LC shall be held in trust by the Account Trustee for the benefit of Project Co. If the Account Trustee has received a City Step-In Notice, the Maintenance LC shall be held in trust by the Account Trustee for the benefit of the City. The Party for whose benefit the Account Trustee is holding the Maintenance LC at the relevant time is hereinafter referred to as the "LC Beneficiary."
- (g) If the LC Beneficiary presents to the Account Trustee a declaration that it or any person it designates requires possession of the original Maintenance LC for the purposes of drawing on the same, the Account Trustee shall provide the original Maintenance LC to the LC Beneficiary or such designated party forthwith (and, in any event, within 2 Business Days following the presentation of such declaration by the LC Beneficiary) without the need for further investigation or inquiry by the Account Trustee. For certainty, the LC Beneficiary shall be entitled to retain the proceeds of any draw on the Maintenance LC.
- (h) The LC Beneficiary shall return the original Maintenance LC to the Account Trustee, for the Account Trustee to hold and release in accordance with Sections 4(e) through (i), within 5 Business Days of the LC Beneficiary drawing on the same.

- (i) Notwithstanding anything to the contrary in this Section 4, the Account Trustee shall release the Maintenance LC to Project Co in accordance with Section 4.4 of Schedule 4 – Funding Requirements.

5. ACCOUNT AGREEMENT

- (a) The Account Trustee hereby agrees to promptly provide to the Lenders' Agent all monthly statements and other information with respect to the Insurance Trust Account provided to the Account Trustee by the Bank pursuant to the relevant account agreement. The Account Trustee further agrees that it shall make such requests to the Bank for additional information with respect to the Insurance Trust Account as the Lenders' Agent may from time to time request in writing.
- (b) The Account Trustee hereby agrees to promptly provide to the City all monthly statements and other information with respect to the Insurance Trust Account provided to the Account Trustee by the Bank pursuant to the relevant account agreement. The Account Trustee further agrees that it shall make such requests to the Bank for additional information with respect to the Insurance Trust Account as the City may from time to time request in writing.

6. THE ACCOUNT TRUSTEE

- (a) The Account Trustee shall not have any duty or obligation to manage, control, use, make any payment in respect of, register, record, insure, inspect, sell, dispose of or otherwise deal with any part of the Trust Property except as expressly provided by the terms of this Insurance Trust Agreement. The Account Trustee shall carry out all written directions given by the Lenders' Agent, the City or Project Co, as applicable, in accordance with this Insurance Trust Agreement and shall not be required to exercise any discretion in exercising any of its duties under this Insurance Trust Agreement in pursuance of such written directions. The Account Trustee shall not be bound to do or take any act, action or proceeding by virtue of the powers conferred on it hereby unless and until it shall have been required to do so under the terms hereof and has received instruction, advice or direction from the Lenders' Agent, the City or Project Co, as applicable, as to the action to be taken (except with respect to actions specifically set out herein to be performed by the Account Trustee).
- (b) The Account Trustee will exercise its powers and carry out its obligations hereunder as account trustee honestly, in good faith and in the best interests of the beneficiaries hereunder and in connection therewith will exercise that degree of care, diligence, and skill that a reasonably prudent professional trustee would exercise in comparable circumstances. Unless otherwise required by law, the Account Trustee will not be required to give bond surety or security in any jurisdiction for the performance of any duties or obligations hereunder. No provision of this Insurance Trust Agreement shall be construed to relieve the Account Trustee from liability for its own dishonesty, fraud, negligence (including negligence in the handling of funds), wilful misconduct, bad faith or reckless disregard of any duty hereunder.
- (c) The Account Trustee will not be subject to any liability whatsoever, in tort, contract or otherwise in connection with the Trust Property or the carrying out of its duties under this Insurance Trust Agreement to the Lenders' Agent, Project Co or any other person for any action taken or permitted by it to be taken, or for its failure to take any action, or for not performing any act or fulfilling any duty, obligation or responsibility hereunder by reason of any occurrence beyond the control of the Account Trustee (including, but not limited to, any act or provision of any present or future law or of any Governmental Authority, any act of God or war, or the unavailability of any wire or communication facility), provided that the foregoing limitation will not apply in

respect of any action or failure to act arising from or in connection with wilful misconduct, negligence or reckless disregard of duty by the Account Trustee. The Account Trustee in doing anything or permitting anything to be done in respect of the Trust Property or the carrying out of its duties under this Insurance Trust Agreement is, and will be conclusively deemed to be, acting as trustee for the beneficiaries hereunder and not in any other capacity. Except to the extent provided in this Section 6(c), the Account Trustee will not be subject to any liability for debts, liabilities, obligations, claims, demands, judgments, costs, charges or expenses against or with respect to the Trust Property, arising out of anything done or permitted by it to be done or its failure to take any action in respect of the execution of its duties hereunder and resort will be had solely to the Trust Property for the payment or performance thereof, and no other property or assets of the Account Trustee, whether owned in its personal capacity or otherwise, will be subject to levy, execution or other enforcement procedure with regard to any obligation under this Insurance Trust Agreement.

- (d) The Account Trustee shall not be required to expend or risk its own funds or otherwise incur financial liability in the performance of any of its duties hereunder, or in the exercise of any of its rights or powers hereunder, or in acting at the request or direction of the Lenders' Agent on behalf of the Lenders, unless it shall have received adequate indemnity or security against such risk or liability satisfactory to it.
- (e) Notwithstanding the foregoing, the Account Trustee shall be liable for any action or failure to act arising from or in connection with the dishonesty, fraud, negligence (including negligence in the handling of funds), wilful misconduct, bad faith or reckless disregard of any duty hereunder by the Account Trustee or any of its directors, officers or employees, or the failure to comply with the standard of care referred to in Section 6(b).
- (f) Except as otherwise provided in Sections 6(c), 6(d) and 6(e):
 - (i) the Account Trustee may rely and shall be protected in acting or refraining from acting upon any signature, resolution, certificate, statement, instrument, opinion, report, notice, request, direction, consent, order or other paper or document reasonably believed by it in good faith to be genuine and to have been signed or presented by the proper party or parties; and
 - (ii) the Account Trustee may exercise its powers and perform its duties by or through such attorneys, representatives, Lenders' Agents and employees as it shall appoint; and may consult with counsel, accountants and other skilled persons selected and employed or retained by it, and the Account Trustee shall not be liable for anything done, suffered or omitted in good faith by it in accordance with the written advice of such counsel, accountants or other skilled persons (provided that such advice pertains to such matters as the Account Trustee may reasonably presume to be within the scope of such person's area of competency) and not contrary to any express provision in this Insurance Trust Agreement.
- (g) Project Co hereby agrees to pay, indemnify and hold harmless the Account Trustee from and against any and all loss, liability, cost, claim and expense incurred by the Account Trustee with respect to the performance of this Insurance Trust Agreement by the Account Trustee or any of the Account Trustee's directors, officers or employees, unless arising from its or their own dishonesty, fraud, negligence (including negligence in the handling of funds), willful misconduct, bad faith or reckless disregard of any duty hereunder.

- (h) Subject to the terms and conditions set forth in the Account Trustee fee letter, the Account Trustee shall receive from the Trust Property reasonable compensation for its services hereunder and shall be reimbursed by Project Co for its reasonable fees and expenses (including the disbursements and reasonable fees of counsel).
- (i) The Account Trustee agrees to look solely to Project Co, and not, except as expressly set forth herein, to the Lenders' Agent or the City for any claim for indemnification which may arise under this Insurance Trust Agreement.
- (j) The Account Trustee shall be responsible for keeping all appropriate books and records relating to the receipt and disbursement of all money which it receives hereunder.
- (k) If at any time the Account Trustee is served with any judicial or administrative order, judgment, decree, writ or other form of judicial or administrative process which in any way affects the Trust Property held by it hereunder (including but not limited to orders of attachment or garnishment or other forms of levies or injunctions or stays relating to the transfer of Trust Property) (each, an "**Order**") , the Account Trustee is authorized to comply therewith in any manner as it or legal counsel of its own choosing deems appropriate. The Account Trustee shall in no way be bound to call for further evidence (whether as to due execution validity or effectiveness, or the jurisdiction of any court, or as to the truth of any fact), and shall not be responsible for any loss that may be occasioned by its failing to do so. If the Account Trustee complies with any Order, the Account Trustee shall not be liable to any of the Parties hereto or to any other person or entity even though such Order may be subsequently modified or vacated or otherwise determined to have been without legal force or effect. If the Account Trustee is served with any Order, it shall forthwith and, in any event, within three (3) Business Days, deliver a copy of such Order to each of the Lenders' Agent, the City and Project Co.
- (l) Unless otherwise specifically set forth herein, the Account Trustee shall proceed as soon as practicable to collect any cheques or other collection items at any time deposited hereunder. All such collections shall be subject to the Account Trustee's usual collection practices or terms regarding items received by the Account Trustee for deposit or collection. Except and to the extent provided herein, the Account Trustee shall not be required, or have any duty, to notify any person of any payment or maturity under the terms of any instrument deposited hereunder, nor to take any legal action to enforce payment of any cheque, note or security deposited hereunder, or to exercise any right or privilege which may be afforded to the holder of any such security.
- (m) In the event that the Account Trustee determines that any direction, instruction, notice or other communication given under this Insurance Trust Agreement by the Lenders' Agent or, where the Account Trustee has received a Change of Authorization Notice, the City, is ambiguous or uncertain, the Account Trustee may, in its sole discretion, refrain from taking any action other than retaining possession of the Trust Property, unless the Account Trustee has received written instructions, signed by the Lenders' Agent or, if the Account Trustee has received a Change of Authorization Notice, the City, which resolve such ambiguity or uncertainty, provided that the Account Trustee shall, forthwith upon determining that such direction, instruction, notice or other communication is ambiguous or uncertain, seek clarification from the Lenders' Agent, or where the Account Trustee has received a Change of Authorization Notice, the City, to resolve such ambiguity or uncertainty.
- (n) Prior to receipt of a Change of Authorization Notice by the Account Trustee, any instruction, notice or other communication delivered to the Account Trustee by the Lenders' Agent shall be paramount to and supersede any direction, instruction, notice or other communication from any

other Party to this Insurance Trust Agreement, and the Account Trustee shall comply with such direction, instruction, notice or other communication from the Lenders' Agent. After the Account Trustee has received a Change of Authorization Notice, any instruction, notice or other communication delivered to the Account Trustee by the City shall be paramount to and supersede any direction, instruction, notice or other communication from any other Party to this Insurance Trust Agreement, and the Account Trustee shall comply with such direction, instruction, notice or other communication from the City.

- (o) Each of the Lenders' Agent and the City shall provide to the Account Trustee an incumbency certificate setting out the names and sample signatures of individuals authorized to give instructions to the Account Trustee hereunder. The Account Trustee shall be entitled to rely on each such incumbency certificate until a revised or replacement incumbency certificate is provided to the Account Trustee by the Lenders' Agent or the City, as applicable. The Account Trustee shall refuse to act upon any instruction given by the Lenders' Agent or the City which is signed by any person other than an individual named in the incumbency certificate provided to the Account Trustee by the Lenders' Agent or the City, as applicable, pursuant to this Section 6(o), as any such incumbency certificate may be amended, supplemented or replaced from time to time.
- (p) The Account Trustee shall be entitled to rely on, and act upon, any direction, instruction, notice or other communication provided to it hereunder which is sent to it by facsimile transmission, provided that any such direction, instruction, notice or other communication is signed by an individual named in the incumbency certificate delivered to the Account Trustee by the Lenders' Agent or the City, as applicable, pursuant to Section 6(o).

7. LENDERS' AGENT AND CITY'S RIGHTS TO DIRECT

- (a) Until the termination of the Project Agreement in accordance with the Lenders' Direct Agreement and receipt by Project Co of any amounts to which it is entitled pursuant to Schedule 23 – Compensation on Termination to the Project Agreement and all Insurance Proceeds to the extent that the value of such Insurance Proceeds was deducted from the amounts payable to Project Co by the City (a “**Change of Authorization Event**”), the Lenders’ Agent shall, subject to Sections 3 and 4, have the exclusive right to direct the Account Trustee with respect to the Insurance Trust Account, the Insurance Policies and the Insurance Proceeds.
- (b) Upon the occurrence of a Change of Authorization Event:
 - (i) the Lenders' Agent shall cease to be entitled, and the City shall thenceforth be entitled, to direct the Account Trustee with respect to the Insurance Trust Account, the Insurance Policies and the Insurance Proceeds; and
 - (ii) the Lenders' Agent and the City shall jointly provide notice to the Account Trustee (a “**Change of Authorization Notice**”) that the City shall, as of the date of such Change of Authorization Event, have the exclusive right to direct the Account Trustee with respect to the Insurance Trust Account, the Insurance Policies and the Insurance Proceeds.
- (c) Notwithstanding the foregoing, no Change of Authorization Event shall occur and no Change of Authorization Notice shall be delivered to the Account Trustee where a City Event of Default has occurred. Where a City Event of Default has occurred, upon receipt by the Lenders' Agent and Lenders of all amounts owing by the City to the Lenders' Agent and Lenders under the Lenders' Direct Agreement, the Account Trustee shall release all amounts in the Insurance Trust Account,

the Insurance Policies and the Insurance Proceeds to Project Co or as Project Co may otherwise direct from time to time.

8. TERMINATION

- (a) Subject to the provisions of Section 8(b), this Insurance Trust Agreement shall remain in full force and effect and be binding in accordance with and to the extent of its terms until:

 - (i) the obligations of Project Co to the Lenders' Agent and the Lenders under the Lending Agreements have been paid and performed in full and the Lenders have no further obligation to make any further advances or other credit accommodations under the Lending Agreements; and
 - (ii) the obligations of Project Co to the City have been paid and performed in full.

(b) The Account Trustee may terminate this Insurance Trust Agreement at any time upon sixty (60) days prior written notice to the other Parties hereto, provided that no termination of this Insurance Trust Agreement by the Account Trustee shall be effective until such time as the Lenders' Agent, the City, and Project Co have entered into a replacement insurance trust agreement on the same terms and conditions as this Insurance Trust Agreement with a replacement account trustee satisfactory the Lenders' Agent and the City.

9. ASSIGNMENT

- (a) The Account Trustee shall not assign, transfer or otherwise dispose of any of its rights or obligations under this Insurance Trust Agreement without the prior written consent of the Lenders' Agent, the City and Project Co.

10. NOTICES

- (a) All notices, requests, demands, instructions, certificates, consents and other communications required or permitted under the Project Agreement shall be in writing (whether or not "written notice" or "notice in writing" is specifically required by the applicable provision of this Insurance Trust Agreement) and served by sending the same by registered mail, facsimile or by hand, (in each case, with a copy by electronic transmission), as follows:

If to the City:

City of Ottawa
110 Laurier Ave West
Ottawa, Ontario K1P 1J1

Email: [REDACTED]
Attn.: [REDACTED]

If to Project Co:

TransitNEXT General Partnership
[REDACTED]

Email: [REDACTED]
Attn.: [REDACTED]

If to the Account Trustee:

[REDACTED]

Fax: [REDACTED]
Attn.: [REDACTED]

If to the Lenders' Agent: [REDACTED]

Attention: [REDACTED]
Facsimile: [REDACTED]
Email: [REDACTED]

- (b) Where any notice is provided or submitted to a Party via facsimile, an original of the notice sent via facsimile shall promptly be sent by regular mail or registered mail. For greater certainty, a notice given via facsimile shall not be invalid by reason only of a Party's failure to comply with this Section 10(b).
- (c) Any Party to this Insurance Trust Agreement may, from time to time, change any of its contact information set forth in Section 10(a) by prior notice to the other Parties, and such change shall be effective on the Business Day that next follows the recipient Party's receipt of such notice unless a later effective date is given in such notice.
- (d) Subject to Sections 10(e), 10(f) and 10(g):
 - (i) a notice given by registered mail shall be deemed to have been received on the third Business Day after mailing;
 - (ii) a notice given by hand delivery shall be deemed to have been received on the day it is delivered; and
 - (iii) a notice given by facsimile shall be deemed to have been received on the day it is transmitted by facsimile.
- (e) If the Party giving the notice knows or ought reasonably to know of difficulties with the postal system which might affect negatively the delivery of mail, any such notice shall not be mailed but shall be made or given by personal delivery or by facsimile transmission in accordance with this Section 10.
- (f) If any Notice delivered by hand or transmitted by facsimile is so delivered or transmitted, as the case may be, either on a day that is not a Business Day or on a Business Day after 4:00 p.m. (recipient's local time), then such Notice shall be deemed to have been received by such recipient on the next Business Day.
- (g) A notice given by facsimile shall be deemed to have been received by the recipient on the day it is transmitted only if a facsimile transmission report (maintained by the sender) indicates that the transmission of such notice was successful.

11. AMENDMENTS

- (a) This Insurance Trust Agreement may not be varied, amended or supplemented except by an agreement in writing signed by duly authorized representatives of the Parties and stating on its face that it is intended to be an amendment, restatement or other modification, as the case may be, to this Insurance Trust Agreement.

12. WAIVER

- (a) No waiver made or given by a Party under or in connection with this Insurance Trust Agreement shall be binding or effective unless the waiver is in writing, signed by an authorized representative of the Party giving such waiver, and delivered by such Party to the other Parties. No waiver made with respect to any right, power or remedy in one instance will be deemed to be a waiver with respect to any other instance involving the exercise of such right, power, or remedy or with respect to any other right, power, or remedy.
- (b) Failure by any Party to exercise any of its rights, powers or remedies hereunder or its delay to do so shall not constitute a waiver of those rights, powers or remedies. The single or partial exercise of a right, power or remedy shall not prevent its subsequent exercise or the exercise of any other right, power or remedy.

13. RELATIONSHIP BETWEEN THE PARTIES

- (a) The Parties are independent contractors. This Insurance Trust Agreement is not intended to and does not create or establish between the Parties any relationship as partners, joint venturers, employer and employee, master and servant, or, except as provided in this Insurance Trust Agreement, of principal and Lenders' Agent.

14. ENTIRE AGREEMENT

- (a) Except where provided otherwise in this Insurance Trust Agreement, this Insurance Trust Agreement constitutes the entire agreement between the Parties in connection with its subject matter and supersedes all prior representations, communications, negotiations and understandings, whether oral, written, express or implied, concerning the subject matter of this Insurance Trust Agreement.

15. SEVERABILITY

- (a) Each provision of this Insurance Trust Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Insurance Trust Agreement is declared invalid, unenforceable or illegal by the courts of a competent jurisdiction, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Insurance Trust Agreement. If any such provision of this Insurance Trust Agreement is invalid, unenforceable or illegal, the Parties shall, acting in good faith, promptly negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Insurance Trust Agreement as near as possible to its original intent and effect.

16. ENUREMENT

- (a) This Insurance Trust Agreement shall enure to the benefit of, and be binding on, each of the Parties and their respective successors and permitted transferees and assigns.

17. GOVERNING LAW AND JURISDICTION

- (a) This Insurance Trust Agreement shall be governed by and construed in accordance with the laws of Ontario and the laws of Canada applicable therein and shall be treated in all respects as an Ontario contract, without regard to conflict of laws principles.

(b) The Parties agree that the courts of the Province of Ontario and all courts competent to hear appeals therefrom shall have exclusive jurisdiction to hear and settle any action, suit, proceeding or dispute in connection with this Insurance Trust Agreement and hereby irrevocably attorn to the exclusive jurisdiction of such courts.

(c) [Intentionally Deleted].

18. INTENTIONALLY DELETED

19. FURTHER ASSURANCE

(a) Each Party shall do all things, from time to time, and execute all further documents necessary to give full effect to this Insurance Trust Agreement.

20. LANGUAGE OF AGREEMENT

(a) Each Party acknowledges having requested and being satisfied that this Insurance Trust Agreement and related documents be drawn in English. Chacune des parties reconnaît avoir demandé que ce document et ses annexes soient rédigés en anglais et s'en déclare satisfaite.

21. COUNTERPARTS

(a) This Insurance Trust Agreement may be executed in one or more counterparts. Any single counterpart or a set of counterparts executed, in either case, by all the Parties shall constitute a full, original and binding agreement for all purposes. Counterparts may be executed either in original or faxed form provided that any Party providing its signature in faxed form shall promptly forward to such Party an original signed copy of this Insurance Trust Agreement which was so faxed.

IN WITNESS WHEREOF the Parties have executed this Insurance Trust Agreement as of the date first above written.

CITY OF OTTAWA

Per:

Name: [REDACTED]

Title: [REDACTED]

TRANSITNEXT GENERAL PARTNERSHIP

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the partnership.

[REDACTED]

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the trust company.

[REDACTED]

Per:

Name: [REDACTED]

Title: [REDACTED]

I/We have authority to bind the corporation.

SCHEDULE 29
PROJECT CO INFORMATION
[REDACTED]

SCHEDULE 30

[REDACTED]

**SCHEDULE 31
WORKS REPORT REQUIREMENTS**

ARTICLE 1 CURRENT PBS UPDATE Each month following Financial Close, within ten (10) Business Days following the prior month's end, Project Co shall submit a PBS Update, which shall include the following:

- (a) actual start and finish dates for completed Activities;
- (b) actual start dates, physical percent complete and remaining duration for Activities in progress;
- (c) projected sequences of Activities for future work;
- (d) revised relationships and durations for unfinished Activities, if warranted;
- (e) identify the Critical Path(s) in a Critical Path report;
- (f) show Near-Critical Path Activities;
- (g) a PBS Update table, which shall include the following:
 - (i) added and deleted activities;
 - (ii) changes to original durations;
 - (iii) changes to constraints;
 - (iv) changes to lags;
 - (v) changes to calendar assignments; and
 - (vi) logic changes.

All changes included in the PBS Update table shall include reasoning for the change.

- 1.2 The PBS Update shall use the Current PBS baseline. Re-baselining of a PBS Update shall not be permitted. Re-baselining shall be as permitted by Schedule 12 – Works Scheduling Requirements.
- 1.3 The Earned Value in a Period shall match the Construction Period Payment application.
- 1.4 The PBS Update shall use the Current PBS baseline. The PBS Update shall not be used to re-baseline the Schedule. All re-baselines shall be performed in accordance with Schedule 12 – Works Scheduling Requirements.
- 1.5 The PBS Update shall remain in compliance with Table 1 of Schedule 12 – Works Scheduling Requirements.

- 1.6 Project Co shall revise the Activities within the Current PBS as appropriate to identify the current sequence of works. If this revision causes impact on the Critical Path(s), or creates a new Critical Path(s), Project Co shall summarise the changes in the Monthly Progress Report.
- 1.7 Where Activities are divided due to changes in maximum duration, the parent activity dollar value shall be preserved across the new children.
- 1.8 The PBS Update shall at all times remain in compliance with the requirements of Schedule 12 – Works Scheduling Requirements.
- 1.9 The PBS Update shall be submitted in two electronic file formats. The first format shall be in the native file format of the software used to generate and manage the Works Schedules, which shall be the exported .XER file for the latest version of Primavera Professional Project Management (PPM). The second format shall be a word-searchable high resolution colour PDF version. Upon City's request, Project Co shall provide the details of the software and any additional software plug-ins used by Project Co, a copy of any templates, and the details for any software settings it has used in its scheduling software, such as calendar settings, user and administrative preferences, schedule settings, and any other information required to enable the City to replicate the Works Schedules submitted by Project Co using the native file formats provided by Project Co.

ARTICLE 2 MONTHLY PROGRESS REPORT The provisions of this Schedule 31 shall apply to the Monthly Progress Reports.

- 2.2 All information included in the Monthly Progress Reports related to Works Schedules shall be in accordance with the requirements of Schedule 12 – Works Scheduling Requirements.
- 2.3 Each month following Financial Close, Project Co shall submit to the City the Monthly Progress Report. Project Co shall submit the Monthly Progress Report within 10 Business Days following the prior month's end.
- 2.4 The Monthly Progress Report shall contain a narrative with the following items:
 - (a) an executive summary describing the general status of the Works;
 - (b) description of progress for the Project, including all phases of Works. Identify start date and completion dates on major areas of Works.
 - (c) For the requirements from 2.4(d) to 2.4(i), where there are no current actions or concerns, Project Co shall withhold the heading.
 - (d) Identification of tasks or activities which are causing delay, or may cause delay to, the works schedule. The Identification of tasks shall be grouped by:
 - (i) System Infrastructure, including where applicable;
 - (A) facilities;
 - (B) structures;
 - (C) systems;

- (D) tunnels;
 - (E) guideway; and,
 - (F) roadways.
- (ii) progress of design and review (until complete); and
 - (iii) progress and issues for:
 - (A) communications and public engagement;
 - (B) traffic and transit management (including upcoming road closures);
 - (C) progress for Utility Work;
 - (D) demolitions and removals;
 - (E) safety, security, and emergency management;
 - (F) property access and business management plan updates;
 - (G) status update of all Permits, Licences, Approvals and Authorizations;
 - (H) environmental monitoring and compliance status;
 - (I) status of warranty work;
 - (J) operations training in accordance with Schedule 15 – Output Specifications; and
 - (K) all Commissioning;
- (e) contemplated innovations, where applicable;
 - (f) outstanding contractual decisions;
 - (g) description and associated metrics to demonstrate compliance on Project elements as appropriate;
 - (h) summary quality assurance/quality control findings;
 - (i) listing of any Variation Directive or Variation Confirmations that were identified or executed during the period from the submission of the previous month's Monthly Progress Report to the submission of the current Monthly Progress Report, including their status;
 - (j) general summary of Works planned for the upcoming period;

- (k) identification of problems and issues that are causing delay or may cause delay to the works schedule, outstanding problems and issues, and summary of resolved problems and issues;
 - (l) identification of requested and/or required City actions for the next month;
 - (m) advance notice of requested and/or required City actions for the next six months;
 - (n) selected digital progress photographs that summarizes key achievements of Project progress as outlined in the Monthly Progress Report narrative;
 - (o) any other information specifically requested by the City on the progress of the applicable Works; and
 - (p) a table of “Near-Critical Activities” for all Works Activities with a float of less than 10 Business Days.
- 2.5 The Monthly Progress Report shall also include, the following:
- (a) sustainability compliance status;
 - (b) summarised quality assurance and quality control data, including:
 - (i) status until approval of each Integrated Management Plan, Traffic and Transit Management Plan. Once the relevant plan is reported as “Complete”, the plan can be removed from the following Monthly Progress Report; and,
 - (ii) status until approval of Design Certificates and Construction Certificates. Once the relevant certificate is reported as “Complete”, the certificate can be removed from the following monthly report.
 - (c) IMS metrics, including:
 - (i) results of monthly Integrated Management System reports, IMS Audit reports and information from the Non-Conformance Tracking System (as described in Schedule 11 - Integrated Management System Requirements), status of Internal IMS Audits and External IMS Audits;
 - (ii) identified Non-Conformances and deficiencies in ongoing Works as identified by the City or Project Co or both; and,
 - (iii) threat and vulnerability actions (with summary).
 - (d) health, Safety, and environmental metrics, including:
 - (i) lost time injuries;
 - (ii) restricted work cases;
 - (iii) medical treatment injuries;

- (iv) fatalities;
 - (v) near misses;
 - (vi) all reportable incidents; and,
 - (vii) accidents with no lost time.
- (e) community metrics, including:
- (i) received and resolved complaints;
 - (ii) community outreach events; and
 - (iii) community involvement.
- (f) management staffing changes, deletions, and additions for Project Co (if applicable);
- (g) status of Proceeding At Risk Matters (if applicable);
- (h) status of all Submittals pursuant to the requirements of the Project Agreement;
- (i) Subcontract status, including:
- (i) consultants;
 - (ii) Subcontracts awarded;
 - (iii) tenders;
 - (iv) small, minority-owned, women-owned, and disadvantaged business enterprises;
 - (v) apprenticeships;
 - (vi) labour report (average workforce); and,
 - (vii) contracts terminated and for what cause.
- (j) Project Co shall use the data to develop, and provide to the City in an acceptable format, the following tabulated data on a monthly basis from the Financial Close date until the latest Final Completion:
- (i) if applicable, the revised forecast cash flow in accordance with a Recovery Schedule;
 - (ii) the actual Earned Value (EV) as equal to the Activities at [REDACTED]% completion in the Current PBS;
 - (iii) the revised forecast cash flow to complete the Works in accordance with the Current PBS;

- (iv) the overall progress expressed as a percentage of the physical work completed; and
 - (v) Project Co shall use the data to calculate the following performance indicators for inclusion in the Monthly Progress Report:
 - (A) Planned Value curve from PBS-1;
 - (B) Planned Value (PV) as calculated up to the Current PBS status date;
 - (C) Earned Value (EV) as calculated up to the Current PBS status date; and
 - (D) Schedule Performance Index (SPI) = Earned Value (EV)/ Planned Value (PV), expressed as a percentage.
 - (k) risk management summary, that shall discuss any of the following that are current:
 - (i) updated risk register;
 - (ii) risk response plans requiring action from the City;
 - (iii) claims;
 - (iv) liens;
 - (v) environmental issues;
 - (vi) labour;
 - (vii) outstanding disputes;
 - (viii) safety and security;
 - (ix) operational risks;
 - (x) Stakeholder risks; and,
 - (xi) other risks.
- 2.6 The Monthly Progress Report shall include a Variance section, which shall include:
- (a) the information provided in Section 1.1(g) in a tabular format; and
 - (b) a summarized narrative that provides justification for the changes.

