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Design & Build Contract

Canola Oil Transload Facility

PROJECT REF: CAVAN-MIS-2022-342/D&B/2022/022

DP World Fraser Surrey Inc.

Contract Documents

Volume 2: Employer's Requirements

Part 1: General Requirements

September 2023





Design & Build Contract

Canola Oil Transload Facility

VOLUME 2 – Employer's Requirements

Part 1: General Requirements

Prepared for

DP WORLD FRASER SURREY Inc

Prepared by

Group Procurement

DP World FZE

September 2023

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Design & Build Contract
Volume 2 – Employer's Requirements
Part 1 - General Requirements



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P1.1 General

P1.1.1. Introduction

DP World (DPW) is proposing construction of a Canola Oil Transload Facility (the Project) at their Fraser Surrey Terminal (the Terminal) where canola oil will be transloaded from railcars to liquid bulk carriers.

The facility will handle one grade of canola oil on Phase 1, the Crude Super Degummed (CSD) grade canola oil. During the second Phase it will then handle two grades, the CSD and the Refined, Bleached, and Deodourized (RBD) canola oil.



The project will be developed in 2 Phases as follows:

- Phase 1: Rail unloading with three (3) tanks for CSD of 15,000 mt each, combining a total storage of 45,000 mt of CSD.
- Phase 2: The storage will be increased to allow for an additional two (2) CSD tanks and three (3) RBD tanks of 2,000 mt each. Total storage of 75,000 mt of CSD and 6,000 mt of RBD.

For CSD grade canola oil, the canola oil in the rail tank cars will usually be unloaded and pumped to the new tanks for intermediate storage before being pumped to ship for export, but the CSD grade canola oil can also be loaded directly to ship i.e., bypassing intermediate storage, including the ability for direct transfer from rail tank car to ship via pipeline to a marine loading arm.

This Contract is for the Design Build Construction of Phase 1 of development (the Works) and includes the following key components:

- a) 32 railcar unloading stations, including new rail tracks
- b) Three 15,000 metric ton (MT) canola oil storage tanks
- c) Underground conveyance piping
- d) Berth access trestle
- e) Vessel loading platform
- f) Operator Shelter and MCC building

This document forms part of the Employer's Requirements for this Contract and is issued as part of a set of documents:

- Volume 1: Commercial
- Volume 2: Employer's Requirements
 - **Part 1: General Requirements**
 - Part 2: Performance, Design and Technical Specification for the Civil & Process Mechanical Works
 - Part 3: Performance, Design and Technical Specification for the Building Works
- Volume 3: Drawings
- Volume 4: Schedule of Prices

This volume (Volume 2, Part 1) describes the General Requirements for the Contract and shall be read in conjunction with all the other volumes listed above.

P1.1.2. Objectives of the Employer's Requirements

These Employer's Requirements set out the functional, quality and performance requirements for the construction of a Canola Oil Transload Facility at DP World Fraser Surrey.

The Works shall be planned in such a way to minimize the disturbance to the existing Terminal's commercial activities.

The Employer's overriding requirement is that the Works are suitable, in all respects, for safe, efficient, reliable, and continuous use under actual operational conditions.

These Employer's Requirements are minimum requirements and shall be read subject to the overriding requirements described above.

P1.1.3. Employer's Responsibility

The Employer shall be responsible only for: (i) obtaining the permits or approvals listed below in this sub-clause 1.13 (a), (b) and (c); and (ii) complying with the Employer's responsibilities provided explicitly in sub-clause P1.1.5 [*Permits' Responsibilities*]:

- a) Vancouver Fraser Port Authority (VFPA) Project Environmental Review (PER) permit for the Permanent Works;
- b) Transport Canada Navigation Protection Program permit for the Permanent Works within the Site (the Contractor shall confirm that the Employer's obtained permit is sufficient for execution of the Works and shall obtain his own permit(s) for any scope not included);
- c) Department of Fisheries and Oceans (DFO) permit for the Permanent Works;

For clarity, the Contractor shall be responsible for all aspects and requirements set out by the permits and/or approvals obtained by the Employer, and to comply with the Contractor's responsibilities outlined in the sub-clause P1.1.5 [*Permits' Responsibilities*].

P1.1.4. Contractor's Responsibility

The Contractor shall design, procure, construct, install, test, commission, and rectify defects of a safe efficient and reliable Canola Oil Transload Facility that is suitable in all respects for the purposes defined within the Employer's Requirements, and as a minimum with the requirements of each and every relevant statutory, regulatory, utilities authority and/or any other Authorities, and that the Works are fit for purpose.

For the avoidance of doubt, where any items are described in these Employer's Requirements as "matching" or having to "match" existing facilities elsewhere in the Terminal, the Contractor shall be responsible for demonstrating that the item so designated is suitable for its intended purpose as set down in these Employer's Requirements.

Any approval, consent, or acceptance by the Engineer and or the Employer, of any proposal or submission by the Contractor in respect of any obligations or requirements imposed by these Employer's Requirements shall not relieve the Contractor of any of his duties or responsibilities under the Contract.

The Contractor responsibilities and key considerations shall include, but not be limited to:

- a) Responsibility for all aspects of the design and construction of the Works;
- b) Responsibility for all permits or approvals required for the execution of the Works, other than the ones referred to in Sub-Clause P1.1.3. – [*Employer's Responsibility*] above and comply with the Contractor's responsibilities outlined in the sub-clause P1.1.5 [*Permits' Responsibilities*]

- c) Responsibility for ensuring that the Works comply with all applicable licenses, consents, environmental commitments, approvals, and permits including but not limited to the Project PER permit and DFO Project requirements;
- d) Giving full consideration in the design and construction of the Works to minimizing future operating and maintenance costs to achieve an optimum lifetime cost and to minimizing the extent/frequency of maintenance and its disruptive effect to operations;
- e) Ensuring that the works are completed in line with Canadian Best Management Practices, the Construction Environmental Management Plan (CEMP), Stormwater Pollution Prevention Program (SPPP) and all other plans and documents submitted to the Vancouver Fraser Port Authority as part of the Project and Environmental Review process;
- f) Ensuring all Works comply with the DP World Fraser Surrey Emergency Response and Pollution Prevention Plans;
- g) Ensuring all workers who enter the secured DP World Fraser Surrey operating Terminal have a valid Port Pass, Marine Transportation Security Clearance (MTSC) where applicable, and have completed a DP World Fraser Surrey Safety Orientation;
- h) Maintaining and meeting all requirements related to the Canadian Border and Services Agency (CBSA) Customs Sufferance Area and Transport Canada security perimeter;
- i) Ensuring the construction works do not impact the ongoing and continuous marine terminal operations at DP World Fraser Surrey berths two through nine;
- j) Ensuring operational and maintenance safety is a continuous focus of all design through the implementation of Hazardous Operation (HAZOP) reviews and workshops for all Permanent Works;
- k) Ensuring construction safety through detailed planning and the completion of Risk Assessments and Method Statement for all Works;
- l) Implementing a comprehensive quality program meeting all employer and code requirements for the design and construction of the Works.
- m) The Contractor shall visit the Site and ascertain for himself the condition and location of the existing Site, structures, and services including, but not limited to, the existing Terminal, access roads, and Terminal operations.
- n) The Contractor shall obtain approval in advance for the lighting and mooring of all floating equipment and for the lighting of marine Temporary Works from the Terminal Authorities when needed.
- o) In the planning, design, and performance of all Works, the Contractor shall make all reasonable efforts to adhere to VFPA Vegetable Oil Marine Terminal Operational Practices Study - Best Practices Manual - December 2012

P1.1.5. Permit's Responsibilities

The Employer and the Contractor are responsible for the Permits and Licenses in accordance with the above Sub-Clauses 1.1.3 [*Employer's Responsibilities*] and 1.14 [*Contractor's Responsibilities*], the provisions of this Sub-Clause 1.15 and Appendix 5 - Permitting Matrices:

- 06-23-002J_PER Conditions Matrix R1
- 06-23-002J_Permit Matrix

For the avoidance of doubt, in the event the submissions and/or approvals of any permits, licenses and approval are delayed by: (i) the Contractor's late delivery of any required documents necessary for submission to the Authorities; and/or (ii) any errors or omissions in the Contractor's submissions that cause delays by the Authorities' rejection or requests for clarifications of such submissions; then the Contractor shall be solely responsible for such delays and shall have to recover them within the Contractor's programme at his own cost. See Sub-Clause 2.2 [*Permits, Licenses or Approvals*]

The Employer has engaged with VFPA Independent Professional (IP) to undertake review services in respect of the Contractor's design documents. The Contractor shall be responsible for any increase in cost (beyond the IP's current commission with the Employer) for any additional IP review services if such review process is extended due to incomplete or deficient Contractor's technical documentation.

P1.2 The Project

P1.2.1 Description of Existing Facility

The DP World Fraser Surrey Terminal is located at 11060 Elevator Road in Surrey, BC on federal lands and waters managed by the Vancouver Fraser Port Authority (VFPA). The terminal currently handles containers, steel, agri-bulk, and break-bulk cargo via marine, truck, and rail gateways. The Terminal is one of the largest multi-use terminals on the west coast of North America, currently comprising seven vessel berths, three quay cranes with lifting capacities of up to 70 metric tons, over 190-acres of terminal footprint and three sheds with 30,900 square meters (m²) of covered warehouse storage.

Berth 10 is located at the northwest corner of the terminal and is currently used for the loading of log export vessels along with ship-to-barge transfers of various bulk commodities. It comprises of 3 existing dolphins with fenders, one mooring dolphin at the northern end, and an access pier with tieup capacity.

Yard 10 is a large breakbulk storage area at the north end of the terminal that primarily facilitates the import of steel along with other breakbulk commodities.

The intermodal railyard (IDC) is located at the northeast corner of the terminal and comprises of 6 tracks (Tracks 1 to 6) where both import and export containers are placed on and off railcars.

The six rail lines in the IDC yard are owned by the Port and are operated by the Employer. The three rail lines on the river side of the IDC yard are operated by SRY (Southern Railway of British Columbia).

Yard 10 and the IDC are bisected by Timberland Road North which is accessed from Tannery Road and becomes Robson Road at the southern end of the IDC.

P1.2.2. Scope of Works

The Project is envisioned to be completed in 2 phases with this Contract covering Phase 1 of development. Phase 1 is proposed to have a permitted capacity of 1,000,000 MT per annum along with 45,000 MT of canola oil storage capacity for Crude Super Degummed (CSD) grade canola oil.

The Works to be executed under this Contract shall include, but not be limited to, the design, procurement, construction, installation, testing, commissioning, and remedying of defects of the following items:

a) Temporary works

- ☐ Site preparation including any levelling, grading, paving, demolitions, or removals required to facilitate safe Site access and prepare the Site for the Works;
- ☐ Permitting, construction and provision of Employer, Engineer and Contractor temporary facilities and services;
- ☐ All falsework, shoring, dewatering, water treatment, scaffold or other temporary construction systems required for the delivery of the Permanent Works;
- ☐ All additional site surveys topographic, bathymetric, and geotechnical surveys, utility locates or other site investigations;



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Temporary security fencing and gates as required to facilitate the staging and sequencing of the works;

- Temporary covering of a portion of the ends of Tracks 3 and 4 along with relocation of rail end stops to allow WB-67 vehicles to turn from the aisle between Tracks 2 & 3 and Tracks 4 & 5;
- Temporary covering of a portion of the end of Track 5 along with relocation of rail end stop to allow for construction access route adjacent to Security Perimeter Fence.