ARTICLE 3 MISCELLANEOUS

- 3.1 Where the following deliverables are submitted separately to the Monthly Progress Report, Project Co shall submit following deliverables in accordance with the timing identified in Schedule 12:
- (a) Short Duration Schedule: Micro Works Schedule
 - (b) Short Duration Schedule: Testing and Commissioning Schedule
 - (c) Short Duration Schedule: Schedule to Complete
- 3.2 The Short Duration Schedules can be provided in either hard copy or .pdf, as agreed in discussions with the City.
- 3.3 Project Co shall prepare and submit a Testing and Commissioning schedule narrative.
- 3.4 This narrative shall be provided six months prior to commencement of Testing and Commissioning Activities, and updated following any detailed revision to the strategy.
- 3.5 Project Co shall prepare and submit a Testing and Commissioning schedule narrative to identify the strategy to achieve Substantial Completion and Final Completion.
- 3.6 The Testing and Commissioning schedule narrative shall be provided to the City six months prior to the first Testing and Commissioning activity.
- 3.7 The Testing and Commissioning schedule narrative shall contain:
- (a) Description of the testing philosophy and process;
 - (b) Description of the interrelationships and system interfaces with the:
 - (i) existing Confederation Line SI at Bayview Station and the head-end management platform at the TOCC and BCC
 - (ii) MacDonald-Cartier International Airport;
 - (iii) CNR and VIA Rail; and
 - (iv) NRC.
 - (c) Description of testing and commissioning sequencing to achieve Substantial Completion and Final Completion; and
 - (d) Identification of potential conflicts and challenges to achieve Substantial Completion and Final Completion.

SCHEDULE 32
CITY PERMITS, LICENCES, APPROVALS AND AUTHORIZATIONS (PLAA)

- a) The Permits, Licences, Approvals and Authorizations may include, but are not limited to, those included in the tables below.
- b) The following Responsibility Tables will be updated by addendum, if applicable, upon receipt of further information.
- c) The following Responsibility Tables are for the purpose of the performance of the Works.
- d) If, for any permit, licence, approval or authorization listed in this Schedule 32, there is a legislative requirement for the applicant to be the City, then Project Co shall act as the City's agent and will be responsible for all aspects of the application preparation and submittal process at Project Co's own cost and expense. If required, the City will sign off on the application.
- e) All other Permits, Licences, Approvals and Authorizations not listed herein or otherwise noted, are the responsibility of Project Co.

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
Site Plan Control – Development Outside of the Public Transit System Right-of-Way	City of Ottawa	Not started. Necessary where required under specific circumstances such as infrastructure not part of the LRT infrastructure, e.g. parking lot redesign and over-build of stations. Consultation with the City will be required.	Project Co
Building and Demolition Permits – Stations and MSF	City of Ottawa	Not started.	Project Co
Noise By-law Exemption	City of Ottawa	Not started.	Project Co
Approval under Sewer Use By-law to discharge waste water	City of Ottawa	Not started.	Project Co
Road Cut Permit (utility circulation)	City of Ottawa	Not started.	Project Co
Temporary Road Closure Permit	City of Ottawa	Not started.	Project Co
Temporary Construction Easements	City of Ottawa	Not started.	Project Co
Street or Lane Closing/Opening	City of Ottawa	Not started.	Project Co
Zoning By-Law Amendment	City of Ottawa	Not started. Necessary where required under specific circumstances , e.g. station related development.	Project Co

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
		Consultation with the City will be required.	
Sign Permit	City of Ottawa	Not started.	Project Co
Permit under Ontario Heritage Act	City of Ottawa	Not started. May be necessary if heritage resources affected.	Project Co
Emergency Services Approval – Fire and Life Safety	City of Ottawa	Not started.	Project Co
Electrical Plan Review	Electrical Safety Authority	Not started.	Project Co
Construction Registration Permit	Electrical Safety Authority	Not started.	Project Co
Notice of Project as per <i>Occupational Health and Safety Act</i> (Ontario)	Ministry of Labour	Not started.	Project Co
Registration of Constructors and Employers Engaged in Construction	Ministry of Labour	Not started.	Project Co
Permit to Take Water	Ontario Ministry of the Environment and Climate Change	Not started.	Project Co
Environmental Compliance Approval (ECA)– SWM Facilities	Ontario Ministry of the Environment and	Not started.	Project Co

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
	Climate Change		
ECA – Water and Sanitary Sewer	Ontario Ministry of the Environment and Climate Change (In certain instances the City of Ottawa has delegated authority from MOECC for review)	Not started.	Project Co
ECA – Air and Noise	Ontario Ministry of the Environment and Climate Change	Not started.	Project Co
Environmental Activity and Sector Registry (EASR)	Ontario Ministry of the Environment and Climate Change	Not started.	Project Co
Approvals from MOECC under Ontario Environmental Assessment Act O. Reg. 231/08	Ontario Ministry of the Environment and Climate Change	An approval has been received from the MOECC Minister for the Trillium Line Extension Environmental Project Report.	City

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
Amendments to the approvals of MOECC under Ontario Environmental Assessment Act O. Reg. 231/08	Ontario Ministry of the Environment and Climate Change	Addendums to the Environmental Project Report for the Bowesville Station Alternative Location, the proposed alignment extension to the Limebank Road extension, the revised Walkley Yard location and the grade separated Ellwood Diamond structure are under preparation by the City and will be provided to Project Co as part of the EA approvals when complete.	<p>The City is responsible for addendums required for Bowesville Station Alternative Location, the proposed alignment extension to Limebank Road, the revised Walkley Yard location and the grade separated Ellwood Diamond structure. The City will provide approved addendums to Project Co by Financial Close.</p> <p>Project Co is responsible for any other addendums to the approved Environmental Project Reports that are required following Financial Close to the extent such addendums are required as a result of changes proposed by Project Co to the design contemplated in the Environmental Approvals, Project Co's construction of the Project, or any other action or inaction of Project Co.</p>
Endangered Species Act Permits	Ontario Ministry of Natural Resources and Forestry	Under preparation by the City	<p>In advance of Financial Close, the City will apply for the necessary permit(s) required under ESA or SARA. Post Financial Close, Project Co will be responsible for obtaining and maintaining the permit(s) as the City's agent. Any permit conditions that must occur after the latest Final Completion Date, such as long term monitoring, will be the responsibility of the City.</p> <p>Permits that have been received prior to financial close will be provided. Pending permit applications will also be provided with the understanding the proposed mitigation measures are conditional until</p>

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
			the permit is received.
Public Lands Act Work Permit	Ontario Ministry of Natural Resources and Forestry	City of Ottawa to initiate	Project Co to implement.
Archaeology – Letter confirming report complies with Ministry requirements and filed with Ontario Public Register of Archaeological Reports	Ontario Ministry of Tourism Culture and Sport	<p>Stage 1 Archaeological Assessment for the Trillium Line Extension completed and acceptance has been received from MTCS.</p> <p>Stage 1 Archaeological Assessment for Bowesville Station Alternative Location and Limebank extension alignment completed and submitted to MTCS for their acceptance.</p> <p>Stage 2 Archaeological Assessments for the Trillium Line Extension as well as the Cunningham's Station and Cunningham-Murray sites have been completed by the City</p>	<p>City is responsible to obtain the letter in respect of all those archaeological assessments completed by the City in advance of Financial Close. Project Co is responsible to obtain the letter in respect of all those archaeological assessments required after Financial Close.</p>

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
		and submitted to MTCS for their acceptance.	
Approval for provincial funding	Ontario Ministry of Transportation	City is seeking provincial funding.	City
Approval from MTO for building and land use permit in accordance with the requirements of the Public Transportation and Highway Improvement Act	Ontario Ministry of Transportation	Not started.	Project Co
Approval pursuant to Section 35 of the Fisheries Act or Clearance that no approval is required	Fisheries and Oceans Canada	Not started.	Project Co
License to Collect Fish for Scientific Purpose	Ministry of Natural Resources and Forestry – Kemptville District	Not started.	Project Co
Land Access Permit	National Capital Commission	Not started. To be obtained by Project Co should access be required to NCC properties not included in the Lands	Project Co
Land Acquisition through Sub-Lease	Airport Authority	Contingent on City receiving NCC FLUDA	City (Part of FLUDA approval coincident with the Airport Authority and NCC)

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
CEAA 2012 Section 67 CEAA determinations (approval) if additional lands required	NCC, Transport Canada, Airport Authority, PSPC, ECCC, DFO (if required), Agriculture and Agri-Food Canada, Canada Post, National Research Council, VIA Rail, Canadian Transportation Agency and Parks Canada	The City is currently preparing the environmental effects evaluation information to submit to federal authorities for determinations. That evaluation will include the construction of new Rideau River pedestrian bridge between Carleton University and Vincent Massey Park.	City will provide environmental effects evaluation information to the various governmental agencies to enable them to make required determinations under CEAA 2012 Section 67. Design and construction relevant environmental commitments part of these documents and federal determinations under section 67 of CEAA, 2012 to be implemented by Project Co.
<i>Navigation Protection Act</i> approval for in-water works in a navigation channel (Rideau River)	Transport Canada	Transport Canada has identified to the City that <i>Navigation Protection Act</i> approvals will be required for proposed repair works to the existing rail bridge as well as the construction of the new proposed pedestrian bridge on the Rideau River between Carleton University and Vincent Massey Park.	Project Co

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
Species at Risk Act Permits	Environment Canada and Climate Change	City has identified Species at Risk for which permitting under SARA will be required. The City will be initiating permits for requirements identified before Financial Close.	<p>Subject to the provisions of section 16.4 of the Project Agreement, the City will submit all approval documentation with Project Co as an agent for the implementation of the permit conditions related to design and construction activities. Copies of the permit applications will be provided to Project Co 10 Business Days after they are submitted to Environment Canada and Climate Change. Post Financial Close, Project Co will be responsible for obtaining and maintaining the Permits as the City's agent. Any permit conditions that must occur after the Termination Date, such as long term monitoring, will be the responsibility of the City.</p> <p>Permits that have been received prior to financial close will be provided. Pending permit applications will also be provided with the understanding the proposed mitigation measures are conditional until the permit is received.</p>
Ontario <i>Invasive Species Act</i> obligations regarding propagation of restricted species	MOECC	Presence of Common Reed (<i>Phragmites</i>), Japanese knotweed and dog strangling vine has been noted within the Lands by the City during 2017 field surveys.	Project Co to complete restricted invasive species surveys before project is carried out and to incorporate mitigation measures into the Environmental Management Plan to ensure legal obligations are met.
Approval for federal funding	Infrastructure Canada	City is seeking provincial funding	City

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
Any and all Remaining Permits, Licences, Authorizations and Approvals	Various Agencies	Not started.	Project Co
NCC Approval in Principle	NCC	Issued September 14, 2017	City
NCC Concept Design Approval	NCC	~May 2018	City
NCC Property Transaction Approval	NCC	~May 2018	City
NCC Federal Land Use, Design and Transaction Approval or Airport Authority - NCC Airport Authority Framework Agreement Approval	NCC for FLUDA and Airport Authority for Framework Agreement	January 1 2019 – December 31 2021 Separated NCC FLUDAs will be sought by the City for the construction of the new Rideau River Pedestrian Bridge between Carleton University and Vincent Massey Park as well as the proposed changes to the Albion/Leitrim intersection	City
Approval pursuant to Ontario Regulation 170/06 – Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (if required for Trillium Line)	Rideau Valley Conservation Authority	The City initiated discussions with RVCA regarding cut/fill compensation requirements for the construction of the new Rideau River pedestrian	Project Co

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
		Bridge between Carleton University and Vincent Massey Park. Discussions also occurred regarding permitting requirements for the construction of the Bowesville Station and Park and Ride. Discussions are also underway for the permitting requirements associated with potential Sawmill Creek tributary realignment at Walkley Yard.	
Rideau Canal In-Water and Shoreline Work Permit (for Trillium Line if required)	Parks Canada	If required for any of the works at the Dow's Lake tunnel.	Project Co
Approval to extend the Trillium Line from the Transport Minister under the Railway Safety Act (section 98)	Approval to the City of Ottawa from Transport Canada	Ongoing discussion Transport Canada	City Notice of Railway Works required to be issued to adjacent property owners and filed with the Minister of Transport, via Transport Canada. If there is objection to the railway works by a property owner, dispute resolution would be enacted between City (owner of the railway) and property owner.
A risk assessment as per Section 15(1) of the Railway Safety Management System Regulations, 2015 and submission of a	Transport Canada	City reviewing requirements	City

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
Notice of Change in Operations document to Transport Canada.			
Reduced Clearance Envelope Exemption Request to the Transport Canada Standards Respecting Railway Clearances (May 14, 1992)	Capital Rail	Capital Railway Chief Engineer or designate needs to approve reduced clearance envelope prior to submittal to Transport Canada.	City
Railway Operating Certificate	Transport Canada	Modification of existing Operating Certificate needs to be submitted. Capital Railway on behalf of the City will be responsible for submitting request to Transport Canada for modification of the ROC.	City
Railway Safety Management System	Transport Canada	Modification of existing RSMS needs to be submitted.	City Capital Rail will submit information provided by Transport Canada.
Certificate of Fitness	Canadian Transportation Agency	Modification of existing Certificate of Fitness needs to be submitted	City. Capital Railway will submit request to the CTA for modifying Certificate of Fitness.

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
Licence of Occupation and Land Lease	Carleton University/City	MOU draft is under preparation between the City and Carleton University which will address requirements for the Licence of Occupation and Land Lease including traffic restrictions, power requirements, road reinstatement, construction schedule constraints, maintenance access, etc...	City
Rail Transfer Agreement – NRC Rail Access	NRC/City	Draft has been prepared by City and is under review by NRC	City
Airport Authority and LRT Airport Connection Construction Agreement	Airport Authority/City	MOU has been developed between the City and the Airport Authority to guide the development of the Agreement.	City
Airport Authority and LRT Airport Connection Operations Agreement	Airport Authority/City	MOU has been developed between the City and the Airport Authority to guide the development of the Agreement.	City

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
Maintenance Interface Agreement with RTG - Bayview	RTG/City	Discussions to be initiated by City with Rideau Transit Group to determine maintenance interface requirements between Confederation Line and Trillium Line at Bayview Station.	City
Updated VIA Rail Crossing Agreement	VIA Rail/City	Capital Rail is negotiating on behalf of the City. Agreement to cover responsibilities for the operation and maintenance of the Elwood Diamond has been drafted and is with VIA Rail for signature.	City
Updated Shared Use Agreement with CN (Walkley Interlocking)	CN/City	City to determine if an update to the agreement is required for the shared use of the Walkley diamond.	City

Trillium LRT PLAA - Other Third Party Agreements

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
Carleton University Parking Garage – Overbuild Air Rights Agreement	City	Drafting of agreement, including Term sheet and O&M, underway by City's solicitor. Will be tied into the MOU containing the Licence of Occupation and Land Lease with Carleton.	City
Access Agreement for work under Hwy 417	MTO	Discussions currently ongoing with MTO	City
Existing Licences with CP transferred with sale to Trillium ROW to the City	Licences are part of City's Trillium ROW land tenure	City reviewing responsibilities	City
Airport Zoning Regulations Exemption	Transport Canada the exemption and not the Airport Authority	Discussions ongoing with the City and Transport Canada	<p>City intends to obtain a 20 year renewable exemption from Transport Canada to the Ottawa Macdonald-Cartier Airport Zoning Regulations under the Aeronautics Act, to allow for a 3 m increase in height allowance for a Leitrim Road Grade Separation in the vicinity of the future Leitrim Road Runway (Runway 07R-25)</p> <p>City is also seeking confirmation that it enjoys legal non-conforming rights to operate within the existing freight envelope in the vicinity of the</p>

Permits, Licences and Approvals	Issuing Agency	Status	Responsibility of: City of Ottawa or Project Co.
			future Golf Course Runway (07C-25C). Project Co will be responsible for obtaining any other exemptions to the Ottawa Macdonald-Cartier Airport Zoning Regulations required for the construction, or maintenance of the Trillium Line Extension.
Central Experimental Farm/Dominion Arboretum Access	Agriculture and Agri-Foods Canada (AAFC)	Discussions ongoing between City and AAFC	City to obtain land access permit/agreement from AAFC. Project Co to implement all permit/agreement conditions.

SCHEDULE 33
LANDS

PART A – DEFINITIONS AND INTERPRETATION

1. DEFINITIONS

- 1.1 For the purposes of the Project Agreement, including but not limited to this Schedule 33, the following terms have the following meanings. Any capitalized term not defined in this Schedule 33 shall have the meaning given to such term in the Project Agreement.
- (a) “**Additional Property Interest**” includes any additional parcel of land not forming part of the Lands, the expansion or alteration of any boundary of any parcel of land forming part of the Lands, the extension of any term of use of any parcel of forming part of the Lands beyond the term specified in the column marked “Duration” in the Lands Table, and the inclusion of additional Permitted Uses for any parcel of land forming part of the Lands, all as requested by Project Co in accordance with Section 8 of this Schedule 33 unless and until such parcel, extension, extended term or additional Permitted Use becomes part of the Lands and is included in the grant of the non-exclusive license described in Section 14.1 of the Project Agreement in accordance with Section 14.6 of the Project Agreement;
- (b) “**City Road Allowance Lands**” means lands forming part of a municipal road having the status of a highway pursuant to Section 26 of the *Municipal Act, 2001* R.S.O. c.25. Within the Lands Table, property comprising City Road Allowance Lands are designated “**ROW**” in the column marked “Restrictions and Requirements”;
- (c) **Commencement Date**” means, with respect to each parcel of property forming part of the Lands, either:
- (i) the date identified in the column marked “Commencement Date” in the Lands Table; or,
 - (ii) the first day of the month following the occurrence of the event described in the column marked “Commencement Date” in the Lands Table (for example, Financial Close); or,
 - (iii) for lands designated City Road Allowance Lands (ROW), the date(s) specified in required permits, approvals or authorizations as described in Section 5 of this Schedule 33 and in Schedule 32 – Permits, Licenses, Approvals and Agreements;
- and is the date upon which any parcel of land identified in the Lands Table becomes part of the Lands and is included in the non-exclusive licence granted by the City to Project Co in accordance with Section 14.1 of the Project Agreement;
- (d) “**Confederation Line Lands**” means lands shown on Property Request Plans identified as “**Stage 1 PRPs**” and included in a folder titled “**Stage 1 PRPs**” located in the Data Room which are lands owned by the City, or lands in which the City has acquired an interest, and upon which assets and/or infrastructure comprising part of the Confederation Line are located and/or have been or will be designed, constructed, operated and/or maintained. Confederation Line Lands do not form part of the “Lands” except to the extent that they are also included in the Lands Table;

- (e) “**Construction Period Lands**” means property designated as “Construction Period” in the column marked “Construction Period or Project Term” in the Lands Table which property will only be included in the non-exclusive license, rights of use and access granted by the City to Project Co during the Construction Period, and which property is subject to any other limits on the term of the non-exclusive license and rights of use and access identified in this Schedule 33 and/or elsewhere in the Project Agreement;
- (f) “**Existing Corridor Lands Agreements**” means:
- (i) The Agreement of Purchase and Sale of Railway for Continued Railway Operations entered into by the City of Ottawa and Canadian Pacific Railway Company and St. Lawrence and Ottawa Railway Company dated March 21, 2005 a copy of which is located in file folder titled “Agreements” in the Data Room, and all of the agreements and Board Orders assigned to and assumed by the City pursuant to the said Agreement of Purchase and Sale and listed in Schedules “D” and “F” thereto;
 - (ii) The Agreement of Purchase and Sale entered into by the City of Ottawa and Canadian Pacific Railway Company and St. Lawrence and Ottawa Railway Company dated December 6, 2002 a copy of which is located in file folder titled “Agreements” in the Data Room and all of the agreements assigned to and assumed by the City pursuant to the said Agreement of Purchase and Sale and listed in Schedule “D” thereto;
 - (iii) The Elwood Interlocking and Diamond Operation and Maintenance Agreement between the City of Ottawa, operating as Capital Railway (“**Capital Railway**”) and VIA Rail Canada Inc. executed by the City a copy of which is located in file folder titled “Agreements” in the Data Room; and,
 - (iv) The Agreement between Canadian National Railway Company and St. Lawrence & Hudson Railway Company Limited (a wholly owned subsidiary of Canadian Pacific Railway Company) dated June 16th, 1999 as it relates to the control, operation and maintenance of the Walkley and Elwood Diamonds, a copy of which is located in file folder titled “Agreements” in the Data Room.
- (g) “**Lands**” means lands owned or to be acquired by the City or lands in respect of which the City has acquired or will acquire certain rights, all as set out in the Lands Table or otherwise deemed to be lands in accordance with this Schedule 33, and over which the City is granting to Project Co a non-exclusive license, right of use and access in accordance with Section 14.1 of the Project Agreement;
- (h) “**Lands Table**” means the table in Part B of this Schedule 33;
- (i) “**Permitted Use**” or “**Permitted Uses**” means the use(s) which may be put to each parcel forming part of the Lands as designated in the column marked “Permitted Use” in the Lands Table being one or more of the following:
- (i) “**New Municipal Infrastructure Lands**” means property forming part of the Lands and designated “**NMI**” in the column marked “Permitted Use” in the Lands Table representing the location where New Municipal Infrastructure is to be constructed or installed in accordance with Schedule 15- Output Specifications;

- (ii) “**System Infrastructure Lands**” means property forming part of the Lands and designated “NSI” in the column marked “Permitted Use” in the Lands Table representing the location where System Infrastructure is located or is to be constructed or installed in accordance with Schedule 15 – Output Specifications;
 - (iii) “**Temporary Access Lands**” means property forming part of the Lands and designated “TA” in the column marked “Permitted Use” in the Lands Table which may be used temporarily for the sole purpose of providing non-exclusive pedestrian and/or vehicular access to other property forming part of the Lands;
 - (iv) “**Temporary Mobilization Lands**” means property forming part of the Lands and designated “TM” in the column marked “Permitted Use” in the Lands Table which may be used as part of a mobilization site or staging area, being a designated area where personnel, equipment, supplies, site offices and other facilities required to undertake the Construction Activities are established and maintained in accordance with the provisions of Schedule 15 – Output Specifications relating to mobilization sites; and,
 - (v) “**Temporary Construction Lands**” means property forming part of the Lands and designated “TC” in the column marked “Permitted Use” in the Lands Table which may be used temporarily in connection with the construction of System Infrastructure and New Municipal Infrastructure but which may not be used as part of a mobilization site or staging area other than for short term storage of mobile equipment and material required for construction in close proximity to the relevant parcel of Temporary Construction Lands;
- (j) “**Project Term Lands**” means property designated as “Project Term” in the column marked “Construction Period or Project Term” in the Lands Table which property will be included in the non-exclusive license, rights of use and access granted by the City to Project Co during the Project Term subject to limits on the term of the non-exclusive license and rights of use and access identified in this Schedule 33 and/or elsewhere in the Project Agreement;
- (k) “**Property Request Plan**” or “**PRP**” means a diagram defining the extent, limits and/or approximate boundaries of property; and,
- (l) “**Third Party Access Agreements**” means the agreements, including Standard Agreements, listed or described in Section 4.1 of this Schedule 33.

2. TERM

- 2.1 The term of the non-exclusive license, rights of use and access to any parcel forming part of the Lands granted to Project Co by the City in accordance with Section 14.1 of the Project Agreement shall, irrespective of whether the parcel has been identified as constituting Construction Term Lands or Project Term Lands, run from the Commencement Date identified in the Lands Table for such parcel until the earlier of:
- (a) the end of the period calculated by adding to the Commencement Date the number of months specified for each parcel in the column marked “Duration” in the Lands Table; and,

- (b) the Termination Date.
- 2.2** Unless otherwise stated in the Lands Table, the number of months identified in the column marked “Duration” in the Lands Table, represents a single term comprised of consecutive months commencing on the Commencement Date.
- 3. PERMITTED USES**
- 3.1** Project Co’s use of any parcel forming part of the Lands shall be limited to the Permitted Use(s) designated in the column marked “Permitted Use” in the Lands Table.
- 3.2** The installation or construction of New Municipal Infrastructure in or on any parcel of lands designated New Municipal Infrastructure Lands may be limited to the construction or installation of the type(s) of infrastructure specified in the “Restrictions and Requirements” column of the Lands Table and/or in the Third Party Access Agreement(s) applicable to such parcel.
- 3.3** The installation of temporary excavation supports such as soldier piles, secant piles, rock dowels, rock bolts or tie backs any part of which will be left in place following completion of construction is only permitted in accordance with Section 3.4 within System Infrastructure Lands or within Temporary Construction Lands if such Temporary Construction Lands have been expressly identified as being available for temporary excavation support.
- 3.4** Except as provided in this Section 3.4 or as expressly provided elsewhere in the Project Agreement, all Works shall take place exclusively within the boundaries of the Lands.
- (i) Subject to the requirements of Section 5 of this Schedule 33 and Schedule 32 with respect to the use of City Road Allowance Lands, Project Co. may:
- (A) construct or install New Municipal Infrastructure within City Road Allowance Lands; and/or,
 - (B) install temporary excavation supports such as soldier piles, secant piles, rock dowels, rock bolts or tie backs within City Road Allowance Lands;
 - (C) use or access City Road Allowance Lands for the purposes of providing Maintenance and Rehabilitation Services in accordance with Schedule 15-3; and/or,
 - (D) use City Road Allowance Lands for the purposes of managing traffic in accordance with a Traffic Management Plan,
- irrespective of whether the City Road Allowance Lands required for the purposes listed above are described in the Lands Table or in the PRPs.
- (ii) In addition to subsection 3.4(i)(B), which permits the installation of temporary excavation supports such as soldier piles, secant piles, rock dowels, rock bolts or tie backs within City Road Allowance Lands, such supports may also be installed in accordance with a licence acquired by Project Co. on its own behalf in accordance with Section 14.6(c) of the Project Agreement or by the City in accordance with Section 8 of this Schedule 33.

- (iii) The Lands Table and PRPs do not describe property required to accommodate Utility Works. Without limiting the provisions of the Project Agreement, including Section 8, Part 2, Schedule 15-2, which govern Utility Works, and subject to the requirements of Section 5 of this Schedule 33 and Schedule 32 with respect to the use of City Road Allowance Lands, Project Co. may undertake Utility Works within System Infrastructure Lands, City Road Allowance Lands or in accordance with the terms of an existing easement in favour of the relevant Utility Company.
- (iv) Utility Works will not be permitted on property other than City Road Allowance Lands, System Infrastructure Lands or within the boundaries of and in accordance with the terms of an existing easement in favour of the relevant Utility Company unless and until a new easement over such property in favour of the relevant Utility Company, and satisfactory to the relevant Utility Company, is acquired by Project Co. or by the City.
- (v) New easements for Utility Works contemplated in subsection 3.4(iv) above shall be acquired by Project Co. in accordance with Section 14.6(c) of the Project Agreement or by the City as Additional Property Interests in accordance with Section 8 of this Schedule 33, the costs of which acquisitions are to remain to Project Co's sole account not to be recovered through any Cash Allowance.
- (vi) Notwithstanding subsection 3.4(v) above, the following exceptions to the provisions of Section 8 of this Schedule 33 shall apply to requests for Additional Property Interests made by Project Co. with respect to new easements for Utility Company Self-Performed Work which are required solely as a result of Utility Agreements for Utility Company Self-Performed Work approved by the City in accordance with Section 20.13 of the Project Agreement:
 - (A) Section 8.1 (a) shall not apply and a request may be made at any time during the Project Term;
 - (B) Sections 8.1(c), 8.1(d), 8.1(e), 8.1(f) and 8.1(g) shall not apply with the exception that, within fifteen (15) Business Days of the delivery by Project Co. to the City of the materials described in Section 8.1(b), the City shall provide to Project Co. an approximate estimate of the time which the City anticipates will be required to secure the required easement;
 - (C) Sections 8.2(b), 8.2(c), 8.2 (e) and 8.2(f) shall not apply and the City shall use all reasonable efforts to complete the acquisition of the new easement with all due dispatch.

- 3.5** To the extent that Project Co undertakes, in accordance with subsections 3.4(i), 3.4(ii), 3.4(iii), and/or 3.4(iv) above, any Works, Utility Company Self-Performed Work or traffic management on lands comprising City Road Allowance Lands, or in accordance with the terms of a licence or easement acquired by Project Co. pursuant to Section 14.6(c) of the Project Agreement or existing easements in favour of relevant Utility Companies, which lands are not identified in the Lands Table and PRPs, all of Project Co.’s obligations and liabilities in respect of the Lands and Site under the Project Agreement shall apply with equal effect to all activities of Project Co and Project Co Parties on such lands.
- 3.6** The property identified as Parcel 43 on PRP 15f is an area which is used by federal agencies for the purposes of conducting ongoing research (the “**Porcine Cemetery**”). The Porcine Cemetery, which is not included in the Lands Table and does not form part of the Lands, shall not be used or accessed by Project Co. for any purpose whatsoever and Project Co. shall implement such measures as may be required from time to time to ensure that the Porcine Cemetery is not disturbed or impacted by the Project Operations in any way.

4. RESTRICTIONS AND REQUIREMENTS

- 4.1** In addition to any other restriction or requirement contained in the Project Agreement, including this Schedule 33, Schedule 15 – Output Specifications and Schedule 16 – Encumbrances, Project Co’s access to and use of the Lands for the purposes of the Project Operations is subject to the terms of the Third Party Access Agreements and other restrictions, qualifications and requirements contained in the Lands Table including as set out in the column marked “Restrictions and Requirements” including as described below:
- (a) **“Carleton University Terms”** designates property the use of which is subject to the terms and conditions of a Third Party Access Agreement, being the Memorandum of Agreement between the City and Carleton University, including all ancillary agreements incorporated as schedules to the Memorandum of Agreement, copies of which are located in file folder titled “Agreements” and located in the Data Room;
- (b) **“CN Terms & Conditions”** designates property the use of which is subject to the terms and conditions of a Third Party Access Agreement dated June 16th, 1999 between the Canadian National Railway Company and the St. Lawrence & Hudson Railway Company Limited (a wholly owned subsidiary of the Canadian Pacific Railway Company) as it relates to the control, operation and maintenance of the Walkley Diamond, a copy of which is located in file folder titled “Agreements” in the Data Room, as may be amended by an agreement between the City and the Canadian National Railway Company;
- (c) **“Corridor Lands Constraints”** designates property which, until the commencement of the Shut Down Period, will continue to be used as an active rail service line operated by Capital Railway. The use of lands designated Corridor Lands Constraints will be prohibited, until the commencement of the Shut Down Period, except to the extent that the City and Capital Railway determine in their sole and absolute discretion that a limited use, proposed by Project Co., of all or part of property designated Corridor Lands Constraints will not interrupt, impact, constrain or otherwise limit the operation of the active service line in any way. In addition to the foregoing, to the extent authorized by the City and Capital Railway, the use of property designated Corridor

Lands Constraints prior to the commencement of the Shut Down Period will be subject to any additional conditions, restrictions or constraints as may be imposed by Capital Railway or the City from time to time;

- (d) “**Confederation Line Lands Constraints**” designates property which includes, abuts or is in close proximity to Confederation Line Lands where coordination with the contractors responsible for constructing the first stage of the City’s Confederation Line light rail transit project may be required in accordance with the terms of the Project Agreement;
- (e) “**Dow’s Lake Terms**” designates property the use of which is subject to the terms and conditions of various Board Orders, licence agreements and easements relating to the construction, use and maintenance of the existing tunnel under Dow’s lake copies of which are located in file folder titled “Agreements” and located in the Data Room;
- (f) “**MNR Terms**” designates property, the use of which is subject to:
 - (i) the terms and conditions of permits issued by the Ontario Ministry of Natural Resources, including work permits, permits for works within a waterbody and permits for work on shorelands;
 - (ii) a Licence of Occupation on terms similar to Licence of Occupation No. 9561 issued to the Regional Municipal of Ottawa-Carleton for a transit way crossing and located in file folder titled “Agreements” and located in the Data Room; and,
 - (iii) Board Orders relating to the Rideau River Bridge structure, copies of which are located in file folder titled “Agreements” in the Data Room.
- (g) “**NCC Terms & Conditions**” designates property, the use of which is subject to the terms and conditions of Third Party Access Agreements between the City and the National Capital Commission, copies of which are located in file folder titled “Agreements” in the Data Room as well as the conditions of the Approvals in Principle issued by the National Capital Commission and any Federal Land Use Design and Transaction Approvals granted by the National Capital Commission with respect to the Project or any part thereof;
- (h) “**NRC Terms & Conditions**” designates property, the use of which is subject to the terms and conditions of a Rail Car Transfer Agreement between the City and the National Research Council of Canada, a copy of which is located in file folder titled “Agreements” in the Data Room, as well as the provisions of Schedule 15 – Output Specifications;
- (i) “**OMCIAA Terms**” designates property, the use of which is subject to the terms and conditions of a sublease entered into between the City of Ottawa and the Airport Authority, a copy of which is located in file folder titled “Agreements” in the Data Room;
- (j) “**PWGSC Terms**” designates property, the use of which is subject to the terms and conditions of the Third Party Access Agreement between the City and Her Majesty the Queen as represented by Public Works and Government Services Canada a copy of which is located in file folder titled “Agreements” in the Data Room;

- (k) “**South Keys Terms and Conditions**” designates property, the use of which is subject to the terms and conditions of the Third Party Access Agreement between the City, [REDACTED] and [REDACTED] a copy of which is located in file folder titled “Agreements” in the Data Room;
- (l) “**Stratified Parcel**” designates property having both horizontal and vertical boundaries;
- (m) “**Telecom License Parcel**” designates property subject to the terms and conditions of certain license agreements between Canadian Pacific Limited, as licensor, and various telecommunications providers, as licensees, with respect to the installation and maintenance of telecommunications cable and associated equipment within segments of the Lands, which license agreements are located in file folder titled “Agreements” in the Data Room, and includes the terms and conditions of any future telecommunications license granted by Canadian Pacific Limited in accordance with the terms of the “network right of way” reserved by Canadian Pacific Limited pursuant to items (i) and (ii) in the definition of Existing Corridor Lands Agreements;
- (n) “**Utility Coordination**” designates property which may also be required to support the construction, installation, use or maintenance of hydro-electric, gas or telecommunications infrastructure and, as a result, use of the parcel may require coordination with the utility provider. Refer to Schedule 15 – Output Specifications and utility plans contained in the Background Information;
- (o) “**VIA Terms and Conditions**” designates property the use of which is subject to the terms and conditions of the following Third Party Access Agreements:
 - (i) An agreement June 16th, 1999 between the Canadian National Railway Company and the St. Lawrence & Hudson Railway Company Limited (a wholly owned subsidiary of the Canadian Pacific Railway Company) as it relates to the control, operation and maintenance of the Elwood Diamond, as amended by the Elwood Interlocking and Diamond Operation and Maintenance Agreement copies of which are located in file folder titled “Agreements” in the Data Room; and,
 - (ii) An agreement on terms similar to the terms of the Agreement entered into on May 16, 2014 between the City and VIA Rail Canada Inc. with respect to the construction and long term maintenance and operation of a heavy and light rail grade separation crossing including but not limited to the VIA Right of Entry Authorization Form appended thereto, provided that in the event of any inconsistency between said agreement and the provisions of Schedule 15 relating to the construction and/or maintenance of a grade separated crossing of the Ellwood subdivision, the provisions of Schedule 15 shall prevail.

The forgoing does not constitute an exhaustive list of the restrictions and requirements which may be listed in the column designated “Restrictions and Requirements” in the Lands Table or which may apply to any property forming part of the Lands.

- 4.2** Segments of the Lands form part of existing rail corridors acquired by the City pursuant to the Existing Corridor Lands Agreements. These segments of the Lands are subject to the terms and conditions of various agreements, including railway crossing agreements, assigned to and assumed by the City at the time of the purchase of the railway corridors and described in the Existing Corridor Lands Agreements.

- 4.3** All of the agreements referred to in Sections 4.1 and 4.2 above, including any Crossing Agreements or Board Orders referenced in the Existing Corridor Lands Agreements which are included in the Data Room, together with all Standard Agreements, shall be treated, for the purposes of Section 15 of the Project Agreement and for the purpose of Schedule 16 - Encumbrances, as Encumbrances of which Project Co had knowledge prior to Financial Close. While the City has made efforts to incorporate significant construction, maintenance and other obligations flowing from the Third Party Access Agreements and the Existing Corridor Lands Agreements into the Project Agreement, Project Co. shall be deemed to have reviewed each of the Third Party Access Agreements and the Existing Corridor Lands Agreements, and any Crossing Agreements or Board Orders referenced in the Existing Corridor Lands Agreements which are included in the Data Room, and shall perform all obligations and observe and comply with all restrictions contained therein which are relevant to the use of any part of the Lands and/or the performance of the Project Operations.
- 4.4** Notwithstanding Section 4.3 above, to the extent that any of the agreements listed in Section 4.1 provide for the payment of a purchase price, license fee, rent, or other consideration in exchange for the transfer from a third party property owner to the City of property, an interest in property or a contractual right to use property forming part of the Lands, such purchase price, license fee, rent, or other consideration shall be paid by the City and not by Project Co, except to the extent that such purchase price, license fee, rent, or other consideration is paid with respect to an Additional Property Interest other than an Additional Property Interest acquired subject to the exception described in Section 3.4(vi) of this Schedule 33.

4.5 STANDARD AGREEMENTS

- (a) For certain parts of the Lands, the City will enter into easement, license, or similar agreement(s) after Financial Close. The City intends to enter into such agreement(s) on substantively the same terms and conditions as an existing easement, license or similar agreement that has been entered into by the City and that is provided as Background Information prior to Financial Close or are currently contemplated in the “Restrictions and Requirements” column of Part B (the “**Standard Agreements**”), copies of which are included in the folder titled “Agreements” in the Data Room. If, after Financial Close,
- (i) the City enters into one or more easement, license or similar agreement(s) in respect of any part of the Lands; or
 - (ii) the City acquires any interest in or right to use any part of the Lands subject to any easement, license or similar agreement(s),

and such agreement(s) have substantively the same terms and conditions as the Standard Agreements, such agreement(s) shall be treated, for the purposes of Section 15 of the Project Agreement and for the purpose of Schedule 16 – Encumbrances, as though Project Co had knowledge of such agreements prior to Financial Close. This Section 4.5 shall not apply in circumstances where the City enters into an easement, license, or similar agreement after Financial Close on terms and conditions materially different from the Standard Agreement if such material differences cause a delay to Project Co in performing the Construction Activities, create additional material obligations or liabilities for Project Co, or cause a material increase in cost to Project Co, except to the extent that such easement, license or agreement relates to an Additional Property Interest, in which case the provisions of Section 8 of this Schedule 33 shall apply unless

the Additional Property Interest is acquired subject to the exception described in Section 3.4(vi) of this Schedule 33.

5. USE OF CITY ROAD ALLOWANCE LANDS

The use of City Road Allowance Lands or any part thereof by Project Co, including but not limited to the term of such use and the date upon which Project Co may commence any Construction Activities on City Road Allowance Lands or any part thereof is subject to the terms of required permits and approvals, including Road Cut Permits and Temporary Construction-Related Encroachment Permits, to be obtained by Project Co in accordance with Schedule 32 – City Permits, Licenses, Approvals and Authorizations.

6. REPORT CARD PROCEDURE – TEMPORARY USE LANDS

Without altering Project Co's obligations to landscape, restore, remediate and/or reinstate the Lands or adjacent lands in accordance with the Project Agreement, including in accordance with Section 16.2 of the Project Agreement, Schedule 15 – Output Specifications and Schedule 17 – Environmental Obligations, for all parcels forming part of the Lands which are designated in the “Restrictions and Requirements” column of the Lands Table as a “**Report Card Parcel**”, Project Co shall comply with the protocol described in this Section 6.

6.1 Report Card

Following the completion by Project Co of all Construction Activities on any Report Card Parcel, and at least thirty (30) days prior to the end of the term of use of such Report Card Parcel as specified in the Lands Table, Project Co shall submit to the City, as part of the Monthly Environmental Report required pursuant to Section 3.10(b) of Schedule 17 – Environmental Obligations, a summary report card in the form attached in Part C of this Schedule 33 together with the attachments set out therein for each Report Card Parcel (a “**Report Card**”).

6.2 City Review of Report Card

Within Twenty Five (25) days of receipt of a Report Card, the City shall notify Project Co if the City has an objection to the information contained in, or the steps taken by Project Co as set out in the Report Card, or requires additional environmental investigations in accordance with Section 16.2 of the Project Agreement and/or Schedule 17 – Environmental Obligations.

6.3 Remediation and Reinstatement During Term

The remediation of any Contamination and/or the reinstatement of any property which Project Co is required to undertake in accordance with Section 16.2 of the Project Agreement, Schedule 15– Output Specifications and/or Schedule 17– Environmental Obligations shall be completed prior to the expiry of the term of use for such property as specified in the Lands Table failing which, in addition to any other obligations of Project Co contained in the Project Agreement, Project Co shall be responsible for indemnifying and/or reimbursing the City with respect to all costs, claims and/or damages incurred by the City as a result of any failure to return possession of the property to the owner of the property prior to the end of the term of use described in the Lands Table.

7. ENVIRONMENTAL INVESTIGATION REPORTS

Information regarding the environmental condition of parts of the Lands, including information about Contamination on, in, under or migrating from parts of the Lands, is contained in the Background Information. In some instances, additional site specific environmental investigation reports have been included in the Background Information, in which case the City has made efforts to provide references to the relevant Property Request Plans in Schedule 17 – Environmental Obligations; however, the inclusion of Property Request Plan references in Schedule 17 – Environmental Obligations shall in no way limit Project Co's obligations pursuant to Section 16.2 of the Project Agreement.

8. ADDITIONAL PROPERTY INTERESTS

8.1 Requests for Additional Property Interests

The following provisions shall be in addition to Section 14.6 of the Project Agreement governing requests for Additional Property Interests by Project Co.

- (a) The City will only consider requests for Additional Property Interests:
 - (i) During the sixty (60) day period commencing nine (9) months following Financial Close (the “**First Additional Property Interests Request Period**”); and,
 - (ii) During the sixty (60) day period commencing eighteen (18) months following Financial Close (the “**Final Additional Property Interests Request Period**”).
- (b) Every request for Additional Property Interests submitted by Project Co shall:
 - (i) include a Property Request Plan prepared by Project Co at Project Co's cost describing the Additional Property Interest, including stratification if appropriate;
 - (ii) state the proposed Commencement Date and duration for the Additional Property Interest;
 - (iii) detail Project Co's reasons for requesting the Additional Property Interest and provide a drawing or sketch describing the horizontal and vertical dimensions of any New Municipal Infrastructure, System Infrastructure, New Utility Company Infrastructure and/or other infrastructure to be installed and/or constructed by Project Co within the boundaries of the Additional Property Interest; and
 - (iv) indicate all reasonably foreseeable implications of acquiring the Additional Property Interest, including whether the acquisition of the Additional Property Interest is expected to result in cost savings for the City from a design, engineering or construction perspective.
- (c) Project Co shall pay to the City, in respect of any request for an Additional Property Interest, an administration fee calculated as follows:
 - (i) For each Additional Property Interest requested during the First Additional Property Interests Request Period, a fee of [REDACTED] Dollars, (\$[REDACTED]); and,

- (ii) For each Additional Property Interest requested during the Final Additional Property Interests Request Period, a fee of [REDACTED] Dollars, (\$[REDACTED]).
- (d) As soon as practicable and in any event within 15 Business Days after receipt of a request for Additional Property Interests, the City shall decide whether or not it is prepared to consider the request and shall either advise Project Co that it has elected not to consider the request or shall deliver to Project Co an approximate estimate of:
 - (i) the time which the City anticipates will be required to secure the Additional Property Interest; and,
 - (ii) the anticipated cost of acquiring the Additional Property InterestThe foregoing approximate estimates shall be in no way binding upon the City and shall not limit Project Co's obligations in Section 8.2(c).
- (e) Project Co acknowledges and agrees that any decision of the City pursuant to Section 8.1(d) above shall be final and binding on the Parties and in the event that the City elects not to consider the acquisition of any Additional Property Interest, Project Co acknowledges and agrees that the City's decision shall not be subject to resolution pursuant to Schedule 27 – Dispute Resolution Procedure.
- (f) If the City, in its sole discretion, elects to consider a request for an Additional Property Interest, the City shall be entitled to retain the administration fee payable in respect of such request for such Additional Property Interest in accordance with Section 8.1(c) above. Such fees are in addition to the costs payable by Project Co in accordance with Section 8.2(c) below and the City shall have no obligation to refund any part of such administrative fee whether or not the request for Additional Property Interests is withdrawn by Project Co as contemplated in 8.1(g)(i) below or whether or not the Additional Property Interest is acquired or accepted as part of the Lands for any reason whatsoever.
- (g) As soon as practicable, and in any event within 15 Business Days after the later of the date the estimate described in Section 8.1(d) above was delivered, Project Co shall either:
 - (i) withdraw its request for the Additional Property Interest by written notice to the City; or
 - (ii) issue a written confirmation directing the City to proceed with the acquisition of the Additional Property Interest.If Project Co does not issue the confirmation described in Section 8.1(g) within such 15 Business Days, then, the request for Additional Property Interests shall be deemed to have been withdrawn. If Project Co does issue the confirmation described in Section 8.1(g) within such 15 Business Days, the City shall, subject to the provisions of Section 8.2 below, proceed with the acquisition of the Additional Property Interest.

8.2 Acquisition of Additional Property Interests

- (a) Notwithstanding anything to the contrary in the Project Agreement, the City's failure to acquire any Additional Property Interest, or its failure to acquire any Additional Property Interest on or

prior to the Commencement Date proposed by Project Co, shall not constitute a Delay Event, a Compensation Event, a Relief Event or a City Event of Default under the Project Agreement.

- (b) The City shall be entitled to abandon the acquisition of any Additional Property Interest at any time, for any reason and in its sole and absolute discretion, in which case the Additional Property Interest will not form part of the Lands and will not be included in the license to be granted to Project Co in accordance with Section 14.1 of the Project Agreement.
- (c) Project Co shall be responsible for all costs and expenses incurred by the City in connection with the acquisition of any Additional Property Interest, irrespective of whether the acquisition of the Additional Property Interest is completed and irrespective of whether the Additional Property Interest is acquired by negotiation or expropriation, including but not limited to all consideration paid to the owner, legal costs, including legal costs incurred by the City and third party legal costs, land surveying and appraisal costs, including third party land surveying and appraisal costs, administrative costs, the market value of the Additional Property Interest, disturbance damages, injurious affection and any and all compensation payable under the *Expropriations Act*, R.S.O. 1990, c. E. 26, if applicable, and the City shall be entitled, in accordance with Section 32.12 of the Project Agreement, to set off any such costs and expenses against any amounts otherwise due to Project Co pursuant to the terms of this Project Agreement.
- (d) Notwithstanding any provision of the Project Agreement to the contrary, including but not limited to Section 16.2, 16.3 and 16.4 of the Project Agreement, Project Co shall be responsible for any Contamination on, in or under, or migrating to or from any new parcel of land or any addition to any parcel forming part of the Lands acquired by the City as an Additional Property Interest and for any Species-at-Risk, fossils, artifacts and other objects having artistic, historic, archaeological or monetary value, including human remains and burial sites which may be found on or at any new parcel of land or any addition to any parcel forming part of the Lands acquired by the City as an Additional Property Interest. Project Co may request the opportunity to undertake additional investigations with respect any Additional Property Interest and, if such additional investigations are undertaken, Project Co shall provide the results of such investigations to the City before the City completes the acquisition of the Additional Property Interest. In the event that the City is unable to obtain the consent of the relevant property owner with respect to any additional investigation requested by Project Co pursuant to this Section 8.2(d), the City shall notify Project Co that it is unable to obtain the required consent, in which case Project Co may, subject to its obligations in Section 8.2(c), direct the City to abandon the acquisition of the relevant Additional Property Interest. Subject to this Section 8.2(d), the City shall have no obligation to conduct any investigation in connection with the acquisition of an Additional Property Interest.
- (e) The terms of any agreement, or amendment to an existing agreement, negotiated by the City with respect to the acquisition of any Additional Property Interest shall be treated, for the purposes of Section 15 of the Project Agreement and for the purpose of Schedule 16 – Encumbrances, as Encumbrances of which Project Co had knowledge prior to Financial Close provided, however, that if such an agreement or amendment is not a Standard Agreement, the City shall provide a copy of any such agreement or amendment to Project Co prior to concluding the agreement or amending agreement. Within ten (10) business days of delivery by the City of a copy of any agreement or amendment to Project Co, Project Co may, subject to its obligations in Section 8.2(c), direct the City to abandon the acquisition of the relevant Additional Property Interest, failing which Project Co shall be deemed to have accepted the terms of the agreement or amending agreement.

- (f) Project Co may, from time to time request and the City shall provide an accounting of the costs incurred in respect of any acquisition of any Additional Property Interest by the City.

9. PROPERTY REQUEST PLANS

9.1 Conflict

In the event of any conflict between information contained on the face of a Property Request Plan and the Lands Table, the provisions contained in the Lands Table shall prevail.

9.2 Building Overlays

Building overlays included in Property Request Plans suggest the approximate extent of existing building envelopes only. Unless otherwise expressly provided in the Lands Table or in Schedule 15 – Output Specifications, notwithstanding the location of any building overlay, the grant of the non-exclusive license, rights of use and access to any parcel forming part of the Lands extends only to within one hundred and fifty millimetres (150mm) from any existing building or structure. The City makes no representation as to the accuracy or completeness of building overlays included in Property Request Plans.

PART B –LANDS TABLE

[REDACTED]

PART C –FORM OF REPORT CARD

Report Card

Property Description:

PRP Reference:

Commencement Date:

Expected date of completion of Construction Activities and/or Works:

Description of Use which Project Co. has put to the Report Card Parcel (include particulars):	
Description of Any Physical Alteration to Report Card Parcel:	
Summary of Baseline Conditions (including reference to relevant Background Information):	
Summary of Spill Reports (append reports):	
Volume of soil imported (append lab reports):	
Description of any soil or groundwater sampling (include results)	
Follow up Environmental Investigation Recommended (include detail):	

Every Report Card shall include the following attachments:

- (1) Property Request Plan(s) (including with relevant site plans describing Report Card Parcel).
- (2) Lab reports with respect to imported soils (if any).
- (3) Spill reports (if any).
- (4) Copies of relevant Background Information or other environmental investigation reports.
- (5) Soil and Groundwater Sampling Reports (if any).
- (6) A summary of all reinstatement, restoration and/or rehabilitation works undertaken in accordance with Parts 1 and 6 of Schedule 15-2 or otherwise is required for all Report Card Parcels:

- i. Designated Temporary Mobilization Lands (TM); and/or
- ii. Where a significant grade change has occurred as a result of Construction Activities

SCHEDEULE 34

[Intentionally Deleted]

SCHEDULE 35

INTELLECTUAL PROPERTY

1. INTERPRETATION

1.1 Definitions: In this Schedule 35, unless the context indicates a contrary intention, terms which are defined in the Project Agreement (and not otherwise defined in this Schedule 35 – Intellectual Property) shall have meanings given to them in the Project Agreement and the following terms shall have the following meanings:

- (a) “**Assigned Intellectual Property**” has the meaning given in Section 2.5(a).
- (b) “**Assignee**” has the meaning given in Section 2.5(a).
- (c) “**Assignor**” has the meaning given in Section 2.5(a).
- (d) “**City Intellectual Property**” means:
 - (i) Intellectual Property that is Owned, created, developed or acquired by City or any City Personnel:
 - (A) prior to the Project Term; or
 - (B) during the Project Term but outside the Project Scope; or
 - (C) during the Project Term and within the Project Scope, but which is not Project Co Intellectual Property, Subcontractor Intellectual Property or Third Party Intellectual Property;
 - (ii) the Developed Intellectual Property, excluding any Developed Intellectual Property that is specified in a Variation or by separate agreement of City and Project Co to be Owned by Project Co;
 - (iii) any other Project Data that is specified in a Variation or by separate agreement of City and Project Co to be Owned by City; and
 - (iv) subject to Section 49.4 of the Project Agreement, all Modifications to any of the foregoing, whether made by or on behalf of Project Co, City or any Subcontractor alone, jointly with each other or with any other person;

and which is used by City, or required to be used by Project Co or a Subcontractor, in the performance of their respective obligations in respect of the Project or under the Project Agreement.

- (e) “**City Personnel**” means persons acting on behalf of City or employed, engaged or retained by City in connection with the performance of City’s obligations in connection with the Project, including City’s consultants, contractors and subcontractors and the employees, officers, directors, volunteers and agents of City and its direct and indirect consultants, contractors and subcontractors, excluding Project Co and any Subcontractor and their respective Personnel.

- (f) **“City Supplied Third Party Intellectual Property”** means Intellectual Property, Owned by a person other than City, Project Co, a Subcontractor or any of their respective Personnel that is delivered, supplied or otherwise provided by City to Project Co under the Project Agreement for the purpose of performing the Works and the Project, including any Background Information.
- (g) **“City Trade-Marks”** means the Trade-Marks Owned by the City.
- (h) **“Copyleft Licence”** means any licence that requires, as a condition of use, modification and/or distribution of Copyleft Materials, that such Copyleft Materials, or other software or content incorporated into, derived from, used, or distributed with such Copyleft Materials: (i) in the case of software, be made available or distributed in a form other than binary (e.g., source code form), (ii) be licensed for the purpose of preparing derivative works, (iii) be licensed under terms that allow the products or portions thereof or interfaces therefor to be reverse engineered, reverse assembled or disassembled (other than by operation of law), or (iv) be redistributable at no license fee. Copyleft licences include the GNU General Public License, the GNU Lesser General Public License, the Mozilla Public License, the Common Development and Distribution License, the Eclipse Public License, and all Creative Commons “sharealike” licenses.
- (i) **“Copyleft Materials”** means any software or content subject to a Copyleft Licence.
- (j) **“Deliverable”** means any item required to be supplied or delivered by Project Co to the City within the Project Scope, including Equipment, Project Software, Project Data and all other deliverable requirements specified in Schedule 10 – Review Procedures.
- (k) **“Delivered”** means, with respect to any Intellectual Property, that such Intellectual Property is:
- (i) a Deliverable;
 - (ii) incorporated, embedded or otherwise included in any Deliverable, the Works (excluding the Vehicles) or any part of the work delivered as part of the Project Operations;
 - (iii) necessary for the undertaking, completion and performance of the Project Operations or any Equivalent Activity; or
 - (iv) necessary for the Use by the City or a subsequent Licensee of any Deliverable, the Works, or any part of the work delivered as part of the Project Operations or any Intellectual Property in accordance with the rights granted to the City hereunder;
- or that the Use of such Intellectual Property for any of the purposes set out in clause (iii) or (iv) above would infringe the Intellectual Property rights of any Person.
- (l) **“Developed Intellectual Property”** means Intellectual Property that is:
- (i) created or developed, or Ownership of which is acquired, by Project Co, any Subcontractor or any Project Co Personnel, or Subcontractor Personnel, whether alone or together with each other or any other person, during the Project Term and within the Project Scope;

(ii) created, developed or Ownership of which is acquired for the purposes of the Project or the Project Operations; and

(iii) created or designed based on functional, design and performance specifications provided by the City, or City Personnel, or City Parties;

and, for greater certainty, Developed Intellectual Property does not include any Project Co Intellectual Property used to develop or create the Developed Intellectual Property.

(m) “**Embedded Software**” means the Project Co Embedded Software, Subcontractor Embedded Software and Third Party Embedded Software.

(n) “**Equipment**” means all electrical and mechanical equipment, machinery, computer hardware and systems comprising or used in the Works other than as is comprised or contained within the Vehicles.

(o) “**Equivalent Activity**” means any activity, undertaking or operation relating to the Works done by the City, any permitted assignee of the City pursuant to Section 57.2 of the Project Agreement and/or any other person acting on behalf of or under the authority of the City, which activity, undertaking or operation if done by Project Co would be within the Project Scope, including the Project Operations.