b) Liquid bulk railcar offload area

- Removal and disposal of existing IDC Track 6 including acceptable decommissioning and capping of adjacent drainage and catch basins;
- New 32 rail car liquid bulk canola unloading capacity on two new rail tracks;
- Continuous top access platform for venting of railcars during canola oil unloading operations. Top access platform to include stair access at each end of railcar offload area and 32 railcar gangways for safe level access to the top of the railcars. The gangways are to be strategically located to maximize compatibility with the Employers breakdown of DOT 111/117 railcars expected to be received;
- 32 mechanical bottom unloading arms with minimum 4 inch diameter complete with quick connect couplers for gravity unloading of canola oil railcars. The mechanical arms shall be strategically located to maximize compatibility with the Employer's breakdown of DOT 111/117 railcars expected to be received;
- Continuous spill containment pans under and extending outside unloading tracks with containment collection system directed railcar unloading sump pump system to facilitate collection and pumping of all containment water to the Oil Water Separator (OWS);
- The area between the spill containment pans shall have continuous asphalt pavement to facilitate safe access and all contact water shall be collected by a storm system and be directed through an oil-water separator before discharge;
- Each railcar offloading arm to have a flow indicator light to indicate flow is detected and turn off once the railcar is emptied;
- Minimum 16" diameter gravity flow header pipe for conveyance of canola oil from Railcars shall be vented to atmosphere above maximum railcar fluid height at midpoint and at each end of the gravity flow header;
- A single clean-out flange shall be provided at only one end of the gravity flow header. Cleanout access is not required on the unloading header, caps indicated on the For Contract Drawing PID 001 are correct.
- Restoration of rail area including re-ballasting of existing Intermodal Track 5;
- Removal of portion of Track 5 if required to maintain minimum 6m wide access corridor between end of Track 5 and Terminal Security Fence along with relocation of rail end stop.
- Rail end stops at the ends of Tracks 6 and 7

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- Associated ground improvements, process piping, valving, power, instrumentation, emergency egress ladders, and appurtenances
- There will be no pedestrian access over rail line #7 to rail unloading platform between rail line #6 and #7

c) Canola storage tank facility

Removal and disposal of existing fencing or other conflicting infrastructure including temporary and permanent relocation of stormwater infrastructure to maintain adequate drainage;

- Construction of three carbon steel API 650, 15,000 MT capacity canola oil storage tanks for a total of 45,000 MT working capacity complete with agitators, overflow protection and water draw off for emptying prior to cleaning;
- Containment walls and ground liner system with sump pump system to facilitate collection and pumping of all containment water to the Oil Water Separator (OWS).;
- Galvanized steel access stairways meeting all Authority requirements for safe access and egress into the canola storage tank area;
- Connections for future storage tank capacity;
- Internal tank coating system;
- External tank coating system;
- Tank top access stairs, fall protection, and maintenance cleaning portals;
- Associated ground improvements, process piping, valving, power, instrumentation, and appurtenances.

d) Canola pumping, and conveyance corridor

- The railcar unloading pumps shall be provided for transfer of canola oil from the railcars into the storage tanks;
- The marine loading pumps shall be provided for transfer of the canola oil from the storage tanks to the marine loading arm;
- The pumps shall also be designed to support the direct of canola oil directly from rail to the marine loading arm;
- The canola oil received from the railcar unloading pumps and the canola oil loaded onto vessels shall each be measured for product custody transfer through the use of highaccuracy flow metering;
- The canola conveyance piping shall include both a main export line, with a minimum 16" diameter, as well as a recycle line, with a minimum 6" diameter, that allows canola to be recycled back to the canola storage tanks or inlet side of the marine loading pumps;
- The railcar unloading pumps and marine loading pumps shall each have a spill containment area with a combined sump pump system to facilitate collection and pumping of all containment water to the Oil Water Separator (OWS);

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- The conveyance corridor shall include a nitrogen supply line as well as conduits for power and communications;
- The conveyance corridor shall be constructed using trenchless methods from the railcar unloading area to Yard 10 on the northwest side of Timberland Road to avoid impacting the existing road and rail infrastructure. A condition and settlement monitoring program shall be implemented for the trenchless crossing section and any damage to existing infrastructure shall be remediated and restored to the satisfaction of the Engineer. Dewatering and water treatment prior to discharge along with any utility conflicts or relocations, if required, shall be the Contractor's responsibility;
- The conveyance corridor through Yard 10 shall be installed in a minimum of stages to minimize the impacts and loss of storage space on terminal operations;