(p) “**Escrow Agent**” means a recognized provider of escrow services selected by Project Co and approved by the City and having a location within the Province of Ontario with whom the Escrow Materials will be deposited in accordance with Section 3.11.

(q) “**Escrow Agreement**” means an escrow agreement that meets the requirements of Section 3.11 and pursuant to which Escrow Materials are held by the Escrow Agent and the City are designated as a beneficiary party.

(r) “**Escrow Materials**” means:

(i) with respect to Software, the Source Materials for that Software; and

(ii) with respect to Embedded Software, the Source Materials for that Embedded Software.

(s) “**Escrow Provider**” means:

(i) Project Co in respect of the Project Co Licensed Software;

(ii) the applicable Subcontractor in respect of any Subcontractor Licensed Software;

(iii) the applicable third party licensor in respect of any Third Party Licensed Software;

(iv) Project Co in respect of the Project Co Embedded Software;

(v) the applicable Subcontractor in respect of any Subcontractor Embedded Software; and

(vi) the applicable third party licensor in respect of any Third Party Embedded Software.

- (t) “**Expanded Purposes**” means (i) the Permitted Purposes; and (b) for any other purpose of the City.
- (u) “**Licence**” means a non-exclusive license or sub-license, as applicable, granting the rights and subject to the restrictions and limitations set out in this Schedule 35.
- (v) “**Licensed Intellectual Property**” means, with respect to any Licence, the Intellectual Property that is within the scope of that Licence as provided for in this Schedule 35.
- (w) “**Licensee**” means, in respect of any Licence granted or required to be granted by Project Co pursuant to this Schedule 35, the City or any permitted assignee under Section 57.2 of the Project Agreement that is the holder of that Licence at the relevant time.
- (x) “**Licensor**” means Project Co in respect of the Project Co Licensed Software, the applicable Subcontractor in respect of any Subcontractor Licensed Software, or the applicable third party licensor in respect of any Third Party Licensed Software.
- (y) “**Limited Modification Rights**” in respect of a Software or an Embedded Software, means the right to configure, customize or modify such Software or Embedded Software, without access to the Source Materials thereto, in order to have complete and unrestricted access to, or otherwise Use, all the functionalities within such Software or Embedded Software that is licensed to the City under this Schedule 35.
- (z) “**Modification**” means all corrections, modifications, changes, enhancements, improvements, supplements, customizations or derivative works, and includes the Limited Modification Rights, and “**Modify**” means to make a Modification.
- (aa) “**Open Source Licence**” means any licence meeting the Open Source Definition (as promulgated by the Open Source Initiative) or the Free Software Definition (as promulgated by the Free Software Foundation), or any substantially similar licence, including any licence approved by the Open Source Initiative, or any Creative Commons Licence. For the avoidance of doubt, Open Source Licences include Copyleft Licences.
- (bb) “**Open Source Materials**” means any software or content subject to an Open Source Licence.
- (cc) “**Operational and Maintenance Data**” means the data, logs and recordings created or generated during the operation and maintenance of the Expanded Trillium Line, whether stored in a data warehouse, Vehicle or any other location, including all CCTV recordings, voice recordings (PA, radio, telephone, intercom), SCADA logs, S&TCS logs, IAC logs, Vehicle logs, PVIS messages and other logs and reports related to the operation and maintenance of the Expanded Trillium Line.
- (dd) “**Ownership**” means, in respect of any Intellectual Property, ownership of all right, title and interest in and to that Intellectual Property and “**Own**”, “**Owned**” and “**Owner**” shall have corresponding meanings.

(ee) “**Permitted Purposes**” means:

- (i) during the Project Term, performance of the City’s obligations and the exercise of the City’s rights under the Project Agreement and any other agreements relating to the Project;
- (ii) during the Project Term, the City’s participation in Project Operations and any activity, undertaking or operation within the Project Scope, including its participation in the design, construction, operation, maintenance, repair, correction and renovation of the Works;
- (iii) after the Project Term, any Equivalent Activity;
- (iv) both during and after the Project Term, the use, integration and interoperation of the Works with:
 - (A) any existing or other transit projects undertaken by or on behalf of the City or interfacing with the City projects, including any Integrated System Extension; and
 - (B) any existing or after-acquired systems, software, technology or equipment related to the use, operation, maintenance, repair, correction, renovation of the Works and any Integrated System Extension;

but, for clarity, not any system that is not the Works or an Integrated System Extension;

- (v) both during and after the Project Term, the integration and interoperation of the Works with any existing or other transit projects undertaken by or on behalf of the City or interfacing with the City projects;
- (vi) both during and after the Project Term, and so long as the Licensee is the City or other Governmental Authority:
 - (A) the provision of governmental services and the conduct of operations and activities provided in connection or otherwise associated with the Works and any Integrated System Extension and the Lands by the City or any Governmental Authority or any emergency service provider; and
 - (B) the development of transportation standards, policies and procedures.

(ff) “**Personnel**” means (i) in reference to Project Co, the Project Co Personnel, (ii) in reference to the City, City Personnel, and (iii) in reference to any Subcontractor, such Subcontractor’s Personnel.

(gg) “**Project Co Embedded Software**” means computer software that is Owned by Project Co and that:

- (i) is included, embedded or otherwise incorporated in Equipment;
- (ii) is not licensed separately and apart from that Equipment; and

(iii) is not subject to a separate warranty, and is not subject to maintenance and repair separately from, that Equipment.

(hh) “**Project Co Intellectual Property**” means:

(i) Intellectual Property that is Owned, created, developed or acquired by Project Co or any Project Co Personnel:

(A) prior to the Project Term; or

(B) during the Project Term but outside the Project Scope; or

(C) during the Project Term and within the Project Scope, but which is not City Intellectual Property, City Supplied Third Party Intellectual Property, Subcontractor Intellectual Property, Intellectual Property of the Revenue Vehicle Supplier or Third Party Intellectual Property;

(ii) the Project Co Licensed Software;

(iii) the Project Co Embedded Software;

(iv) Project Co’s Technical Information;

(v) the Project Intellectual Property;

(vi) the Project Data, excluding: (A) all Operational and Maintenance Data; and (B) any other Project Data that are specified in a Variation or by separate agreement of the City and Project Co to be Owned by the City;

(vii) any Developed Intellectual Property that is specified in a Variation or by separate agreement of the City and Project Co to be Owned by Project Co; and

(viii) Subject to Section 49.4 of the Project Agreement, all Modifications to any of the foregoing, whether made by or on behalf of Project Co, the City, City Parties, or any Subcontractor alone, jointly with each other or with any other person.

(ii) “**Project Co Licensed Software**” means any computer software that is Owned by Project Co, is not Project Co Embedded Software and is delivered, supplied or otherwise provided by Project Co under the Project Agreement as or as part of any Deliverable.

(jj) “**Project Co Personnel**” means persons acting on behalf of Project Co or employed, engaged or retained by Project Co in connection with the performance of Project Co’s obligations under the Project Agreement, including Project Co’s consultants, contractors and Subcontractors and the employees, officers, directors, volunteers and agents of Project Co and its direct and indirect consultants, contractors and Subcontractors.

(kk) “**Project Data**” means:

(i) all Design Data;

- (ii) all drawings, reports, documents, plans, formulae, calculations and other data prepared by Project Co relating to the performance of the Maintenance and Rehabilitation Services;
 - (iii) all Operational and Maintenance Data; and
 - (iv) any other materials, documents and/or data prepared by or on behalf of Project Co or Subcontractors in relation to the Project Operations or the Project Agreement, excluding the Jointly Developed Materials, the Background Information and any Developed Intellectual Property.
- (ll) **“Project Intellectual Property”** means Intellectual Property that is created or developed, or Ownership of which is acquired, by Project Co, any Subcontractor or any Project Co Personnel or Subcontractor Personnel, whether alone or together with each other or any other person, during the Project Term and within the Project Scope, and which is created, developed or acquired for the purposes of the Project or the Works, but excluding Project Software, Embedded Software, Project Data, Developed Intellectual Property and Technical Information.
- (mm) **“Project Scope”** means the scope of the Project, including the performance of all Project Operations, as defined by the terms of the Project Agreement.
- (nn) **“Project Software”** or **“Software”** means any Project Co Licensed Software, Subcontractor Licensed Software and Third Party Licensed Software, but does not include Embedded Software.
- (oo) **“Software Maintenance and Support”** means, with respect to any Software, the software maintenance and support services for that Software that form part of the Maintenance and Rehabilitation Services or that are provided separately under a software maintenance and support agreement with the licensor of that Software.
- (pp) **“Software Tools”** means, with respect to any Software or Embedded Software, any routines, compilers, bootstraps, analyzers, monitors, toolkits and other software tools used by the licensor of such Software or Embedded Software in connection with the programming, compiling, maintenance, debugging, analysis, configuration, customization, verification or monitoring of such Software or Embedded Software.
- (qq) **“Source Materials”** means:
- (A) a complete source code version of the Software or Embedded Software, in machine-readable form which, when compiled, will produce the executable version of the Software or Embedded Software and in human-readable form with annotations in the English language or such other language as is acceptable to the City, acting reasonably, in both cases on a storage medium suitable for long term archival storage;
 - (B) a complete copy, in English or such other language as is acceptable to the City, acting reasonably, in both electronic and paper form, suitable for long term archival storage, and appropriately labelled to describe the contents thereof, of all applicable documentation and other explanatory materials, including programmer’s notes, technical or otherwise, for the Software or Embedded Software as may be required for a person other than the licensor of the Software

or Embedded Software, using a competent computer programmer possessing ordinary skills and experience, to further develop, maintain and operate the Software or Embedded Software without further recourse to the licensor, which will include, to the extent such items have been or are created for such Software or Embedded Software, general flow charts, input and output layouts, field descriptions, volumes and sort sequence, data dictionary, file layouts, processing requirements and calculation formulae, circuit diagrams and the details of all algorithms and which shall be deemed to include those materials, as revised from time to time; and

- (C) all Software Tools for such Software or Embedded Software, to the extent not previously delivered with the Software or Embedded Software.
- (rr) “**Subcontractor Embedded Software**” means computer software that is Owned by a Subcontractor and that:
- (i) is included, embedded or otherwise incorporated in Equipment;
 - (ii) is not licensed separately and apart from that Equipment; and
 - (iii) is not subject to a separate warranty, and is not subject to maintenance and repair separately from, that Equipment.
- (ss) “**Subcontractor Intellectual Property**” means, with respect to each Subcontractor:
- (i) Intellectual Property that is Owned, created, developed or acquired by that Subcontractor:
 - (A) prior to the Project Term; or
 - (B) during the Project Term but outside the Project Scope; or
 - (C) during the Project Term and within the Project Scope, but which is not City Intellectual Property, City Supplied Third Party Intellectual Property, Project Co Intellectual Property, Intellectual Property of the Vehicle Manufacturer or Third Party Intellectual Property;
 - (ii) the Subcontractor Licensed Software;
 - (iii) the Subcontractor Embedded Software;
 - (iv) the Subcontractor’s Technical Information; and
 - (v) subject to Section 49.4 of the Project Agreement, all Modifications to any of the foregoing, whether made by or on behalf of Project Co, the City, City Parties, or any Subcontractor alone, jointly with each other or with any other person.
- (tt) “**Subcontractor Licensed Software**” means any computer software that is Owned by a Subcontractor, is not Subcontractor Embedded Software and is delivered, supplied or otherwise provided by the Subcontractor under the Project Agreement, the Subcontract as or as part of any Deliverable.

- (uu) “**Subcontractor Personnel**” means, with respect to any Subcontractor, persons acting on behalf of that Subcontractor or employed, engaged or retained by that Subcontractor in connection with the performance of that Subcontractor’s obligations under the Project Agreement or the Subcontract, including the Subcontractor’s consultants, contractors and subcontractors and the employees, officers, directors, volunteers and agents of the Subcontractor and its direct and indirect consultants, contractors and subcontractors.
- (vv) “**System Architecture and Look and Feel**” means any work product, including any Intellectual Property therein, Owned, created, developed, acquired or licensed whether by Project Co or any Subcontractor in respect of any aspect of the architecture or look and feel of the System, including without limitation all designs, design details, drawings, specifications, prototypes, documentation, works and all instruments of architectural service that relate to the design identity, look and feel of any aspect of the architectural and landscape design whether in respect of the stations, stops, landscape and urban design elements, furniture, fit and finish, or any other aspect of the System.
- (ww) “**Technical Information**” means technical information relating to any Equipment supplied or Intellectual Property licensed under the Project Agreement, including software documentation, user and operating manuals, maintenance and repair manuals, parts lists and other materials relevant to the use, operation, maintenance or repair of such Equipment or Intellectual Property.
- (xx) “**Third Party Embedded Software**” means computer software that is not Owned by the City, Project Co or a Subcontractor and that:
- (i) is included, embedded or otherwise incorporated in Equipment;
 - (ii) is not licensed separately and apart from that Equipment; and
 - (iii) is not subject to a separate warranty, and is not subject to maintenance and repair separately from, that Equipment.
- (yy) “**Third Party Intellectual Property**” means Intellectual Property Owned by a person other than the City, Project Co, a Subcontractor or any of their respective Personnel that is delivered, supplied or otherwise provided by Project Co or a Subcontractor under the Project Agreement as or as part of any Deliverable, including Third Party Licensed Software and Third Party Embedded Software.
- (zz) “**Third Party Licensed Software**” means any computer software that is not Owned by the City, Project Co or a Subcontractor, is not Third Party Embedded Software and is delivered, supplied or otherwise provided by Project Co or a Subcontractor under the Project Agreement as or as part of any Deliverable.
- (aaa) “**Trade-Mark Licence Agreement**” means the trademark licence agreement entered into between Project Co and the City providing for the license by the City of City Trade-Marks to Project Co, being substantially in the form of Appendix A attached to this Schedule 35.
- (bbb) “**Use**” means, with respect to any Intellectual Property, to do any and all things with that Intellectual Property that the Owner of that Intellectual Property could do, including to load, transmit, access, execute, use, store, display, copy, adapt, translate, incorporate into other

materials, practice, make and have made, but specifically excluding the right to Modify and subject to any limitations in the provision of this Schedule 35 pursuant to which a Licence is granted.

2. OWNERSHIP

2.1 Project Co Intellectual Property: Project Co shall be and remain the sole and exclusive Owner of the Project Co Intellectual Property. For certainty, nothing in this Schedule 35 shall transfer to Project Co any Ownership of, or grant to Project Co any right in respect of, City Intellectual Property used in the creation or development of or that is embodied, incorporated, embedded, otherwise included or illustrated in any Project Co Intellectual Property, except for the Licence granted under Section 3.1.

2.2 City Intellectual Property: The City shall be and remain the sole and exclusive Owner of City Intellectual Property. For certainty, nothing in this Schedule 35 shall transfer to the City any Ownership of, or grant to the City any right in respect of, the Project Co Intellectual Property used in the creation or development of or that is embodied, incorporated, embedded, otherwise included or illustrated in any City Intellectual Property, except for the Licence granted under Section 3.2.

For greater clarity and without limiting the City's Ownership rights, Project Co acknowledges and agrees that the City shall be entitled to Use and Modify the Developed Intellectual Property (other than any Developed Intellectual Property that is specified in a Variation or by separate agreement of the City and Project Co to be Owned by Project Co) in any manner and for any purpose whatsoever, including without limitation in connection with the Expanded Purposes.

2.3 Subcontractor Intellectual Property: As between the City and Project Co, but subject to any agreement to the contrary between Project Co and any Subcontractor, each Subcontractor shall be and remain the sole and exclusive Owner of its Subcontractor Intellectual Property.

2.4 City Supplied Third Party Intellectual Property: As between the City and Project Co, but subject to any agreement to the contrary between the City and the Owner of any City Supplied Third Party Intellectual Property, the Owner of any City Supplied Third Party Intellectual Property shall be and remain the sole and exclusive Owner of any City Supplied Third Party Intellectual Property. For certainty, nothing in this Schedule 35 shall transfer to Project Co or any Subcontractor any Ownership of, or grant to Project Co or any Subcontractor any right in respect of, City Supplied Third Party Intellectual Property used in the creation or development of or that is embodied, incorporated, embedded, otherwise included or illustrated in any Project Co Intellectual Property or any City Intellectual Property or any Subcontractor Intellectual Property, except for the Licence granted under Section 3.1.

2.5 Assignments

(a) If, notwithstanding Section 2.1, 2.2, 2.3 or 2.4 or Section 49.4 of the Project Agreement, either party (the “**Assignor**”) retains, acquires or owns any right, title or interest in or to any Intellectual Property that is to be Owned by another person (the “**Assignee**”) pursuant to Section 2.1, 2.2, 2.3, or 2.4 or Section 49.4 of the Project Agreement as applicable, (the “**Assigned Intellectual Property**”), then the Assignor will assign, and for no further consideration and without any further act or formality does hereby irrevocably assign, to the Assignee all of the Assignor’s

worldwide right, title and interest in and to the Assigned Intellectual Property free and clear of all liens, claims, charges or encumbrances, but subject to any Licences granted or required to be granted by the Assignee to the Assignor pursuant to this Schedule 35.

- (b) If and to the extent that the assignment pursuant to Subsection 2.5(a) is not effective on the date hereof or on any future date, either generally or pursuant to the laws of any jurisdiction, then any and all right, title and interest in and to the Assigned Intellectual Property that is retained, acquired or owned by the Assignor (collectively, the “**Trust Rights**”), will be held by the Assignor in trust for the exclusive benefit and use of the Assignee, except for any Licences granted or required to be granted by the Assignee to the Assignor pursuant to this Schedule 35, and the Assignor will execute and deliver to the Assignee such transfers, assignments, documents and instruments as may be necessary to transfer and assign to the Assignee the Trust Rights, free and clear of all liens, claims, charges or encumbrances, promptly upon receipt thereof from the Assignee, and will otherwise cooperate with the Assignee to give effect to, record and register the Assignee’s ownership of the Trust Rights.
- (c) Project Co will include in each Subcontract provisions equivalent to Subsections 2.5(a) or 2.5(b) with respect to: (i) City Intellectual Property, Jointly Developed Materials, Developed Intellectual Property, Project Data and any Modifications thereto, and shall enforce those provisions against each Subcontractor to the extent necessary to ensure that the City remains at all times the sole and exclusive Owner of all such property; and (ii) the Intellectual Property of the Revenue Vehicle Supplier and City Supplied Third Party Intellectual Property and any Modifications thereto, and shall enforce those provisions against each Subcontractor to the extent necessary to ensure that the Revenue Vehicle Supplier or the Lessor, as applicable, remains at all times the sole and exclusive Owner of all such property.

2.6 Personnel: The City and Project Co shall, and Project Co shall include in each Subcontract an obligation of each Subcontractor to, ensure that their respective Personnel shall:

- (a) by duly executed written agreement or by operation of law, irrevocably and unconditionally sell, assign and transfer to that party all right, title and interest that its Personnel may have in or to any and all Intellectual Property referred to in this Schedule 35 and all Modifications thereto, such that agreements as to Ownership of Intellectual Property pursuant to Sections 2.1, 2.2, 2.3 or 2.4 and Section 49.4 of the Project Agreement and the assignment by that party pursuant to Section 2.5 include all right, title and interest of its Personnel; and
- (b) by duly executed written agreement, irrevocably waive all non-transferable rights, including moral rights, that they have or may have in any Intellectual Property assigned by such Personnel pursuant to Subsection 2.6(a) in favour of the assignee and its successors, assigns and licensees.

3. LICENCES

3.1 Licence by the City to Project Co

- (a) Subject to Subsection 3.1(d), the City hereby grants to Project Co:

- (i) a royalty free, fully paid-up, limited Licence to Use and Modify City Intellectual Property for the sole purpose of and only to the extent necessary for the performance by Project Co of the Project Scope and its obligations under the Project Agreement;

- (ii) a limited Licence to Use City Supplied Third Party Intellectual Property for the sole purpose of and only to the extent necessary for the performance by Project Co of the Project Scope and its obligations under the Project Agreement.
- (b) Subject to Subsection 3.1(d), Project Co may sublicense its rights under the Licence granted in Subsection 3.1(a) to any Subcontractor for the sole purpose of and only to the extent necessary for the performance by that Subcontractor of its obligations under its Subcontract.
- (c) Except as provided in Subsection 3.1(b), Project Co may not transfer, assign, sublicense or otherwise dispose of the Licence granted under Subsection 3.1(a) without the prior written consent of the City, which consent may be given or refused by the City in its absolute and unfettered discretion.
- (d) The Licence of any City Supplied Third Party Intellectual Property pursuant to Subsection 3.1(a) shall be subject to the terms and conditions of the license agreement between the City and the licensor of City Supplied Third Party Intellectual Property. The City will provide to Project Co a copy of any such third party license agreement (which may be redacted as to financial and other terms not relevant to use of City Supplied Third Party Intellectual Property by Project Co and Subcontractors), or where prohibited from doing so by obligations of confidentiality to the third party licensor, a summary of the obligations, limitations and restrictions applicable to use of City Supplied Third Party Intellectual Property by Project Co and Subcontractors. Project Co will comply, and will require any Subcontractor to comply, with the terms and conditions of such third party license agreement (as set out in the copy of the third party license agreement or summary thereof provided by the City to Project Co) to the extent applicable to Project Co and any Subcontractor in the performance of their respective obligations under the Project Agreement and any Subcontract. If requested by the City, Project Co will, and will require any Subcontractor to, execute and deliver to the City and the third party licensor an agreement that includes reasonable terms for the protection of the confidentiality of City Supplied Third Party Intellectual Property and an acknowledgement of the third party licensor's ownership thereof, unless Project Co disputes such ownership.
- (e) [Intentionally deleted].
- (f) The Licence granted to Project Co under: Subsection 3.1(a)(i), and any sublicense granted by Project Co to a Subcontractor thereunder, will terminate upon the expiry or termination of Project Co's services and other obligations under the Project Agreement; Subsections 3.1(a)(ii) and any sublicense granted by Project Co to a Subcontractor thereunder, will terminate upon the earlier of: (A) expiry or termination of Project Co's services and other obligations under the Project Agreement; and (B) the termination of the contract in respect of the applicable City Supplied Third Party Intellectual Property or the City's licence or sublicence rights thereunder.
- (g) The Licences granted to Project Co under Section 3 do not include licences to any City Trade-Marks. The use of any City Trade-Marks shall be governed by the terms of the Trade-Mark Licence Agreement.

3.2 Licence by Project Co to the City

- (a) Project Co hereby grants to the City a Licence to:

- (i) Use and Modify the Project Co Intellectual Property (excluding Project Co Licensed Software and Project Co Embedded Software) that is Delivered and the Subcontractor Intellectual Property (excluding the Subcontractor Licensed Software and the Subcontractor Embedded Software) that is Delivered;
- (ii) Use, and have Limited Modification Rights to, the Project Co Licensed Software that is Delivered and the Subcontractor Licensed Software that is Delivered and only in respect of the modules that are Delivered; and
- (iii) Use, and have Limited Modification Rights to, the Project Co Embedded Software and the Subcontractor Embedded Software as part of and for the Use of the Equipment in which such software is included, embedded or otherwise incorporated;

for the Permitted Purposes. Subject to Section 3.11, the Licenses granted pursuant to this Section 3.2 in respect of Project Software and Embedded Software apply to only object code versions thereof and not the source code materials for any such Project Software or Embedded Software.

In addition and notwithstanding any other provision of this Schedule 35, Project Co hereby grants to the City a Licence to Use and Modify any System Architecture and Look and Feel that is not owned by the City pursuant to this Schedule 35, for the Expanded Purposes.

- (b) The Licence granted pursuant to this Section 3.2 will be irrevocable (except as provided in Subsection 3.2(d)), perpetual, royalty free, fully paid-up (upon payment of the fees specified in the Project Agreement for the Deliverable which consists of or incorporates the Licensed Intellectual Property in respect of which the Licence is granted), and permit Use by the City on an enterprise basis without restriction or limitation as to users (whether by number, identity or otherwise), location, capacity, authorized system or otherwise, as part of or in connection with the Works, or in the case of the System Architecture and Look and Feel, in connection with the Expanded Purposes.
- (c) The Licence granted pursuant to this Section 3.2 may be transferred, assigned, sublicensed and otherwise disposed of by the City subject to and in accordance with Section 57.2 of the Project Agreement, provided that the Licence in respect of Project Co Embedded Software and Subcontractor Embedded Software may only be transferred together with the Equipment in which such software is included, embedded or otherwise incorporated.
- (d) The Licence granted pursuant to this Section 3.2 may not be terminated except (i) in the event of the failure of the Licensee to pay the applicable fees as provided for in the Project Agreement for the specific Deliverable which consists of or incorporates the Licensed Intellectual Property, and such failure is not remedied by the Licensee within sixty (60) days after notice by Project Co to the Licensee demanding that such failure be remedied and (ii) in case of wilful breach of the Licence provided by the Revenue Vehicle Supplier only under the Revenue Vehicle Supply Contract by the Licencee or any authorized sublicensee, provided that any such termination shall apply only to the Licensed Intellectual Property to which such failure applied and not to any other Licensed Intellectual Property. Except as specifically provided in this Subsection 3.2(d), Project Co shall not be entitled to terminate or rescind the Licence granted under this Section 3.2, and if the Licensee commits any other breach of or default under this Schedule 35 or the Project Agreement, whether material or not and whether that breach or default is or is not capable of being remedied, Project Co's rights and remedies in respect of that breach or default shall be

limited to such rights and remedies other than termination or rescission of the Licence granted under this Section 3.2 as may exist at law or in equity, it being acknowledged by Project Co that except as provided in this Subsection 3.2(d) the Licence granted under this Section 3.2 is perpetual and irrevocable. No breach of or default under this Schedule 35 by the City shall constitute a repudiation of the Licence granted under this Section 3.2 by the City.

- (e) The Licensee may provide and disclose the Licensed Intellectual Property to any employee, contractor, subcontractor, consultant, service provider, outsourcer or other person retained by the Licensee in connection with the Permitted Purposes, except in respect of the System Architecture and Look and Feel in connection with the Expanded Purposes, and any such employee, contractor, subcontractor, service provider, outsourcer or other person may exercise all rights to Use and Modify the Licensed Intellectual Property as may be granted by the Licensee to such person within the scope of the Licence granted by Project Co to the Licensee pursuant to this Schedule 35, provided that the Licensee shall be responsible for anything done or failed to be done by any employee, contractor, subcontractor, service provider, outsourcer or other person to whom the Licensee provides and discloses the Licensed Intellectual Property, including a breach by any such person of the City's obligations of confidentiality in respect of any Confidential Information that is or is part of Licensed Intellectual Property.
- (f) The Licensee may Use Project Software that is licensed pursuant to this Section 3.2 in multiple environments or instances, including for training, development, testing, staging, and disaster recovery and in a live, production or operating environment.
- (g) The Licensee may make copies of the Licensed Intellectual Property as may be reasonably necessary for Use and Modification of the Licensed Intellectual Property in accordance with the Licence granted pursuant to this Section 3.2 or otherwise this Schedule 35. All such copies shall be Owned by Owner of the original Licensed Intellectual Property and licensed to the Licensee pursuant to this Section 3.2. Except as permitted by this Schedule 35, the Licensee will not copy, Modify, disassemble, reverse engineer, decompile, translate or otherwise obtain or create the source code for any Project Co Intellectual Property, Project Co Licensed Software, Project Co Embedded Software, Subcontractor Intellectual Property, Subcontractor Licensed Software or Subcontractor Embedded Software.
- (h) The Licensee will not remove from any Licensed Intellectual Property any markings or notices with respect to the ownership thereof, copyright therein or the confidentiality thereof.
- (i) Where the City has the right to Modify any Licensed Intellectual Property, Project Co shall ensure that all authors of such Licensed Intellectual Property have waived all moral rights that such authors may have therein in favour of the City and its successors, assigns and licensees.

3.3 Licences with Subcontractors

- (a) Project Co will be responsible to obtain from each Subcontractor the right to grant the Licence under Section 3.2 in respect of the Subcontractor Intellectual Property.
- (b) Project Co will be responsible to obtain from each Subcontractor the right to Use and Modify the Subcontractor Intellectual Property to the extent necessary for Project Co to perform its obligations under the Project Agreement, on such terms as are not in breach of or conflict with the Project Agreement.

- (c) Project Co will be responsible to grant to each Subcontractor the right to Use and Modify City Intellectual Property and Project Co Intellectual Property to the extent necessary for each Subcontractor to perform its obligations under its Subcontract, on such terms as are not in breach of or conflict with the Project Agreement.
- 3.4 Third Party Intellectual Property:** Project Co will not, and will not permit any Project Co Personnel, Subcontractor or Subcontractor Personnel to, incorporate, embed or otherwise include in the Works or any Deliverable any Third Party Intellectual Property unless:
- (a) for Third Party Intellectual Property other than Third Party Embedded Software, such Third Party Intellectual Property is provided by the Owner thereof pursuant to a license agreement that:
- (i) grants to the Licensee rights equivalent to or better than the rights granted under the Licence in Section 3.2, including being assignable in accordance with Subsection 3.2(c), and, where the Third Party Intellectual Property is software or includes software, provides for the maintenance and support of that software on terms acceptable to the City; or
 - (ii) has been approved by the City in writing, which approval may be given or refused by the City in its absolute and unfettered discretion;
- and such license agreement, if not entered into with the City directly, has been assigned or is freely assignable to the City;
- (b) for Third Party Embedded Software, either (i) such Third Party Embedded Software is embedded in Equipment and is not provided by the Owner thereof pursuant to a license agreement, but may be used by the City or any subsequent owner of the machine or equipment as part of and for the intended purposes of such machine or equipment upon the purchase thereof, or (ii) such Third Party Embedded Software is subject to a license agreement that complies with Subsection 3.4(a).
- (c) If Project Co, Project Co Personnel, Subcontractor or Subcontractor Personnel incorporates, embeds or includes any Third Party Intellectual Property in the Works or any Deliverable other than in compliance with this Section 3.4, then in addition to any other rights and remedies the City may have against Project Co, Project Co will at its sole cost and expense take all necessary steps to comply with this Section 3.4 or, if Project Co is unable to do so, to remove such Third Party Intellectual Property and replace it with Project Co Intellectual Property that provides the same functionality and performance as such Third Party Intellectual Property and which will operate within the Works without any degradation thereof or adverse effect thereon, and which will be included in the Project Co Intellectual Property for the purposes of the Licence granted pursuant to Section 3.2.
- 3.5 Non-Assertion:** Project Co agrees not to assert, and to cause its Subcontractors not to assert, any Intellectual Property right against the City or any Licensee that would have the effect of diminishing the rights granted to the City or any Licensee hereunder. Without limiting the generality of the foregoing, Project Co will not sue, and will cause its Subcontractors not to sue, the City or any Licensee on the basis that any Equivalent Activity or the Ownership or Use of the Works or any Deliverable within the scope of the Permitted Purposes infringes any Intellectual Property right of Project Co or any Subcontractor.

- 3.6 Deliveries:** Project Co will deliver to the City all Licensed Intellectual Property at the times specified in the Project Agreement, or where no time is specified, on or before the Final Completion Date or the Termination Date, whichever is first to occur. The media on which Project Software is delivered and tangible copies or embodiments of any Licensed Intellectual Property other than Project Software and will be the property of the City, notwithstanding Project Co's, a Subcontractor's or a third party's Ownership of the Licensed Intellectual Property. If any Licensed Intellectual Property requires software in order to Use that Licensed Intellectual Property, Project Co will ensure that such software will be commercially available to the City at a reasonable license fee, or if such software is not commercially available, Project Co will at its cost provide such software and a license therefor to the City and City Parties on terms and conditions that do not result in any impairment of the City's Use of the Licensed Intellectual Property in accordance with the Licence therefor.
- 3.7 Pass Through Obligations:** Project Co is responsible to include in all contracts with Project Co Personnel and in all Subcontracts with Subcontractors such terms and conditions as may be necessary for Project Co to grant, or obtain for the City, the Ownership, Licences, rights and benefits provided for in this Schedule 35.
- 3.8 Conflicting Software Licences:** All software referenced in this Schedule 35 will be licensed in accordance with this Schedule 35, and any form of software license agreement used or provided by a licensor in association with any such software will be of no force or effect and will not be binding on the City or any other Licensee, even if by its terms such software license agreement is stated to be accepted by the installation or use of the software, and regardless of any acceptance of such software license agreement that is required in order to install or use the software.
- 3.9 Trade-Marks and Names:** Except as expressly set forth: (a) in the Trade-Mark Licence Agreement; (b) the Project Agreement; or (c) otherwise in a writing executed by each of the City and Project Co, neither Party shall use any Trade-Marks owned by the other Party, or use the names or any identifying logos or otherwise of the other Party in any advertising or permit them so to be used.
- 3.10 Open Source.** Project Co shall not, and shall cause the Subcontractor not to, incorporate, embed or include any Open Source Materials in any Deliverables, City Intellectual Property, City Supplied Third Party Intellectual Property, or the Intellectual Property of the Revenue Vehicle Supplier without the prior written consent of the City.
- 3.11 Escrow Agreements**
- (a) If requested by the City (which for the purposes of this Section 3.11 includes any permitted assignee under Section 57.2 of the Project Agreement), at any time during the Project Term, Project Co will, or will require the applicable Subcontractor or third party licensor to, enter into an Escrow Agreement for any Software or Embedded Software (an “**Escrowed Deliverable**”) on terms that comply with this Section 3.11, or amend its existing Escrow Agreement for such Software or Embedded Software to comply with this Section 3.11, and add the City as a beneficiary under the Escrow Agreement.
- (b) The Escrow Provider will deposit with the Escrow Agent the Escrow Materials for the Escrowed Deliverable and all Modifications thereto provided by the Escrow Provider to the City as part of the Project Operations, Software Maintenance and Support (if purchased by or on behalf of the

City) or any other services performed by the Escrow Provider for the City, and in the case of Software or the Embedded Software, the Escrow Provider will update the Escrow Materials to conform to the then-current version of the Software in use by the City including all Modification thereto made for the benefit of the City.

- (c) The City will have the right, on reasonable notice to the Escrow Provider and the Escrow Agent, to verify that the Escrow Materials conform to the Escrowed Deliverable supplied to and in use by the City to which the Escrow Materials relate. In addition, the City may purchase such additional verification services as may be offered by the Escrow Agent and the Escrow Provider will cooperate with the City and the Escrow Agent in the performance of those verification services.
- (d) The City will have the right to obtain from the Escrow Agent a copy of the Escrow Materials upon any of the following events:
 - (i) the Escrow Provider is bankrupt;
 - (ii) a trustee, receiver, manager, receiver-manager, custodian or Person having similar authority is appointed for the Escrow Provider or its business and assets and is not released or removed within 30 days after the appointment;
 - (iii) the Escrow Provider seeks protection from its creditors or undertakes any reorganization for the purpose of obtaining relief from its creditors;
 - (iv) the Escrow Provider ceases to carry on business; or
 - (v) in the case of Software, if the City is purchasing Software Maintenance and Support for the Software in respect of which the Escrow Materials have been deposited, if the Escrow Provider has given the City or any of its representatives notice that it will no longer provide Software Maintenance and Support or if the Escrow Provider defaults in the performance of Software Maintenance and Support and does not remedy that default within thirty (30) days after receipt of notice from the City demanding that the Escrow Provider do so.
- (e) Project Co shall ensure that the Escrow Agreement: (i) requires the Escrow Agent to release the Escrow Materials to the City if any of the events listed in Section 3.11(d) occur; (ii) does not contain any provision placing any obligation on the City, including without limitation, any indemnity obligation; and (iii) complies with and does not contradict any provision of this Section 3.11. Where this Section 3.11 places an obligation on the Escrow Agent, Project Co shall cause the Escrow Agent to comply with all such obligations.
- (f) Project Co hereby grants, and Project Co shall ensure that all Escrow Providers grant to the City as of the date the applicable Software or the applicable Embedded Software is used in connection with the Project Scope, a Licence to:
 - (i) Use the Escrow Materials to enable the City to Use the Escrowed Deliverable to which the Escrow Materials relate for the Permitted Purposes, and where the Escrowed Deliverable is or contains Licensed Intellectual Property in accordance with the Licence applicable thereto;

- (ii) make Modifications to the Escrow Materials notwithstanding any contradictory term or condition in the Licence applicable to the Escrowed Materials which Modifications are only used for the Permitted Purposes or the Expanded Purposes, as applicable, and are subject to confidentiality obligations under Subsection 3.11(f)(v);
 - (iii) recompile versions of the Software or Embedded Software from the Escrow Materials, which recompiled versions shall be deemed to form part of the Software or Embedded Software and be subject to the terms hereof;
 - (iv) make only those copies of the Escrow Materials that the City reasonably requires for the purposes set out in Subsections 3.11(f)(i), 3.11(f)(ii) and 3.11(f)(iii); and
 - (v) disclose the Escrow Materials, or any part thereof, only to agents, employees or contractors of the City as reasonably required for the purposes set out in Subsections 3.11(f)(i), 3.11(f)(ii) and 3.11(f)(iii), provided that such agents, employees and contractors are bound by obligations of confidentiality in respect of any Escrow Materials disclosed to them, the breach of which shall constitute a breach by the City of its obligations of confidentiality in respect of the Escrow Materials.
- (g) The Licence granted pursuant to Subsection 3.11(f) will:
- (i) where the Escrow Provider is Project Co or a Subcontractor, form part of the Licence granted pursuant to Section 3.2; or
 - (ii) where the Escrow Provider is a third party, form part of the license granted by such third party to the City;
- and in either case remain in effect for so long as such licence remains in effect.
- (h) Except where the City (i) terminates the Escrow Agreement, (ii) has a renewal right and fails to renew the Escrow Agreement, or (iii) fails to make payments as set out in Section 3.11(i), the Escrow Provider will not terminate or fail to renew the Escrow Agreement without entering into a new Escrow Agreement with a replacement escrow agent on terms and conditions substantially the same as the Escrow Agreement and this Section 3.11.
- (i) The City will pay all fees charged by the Escrow Agent in association with the deposit and maintenance of the Escrow Materials by the Escrow Agent under the Escrow Agreement for the benefit of the City. The Escrow Provider shall have no responsibility or liability arising from any failure of the City to pay fees when due in order to maintain the Escrow Materials with the Escrow Agent.
- (j) If the City receives the Escrow Materials, then as between the City and Project Co and notwithstanding any other provision of the Project Agreement, the City will own all Modifications to the Escrow Materials made by or for the City and all Intellectual Property in such Modifications.
- 3.12 Modifications:** Notwithstanding the granting of any licence pursuant to this Schedule 35, where the City has made any Modification to the Project Co Intellectual Property or the Subcontractor Intellectual Property other than (a) a Modification made by or on behalf of Project Co or a

Subcontractor or otherwise authorized by Project Co or any Subcontractor, or (b) a Modification made through the Limited Modification Rights,

then,

- (i) any warranty provided by Project Co under the Project Agreement shall not apply solely in respect of such Modification;
- (ii) Project Co and the Subcontractors shall not be liable in respect of any Direct Losses arising in connection with such Modifications where such Modifications are the direct cause of such Direct Losses, and the Direct Losses would not have occurred but for the Modifications; and
- (iii) the indemnity obligations of Project Co set out in Section 54.1(g) of the Project Agreement shall not apply in respect of any such Modifications where the Modifications are the direct cause of such Direct Losses, and the Direct Losses would not have occurred but for the Modifications.

Appendix A

Form of Trade-Mark Licence Agreement

TRADE-MARK LICENSE AGREEMENT

THIS TRADE-MARK LICENSE AGREEMENT, effective as of [DATE] (the “**Agreement**”), is between [the City] (the “**Licensor**”), and [●] (the “**Licensee**”), and Licensor and Licensee are referred to herein individually as a “**Party**” and collectively as the “**Parties**”.

WHEREAS:

1. Licensor and Licensee are parties to a Project Agreement dated [DATE] (the “**Project Agreement**”);
2. Capitalized terms used but not defined herein have the meanings assigned to them in the Project Agreement and Schedule 35 thereto;
3. Licensor owns the trade-marks shown on Exhibit A (the “**Marks**”);
4. Licensee proposes to use the Marks in [Ontario] (the “**Territory**”) for the Limited Purpose set forth below; and
5. Subject to the terms and conditions set forth herein, Licensor is willing to grant to Licensee, and Licensee is willing to accept, a non-exclusive license to use the Marks pursuant to the terms of this Agreement.

NOW THEREFORE in consideration of the covenants contained herein, the receipt and sufficiency of which are acknowledged, the Parties agree as follows:

1. **Grant:** Licensor grants to Licensee, and Licensee accepts, a limited, non-transferable, non-exclusive, royalty-free right and license to use the Marks in the Territory for the sole purpose of and only to the extent necessary for the performance by Licensee of the Project Scope and its obligations under the Project Agreement (the “**Limited Purpose**”).
2. **No Right to Sublicense:** Licensee acknowledges and agrees that it does not have the right to sublicense the use of the Marks to any party without the express written consent of Licensor.
3. **Ownership:** Licensee acknowledges Licensor’s ownership of the Marks, and agrees that its use of the Marks shall enure to Licensor’s benefit.
4. **Licensee Covenants:** Licensee acknowledges that Licensor is the owner of all rights in the Marks, and, except as otherwise expressly permitted by this Agreement, Licensee shall not at any time do or suffer to be done any act or thing that will in any way impair the rights of Licensor in and to the Marks. Nothing in this Agreement grants, nor shall Licensee acquire, any right, title or interest in or to the Marks or any goodwill associated with the Marks, other than those rights

expressly granted hereunder. Licensee shall affix to all materials that contain or bear one or more of the Marks such legends and notices as Licensor may reasonably require. At Licensor's request, Licensee shall publish a public notice in the following form, or in any other form prescribed by Licensor from time to time, in appropriate publications addressed to the general public: "[MARK] is a trade-mark owned by [LICENSOR] used under license by [LICENSEE]". Licensee undertakes to comply with all relevant laws and regulations pertaining to trade-marks and marking requirements. Licensee shall execute all documents and provide all assistance reasonably required by Licensor to apply for, obtain and maintain registrations for the Marks, and to enforce rights in, and defend any proceedings brought against applications or registrations for, the Marks.

5. **Restrictions On Use:** Notwithstanding anything contained in this Agreement or otherwise, Licensee shall use the Marks only in accordance with the design, description and/or appearance of the Marks as shown on Exhibit A. Licensee may not change or modify the Marks nor join the mark with any other words or designs. Licensee agrees to abide by any reasonable guidelines provided by Licensor from time to time in connection with the use of the Marks.
6. **Quality Standards and Control:** Licensee agrees that use of the Marks by Licensee in association with any products or services (the "**Products**" and "**Services**") will meet or surpass the standards set by Licensor and conveyed to Licensee from time to time for the character and quality of such Products and Services.
7. **Inspection:** At the request of the Licensor, the Licensee shall provide to Licensor for Licensor's review, comment and approval samples of the any Products and sample copies of materials associated with the Products or Services or used to advertise/promote the Products or Services.
8. **Breach of License:** Licensor may notify the Licensee if it objects to any proposed or actual use of the Marks if in Licensor's sole judgment (acting reasonably) Licensor believes that the Marks is being used or proposed to be used in a manner that erodes the goodwill associated with the Marks or otherwise reduces the value of the Marks. If Licensee is so notified, the Parties shall attempt to settle any dispute and Licensee shall, if directed by Licensor to do so, cease using or cease from using the Marks until the time such dispute has been settled between the Parties or otherwise finally determined.
9. **Infringement:** Licensee shall promptly notify Licensor upon becoming aware of any infringement or dilution of the Marks and shall cooperate fully with Licensor to stop such infringement or dilution. Licensor, in its sole discretion, will take any action that it deems necessary to protect the validity of the Marks, and Licensee hereby waives any rights that it may have pursuant to Section 50(3) of the *Trade-marks Act*.
10. **Indemnification:** Licensor does not assume any liability to Licensee, or third parties, for Licensee's goods or services, including the Products and Services, and Licensee shall defend, indemnify and hold harmless Licensor and its affiliates, successors and assigns, and their respective officers, directors, employees, agents, lawyers and representatives from and against any and all claims, causes of action, suits, damages, losses, liabilities, costs and expenses (including, but not limited to, reasonable lawyer fees and expenses), which may be sustained or suffered as a result of any such third party claims or arising from a breach of this Agreement by

Licensee including, without limitation, any act or omission, which causes or is alleged to cause harm or a violation of any of the rights of any third party.

11. **Breach/Use Outside Limited Purpose:** In the event that Licensee breaches any of the terms of this Agreement, including use of the Marks outside the Limited Purpose or Territory as determined by Licensor in its sole discretion, but acting reasonably, Licensor shall have the option to terminate this Agreement immediately, and if so terminated, all subsequent use by Licensee will be unauthorized and subject to legal action. Upon the termination of this Agreement for any reason, all rights in the Marks granted to Licensee hereunder shall automatically revert to Licensor, Licensee shall have no further rights in the Marks, and Licensee shall immediately change its use of the Marks to uses that do not consist of or include the Marks or any words similar to the Marks. In the event of an unauthorized use of the Marks by Licensee, Licensee consents to the immediate entry of a court injunction preventing Licensee's further use of the Marks.
12. **Termination:** This licence granted to Licensee will terminate upon the expiry or termination of Licensee's services and other obligations under the Project Agreement.
13. **No Agency:** The Parties hereto are independent contractors with respect to each other, and nothing herein shall create any association, partnership, joint venture or agency relationship between them.
14. **Assignment:** Licensee may not convey, sublicense, assign, transfer, pledge, hypothecate, encumber or otherwise dispose of this Agreement without the prior written consent of Licensor, which consent may be unreasonably withheld.
15. **Headings:** The headings contained in this Agreement are for purposes of convenience only and shall not affect the meaning or interpretation of this Agreement.
16. **Notices:** All notices, requests, demands and other communications made in connection with this Agreement shall be made in the manner set out in the Project Agreement.
17. **Entire Agreement:** This Agreement constitutes the entire agreement between Licensor and Licensee with respect to the subject matter hereof and supersedes all prior agreements and understandings, whether oral, written, express or implied, between Licensor and Licensee.
18. **No Waiver:**
 - (a) No waiver made or given by a Party under or in connection with this Agreement shall be binding or effective unless the waiver is in writing, signed by an authorized representative of the Party giving such waiver, and delivered by such Party to the other Party. No waiver made with respect to any right, power or remedy in one instance will be deemed to be a waiver with respect to any other instance involving the exercise of such right, power, or remedy or with respect to any other right, power, or remedy.
 - (b) Failure by either Party to exercise any of its rights, powers or remedies hereunder or its delay to do so shall not constitute a waiver of those rights, powers or remedies. The

single or partial exercise of a right, power or remedy shall not prevent its subsequent exercise or the exercise of any other right, power or remedy.

19. **Successors:** This Agreement shall be binding upon and shall enure to the benefit of the Parties and their respective successors and permitted assigns.
20. **Severability:** Each provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Agreement is declared invalid, unenforceable or illegal by the courts of a competent jurisdiction, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Agreement. If any such provision of this Agreement is invalid, unenforceable or illegal, the Parties shall, acting in good faith, promptly negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Agreement as near as possible to its original intent and effect.
21. **Governing Law:** This Agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein and shall be treated in all respects as an Ontario contract, without regard to conflict of laws principles. Each of the Parties attorn to the jurisdiction of the courts of the Province of Ontario and all courts competent to hear appeals therefrom.
22. **Counterparts:** The Project Agreement may be executed in one or more counterparts. Any single counterpart or a set of counterparts executed, in either case, by all the Parties shall constitute a full, original and binding agreement for all purposes. Counterparts may be executed either in original or faxed form provided that any Party providing its signature in faxed form shall promptly forward to the other Party an original signed copy of the Project Agreement which was so faxed.

[Remainder of page intentionally blank – Next page is the signature page.]

IN WITNESS WHEREOF, the Parties have signed this Agreement effective as of the date set forth above.

City of Ottawa

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the corporation.

[LICENSOR]

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the corporation.

EXHIBIT A

Trade-marks

[To be completed once trade-marks identified.]

SCHEDULE 36
SYSTEM EXTENSION

ARTICLE 1
DEFINITIONS

1.1 Definitions

- (a) Any capitalized term not defined in this Schedule 36 shall have the meaning given to such term in the Project Agreement. In this Schedule 36, unless the context otherwise requires:
- (i) “**Extension Contractor**” means a person or persons engaged by the City to perform any part of a System Extension, which person may or may not be Project Co.
 - (ii) “**Extension Maintenance Services**” means the maintenance and other work to be performed and services to be provided in respect of a System Extension including those set out in City Extension Requirements.
 - (iii) “**Extension Notice Response**” means the response delivered by the Project Co pursuant to Section 2.2(b).
 - (iv) “**Extension Permits, Licences and Approvals**” means all permissions, consents, approvals, certificates, permits, licences, statutory agreements and authorizations needed to complete a System Extension described in City Extension Requirements in accordance with Applicable Law.
 - (v) “**Extension Work**” means the design, construction, installation, testing, commissioning and completion of a System Extension, including rectification of any Extension Work Minor Deficiencies, and any other activities required to enable or facilitate the commencement of the Extension Maintenance Services.
 - (vi) “**Extension Work Minor Deficiencies**” means any defects, deficiencies and items of outstanding work which would not materially impair the City’s use and enjoyment of the System Extension.
 - (vii) “**City Extension Requirements**” means the proposal delivered by the City pursuant to Section 2.2(c).
 - (viii) “**Integrated System Extension**” means the development, testing, commissioning and certification (including safety recertification in order to satisfy the Safety Management Plan) of additional facilities, infrastructure, electrical and mechanical equipment, computer hardware and systems, including communication and control systems, in order to connect with the System such that the Vehicles and all other components of the light rail transit system, as extended by the Integrated System Extension, function together using contiguous track works and an integrated service.
 - (ix) “**Non-Integrated System Extension**” means the development, testing, commissioning and certification (including safety recertification in order to

satisfy any safety and security management plan in place for the System) of additional facilities, infrastructure, electrical and mechanical equipment, computer hardware and systems, including communication and control systems, in order to form a transit system that connects with the System at a single interchange point such that the Vehicles and other components of the System do not form part of a coherent integrated system with the extended transit system.

- (x) “**Notice of Extension**” means the notice delivered by the City pursuant to Section 2.2(a).
- (xi) “**Project Co Extension Proposal**” means the proposal delivered by Project Co pursuant to Section 2.2(d).
- (xii) “**Reciprocal Agreement**” means the agreement to be executed in the event of a Non-Integrated System Extension as described in further detail in Section 3.1(e).
- (xiii) “**System**” means, for the purposes of this Schedule 36 only, the Expanded Trillium Line.
- (xiv) “**System Extension**” means either an Integrated System Extension or a Non-Integrated System Extension.

ARTICLE 2 SYSTEM EXTENSION

2.1 System Extension

- (a) The City and Project Co acknowledge that the City may, in its sole discretion, elect to pursue one or more System Extensions during the Project Term.
- (b) The City may pursue any System Extension through one or more Extension Contractors, through a negotiated agreement with Project Co in accordance with this Schedule 36, or a combination of both. In the event the City elects to engage an Extension Contractor(s), the City may decide which persons are eligible for consideration, and such persons may or may not include Project Co or any of the Project Co Parties, in the City’s sole discretion, and the City may use any form of competitive procurement or other method of retaining an Extension Contractor(s) that the City in its sole discretion decides. If the City elects to negotiate an agreement with Project Co, the Parties shall follow the process set out in Section 2.2. Project Co acknowledges and agrees that the City’s decisions pursuant to this Section 2.1 are subject to approval by the City’s boards of directors and, in some circumstances, the Province, and shall be subject to Applicable Law. Project Co acknowledges that the City may have to designate that Project Co or a Project Co Party, be a restricted party that is not permitted to bid or otherwise participate in an open competitive procurement – for all or certain components of a System Extension in order to establish a fair and properly competitive procurement in the best interests of the City. Project Co acknowledges that it has no preferential rights of any kind, whether in the nature of an option or first opportunity to submit a bid or a proposal or to express interest in providing services, equipment or supplies, or to otherwise undertake any work in respect of a System Extension except as set out in this Schedule 36.

- (c) The City may, in its sole discretion, elect to implement all or part of a System Extension by way of a Variation in which case Section 37 of the Project Agreement and the provisions of Schedule 21 – Variation Procedure shall apply in respect of such System Extension.
- (d) The City may, in its sole discretion, elect to procure or negotiate, as the case may be, the performance of Extension Work, and/or Extension Maintenance Services in respect of a System Extension through consolidated or separate procurements or negotiations.
- (e) For clarity, the City may pursue a System Extension at any time or times pursuant to any of the alternatives set out in this Section 2.1, in its sole discretion. In the event the City has elected to pursue a System Extension in accordance with this Section 2.1, the City may, at any time prior to entering into a binding agreement in respect of the System Extension, in its sole discretion, elect to cease pursuing the System Extension under the chosen alternative and pursue the same System Extension under a different alternative process.

2.2 Negotiation between the City and Project Co of Extension Work and/or Extension Maintenance Services

- (a) If the City notifies Project Co that it wishes to negotiate with Project Co to perform any or all of the Extension Work and/or Extension Maintenance Services, the City shall provide Project Co with a Notice of Extension which will include information respecting the project, including:
 - (i) a description of the scope of the Extension Work and/or the Extension Maintenance Services, as applicable;
 - (ii) preliminary “term sheet level” output specifications for the Extension Work and/or the Extension Maintenance Services, as applicable, including: details with respect to alignment, number of stations, length of track (in kilometres), modelling results and performance expectations with respect to the System Extension, as-builts for existing System infrastructure and utilities, condition reports, results of environmental assessments, development plans, stakeholder engagement information, electrical and mechanical requirements specific to the System Extension, location and the City requirements of any maintenance and storage facilities, and
 - (iii) a preliminary schedule and required timelines for completion of the Extension Work and/or the Extension Maintenance Services, as applicable.

For clarity, the City may, in its sole discretion, issue an Extension Notice in respect of any one of or all of Extension Work, and/or Extension Maintenance Services.

- (b) No later than 30 days after the date of receipt of the Notice of Extension, Project Co shall deliver to the City its Extension Notice Response advising the City whether or not Project Co desires to proceed to the next stage of negotiation with the City in respect of the System Extension. In the event Project Co desires to proceed, Project Co shall, no later than 60 days after the delivery of its Extension Notice Response, deliver to the City a preliminary cost estimate and schedule for the Extension Work and/or the Extension Maintenance Services, as applicable.

- (c) If the City elects, in its sole discretion, to continue to consider Project Co for the Extension Work and/or the Extension Maintenance Services, as applicable, the City shall, no later than 120 days after the date of receipt of Project Co's Extension Notice Response, deliver its City Extension Requirements. City Extension Requirements (which shall be non-binding on the City) shall include:
- (i) a draft heads of terms agreement for the Extension Work and/or the Extension Maintenance Services, as applicable;
 - (ii) draft output specifications and commissioning processes for the System Extension;
 - (iii) draft “term sheet level” parameters of the payment mechanism to be used in respect of the Extension Work and/or the Extension Maintenance Services; and
 - (iv) guidelines with respect to the structure of construction or permanent financing to be secured by Project Co.
- (d) No later than 150 days after the date of Project Co's receipt of City Extension Requirements, Project Co shall deliver to the City the Project Co Extension Proposal which shall be non-binding on Project Co. The Project Co Extension Proposal shall include:
- (i) a detailed cost estimate and construction schedule in respect of the Extension Work and/or the Extension Maintenance Services, as applicable;
 - (ii) a detailed description of any impact the Extension Work and/or the Extension Maintenance Services, as applicable, would have on Project Co's activities under the Project Agreement, including, if applicable, any schedule impact on the provision of the System, the public and third party infrastructure and completion of the Works;
 - (iii) a detailed description of any impact on expected usage of utilities for the current Contract Year and subsequent Contract Years;
 - (iv) any contemplated amendments to the Project Agreement to coordinate the Extension Work and/or the Extension Maintenance Services, as applicable, with Project Co's obligations in respect of the Project Operations;
 - (v) the expected Direct Costs of Project Co and each subcontractor of Project Co that will be incurred in respect of the Extension Work and/or the Extension Maintenance Services, as applicable, including:
 - (A) any capital expenditure that will be incurred; and
 - (B) any other costs that will be incurred, reduced or avoided and the impact on Project Co's cash flows from incurring, reducing or avoiding such costs;
 - (vi) preliminary terms of the financing structure specified in City Extension Requirements;

- (vii) Project Co's confirmation that the projected internal rate of return on any equity capital required in respect of the Extension Work and/or the Extension Maintenance Services, as applicable, will be the Base Case Equity IRR;
 - (viii) Project Co's preliminary indication of the potential increase or decrease, if any, of the Monthly Service Payments, with such amount calculated by reference to the relevant parts of the Financial Model to demonstrate the impact of the Extension Work and/or the Extension Maintenance Services, as applicable; and
 - (ix) any Extension Permits, Licences and Approvals that must be obtained or any Permits, Licences and Approvals amended for the Extension Work and/or the Extension Maintenance Services, as applicable, to be implemented;
- in each case, together with such supporting information and justification as is reasonably required.
- (e) In preparing the Project Co Extension Proposal, Project Co shall include sufficient information to demonstrate to the City's satisfaction, acting reasonably, that:
- (i) Project Co has used or has obliged each subcontractor (or will oblige any subcontractor not yet selected) to use commercially reasonable efforts, including the use of competitive quotes or tenders to minimize costs in respect of the System Extension;
 - (ii) except as otherwise set out herein, all costs of Project Co and each Subcontractor are limited to Direct Costs;
 - (iii) Project Co and any subcontractor shall charge only the margins for overhead and profit as set out in Appendix B to Schedule 21 – Variation Procedure (such margins each calculated on the basis of the applicable Direct Costs so that no margin of Project Co or any subcontractor is calculated on any other margin under the Project Agreement of Project Co or any subcontractor), and no other margins or mark ups;
 - (iv) the margins for overheads and profit as set out in Appendix B to Schedule 21 – Variation Procedure as applicable to Project Co's Direct Costs shall only be chargeable on Direct Costs of Project Co, such that Project Co shall not charge any margins on any amounts charged by any subcontractors;
 - (v) all costs of completing the Extension Work and/or the Extension Maintenance Services, as applicable, including Capital Expenditures, reflect labour rates applying in the open market to providers of services similar to those required for the Extension Work and/or the Extension Maintenance Services, as applicable;
 - (vi) Project Co has mitigated or will mitigate the impact of the Extension Work and/or the Extension Maintenance Services, as applicable, including on the Works Schedule, the performance of the Project Operations, the expected usage of utilities, and the Direct Costs to be incurred; and
 - (vii) Project Co will use commercially reasonable efforts to obtain the best value for money when procuring any work, services, supplies, materials or equipment

required in respect of the Extension Work and/or the Extension Maintenance Services, as applicable, and will comply with all Good Industry Practice in relation to any such procurement, to a standard no less than Project Co would apply if all costs incurred were to its own account without recourse to the City, including using commercially reasonable efforts to mitigate such costs.

- (f) Subject to Section 2.2(g), as soon as practicable after the receipt of the Project Co Extension Proposal, the City and Project Co shall, in good faith and acting reasonably, negotiate the terms of the binding agreement for the performance of the Extension Work and/or Extension Maintenance Services, as applicable, as well as any necessary amendments to the Project Agreement and any relevant project documents, based on the contents of City Extension Requirements and the Project Co Extension Proposal.
- (g) Notwithstanding anything contained in this Schedule 36, except as may be the subject matter of a competitive procurement process, no agreement relating to the subject matter of this Schedule 36 shall be effective unless entered into in writing by each of the Parties and the entering into of same shall be subject to each Party's sole discretion. Either Party may, in their sole discretion, elect to cease negotiations at any time in the process set out in this Section 2.2 prior to the signing of such written agreement.

ARTICLE 3 PROJECT CO COOPERATION

3.1 Project Co Cooperation with the City and Interface with an Extension Contractor

- (a) In the event the City pursues all or any part of a System Extension with any one or more Extension Contractors, subject to Section 3.1(b), Project Co shall, within a reasonable period of time, use commercially reasonable efforts to provide such assistance to the City as the City may request, acting reasonably. Such assistance shall include:
 - (i) providing to the City such information which the City may reasonably require concerning the System and the public and third party infrastructure or the operations, maintenance and rehabilitation of the System and the public and third party infrastructure necessary for the purposes of the City procuring or entering into (or considering procuring or entering into) contracts for design, construction, and/or operations, and/or maintenance of any System Extension and in particular (but without limitation to) for the purposes of compiling and making available any information memorandum, invitation to tender, technical specifications, draft contract or other document connected with such purposes;
 - (ii) the development of technical specifications in respect to the Extension Work and the Extension Maintenance Services, as applicable, and the evaluation of designs proposed by prospective Extension Contractors to ensure compatibility with the Trillium Line Extension, electrical and mechanical equipment, Vehicles already supplied, and other items as specified by the City;
 - (iii) permitting the City access to relevant information respecting the System, electrical and mechanical equipment and Vehicles already supplied, and other items as specified by the City;

- (iv) advising the City on potential modifications to the Extension Work and the Extension Maintenance Services, as applicable, that could result in cost savings or other benefits to the City (If Project Co identifies any cost savings to the Maintenance and Rehabilitation Services or the Extension Maintenance Services, such savings shall be shared equally by the City and Project Co by way of an adjustment to the Monthly Service Payments);
- (v) the development of an interface protocol between the City, Project Co and the Extension Contractors;
- (vi) liaising with Extension Contractors (or any of their consultants and advisors) who are performing any aspect of the design, construction, maintenance or operation of any System Extension, as applicable, in accordance with the reasonable requests of the City or any Extension Contractors; and
- (vii) subject to the prior reasonable notice and reasonable requirements of Project Co with regard to health and safety, co-operate and co-ordinate with any Extension Contractor (and any of their consultants and advisers) who has been given access by the City to those parts of the System and public and/or third party infrastructure to which access is required for the efficient carrying out of such design, construction, maintenance or operation of any System Extension by the Extension Contractor.

The City and Project Co's obligations under this Section 3.1(a) shall be subject to and in accordance with Schedule 35 – Intellectual Property.

- (b) The City shall pay Project Co reasonable fees in respect of the assistance Project Co provides pursuant to this Section 3.1. Such fees shall be agreed by the parties prior to Project Co providing assistance to the City and shall be invoiced on a monthly basis (or such other period as the parties may agree) and shall be paid within 30 days of receipt of an invoice from Project Co. Each Project Co invoice shall set out in reasonable detail, the nature of assistance provided in the invoice period, the personnel involved and the time committed by Project Co personnel in respect of such assistance.
- (c) As soon as practicable after the City provides notice to Project Co that the City has reached a binding agreement with an Extension Contractor, the City and Project Co shall meet with the Extension Contractor(s) and, in good faith and acting reasonably, negotiate and execute an interface agreement and/or construction procedures agreement to govern matters relating to the coordination of Project Co's activities in respect of the Project Operations and the Extension Contractor's activities relating to the Extension Work and/or the Extension Maintenance Services, as applicable. the City shall also include, in its agreement with any Extension Contractor, an obligation on the Extension Contractor to negotiate with the City and Project Co the terms of the interface agreement and/or construction procedures agreement in good faith and acting reasonably.
- (d) In the event of an Integrated System Extension, the agreement to be negotiated between the City, Project Co and each Extension Contractor pursuant to Section 3.1(c) shall include provisions related to:

- (i) the rights and obligations of the City, Project Co and the Extension Contractor in respect of the physical linking, testing and commissioning, safety and system certification of the System, public and third party infrastructure and the Integrated System Extension operations on the System at the same time as Project Co;
 - (ii) commissioning requirements with respect to additional vehicles that are required as a result of the Integrated System Extension and the extended lines;
 - (iii) a protocol with respect to the testing of the entire System and Integrated System Extension to ensure integration and ability for the operation of the entire line as contemplated in the Output Specifications and the final output specifications developed in respect of the Integrated System Extension;
 - (iv) provision for the sharing of the Trillium Line Extension if the City so requires in which case Project Co shall be entitled to a reasonable fee as negotiated between the parties in good faith and acting reasonably;
- (e) In the event of a Non-Integrated System Extension, the City, Project Co and the Extension Contractors shall execute a reciprocal agreement in a form to be agreed to between the parties acting reasonably and negotiating in good faith (the “**Reciprocal Agreement**”). The Reciprocal Agreement shall govern the rights of the parties in respect of the station, infrastructure or other location on the System which has an interchange point with the Non-Integrated System Extension and shall govern matters such as:
- (i) reciprocal easements or other rights-of-access;
 - (ii) appropriate cost sharing arrangements;
 - (iii) sharing of information;
 - (iv) decision making process regarding matters affecting the interchange between the System and the Non-Integrated System Extension; and
 - (v) mutual repair obligations of structural or other elements in common between the System, the public and third party infrastructure and the Non-Integrated System Extension.
- (f) This Article 3 is without prejudice to the City’s ability to instruct a Variation in accordance with Schedule 21 – Variation Procedure.

ARTICLE 4 EQUITY PURCHASE OPTION

4.1 Equity Purchase Option

- (a) The City may exercise the Equity Purchase Option (outlined in Section 4.1(b) below) in connection with any System Extension in respect of which capital costs are reasonably anticipated to exceed \$[REDACTED] and any one of the following events has occurred (each a “**Triggering Event**”):

- (i) Project Co fails to remedy a material breach of this Schedule 36 (including a failure to diligently progress any of the activities that Project Co performs, or is required to perform, under this Schedule 36) within 20 Business Days of having received written notice from the City identifying the material breach;
 - (ii) in the City's view (acting reasonably and in good faith), it is unlikely that the parties will be able to reach agreement on any of the matters provided or which ought to have been provided for pursuant to this Schedule 36; or
 - (iii) the City has rejected the Project Co Extension Proposal and in the City's view (acting reasonably and in good faith) it is unlikely that the parties will be able to reach agreement on the Project Co Extension Proposal.
- (b) Following a Triggering Event, upon written notice to Project Co, the City may exercise the option to purchase all of the Equity Capital (the “**Equity Purchase Option**”) pursuant to the terms and conditions of the Equity Purchase Agreement attached hereto as Exhibit A.

Exhibit A

Form of Equity Purchase Agreement

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THIS EQUITY PURCHASE AGREEMENT is made on 2018

BETWEEN:

1. THE CITY OF OTTAWA (the **City**);
2. _____ (____);
3. _____ (____); and
4. _____ (____), and
5. (the parties in (2) - (4)¹ together, the **Sellers**, and each, a **Seller**).

RECITALS:

- (A) Each Seller is the registered holder and the beneficial owner of its Option Securities.
- (B) Each Seller wishes to grant to the City the Equity Purchase Option on the terms and conditions of this Agreement.

THE PARTIES AGREE AS FOLLOWS:

1. DEFINITIONS AND INTERPRETATION

1.1 Project Agreement

All capitalized terms used but not defined herein shall have the meanings ascribed to such terms as set forth in the Project Agreement.

1.2 Definitions

The following definitions apply in this Agreement:

Accounts and Liabilities Certificate means a certificate in the form of Schedule 2, signed by two directors of each Seller setting out:

- (a) the Project Co Accounts and Receivables as at the Settlement Date; and
- (b) the Project Co Liabilities as at the Settlement Date.

Additional Equity Securities means any Equity, and includes any securities which are convertible into Equity, that are issued after the date of this Agreement.

Assessment means something which creates or evidences an obligation to pay an ascertained amount for Tax at or before a fixed time, including but not limited to:

¹ To be populated with identities of shareholders of Project Co

- (a) any document received from a Governmental Authority administering any Tax assessing, imposing, claiming or indicating an intention to claim any Tax (such as an assessment, penalty notice or demand); or
- (b) filing of a Tax return or a request for amendment of an assessment under applicable Tax laws.

Authorization means an authorization, consent, declaration, exemption, notarization or waiver, however it is described; and in relation to anything that could be prohibited or restricted by law if a Governmental Authority acts in any way within a specified period, the expiry of that period without that action being taken, including any renewal or amendment.

Business Day means any day other than Saturday, Sunday, a statutory holiday in the Province of Ontario or any day on which banks are not open for business in the City of Ottawa, Ontario.

Completion means completion of the sale and purchase of the Option Securities following exercise of the Equity Purchase Option as described in clause 5 (Completion).

Dispute means any dispute or difference between the parties (other than a dispute or difference as to the market discount rate or the Fair Value of Equity determined pursuant to Schedule 3 that does not involve manifest error or fraud) arising out of, relating to or in connection with this Agreement or the Equity Purchase Option, including any dispute or difference as to the formation, validity, existence or termination of this Agreement.

Encumbrance means:

- (a) a Security Interest;
- (b) any third party interest (for example, a trust or an equity);
- (c) a right of a person to acquire a share or to restrain someone from acquiring a share (including under an option, a right of pre-emption or a right of first refusal, such as one in a shareholders' agreement or in a constitution);
- (d) a right of any person to purchase, occupy or use an asset (including under an option, agreement to purchase, licence, lease or hire purchase);
- (e) an easement, restrictive covenant, caveat or similar restriction over property; or
- (f) an agreement to create any of the above or to allow any of the above to exist, but excludes a Permitted Security Interest.

Equity means any securities (i) having voting rights in the election of the Board of Directors not contingent upon default, (ii) evidencing an ownership interest in Project Co or (iii) convertible into or exercisable or exchangeable for any of the foregoing (other than unexercised options issued to an employee, officer or director of Project Co or any subsidiary pursuant to an incentive option plan or otherwise), or any agreement or commitment to issue any of the foregoing.

Equity Purchase Exercise Notice means a notice in the form of Schedule 1 given by the City to the Sellers in respect of the Equity Purchase Option in accordance with clause 3 (*Exercise of the Equity Purchase Option*).

Equity Purchase Exercise Notice Date means the date on which the Equity Purchase Exercise Notice is given by the City to the Sellers.

Equity Purchase Option means the option granted by each Seller to the City under clause 2 (*Grant of the Equity Purchase Option*).

Equity Purchase Option Validity Period has the meaning set out in clause 7.2 (*Seller undertakings*).

Fair Value has the meaning set out in clause 1(b) of Schedule 3.

Governmental Authority means:

- (a) a government or government department or other body;
- (b) a governmental, semi-governmental or judicial person; or
- (c) a person (whether autonomous or not) who is charged with the administration of a law.

Lifecycle Payment Payable means in respect of a month, as shown in the Financial Model, that are payable for that month (if any) by Project Co.

Miscellaneous Current Assets means amounts which constitute "current assets" of Project Co but excluding any amounts in relation to Lending Agreements, O&M and SPV (incl. Insurance) Costs Payable and Lifecycle Payment Payable.

Miscellaneous Current Liabilities means amounts which constitute "current liabilities" of Project Co but excluding any amounts in relation to Lending Agreements, O&M and SPV (incl. Insurance) Costs Payable and Lifecycle Payment Payable.

Net Settlement Amount means the amount calculated in accordance with clause 4.1 (Net Settlement Amount).

O&M and SPV (incl. Insurance) Costs Payable means in respect of a month, as shown in the Financial Model, that are payable for that month (if any) by Project Co.

Option Securities means

- (a) in respect of ___, all of the ___ of Project Co;
- (b) in respect of ___, all of the ___ of Project Co; and
- (c) in respect of ___, all of the ___ of Project Co.

Permitted Security Interest means a Security Interest created under a Project Agreement, or each of the Lending Agreements.

Project Co means _____.

Project Co Accounts and Receivables means, the aggregate, at the Settlement Date, of any amounts that are due to, but have not been received by, Project Co, relating to the Service Payment Receivable, plus the all credit balances on any bank accounts held by or on behalf of Project Co and any Miscellaneous Current Assets as at the Settlement Date:

Project Co Liabilities means, the aggregate, at the Settlement Date, of any amounts that are due but have not been paid by Project Co, relating to:

- (a) the O&M and SPV (incl. Insurance) Costs Payable; and
- (b) the Lifecycle Payment Payable,

plus the balance of Miscellaneous Current Liabilities as at the Settlement Date.

Relevant Proportion means, in respect of each Seller, the respective proportion which is equal to that Seller's ownership percentage in Project Co as at the Settlement Date.

Security Interest means any mortgage, charge, pledge, lien, encumbrance, assignment, hypothecation, security interest, title retention, preferential right, trust arrangement, contractual right of set-off or any other security agreement or arrangement in favour of any person or any interest in relation to personal property provided for by a transaction that in substance secures payment or performance of an obligation or otherwise would be considered to be a "security interest" that is subject to the *Personal Property Security Act* (Ontario).

Service Payment Receivable means in respect of a month, the service payment for that month (if any) payable by the City to Project Co, calculated in accordance with the Project Agreement, as adjusted in accordance with the Project Agreement.

Settlement Amount means the amount determined in accordance with Schedule 3 (*Settlement Amount Calculation*) which shall never be less than \$[REDACTED] (such that if the amount is a negative number it will be deemed to be \$[REDACTED]).

Settlement Date means the date for settlement in respect of the exercise of the Equity Purchase Option specified in the Equity Purchase Exercise Notice being no earlier than two months, and no later than nine months, after the Equity Purchase Exercise Notice Date, and in any event which must be after Substantial Completion.

Tax means a tax, levy, duty, charge, deduction or withholding, however it is described, that is imposed by law or by a Governmental Authority, together with any related interest, penalty, fine or other charge.

1.3 Interpretation

In this Agreement:

- (a) the division of this Agreement into clauses and the insertion of headings are for convenient reference only and are not to affect or be used in the construction or interpretation of this Agreement;

and unless there is something in the subject matter or context inconsistent therewith:

- (b) "person" means a natural person, partnership, limited partnership, limited liability partnership, syndicate, sole proprietorship, corporation or company (with or without share capital), limited liability company, stock company, trust, unincorporated association, joint venture or other entity or Governmental Authority;
- (c) a reference to a document (including this Agreement) is to that document as amended, restated, varied, novated, ratified or replaced from time to time;
- (d) unless otherwise specifically indicated, any reference to a statute in this Agreement refers to that statute and the regulations and ministerial orders made under that statute, as the same may, from time to time, be amended, re-enacted or replaced;
- (e) words in the singular number include the plural and are to be construed as if the plural had been used and vice versa;
- (f) words importing the use of any gender include all genders where the context or party referred to so requires, and the rest of the sentence is to be construed as if the necessary grammatical changes had been made;
- (g) a reference to a party, clause, schedule, exhibit, annexure or attachment is a reference to a party, clause, schedule, exhibit, annexure or attachment to or of this Agreement, and a reference to this Agreement includes all schedules, exhibits, annexures and attachments to it;
- (h) the words "including" and "includes" mean "including (or includes) without limitation", and in the computation of periods of time from a specified date to a later specified date, unless otherwise expressly stated, the word "from" means "from and including" and the words "to" and "until" each mean "to but excluding". If the last day of any such period is not a Business Day, such period will end on the next Business Day; and
- (i) when calculating the period of time "within" which or "following" which any act or event is required or permitted to be done, notice given or steps taken, the date which is the reference date in calculating such period is to be excluded from the calculation. If the last day of any such period is not a Business Day, such period will end on the next Business Day; and
- (j) all monetary amounts in this Agreement, unless otherwise specified, are stated in Canadian currency.

1.4 Business Day

If the day on or by which any thing is to be done under this Agreement is not a Business Day, that thing must be done no later than the next Business Day.

2. GRANT OF THE EQUITY PURCHASE OPTION

2.1 Call Option

In consideration of the payment of the sum of \$[REDACTED] (receipt of which is acknowledged by each Seller), and upon the City providing an Equity Purchase Exercise Notice to the Sellers, the Sellers each grant to the City the right to require the Sellers to each sell their respective Option Securities to the City or its nominee (as the City may elect) in accordance with this Agreement for a Seller's Relevant Proportion of the Net Settlement Amount.

2.2 Nature of the Equity Purchase Option

The Equity Purchase Option confers on the City the right, but not the obligation, to give the Sellers an Equity Purchase Exercise Notice at any time during the period described in clause 3.1 (*Exercise of the Equity Purchase Option*); and on exercise of the right conferred by clause 2.1 in accordance with this Agreement, requires the Sellers to each sell their respective Option Securities to the City or to its nominee (as the City may direct) in accordance with this Agreement.

2.3 Title, property and risk

Until Completion, the title to, property in and risk of the Option Securities remain solely with the Sellers, but they pass to the City on and from Completion.

3. EXERCISE OF THE EQUITY PURCHASE OPTION

3.1 Exercise of the Equity Purchase Option

The City may exercise the Equity Purchase Option by serving an Equity Purchase Exercise Notice contemporaneously on the Sellers at any time within 45 Business Days after the occurrence of any of the events specified in Section 4.1 of Schedule 36 of the Project Agreement.

3.2 Exercise in relation to all Option Securities

The Equity Purchase Option may only be exercised in respect of all (but not less than all) of the Option Securities.

3.3 Effect of serving an Equity Purchase Exercise Notice

As of the Equity Purchase Exercise Notice Date a contract arises between the City and each Seller under which on the Settlement Date:

- (a) each Seller must sell to the City or its nominee (as the City may elect) all of its Option Securities free from any Encumbrance or restriction on transfer; and
- (b) the City must buy, or ensure its nominee buys, all the Option Securities from each Seller,

for each Seller's Relevant Proportion of the Net Settlement Amount, apportioned as against each Seller and such apportionment taking into account any warranty disclosures by, or in respect of, each Seller, and otherwise in accordance with the terms of this Agreement.

4. NET SETTLEMENT AMOUNT

4.1 Net Settlement Amount

The Net Settlement Amount will be:

- (a) the Settlement Amount;

plus:

- (b) the Project Co Accounts and Receivables as set out in the Accounts and Liabilities Certificate delivered on the Settlement Date in accordance with clause 5.2(a),

less:

- (c) the Project Co Liabilities (but excluding any Tax liabilities) as set out in the Accounts and Liabilities Certificate delivered on the Settlement Date in accordance with clause 5.2(a),

if and to the extent the amounts under clauses 4.1(b) and 4.1(c) differ from the amounts taken into account in the valuation undertaken pursuant to Schedule 3 and provided that:

- (d) if the Net Settlement Amount is [REDACTED], it will be deemed to be [REDACTED].

5. COMPLETION

5.1 Settlement Date

Completion of the sale and purchase of the Option Securities must take place at 9.00 a.m. (Eastern Time) on the Settlement Date (or, if the Settlement Date is not a Business Day, on the next Business Day to occur after the Settlement Date) at such place as the City may nominate before the Settlement Date.

5.2 Obligations on settlement

- (a) Each Seller must deliver, or cause to be delivered (as appropriate) to the City (or, as the City may elect, the City's nominee):
- (i) a duly completed Accounts and Liabilities Certificate;
 - (ii) duly executed transfers of its Option Securities in favour of the City or its nominee, as the case may be;
 - (iii) the original certificates for its Option Securities, or an indemnity acceptable to the City (or, as the City may elect, the City's nominee) if any certificates are found to be missing or not provided;
 - (iv) evidence to the City's (or, as the City may elect, the City's nominee's) satisfaction that any Encumbrances granted in respect of its Option Securities (other than Permitted Security Interests) have been released and discharged;

- (v) a certified copy of the power of attorney pursuant to which any attorney has executed the transfers of its Option Securities;
 - (vi) the written resignations of each officer and director of Project Co in a form acceptable to the City (or, as the City may elect, the City's nominee), to take effect on and from Completion; and
 - (vii) duly completed authority to alter the signatories of each bank account of each of Project Co;
- (b) each Seller shall procure that on or before the Settlement Date a duly convened meeting of its directors is held, and that resolutions for the following are passed at that meeting:
- (i) to approve the transfer of its Option Securities to the City or its nominee (as the City may elect), to register the transfers of the Option Securities, to issue new share certificates and unit certificates (if applicable) for the Option Securities in the name of the City or its nominee (as the City may elect), and to cancel the existing share certificates;
 - (ii) to appoint as directors, secretaries and public officers of Project Co the persons nominated by the City (or, as the City may elect, by the City's nominee), subject to the receipt of duly signed consents to act of such persons;
 - (iii) to revoke any existing authority to operate any bank account or safety deposit box with a bank or a financial institution, and to appoint instead as signatories of any such bank accounts and deposit boxes persons nominated by the City (or, as the City may elect, by the City's nominee); and
 - (iv) to note the resignation of each existing director, secretary and public officer effective as of Completion; and
- (c) subject to the performance by the Sellers of all of their respective obligations under clauses 5.2(a) and (b), the City or its nominee, as the case may be, must pay to each Seller in immediately available funds each Seller's Relevant Proportion of the Net Settlement Amount apportioned as against each Seller on the basis of any warranty disclosures by, or in respect of, each Seller, on the Settlement Date.

5.3 Failure to deliver

The Sellers each irrevocably authorizes and appoints the City (or, as the City may elect, the City's nominee) as its attorney to execute on its behalf transfers of its Option Securities naming the City or its nominee (as the City may elect) as transferee, if that Seller fails to deliver transfers in accordance with clause 5.2(a)(ii).

6. SELLERS REPRESENTATIONS AND WARRANTIES

6.1 General representations and warranties

The Sellers each represent and warrant that:

- (a) **(status and power)** it is a corporation incorporated, organized and existing under the laws of [____] and has the corporate power and authority to own and operate its property and assets, carry on its business and enter into and perform its obligations under this Agreement;
- (b) **(corporate authority)** the execution, delivery and performance by it of this Agreement;
 - (i) has been duly authorized by all necessary corporate action on its part; and
 - (ii) do not (or would not with the giving of notice, the passage of time or the happening of any other event or circumstance) result in a breach or a violation of, or conflict with, or allow any other person to exercise any rights under, any of its constating documents shareholders' agreements, by-laws or resolutions of its board of directors or shareholders.
- (c) **(Authorizations)** the execution, delivery and performance by it of this Agreement does not (or would not with the giving of notice, the passage of time or the happening of any other event or circumstance):
 - (i) result in a breach or a violation of, conflict with, or cause the termination or revocation of, any Authorization held by it or necessary to the ownership of the Option Securities, the operation of the Project;
 - (ii) result in or require the creation of any lien upon any of the Option Securities;
 - (iii) result in a breach or a violation of, or conflict with, any judgement, order or decree of any Governmental Authority; or
 - (iv) result in a breach or a violation of, or conflict with, any Law applicable to it.
- (d) **(execution and binding obligation)** this Agreement constitutes legal, valid and binding obligations of it, as the case may be, enforceable against it in accordance with their respective terms;
- (e) **(no contravention)** its execution, delivery or performance of this Agreement, or the carrying out by it of the transactions that it contemplates, does not and will not violate or conflict with, or constitute a default under:
 - (i) any law to which it or any of its property is subject or any order of any Governmental Authority that is binding on it or any of its property;
 - (ii) any Authorization or Applicable Law;
 - (iii) its constating, formation or organizational documents, including any by-laws; or
 - (iv) any covenant, contract, agreement, or understanding to which it is a party or by which it or any of its properties or assets is bound or affected;

- (f) **(commercial benefit)** the execution, delivery and performance by it of this Agreement to which it is a party, and the carrying out by it of the transactions that this Agreement contemplates, is for its corporate benefit and in its commercial interests;
- (g) **(solvency)** it and Project Co, is able to pay its debts as and when they generally become due and payable;
- (h) **(no trust)** it is not entering into this Agreement as trustee of any trust or settlement;
- (i) **(no litigation)** there are no actions, suits or proceedings, at law or in equity, by any person, nor any arbitration, administrative or other proceeding by or before (or to its knowledge any investigation by) any Governmental Authority, current or pending, or, to its knowledge, threatened against it, or Project Co, and any of its officers or directors (in their capacity as such). No event has occurred or circumstance exists which could reasonably be expected to give rise to, or serve as a valid basis for, the commencement of any action, suit, proceeding, arbitration or investigation by or against it, any of its officers or directors (in their capacity as such). In the past three years, it has not been subject to any judgment, order or decree entered in any lawsuit or proceeding nor has it settled any claim prior to being sued or prosecuted or a judgment being given in respect of it; and
- (j) **(Net Settlement Amount information)** all of the information contained in any Accounts and Liabilities Certificate delivered under this Agreement is true, accurate and complete.

6.2 Representations and warranties by the Sellers in respect of the Option Securities

The Sellers each represent and warrant that:

- (a) **(title)** subject to the Permitted Securities Interests, it is the registered and beneficial owner of the Option Securities with good and valid title thereto, free and clear of all liens including pre-emptive rights, rights of first refusal or “put” or “call” rights created by statute, its articles or otherwise, and full power to grant the Equity Purchase Option and, if the option is exercised, to complete the sale and purchase of its Option Securities in the manner provided in this Agreement including, for the avoidance of doubt, by transferring legal and beneficial right and title to its Option Securities to the City or its nominee, as the case may be;
- (b) **(no other interest)** no person other than the Seller has any interest in or other right over its Option Securities including any Security Interest, option or right of pre-emption except:
 - (i) pursuant to the Permitted Security Interests; or
 - (ii) as otherwise agreed by the City in its absolute discretion;
- (c) **(entire issued share capital of Project Co)** its Option Securities constitute the entire issued and outstanding share capital of Project Co. Other than its Option Securities, there are no other class of shares, units or other interests in the nature of Equity in Project Co;
- (d) **(all calls satisfied)** all calls made in respect of the Option Securities have been satisfied;

- (e) **(fully paid Option Securities)** each of its Option Securities have been duly issued and are outstanding as fully paid and non-assessable;
- (f) **(no Encumbrance)** the Sellers will on Completion have good and marketable title to their respective Option Securities free from any Encumbrance. On Completion, no person will have a claim to be entitled to an Encumbrance affecting any Option Security;
- (g) **(no disposal, option)** the Sellers have not sold, transferred or otherwise disposed of, agreed to sell, transfer or dispose of or granted any option to purchase its respective Option Securities or any interest in its Option Securities (other than as contemplated in this Agreement or pursuant to the Permitted Securities Interests);
- (h) **(no agreement)** there is no agreement, arrangement or understanding, or issued security or financial product, which calls for the present or future issue of, or gives to any person the right to require the issue of, any share or unit in, or security of, or other form of Equity in Project Co; and
- (i) **(no convertible securities)** Project Co has not issued any security convertible into shares or units in Project Co (other than any security being transferred as part of the sale under this Agreement).

6.3 Reliance on representations and warranties

- (a) Each of the Sellers acknowledges that the City has executed this Agreement and agreed to take part in the transactions that it contemplates in reliance on the representations and warranties that are made in this clause 6 (*Sellers representations and warranties*) and the disclosures referred to in clause 6.3(d).
- (b) Each of the Sellers acknowledges that it has not relied and will not rely on any financial or other advice, representation, statement or promise provided or made by or on behalf of the City in deciding to enter into this Agreement or to exercise any right or perform any obligation under it.
- (c) The maximum aggregate liability of the Sellers to the City in relation to any Claim for breach of any representation or warranty given under clause 6.1(g), 6.1(i) or 6.1(j) shall be limited (in aggregate) to the Settlement Amount.
- (d) Notwithstanding any other provision of this Agreement, no reliance may be placed by the City on any warranty given pursuant to clauses 6.1(g), 6.1(i) and 6.1(j) and the Sellers shall not have any liability to the City for a breach of any warranty given pursuant to clauses 6.1(g), 6.1(i) and 6.1(j) if and to the extent that:
 - (i) the Sellers disclose relevant facts and circumstances to the City to demonstrate to the City's reasonable satisfaction that any of the warranties in clauses 6.1(g), 6.1(i) and 6.1(j), as the case may be, are not true and correct; and
 - (ii) the disclosure referred to in clause 6.3(d)(i) above is made prior to the final determination of the Settlement Amount following the valuation pursuant to Schedule 3, provided that the City may in that instance:

- (A) withdraw from the purchase, in which case no party will have any liability to the other parties as a consequence (other than in respect of any accrued liability arising out of a prior breach of this Agreement); or
- (B) proceed with the purchase on the basis that the valuation pursuant to Schedule 3 will be delayed or otherwise extended (if required) to take into account:
 - (01) the disclosed facts or circumstances which gave rise to the warranty in clauses 6.1(g), 6.1(i) and/or 6.1(j), as the case may be, being untrue and incorrect; and
 - (02) any other relevant facts of which the City is aware and which give rise to the warranty in clauses 6.1(g), 6.1(i) and/or 6.1(j), as the case may be, being untrue and incorrect.

Provided that if the disclosure occurs after the valuation pursuant to Schedule 3 and prior to the Settlement Date, the City may:

- (iii) withdraw from the purchase, in which case no party will have any liability to the other parties as a consequence (other than in respect of any accrued liability arising out of a prior breach of this Agreement); or
- (iv) defer the Settlement Date so as to seek a revised valuation to take into account:
 - (A) the disclosed facts or circumstances which gave rise to the warranty in clauses 6.1(g), 6.1(i) and/or 6.1(j), as the case may be, being untrue and incorrect; and
 - (B) any other relevant facts of which the City is aware and which give rise to the warranty in clauses 6.1(g), 6.1(i) and/or 6.1(j), as the case may be, being untrue and incorrect,

in which case the parties will reapply the process in Schedule 3 as if the date of the disclosure was the Equity Purchase Exercise Notice Date (and, to avoid doubt, the Sellers will not in that instance have any liability on account of the facts or circumstances which gave rise to the warranty in clauses 6.1(g), 6.1(i) and/or 6.1(j), as the case may be, being untrue or incorrect), to the extent of the disclosure under clauses 6.3(d).

7. SELLER UNDERTAKINGS

7.1 Additional Equity Securities

Project Co must not, and the Sellers must procure that Project Co does not, issue or grant any Additional Equity Securities, nor register a person as a holder of any such Additional Equity Security, unless the parties to this Agreement and that person have executed an agreement on terms which the City is satisfied are consistent with the terms of this Agreement and pursuant to which that person grants to the City the right to require that person to sell the Additional Equity Securities of that person to the City or its nominee (as the City may elect) without any change to the Settlement Amount.

7.2 Exercise of voting rights

From the Equity Purchase Exercise Notice Date until and including Completion (the **Equity Purchase Option Validity Period**), each Seller must not exercise any votes in respect of its Option Securities, and will procure that Sellers must not exercise any votes in respect of securities in Project Co, without the City's prior written consent (not to be unreasonably withheld or delayed in light of the best interests of the Sellers or Project Co).

7.3 Restraint on dealing

During the Equity Purchase Option Validity Period, each Seller must not, and will procure that Project Co must not, sell, transfer, assign, grant a security in respect of, allow a security interest to attach or otherwise deal with any legal or beneficial interest in, any Option Securities or, as the case may be, in respect of the securities of Project Co, other than a Permitted Security Interest or with the prior written consent of the City.

7.4 Other undertakings

- (a) During the Equity Purchase Option Validity Period, each Seller must procure that Project Co, does not, without the prior written consent of the City (not to be unreasonably withheld or delayed in light of the best interests of the Sellers or Project Co);
 - (i) sell, transfer, lease, license, assign or otherwise dispose of the whole or any part of its business, undertaking, property or assets;
 - (ii) carry on any activity other than the business of providing the Maintenance and Rehabilitation Services and the Works contemplated by the Project Agreement in the normal and proper course;
 - (iii) issue or allot or agree to issue or allot any shares or units in its capital or any securities or loan notes convertible into shares or units or grant or agree to grant options over or rights in any such shares or units, securities and loan notes;
 - (iv) create or issue any debenture, mortgage, charge or other security or increase the amount of any borrowings capable of being secured thereby;
 - (v) acquire or dispose of any share, debenture, mortgage, loan capital or security (or any interest therein) in any body corporate or trust;
 - (vi) make any loan other than credit given in the normal course of trading;
 - (vii) enter into any material contract or commitment or pay any management or other fee other than in the ordinary course of ordinary business on arm's length terms;
 - (viii) enter into any joint venture, partnership or profit sharing agreement with any other person;
 - (ix) sell, release, assign or factor the debts or securities of Project Co;

- (x) approve any transferee of any share or unit or other form of Equity in Project Co, other than any such transferee as is authorised by this Agreement;
 - (xi) do or permit or suffer to be done any act or thing whereby Project Co, may be wound up (whether voluntarily or compulsorily);
 - (xii) commence any litigation, mediation or arbitration or any other form of dispute resolution the costs of which are likely to exceed \$[REDACTED];
 - (xiii) compromise any claims, demands or proceedings for an amount in excess of \$[REDACTED] or take steps to do so;
 - (xiv) make any tax election or settle or compromise any income tax liability, unless that election, settlement or compromise is required by law and is supported by an opinion of counsel, or is in the ordinary course of business and is consistent with past practices;
 - (xv) terminate or permit the termination or amendment of, or fail to renew on its expiry, any insurance policy held by Project Co, as at the Equity Purchase Exercise Notice Date; or
 - (xvi) do or omit to do anything which might result in the variation, termination, suspension, revocation or non-renewal of any Authorization held by Project Co, which is material to the operation its business.
- (b) During the Equity Purchase Option Validity Period, each Seller must procure that:
- (i) no amendment or alteration is made to the constitutional documents of Project Co, without the City's prior written consent;
 - (ii) Project Co, does not purchase or cancel any of its own shares or units or make any repayment of, or reduction in, its share or unit capital or make any alteration to any of the rights attaching to any class of its share or unit capital, as applicable;
 - (iii) Project Co does not make any material change in the nature of its business;
 - (iv) Project Co, does not enter into any transaction that is not in the normal and proper course of conducting its business nor enter into any transaction which is not on arm's length terms.

8. ACCESS TO INFORMATION

Each of the Sellers must, and will procure that Project Co, must, at all times during the term of this Agreement upon reasonable notice from the City, provide the City and its representatives with;

- (a) access to such information (other than legally privileged information if such access would waive such privilege) as the City may reasonably request from time to time in order;
 - (i) to evaluate whether it wishes to exercise the Equity Purchase Option; and

- (ii) to verify any information provided under this Agreement (including in an Accounts and Liabilities Certificate);
- (b) full access to its personnel and premises; and
- (c) details of any facts or circumstances which affect the representations and warranties in clause 6.1 to 6.2 (both inclusive).

9. ANNOUNCEMENTS

No press release or other public announcement with respect to this Agreement or any transaction contemplated therein is to be made by a party unless and until the text of the announcement and the time and manner of its release have been approved by the other party. However, if a party is bound by law to make a press release or other public announcement, such party may do so, notwithstanding the failure of the other party to approve same, provided (a) the other party is given at least three Business Days prior written notice of the intention to make such announcement and has a reasonable opportunity to comment on the announcement, and (b) the announcement merely relates the facts and then only to the extent necessary to satisfy the specific legal requirement

10. MISCELLANEOUS

10.1 Notices

Any notice, consent, waiver or other communication given under this Agreement must be in writing in the English language and shall be given by delivering it (personally or by nationally recognized courier) or sending it by facsimile or electronic mail addressed:

- (a) to the City at:

•

Attention: •
Facsimile: •
Email: •

with a copy (which does not constitute notice to the City) to:

Norton Rose Fulbright Canada LLP

•

Attention: •
Facsimile: •
Email: •

- (b) to the Seller at:

•

Attention: •
Facsimile: •
Email: •

with a copy (which does not constitute notice to the Seller) to:

[the Seller's counsel]

•

Attention: •
Facsimile: •
Email: •

(c) to the [_____] at:

•

Attention: •
Facsimile: •
Email: •

with a copy (which does not constitute notice to the [_____]) to:

[the [_____] counsel]

•

Attention: •
Facsimile: •
Email: •

Any such communication is deemed to have been duly given (a) if delivered personally, on the day of delivery, (b) if sent by a nationally recognized courier service (delivery receipt requested) with charges paid by the sender, on the later of (i) the first Business Day following the date of dispatch, or (ii) the scheduled day of delivery by such service, (c) if sent by facsimile (with confirmation of transmission), on the day so sent if the day is a Business Day and the transmission was sent prior to 5 pm (Ottawa time) and otherwise on the next Business Day, and (d) if sent by electronic mail on the date so sent, if the day is a Business Day and the email was sent prior to 5 pm (Ottawa time) and otherwise on the next Business Day. In the case of electronic mail, receipt of each communication must be confirmed by the recipient by the end of the next Business Day or, if not so confirmed, must be followed by the dispatch of a copy of such communication pursuant to one of the other methods described above; provided however that such email notice shall be deemed to have been given on the date stipulated in (d) above. A Person may change its address for service by notice given in accordance with the foregoing and any subsequent communication must be sent to such Person at its changed address

10.2 Governing Law

- (a) This Agreement is governed by and is to be interpreted, construed and enforced in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable therein, without regard to conflict of law principles.
- (b) Each of the Parties irrevocably attorns and submits to the exclusive jurisdiction of the courts of Ontario in any action or proceeding arising out of or relating to this Agreement. Each of the Parties waives objection to the venue of any action or proceeding in such court or any argument that such court provides an inconvenient forum.

10.3 Amendments

This Agreement may only be amended, supplemented or otherwise modified by written agreement each of the parties hereto.

10.4 Assignment

- (a) This Agreement will become effective when executed by the Parties and thereafter will be binding upon and enure to the benefit of the Parties and their respective successors and permitted assigns.
- (b) None of the Parties may, without the prior written consent of the other Parties, transfer, assign, or otherwise dispose of any of its rights, duties or obligations under this Agreement.

10.5 Waiver

The failure or delay by a party in enforcing, or insisting upon strict performance of, any provision of this Agreement does not constitute a waiver of such provision or in any way affect the enforceability of this Agreement (or any of its provisions) or deprive a party of the right, at any time or from time to time, to enforce or insist upon strict performance of that provision or any other provision of this Agreement. Any waiver by a party of any provision of this Agreement is effective only if in writing and signed by a duly authorized representative of such party

10.6 Further Assurances

From time to time after the Closing, each party will, at the request of the other party, execute and deliver such additional conveyances, transfers and other assurances and perform or cause to be performed such further and other acts or things as may be reasonably required to give effect to, and carry out the intent of, this Agreement.

10.7 Consents

A consent required under this Agreement from the City may be given or withheld, or may be given subject to any conditions, in its absolute discretion, unless this Agreement expressly provides otherwise.

10.8 No representation or reliance

- (a) Each party acknowledges that no party (nor any person acting on a party's behalf) has made any representation or other inducement to it to enter into this Agreement, except for representations or inducements expressly set out in this Agreement.
- (b) Each party acknowledges and confirms that it does not enter into this Agreement in reliance on any representation or other inducement by or on behalf of any other party, except for representations or inducements expressly set out in this Agreement.

10.9 Severability

If any provision of this Agreement is determined by an arbitrator or a court of competent jurisdiction to be illegal, invalid or unenforceable, that provision will be severed from this Agreement and the remaining provisions will continue in full force and effect, without amendment.

10.10 Remedies cumulative

The rights and remedies provided in this Agreement are cumulative and are not exclusive of any rights or remedies provided by law or any other agreement, except to the extent expressly provided in this Agreement.

10.11 Entire agreement

This Agreement constitutes the entire agreement between the parties and supersedes all prior agreements, understandings, negotiations and discussions relating to the subject matter thereof, whether oral or written. There are no representations, warranties, covenants, conditions or other agreements, express or implied, collateral, statutory or otherwise, between the parties relating to the subject matter hereof except as specifically set forth in this Agreement. Neither party has relied or is relying on any other information, discussions or understandings in entering into and completing the transactions contemplated in this Agreement.

10.12 Counterparts

This Agreement may be executed in any number of separate counterparts (including by facsimile or other electronic means) and all such signed counterparts will together constitute one and the same instrument. To evidence its execution of an original counterpart of this Agreement, a party may send a copy of its signature on the execution page hereof to the other parties by facsimile or other means of recorded electronic transmission (including in PDF form) and such transmission shall constitute valid delivery of an executed copy of this Agreement to the receiving party.

10.13 Expenses

Except as otherwise expressly provided in this Agreement, all costs and expenses (including the fees and disbursements of legal counsel, brokers, investment advisers, consultants and accountants) incurred in connection with this Agreement and the transactions contemplated herein are to be paid by the party incurring such expenses. If this Agreement is terminated, the obligation of each party to pay its own expenses will be subject to any rights of such party arising from a breach of this Agreement by the other party.

10.14 Several Obligations

If a party to this document is made up of more than one person, or a term is used in this document to refer to more than one party (for example, the Sellers), then unless otherwise specified in this document, the obligations and liabilities of those persons are several and any representations and warranties are given by that person for, or in respect of, itself but not for, or in respect of, any other entity.

[Signature Page Follows]

IN WITNESS WHEREOF the parties have executed this Agreement as of the first date written above.

CITY OF OTTAWA

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the corporation.

[Seller]

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the corporation.

[●]

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the corporation.

Schedule 1
Equity Purchase Exercise Notice

To: _____,

(together, the **Sellers**).

Re: Equity Purchase Agreement, dated [insert] between ___ and ___ (the "EPA")

We refer to the EPA. Unless otherwise defined or the context otherwise requires, capitalised terms used in this Equity Purchase Exercise Notice have the meanings given to them (including by incorporation) in the EPA.

We hereby give notice pursuant to clause 3.1 of the EPA that we exercise the Equity Purchase Option and require each of you to sell to us or our nominee your respective Option Securities for your Relevant Proportion of the Net Settlement Amount and otherwise in accordance with the EPA.

The Settlement Date is **[to be inserted by the City]**.

[Our appointed nominee for the purposes of this transaction is **[to be inserted by the City]2**

Other than as specifically contemplated under the EPA, this Equity Purchase Exercise Notice is irrevocable.

DATED [date]

Officer:
Name: (printed)

² Note to Proponents: to be deleted if not applicable

**Schedule 2
Accounts and Liabilities Certificate**

To: The City of Ottawa

Re: Equity Purchase Agreement, dated [insert] between ____ and ____ (the "EPA")

We refer to the EPA. Unless otherwise defined or the context otherwise requires, capitalised terms used in this Equity Purchase Exercise Notice have the meanings given to them (including by incorporation) in the EPA.

This is an Accounts and Liabilities Certificate delivered under clause 5.2(a)(i) of the EPA. We hereby certify that:

(a) the Project Co Accounts and Receivables, as at the Settlement Date, are as set out below:

<u>Item</u>	<u>Amount (\$)</u>
Service Payment Receivable	[insert]
[All credit balances on any bank accounts held by or on behalf of Project Co]	[insert]
Miscellaneous Current Assets	[insert]

(b) the Project Co Liabilities, as at the Settlement Date, are as set out below:

<u>Item</u>	
O&M and SPV (incl Insurance) Costs Payable	[insert]
Lifecycle Payment Payable	[insert]
Miscellaneous Current Liabilities	[insert]

DATED [date]

Signed for and on behalf of _____

Schedule 3
Settlement Amount Calculation

1. Calculation of Settlement Amount

- (a) The parties agree that the Settlement Amount will be the amount, as at the Equity Purchase Exercise Notice Date, calculated in accordance with paragraph 1(b) of this Schedule 3.
- (b) The Settlement Amount will be shall be an amount which, if paid on the Settlement Date and taken together with all dividends and other Distributions paid on or made in respect of the Equity Capital on or before the Settlement Date and taking account of the actual timing of all such payments, but, in any event, excluding all amounts (whether for costs, overhead, profit or otherwise) after the Settlement Date, gives a nominal internal rate of return to the Settlement Date equal to the Base Case Equity IRR on the amount paid for the Equity Capital (to the extent that such Equity Capital has been applied by Project Co for the purposes of the Project) while taking into consideration the timing of such Equity Capital investment in the Project.
- (c) Not Used.
- (d) If the City exercises any of its rights under clause 6.3(d)(ii)(B) or 6.3(d)(iv), then the parties must take into account the relevant facts or circumstances contemplated under that clause (whether the relevant facts or circumstances relate to Project Co) in undertaking its valuation and will make appropriate adjustments (if any) to the determination of the Settlement Amount, including factoring in any contingent liability (other than any contingent tax liability) or risk evidenced by such facts or circumstances. The calculation of the Settlement Amount will individually allocate the valuation as against each Seller on the basis of each Seller's Relevant Proportion and any warranty disclosures by, or in respect of, each Seller.

2. Not Used

3. Not Used

SCHEDEULE 37

[Intentionally Deleted]

SCHEDEULE 38

[Intentionally Deleted]

**TRILLIUM LINE EXTENSION PROJECT
REVENUE VEHICLE SUPPLY CONTRACT**

[REDACTED]

SCHEDULE 40

UTILITY BASELINE REPORT

[REDACTED]

SCHEDULE 41

LENDERS' DIRECT AGREEMENT

THIS LENDERS' DIRECT AGREEMENT is made as of the 28th day of March, 2019.

BETWEEN:

THE CITY OF OTTAWA

(the "City")

AND:

[REDACTED]

(the "Lenders' Agent")

AND:

TRANSITNEXT GENERAL PARTNERSHIP [REDACTED]

("Project Co")

WHEREAS:

- A. City and Project Co have entered into the Project Agreement.
- B. Under the Lending Agreements, the Financing is to be provided to Project Co by the Lenders to partially finance the Works under the Project Agreement, conditional, among other things, on Project Co executing and delivering the Lending Agreements.
- C. The Lenders' Agent has agreed to enter into this Lenders' Direct Agreement with City and Project Co in relation to the Lending Agreements, the exercise of its rights under the Lending Agreements and the remedying of breaches by Project Co under the Project Agreement.
- D. With a view to ensuring that City is able to properly and effectively discharge its duties, functions and responsibilities under Applicable Law, Project Co, the Lenders' Agent and the Lenders commit to working collaboratively, responsibly and cooperatively with City throughout the duration of the Project Agreement.

NOW THEREFORE in consideration of the mutual covenants and agreements of the Parties hereinafter contained and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties covenant and agree as follows:

1 DEFINITIONS AND INTERPRETATION

- 1.1** In this Lenders' Direct Agreement, all capitalized terms not otherwise defined in this Lenders' Direct Agreement shall have the meanings ascribed to them in the Project Agreement and unless the context otherwise requires:
- (a) "**Appointed Representative**" means any of the following to the extent so identified in an Appointed Representative Notice:
 - (i) the Lenders' Agent, any Lenders or any of their Affiliates;
 - (ii) a receiver or receiver and manager or any permutation thereof of Project Co appointed under the Security Documents;
 - (iii) a trustee in bankruptcy or court appointed receiver of Project Co;
 - (iv) an administrator of Project Co;
 - (v) a person directly or indirectly owned or controlled by the Lenders' Agent or any of the Lenders; or
 - (vi) any other person approved by City (such approval not to be unreasonably withheld or delayed).
 - (b) "**Appointed Representative Notice**" has the meaning given in Section 8(b).
 - (c) "**City Project Documents**" means the Project Agreement and all other documents to which both the City and Project Co are parties pursuant to or in connection with the Project Agreement.
 - (d) "**Default Notice**" has the meaning given in Section 7(b)(i).
 - (e) "**Enforcement Action**" means any acceleration of amounts due and owing to the Lenders under any of the Lending Agreements and/or any enforcement proceeding or enforcement action commenced or taken under any of the Security Documents.
 - (f) "**Enforcement Event**" means an event of default as defined in the Lending Agreements, or any other event which permits an Enforcement Action.
 - (g) "**Exercise Date**" has the meaning given in Section 12(b).
 - (h) "**Indebtedness Notice**" has the meaning given in Section 7(b)(ii).
 - (i) "**Lender Representative**" means a representative (which may be the Lenders' Agent) acting as agent or trustee for and on behalf of all of the lenders lending to a Suitable Substitute.
 - (j) "**Lenders' Agent**" means [REDACTED] acting as agent for and on behalf of the Lenders.

- (k) “**Lenders’ Construction Contractor Direct Agreement**” means the direct agreement among the Lenders’ Agent, the Construction Contractor and Project Co.
- (l) “**Lenders’ Direct Agreement**” means this lenders’ direct agreement.
- (m) “**Notice Period**” means the period starting on the date of delivery of a Default Notice and ending 120 days later.
- (n) “**Novation Date**” has the meaning given in Section 10(a).
- (o) “**Novation Notice**” has the meaning given in Section 10(a).
- (p) “**Party**” means the City, Project Co or the Lenders’ Agent, and “**Parties**” means collectively, the City, Project Co and the Lenders’ Agent.
- (q) “**Project Agreement**” means the project agreement made on or about March 28, 2019 between the City and Project Co.
- (r) “**Security**” means any security interests granted to the Lenders’ Agent pursuant to the Security Documents.
- (s) “**Security Documents**” means all security granted by Project Co to the Lenders (or any trustee or agent thereof, including the Lenders’ Agent) pursuant to or in connection with the Lending Agreements, including but not limited to:
 - (i) the Lenders’ CC Direct Agreement (as defined in the Lending Agreements);
 - (ii) general security agreement between Project Co, [REDACTED], and the Lenders’ Agent dated the date of the Project Agreement;
 - (iii) limited recourse guarantee and pledge between [REDACTED] and the Lenders’ Agent dated the date of the Project Agreement;
 - (iv) blocked account agreement – general, between Project Co, the Lenders’ Agent and [REDACTED] dated the date of the Project Agreement;
 - (v) blocked account agreement – springing, between Project Co, the Lenders’ Agent and [REDACTED], dated the date of the Project Agreement.
- (t) “**Step-In Date**” means the date on which the City receives a Step-In Notice from the Lenders’ Agent.
- (u) “**Step-In Notice**” means the notice given by the Lenders’ Agent to the City pursuant to Section 8(a) stating that the Lenders’ Agent is exercising its step-in rights under this Lenders’ Direct Agreement.
- (v) “**Step-In Period**” means the period from the Step-In Date up to and including the earlier of:

- (i) the Step-Out Date;
 - (ii) the Termination Date (provided that the City has complied with its obligations in Section 7 of this Lenders' Direct Agreement);
 - (iii) the date that a transfer of Project Co's rights and obligations under the City Project Documents to a Suitable Substitute pursuant to Section 10 becomes effective; and
 - (iv) if the Step-In Date occurs prior to the Substantial Completion Date, the earlier of:
 - (A) the date falling 180 days after the Longstop Date; or
 - (B) the date falling 2 years after the Step-In Date.
- (w) "**Step-Out Date**" means the date falling 30 days after the date on which the City receives a Step-Out Notice.
- (x) "**Step-Out Notice**" has the meaning given in Section 9(a).
- (y) "**Subsequent Indebtedness Notice**" has the meaning given in Section 7(c).
- (z) "**Suitable Substitute**" means a person, approved in writing by the City in accordance with Sections 10(b) and 10(c), which:
 - (i) has the legal capacity, power and authority to become a party to and perform the obligations of Project Co under the City Project Documents; and
 - (ii) employs individuals having the appropriate qualifications, experience and technical competence, and having the resources available to it (including committed financial resources and subcontracts) that are sufficient to enable it to perform the obligations of Project Co under the City Project Documents.

2 INTERPRETATION

This Lenders' Direct Agreement shall be interpreted according to the following provisions, unless the context requires a different meaning:

- (a) The headings in this Lenders' Direct Agreement are for convenience of reference only, shall not constitute a part of this Lenders' Direct Agreement, and shall not be taken into consideration in the interpretation of, or affect the meaning of, this Lenders' Direct Agreement.
- (b) Unless the context otherwise requires, references to specific Sections, Clauses, Paragraphs, Subparagraphs, and other divisions are references to such Sections, Clauses, Paragraphs, Subparagraphs, or divisions of this Lenders' Direct Agreement and the terms "Section" and "Clause" are used interchangeably and are synonymous.

- (c) Words importing persons or parties are to be broadly interpreted and include an individual, corporation, limited liability company, joint stock company, firm, partnership, joint venture, trust, unincorporated organization, Governmental Authority, unincorporated body of persons or association and any other entity having legal capacity, and the heirs, beneficiaries, executors, administrators or other legal representatives of a person in such capacity.
- (d) Unless the context otherwise requires, wherever used herein the plural includes the singular, the singular includes the plural, and each of the masculine, feminine and neuter genders include all other genders.
- (e) References to any standard, principle, agreement or document include (subject to all relevant approvals and any other provisions of this Lenders' Direct Agreement concerning amendments) a reference to that standard, principle, agreement or document as amended, supplemented, restated, substituted, replaced, novated or assigned.
- (f) The words in this Lenders' Direct Agreement shall bear their natural meaning.
- (g) References containing terms such as:
 - (i) "hereof", "herein", "hereto", "hereinafter", and other terms of like import are not limited in applicability to the specific provision within which such references are set forth but instead refer to this Lenders' Direct Agreement taken as a whole; and
 - (ii) "includes" and "including", whether or not used with the words "without limitation" or "but not limited to", shall not be deemed limited by the specific enumeration of items but shall, in all cases, be deemed to be without limitation and construed and interpreted to mean "includes without limitation" and "including without limitation".
- (h) In construing this Lenders' Direct Agreement, the rule known as the *ejusdem generis rule* shall not apply nor shall any similar rule or approach to the construction of this Lenders' Direct Agreement and, accordingly, general words introduced or followed by the word "other" or "including" or "in particular" shall not be given a restrictive meaning because they are followed or preceded (as the case may be) by particular examples intended to fall within the meaning of the general words.
 - (i) Where this Lenders' Direct Agreement states that an obligation shall be performed "no later than" or "within" or "by" a stipulated date or event which is a prescribed number of days after a stipulated date or event, the latest time for performance shall be 5:00 p.m. on the last day for performance of the obligation concerned, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
 - (j) Where this Lenders' Direct Agreement states that an obligation shall be performed "on" a stipulated date, the latest time for performance shall be 5:00 p.m. on that day, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
 - (k) Any reference to time of day or date means the local time or date in Ottawa, Ontario.

- (l) Unless otherwise indicated, time periods will be strictly construed.
- (m) Whenever the terms “will” or “shall” are used in this Lenders’ Direct Agreement they shall be construed and interpreted as synonymous and to read “shall”.

3 CONFLICT OF DOCUMENTS

In the event of any ambiguity, conflict or inconsistency between the provisions of this Lenders’ Direct Agreement, the Project Agreement and the Construction Contractor’s Direct Agreement, the provisions of this Lenders’ Direct Agreement shall prevail and govern to the extent of such ambiguity, conflict or inconsistency.

4 TERM

- (a) This Lenders’ Direct Agreement shall terminate automatically on the earliest of:
 - (i) the date on which all amounts which may be or become owing to the Lenders under the Lending Agreements have been irrevocably paid in full;
 - (ii) the Termination Date (provided that the City has complied with its obligations in Section 7); and
 - (iii) the date that any transfer of Project Co’s rights and obligations under the City Project Documents to a Suitable Substitute pursuant to Section 10 becomes effective and the agreements contemplated in Section 10(e)(iii) are executed and delivered by the parties thereto.
- (b) Within 30 days following its occurrence, the Lenders’ Agent shall provide notice to the City of the date referred to in Section 4(a)(i).

5 AGREEMENTS AND SECURITY

- (a) Project Co and the Lenders’ Agent shall not amend or modify the Lending Agreements, or any of them, except where Project Co is permitted to do so pursuant to Section 7.3 of the Project Agreement.
- (b) Project Co shall not, prior to the Substantial Completion Date, exercise any rights of voluntary prepayment, voluntary redemption, or other voluntary repayment of loan, as applicable, under the Lending Agreements without the prior written consent of the City, acting in its sole discretion. In exercising its sole discretion to grant consent, the City shall be entitled to request and consider, and Project Co shall be required to provide within 10 Business Days following a request by the City, amongst other things and not limited to, the following:
 - (i) written certification by an officer of Project Co of the remaining Project Costs (as defined in the Lending Agreements) accrued and unpaid or expected to be incurred to achieve Substantial Completion and to fund any Project Accounts (as defined in the Lending Agreements) then not funded and required to be funded at or prior to the then anticipated prepayment and/or redemption (as approved by

- the SCTA (as defined in the Lending Agreements)) by the Substantial Completion Date;
- (ii) written certification by an officer of Project Co that no Funding Shortfall (as defined in the Lending Agreements) would reasonably be expected to arise as a consequence of such prepayment and/or redemption, including any related cancellation of unutilized commitments, if applicable, under the Lending Agreements;
 - (iii) written confirmation from the Lenders' Consultant, addressed to the City, that the Project Co's calculation in Section 5(b)(i) and Project Co's certification in Section 5(b)(ii) is, in the opinion of the Lenders' Consultant, correct;
 - (iv) written confirmation from the Lenders' Consultant, addressed to the City, that no incremental delay in achieving the any Substantial Completion Date (beyond the applicable Scheduled Substantial Completion Date) would reasonably be expected as a consequence of such prepayment and/or redemption and related cancellation of unutilized commitments, if applicable, under the Lending Agreements; and
 - (v) written confirmation from the Lenders' Consultant, addressed to the City, that the remaining Substantial Completion Dates are likely to occur on or prior to the then Scheduled Substantial Completion Dates.
- (c) Project Co and the City shall not amend or modify the City Project Documents (other than in accordance with the terms of those agreements) without the prior written consent of the Lenders' Agent, not to be unreasonably withheld or delayed, which consent shall not be withheld if the relevant amendment or modification shall not (i) materially adversely affect the ability of the Lenders to exercise their rights under the Security, (ii) materially adversely affect the value of the Security, or (iii) increase the liability of the Lenders or Project Co under the relevant agreement. The Lenders' Agent shall respond to any request for consent under this Section 5(c) within 30 days following receipt thereof.
 - (d) Project Co acknowledges and consents to the arrangements set out in this Lenders' Direct Agreement, and agrees not to do or omit to do anything that may prevent any other Party from enforcing its rights under this Lenders' Direct Agreement.
 - (e) The Lenders' Agent acknowledges having received a copy of the Project Agreement.
 - (f) The City acknowledges having received copies of the Lending Agreements, and confirm that they are in form and substance satisfactory to the City as at the date of Financial Close.
 - (g) The City acknowledges notice of and consents to the Security, and confirm that they have not received notice of any other security interest granted over Project Co's rights under any of the City Project Documents.

- (h) Project Co and the Lenders' Agent hereby authorize and instruct the City (and the City agrees) to pay the Substantial Completion Payment and all sums payable to Project Co under the Project Agreement in respect of any Debt Amount or any Debt Service Amount to the construction payment account described below in this Section 5(h) maintained by Project Co at [REDACTED], and Project Co and the City agree that upon the occurrence of an Enforcement Event, if so directed in writing by the Lenders' Agent upon giving reasonable notice, the City shall pay any sum which they are obliged to pay to Project Co under the Project Agreement to a bank account specified by the Lenders' Agent.

Construction Payment Account

SWIFT:	[REDACTED]
Canadian Routing Code:	[REDACTED]
Account No.:	[REDACTED]
Beneficiary Name:	[REDACTED]

The Parties acknowledge and agree that the RVSC Fixed Costs Amount will be paid by the City in accordance with Section 9.11 of the Project Agreement and shall not be deposited by the City in the Project Accounts (as defined in the Lending Agreements), either before or following a default or event of default under the Lending Agreements.

- (i) Prior to the irrevocable payment in full of all amounts owing to the Lenders under the Lending Agreements, the City shall not take any action to wind-up, liquidate, dissolve or appoint a receiver or receiver and manager of Project Co or to institute or sanction a voluntary arrangement or any other bankruptcy or insolvency proceedings in relation to Project Co.
- (j) The Lenders' Agent shall cause the Lenders' Consultant to provide the City with a copy of any written assessment or report prepared by the Lenders' Consultant in relation to the status or progress of the Works under the Construction Contract, including but not limited to, any certificate of payment, concurrently with its delivery to the Lenders' Agent. The Lenders' Agent acknowledges and agrees that this Section 5(j) shall constitute sufficient authority for the Lenders' Consultant to provide, without delay, a copy of any and all of its written assessments and reports to the City.
- (k) The City agrees that any enforcement by the Lenders' Agent of a security interest in the Equity Capital of Project Co granted in favour of the Lenders' Agent as party of the Security following an Enforcement Event shall not constitute a Change in Ownership, Change in Control or Project Co Event of Default under the Project Agreement.
- (l) Any agreement provided to Project Co pursuant to Section 14.5(a) of the Project Agreement shall be in form and substance satisfactory to the Lenders' Agent, acting reasonably.

6 ENFORCEMENT OF SECURITY BY LENDERS' AGENT

- (a) The Lenders' Agent shall promptly notify the City of any Enforcement Event, any Enforcement Action, any notice from the Lenders to Project Co to accelerate the maturity of any amounts owing by Project Co to the Lenders under the Lending Agreements or

any notice from the Lenders to Project Co to demand repayment of any amounts owing by Project Co to the Lenders under the Lending Agreements.

- (b) The Lenders' Agent may assign, transfer or otherwise dispose of any right, title or interest it may have in, or rights or obligations it may have pursuant to, the Security Documents to a successor agent in accordance with the terms of the Lending Agreements except where:
 - (i) such assignment, transfer or other disposition would constitute a Refinancing and the provisions of Schedule 27 - Refinancing to the Project Agreement have not been complied with in connection therewith; or
 - (ii) the person to whom such assignment, transfer or other disposition is to be made, or an Affiliate of such person, is a Restricted Person or a person whose standing or activities may compromise (i) the City's reputation or integrity, or (ii) the nature of the public transit system in the City of Ottawa so as to affect public confidence in the public transit system in the City of Ottawa or the Project.
- (c) Any Lender may assign, transfer or otherwise dispose of any right, title or interest it may have in, or rights or obligations it may have pursuant to, the Lending Agreements in accordance with the terms of the Lending Agreements.

7 TERMINATION OF PROJECT AGREEMENT BY THE CITY

- (a) Subject only to the rights expressly afforded to the Lenders' Agent pursuant to, and the restrictions set forth in, this Section 7, the City may, at any time, serve notice terminating the Project Agreement if it is entitled to do so under the terms of the Project Agreement.
- (b) At any time other than during the Step-In Period (with the restriction on termination during the Step-In Period set out in Section 7(d), the City shall not exercise any right it may have to terminate or serve notice terminating the Project Agreement for a Project Co Event of Default unless:
 - (i) the City promptly delivers written notice (a "**Default Notice**") to the Lenders' Agent setting out the Project Co Event of Default in reasonable detail;
 - (ii) not later than 30 days after the date of a Default Notice, the City delivers written notice (an "**Indebtedness Notice**") to the Lenders' Agent setting out:
 - (A) all amounts owed by Project Co to the City and any other existing liabilities and unperformed obligations of Project Co to the City of which the City is aware (having made reasonable enquiry), in each case, as of the date on which the City sent the Default Notice; and
 - (B) all amounts which will become owing by Project Co to the City and any other liabilities and obligations of Project Co to the City of which the City is aware (having made reasonable enquiry), in each case, on or before the end of the Notice Period; and

- (iii) the Notice Period has expired and the Lenders' Agent has not delivered a Step-In Notice.
- (c) At any time after the City sends an Indebtedness Notice but before the City receives a Step-In Notice, if the City discovers amounts that have become owing by Project Co to the City or any other liabilities or obligations of Project Co to the City that have come due but which were not included in the Indebtedness Notice, the City shall deliver written notice (a "**Subsequent Indebtedness Notice**") to the Lenders' Agent setting out those amounts, liabilities or obligations.
- (d) During the Step-In Period, the City shall not terminate the Project Agreement on grounds:
 - (i) that the Lenders' Agent has served a Step-In Notice or enforced any Security Document; or
 - (ii) arising prior to the Step-In Date of which the City was aware (having made due inquiry) and whether or not continuing at the Step-In Date unless:
 - (A) the grounds arose prior to the Substantial Completion Date, and the Substantial Completion Date does not occur on or before the date falling 180 days after the Longstop Date; or
 - (B) the grounds (whenever they first arose) did not give rise to any right to terminate the Project Agreement until after the Step-In Date; or
 - (C) the grounds arose after the Substantial Completion Date, and neither the Appointed Representative nor Project Co, as the case may be, is diligently proceeding to cure any breach of the Project Agreement that:
 - (1) arose prior to the Step-In Date;
 - (2) is continuing and capable of being cured; and
 - (3) would have entitled the City to terminate the Project Agreement; or
 - (iii) arising solely in relation to Project Co.
- (e) The City shall be entitled to terminate the Project Agreement by written notice to Project Co and the Appointed Representative:
 - (i) if any amount referred to in Section 7(b)(ii)(A) has not been paid to the City on or before the Step-In Date;
 - (ii) if any amount referred to in Section 7(b)(ii)(B) has not been paid on or before the last day of the Notice Period;
 - (iii) if amounts included in a Subsequent Indebtedness Notice have not been paid on or before the date the later of:

- (A) the date falling 30 days after the date on which the Subsequent Indebtedness Notice is delivered to the Lenders' Agent; and
 - (B) the Step-In Date; or
- (iv) on grounds arising after the Step-In Date in accordance with the terms of the Project Agreement.

8 STEP-IN RIGHTS

- (a) Subject to Section 8(b) and without prejudice to rights of the Lenders' Agent to enforce the Security, the Lenders' Agent may give the City a Step-In Notice at any time:
 - (i) during which a Project Co Event of Default is subsisting (whether or not a Default Notice has been served);
 - (ii) during the Notice Period; or
 - (iii) during which an Enforcement Event is subsisting.
- (b) At least 5 Business Days before the Lenders' Agent delivers a Step-In Notice, the Lenders' Agent shall deliver written notice (an "**Appointed Representative Notice**") to the City of:
 - (i) its intention to deliver a Step-In Notice; and
 - (ii) the identity of its proposed Appointed Representative.
- (c) Upon issuance of a Step-In Notice, the Appointed Representative shall assume, jointly with Project Co, all of Project Co's rights under the City Project Documents.
- (d) During the Step-In Period, the City shall deal with the Appointed Representative instead of Project Co in connection with all matters related to the City Project Documents. Project Co agrees to be bound by all such dealings between the City and the Appointed Representative to the same extent as if they had been between the City and Project Co.

9 STEP-OUT RIGHTS

- (a) The Appointed Representative may, at any time during the Step-In Period, deliver written notice (a "**Step-Out Notice**") to the City to terminate the Step-In Period on the Step-Out Date.
- (b) On expiry of the Step-In Period:
 - (i) the rights and obligations of the Appointed Representative in relation to the City under the City Project Documents arising prior to the expiry of the Step-In Period will be assumed by Project Co to the exclusion of the Appointed Representative;

- (ii) the City will no longer deal with the Appointed Representative and will deal with Project Co in connection with all matters related to the City Project Documents; and
 - (iii) the Appointed Representative and the City shall be and hereby are released from all obligations and liabilities to one another under the City Project Documents.
- (c) There will not be more than one Step-In Period in respect of any one Default Notice.

10 NOVATION TO SUITABLE SUBSTITUTE

- (a) Subject to Section 10(b), at any time:
 - (i) after an Enforcement Event has occurred;
 - (ii) during the Notice Period; or
 - (iii) during the Step-In Period,
- the Lenders' Agent may deliver to the City and any Appointed Representative written notice (a "**Novation Notice**") that it wishes to transfer Project Co's rights and obligations under the City Project Documents to a proposed transferee, together with all information reasonably necessary for the City to decide whether the proposed transferee is a Suitable Substitute. The Novation Notice shall specify a Business Day not less than 30 days from the date on which the City receives the Novation Notice ("**Novation Date**") for the transfer of Project Co's rights and obligations under the City Project Documents to the proposed transferee in accordance with the provisions of Section 10(e).
- (b) The City shall promptly notify the Lenders' Agent of any additional information it requires in order to assess whether the proposed transferee is a Suitable Substitute. The City shall notify the Lenders' Agent, in writing, as to whether the person to whom the Lenders' Agent proposes to transfer Project Co's rights and liabilities under the City Project Documents is approved by the City as a Suitable Substitute, on or before the date falling 30 days after the later of the date of receipt by the City of the Novation Notice and the date of receipt of any additional information requested by the City. For greater certainty, if the City fails to respond within such period, the City shall be deemed not to have approved the proposed transferee.
 - (c) The City shall not unreasonably withhold or delay its approval of a proposed transferee as a Suitable Substitute, but it shall, without limitation, be reasonable for the City to withhold its approval if:
 - (i) there are unremedied breaches under the Project Agreement which are capable of being remedied by the Appointed Representative or the Suitable Substitute and there is no rectification plan acceptable to the City, acting reasonably, in respect of such breaches;
 - (ii) the proposed transferee is a Restricted Person or other person who is not permitted to be a Project Co Party pursuant to the Project Agreement; or

- (iii) the proposed security interests to be granted by the Suitable Substitute to the Lender Representative are materially different from the Security, materially adversely affect the ability of the Suitable Substitute to perform under the City Project Documents or have the effect of increasing any liability of the City, whether actual or potential.
- (d) If the City withholds its approval of a proposed transferee as a Suitable Substitute in accordance with Section 10(c), the Lenders' Agent may give one or more subsequent Novation Notices pursuant to the provisions of Section 10(a) containing changed particulars relating to the same proposed transferee or particulars relating to another proposed transferee which the Lenders' Agent has good cause to believe will be acceptable to the City, acting reasonably, provided that only one Novation Notice may be outstanding at any one time.
- (e) On the Novation Date:
 - (i) Project Co and the City will be released from their obligations under the City Project Documents to each other, and the Suitable Substitute and the City will assume those same obligations towards each other;
 - (ii) each of the rights of Project Co against the City under the City Project Documents and the rights of the City against Project Co under the City Project Documents will be cancelled, and the Suitable Substitute and the City will acquire those same rights against each other;
 - (iii) the Parties will enter into, and the Lenders' Agent shall cause the Suitable Substitute and the Lender Representative to enter into, all such agreements or other documents as are reasonably necessary to give effect to the foregoing, including:
 - (A) an agreement between the City and the Suitable Substitute, on substantially the same terms as the Project Agreement; and
 - (B) an agreement among the City, the Suitable Substitute and the Lender Representative on substantially the same terms as this Lenders' Direct Agreement;
 - (iv) any subsisting ground for termination by the City of the Project Agreement will be deemed to have no effect and any subsisting Default Notice will be automatically revoked.

11 TRANSFERS

The City shall, at Project Co's cost and expense, take whatever action the Lenders' Agent, the Appointed Representative or a Suitable Substitute may reasonably require for perfecting any assumption or transfer of or release pursuant to Sections 8, 9 or 10, including the execution of any transfer or assignment, and the giving of any notice, order or direction and the making of any registration which, in each case, the Lenders' Agent, the Appointed Representative or the Suitable Substitute reasonably requires.

12 CONSTRUCTION CONTRACTOR'S DIRECT AGREEMENT

- (a) Notwithstanding any provision in the Construction Contractor's Direct Agreement, the City hereby undertake that it will not exercise any rights they may have under or arising out of any of the Construction Contractor's Direct Agreement, except as provided in Sections 12(b) to 12(f) inclusive.
- (b) Following termination of the Project Agreement (other than as a result of a novation pursuant to this Lenders' Direct Agreement) in accordance with this Lenders' Direct Agreement, the City shall from such date (the "**Exercise Date**") be entitled to exercise its rights under the Construction Contractor's Direct Agreement to step in to and/or novate the Construction Contract in accordance with the Construction Contractor's Direct Agreement.
- (c) Following the Exercise Date, the City shall not do anything to prejudice the rights which are not transferred to them pursuant to the Construction Contractor's Direct Agreement.
- (d) Where all amounts which may be or become owing by Project Co to the Lenders under the Lending Agreements have been irrevocably paid in full, the Lenders' Agent shall promptly release and discharge all Security in respect of the Construction Contract assumed or novated by the City pursuant to the Construction Contractor's Direct Agreement.
- (e) Notwithstanding the terms of the Construction Contractor's Direct Agreement and any other provisions of this Section 12, the Construction Contractor (and any guarantor thereof) shall remain responsible, and be liable, to Project Co in respect of all costs, claims, damages, losses and liabilities which shall have arisen out of or in connection with the Construction Contract in respect of the period prior to the Exercise Date.
- (f) Without prejudice to Sections 12(a) to 12(e) inclusive, the City shall not, prior to the date on which this Lenders' Direct Agreement terminates:
 - (i) claim, recover, retain or receive (or seek to claim, recover, retain or receive) any amount under the Construction Contractor's Direct Agreement (and/or the Construction Contract) from the Construction Contractor;
 - (ii) take any action to wind-up, liquidate, dissolve or appoint a receiver or receiver and manager of the Construction Contractor or to institute or sanction a voluntary arrangement or any other bankruptcy or insolvency proceedings in relation to the Construction Contractor; or
 - (iii) compete with the rights of the Lenders' Agent on a winding-up or other insolvency or bankruptcy of the Construction Contractor, nor claim to be subrogated to any rights of the Lenders' Agent or any Lender.

The City agrees and undertakes that if it receives any amount in contravention of the provisions of this Section 12(f), it will immediately turn the same over to the Lenders' Agent for the account of the Lenders' Agent and the Lenders and, pending such payment, hold the same in trust for the Lenders' Agent and the Lenders.

13 NOTICE OF PROJECT CO DELAY OR PROCEEDING AT RISK

- (a) The Parties acknowledge that, if Project Co is Proceeding At Risk pursuant to Section 14.6(g) of the Project Agreement, the City may, in its sole discretion, give notice to the Lenders' Agent that Project Co is Proceeding At Risk, together with the relevant information supporting the City's opinion that Project Co is Proceeding At Risk.

14 ASSIGNMENT

- (a) No Party to this Lenders' Direct Agreement may assign, transfer or otherwise dispose of any part of its rights or obligations under this Lenders' Direct Agreement save as provided in this Section 14.
- (b) Project Co may assign, transfer or otherwise dispose of the benefit of this Lenders' Direct Agreement to any person to whom Project Co assigns, transfers or otherwise disposes of its interest in the Project Agreement pursuant to Section 49.1 of the Project Agreement and the provisions of the Lending Agreements, and shall provide written notice to the City and the Lenders' Agent of such assignment, transfer or other disposition. Such assignee, as a condition precedent to any such assignment, transfer or other disposition, shall assume the obligations and acquire the rights of Project Co under this Lenders' Direct Agreement pursuant to an assumption agreement with, and in form and substance satisfactory to, the City and the Lenders' Agent, each acting reasonably. The City and the Lenders' Agent shall, at Project Co's cost and expense, do all things and execute all further documents as may be necessary in connection therewith.
- (c) The City may assign, transfer or otherwise dispose of the benefit of the whole or part of this Lenders' Direct Agreement to any person to whom the City assigns, transfers or otherwise disposes of its interest in the Project Agreement pursuant to Section 49.2 of the Project Agreement, and shall provide written notice to Project Co and the Lenders' Agent of such assignment, transfer or other disposition. Such assignee, as a condition precedent to any such assignment, transfer or other disposition, shall assume the obligations and acquire the rights of the City under this Lenders' Direct Agreement pursuant to an assumption agreement with, and in form and substance satisfactory to, Project Co and the Lenders' Agent, each acting reasonably. Project Co and the Lenders' Agent shall, at the City's cost and expense, do all things and execute all further documents as may be necessary in connection therewith.
- (d) The Lenders' Agent may only assign, transfer or otherwise dispose of any interest in this Lenders' Direct Agreement as permitted by the Lending Agreements, and shall provide written notice to Project Co and the City of such assignment, transfer or other disposition; provided that, notwithstanding any provision to the contrary in the Lending Agreements, the Lenders' Agent may not assign, transfer or otherwise dispose of any interest in this Lenders' Direct Agreement to a Restricted Person. The Lenders' Agent, as a condition precedent to any such assignment, transfer or other disposition, shall cause the assignee to enter into a new agreement with Project Co and the City on substantially the same terms as this Lenders' Direct Agreement and Project Co and the City shall enter into such new agreement with the assignee. Project Co and the City shall, at the Lenders' Agent's cost and expense, do all things and execute all further documents as may be necessary in connection therewith.

15 NOTICES

- (a) All notices, requests, demands, instructions, certificates, consents and other communications required or permitted under this Lenders' Direct Agreement shall be in writing (whether or not "written notice" or "notice in writing" is specifically required by the applicable provision of this Lenders' Direct Agreement) and served by sending the same by registered mail or by hand (in each case, with a copy by electronic submission), as follows:

If to the City:

City of Ottawa
110 Laurier Ave West
Ottawa, Ontario K1P 1J1
Mail code: [REDACTED]

Attention: [REDACTED]
Email: [REDACTED]

If to the Lenders' Agent:

[REDACTED]

Attention: [REDACTED]
Facsimile: [REDACTED]
Email: [REDACTED]

If to Project Co:

TransitNEXT General Partnership
[REDACTED]

Email: [REDACTED]
Attn.: [REDACTED]

If to the Construction Guarantor:

[REDACTED]

Attention: [REDACTED]
Title: [REDACTED]
Email: [REDACTED]
With copy to: [REDACTED]

- (b) Any Party to this Lenders' Direct Agreement may, from time to time, change any of its contact information set forth in Section 15(a) by prior notice to the other Parties, and such change shall be effective on the Business Day that next follows the recipient Party's receipt of such notice unless a later effective date is given in such notice.

- (c) Subject to Sections 15(d) and 15(e):
- (i) a notice given by registered mail shall be deemed to have been received on the third Business Day after mailing; and
 - (ii) a notice given by hand delivery shall be deemed to have been received on the day it is delivered.
- (d) If the Party giving the notice knows or ought reasonably to know of difficulties with the postal system which might affect negatively the delivery of mail, any such notice shall not be mailed but shall be made by personal delivery in accordance with this Section 15.
- (e) If any notice delivered by hand or transmitted by facsimile is so delivered or transmitted either on a day that is not a Business Day or on a Business Day after 4:00 p.m. (recipient's local time), then such notice shall be deemed to have been received by such recipient on the next following Business Day.

16 AMENDMENTS

This Lenders' Direct Agreement may not be varied, amended or supplemented except by an agreement in writing signed by duly authorized representatives of the Parties and stating on its face that it is intended to be an amendment, restatement or other modification, as the case may be, to this Lenders' Direct Agreement.

17 WAIVER

- (a) No waiver made or given by a Party under or in connection with this Lenders' Direct Agreement shall be binding or effective unless the waiver is in writing, signed by an authorized representative of the Party giving such waiver, and delivered by such Party to the other Parties. No waiver made with respect to any right, power or remedy in one instance will be deemed to be a waiver with respect to any other instance involving the exercise of such right, power, or remedy or with respect to any other right, power, or remedy.
- (b) Failure by any Party to exercise any of its rights, powers or remedies hereunder or its delay to do so shall not constitute a waiver of those rights, powers or remedies. The single or partial exercise of a right, power or remedy shall not prevent its subsequent exercise or the exercise of any other right, power or remedy.

18 RELATIONSHIP BETWEEN THE PARTIES

The Parties are independent contractors. This Lenders' Direct Agreement is not intended to and does not create or establish between the Parties any relationship as partners, joint venturers, employer and employee, master and servant, or, except as provided in this Lenders' Direct Agreement, of principal and agent.

19 ENTIRE AGREEMENT

Except where provided otherwise in this Lenders' Direct Agreement, this Lenders' Direct Agreement constitutes the entire agreement between the Parties in connection with its subject matter and supersedes all prior representations, communications, negotiations and understandings, whether oral, written, express or implied, concerning the subject matter of this Lenders' Direct Agreement.

20 SEVERABILITY

Each provision of this Lenders' Direct Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Lenders' Direct Agreement is declared invalid, unenforceable or illegal by the courts of a competent jurisdiction, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Lenders' Direct Agreement. If any such provision of this Lenders' Direct Agreement is invalid, unenforceable or illegal, the Parties shall, acting in good faith, promptly negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Lenders' Direct Agreement as near as possible to its original intent and effect.

21 ENUREMENT

This Lenders' Direct Agreement shall enure to the benefit of, and be binding on, each of the Parties and their respective successors and permitted transferees and assigns.

22 GOVERNING LAW AND JURISDICTION

- (a) This Lenders' Direct Agreement shall be governed by and construed in accordance with the laws of Ontario and the laws of Canada applicable therein and shall be treated in all respects as an Ontario contract, without regard to conflict of laws principles.
- (b) The Parties agree that the courts of the Province of Ontario and all courts competent to hear appeals therefrom shall have exclusive jurisdiction to hear and settle any action, suit, proceeding or dispute in connection with this Lenders' Direct Agreement and hereby irrevocably attorn to the exclusive jurisdiction of such courts.

23 DISPUTE RESOLUTION PROCEDURE

The Parties agree that the dispute resolution procedure provided for in Schedule 26 - Dispute Resolution Procedure to the Project Agreement shall not apply to any dispute under this Lenders' Direct Agreement.

24 FURTHER ASSURANCE

Each Party shall do all things, from time to time, and execute all further documents necessary to give full effect to this Lenders' Direct Agreement.

25 LANGUAGE OF AGREEMENT

Each Party acknowledges having requested and being satisfied that this Lenders' Direct Agreement and related documents be drawn in English. Chacune des parties reconnaît avoir demandé que ce document et ses annexes soient rédigés en anglais et s'en déclare satisfaite.

26 COUNTERPARTS

This Lenders' Direct Agreement may be executed in one or more counterparts. Any single counterpart or a set of counterparts executed, in either case, by all the Parties shall constitute a full, original and binding agreement for all purposes. Counterparts may be executed either in original or faxed form provided that any Party providing its signature in faxed form shall promptly forward to such Party an original signed copy of this Lenders' Direct Agreement which was so faxed.

27 CONFIDENTIALITY

The Lenders' Agent agrees to comply with the obligations imposed on Project Co by the provisions of Section 42 of the Project Agreement, *mutatis mutandis*, provided that the Lenders' Agent will be permitted to disclose to any relevant regulatory authority only such Confidential Information (as defined in the Project Agreement) as is necessary for the Lenders' Agent to comply with Applicable Law.

[SIGNATURE PAGES IMMEDIATELY FOLLOW]

IN WITNESS WHEREOF the Parties have executed this Lenders' Direct Agreement as of the date first above written.

THE CITY OF OTTAWA

Per: _____

Name: [REDACTED]
Title: [REDACTED]

[REDACTED]

Per:

Name: [REDACTED]

Title: [REDACTED]

I/We have authority to bind the corporation.

TRANSITNEXT GENERAL PARTNERSHIP

Per:

Name:

Title:

Per:

Name:

Title:

I/We have authority to bind the corporation.