Associated ground improvements, pavement restoration, process piping, valving, power, instrumentation, and appurtenances.

e) Canola marine loading platform

- Selective tree topping and clearing as required for the construction and safe operation of the Works;
- Dolphin 2 shall be removed and disposed;
- All other existing Berth 10 infrastructure shall be maintained and the Contractor shall perform the upgrades and repairs detailed in Volume 2 Part 2 of the Employer's Requirements
- Construction of an 4m wide access trestle to the loading arm platform at Berth 10. Note the location of the pile bents was agreed with the relevant Authority and shall not be materially changed by the Contractor without approval by the Engineer. (Total in-water canola loading access trestle pile footprint not to exceed 17 m², excluding abutment piles);
- Construction of a pile suspended loading platform at Berth 10 with a minimum length of 26 m along the berth and a minimum width of 14 m (total in-water canola loading platform pile footprint not to exceed 25 m²); ○ Pile footprint limitations are
 - Platform = 25m²
 - Trestle = 17m²
- Construction of a new 1.2m wide catwalk to provide pedestrian access between Berth 9 and the Berth 10 loading platform;
- The Canola loading platform shall include provision for one 10" diameter powered marine loading arm that is compatible with each of the design vessels provided through the full range of possible tidal and vessel draft conditions. The marine loading arm shall be provided with an emergency release coupling and nitrogen supply to the apex to facilitate draining.
- The main export line extending from land to the marine loading arm shall be constructed of double walled pipe and include a remotely monitored leak detection and alert system.

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The double walled pipe shall be sloped such that all product in the line can be gravity drained to a land based sump pump system to facilitate collection and pumping of canola oil back into the recycle line to minimize product losses.

- The double walled pipe and marine loading arm shall be normally empty and purged with nitrogen such that it is only charged with canola oil during vessel loading.
- The marine loading platform shall be designed to include minimum two new marine fenders installed near the up and down stream ends of the platform which shall be compatible with the existing Berth 10 dolphin fenders;
- The marine loading platform shall include minimum two new ship bollards located along the berth face with a minimum of 100 ton working capacity;
- Enclosed operators shelter with a minimum size of 2.4m long x 2.4m wide x 2.4m high providing 360-degree visibility through windows on all 4 sides for operations personnel. The shelter shall be fixed to the marine loading platform at an approved location and be provided with 120 volt power, a hard wired network communications connection, and electrical heating. The shelter shall be built out of noncombustible materials.

Associated abutment pavement restoration, valving, power, instrumentation, and appurtenances including bull rails, handrails, and emergency ladders.

f) Support facilities & miscellaneous items

- Building ○ MCC building, including:
 - Minimum 13m x 6m footprint, not including the control room and PLC/electrical room.
 - Minimum floor elevation of 4.1m
 - 2 doors which must allow for installation and replacement of all MCC equipment
 - All 600V MCC equipment, stepdown transformers, lighting panels, UPS system, HVAC, lighting & receptacle, space for control system cabinets, and associated electrical distribution
 - Minimum working space around all maintenance and service panels of minimum 1.2m
 - One mandoor must have access control for entry to building that connects to Terminal security network
 - All doors must have contact checks that connect to Terminal security network
 - Control room of minimum 9sqm with all electrical and communication receptacles for 2 workstations capable of controlling the Project operation
 - PLC/Electrical room of minimum 6sqm c/w all process controls, and electrical and communications equipment
 - Minimum 6sqm of windows in the control room

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- Man door facing parking area must have access control for entry to building that connects to Terminal security network

□ Roads and Yard Pavements:

- 6m wide paved emergency access corridor from Track 6 crossing at south end to emergency gate at the north end of the IDC;
- Paved parking stalls 5.8m long x 2.7m wide for 10 vehicles in front of the MCC building with curb stops and line marking;
- Roll-over curbs to equipment doors on MCC building;
- Minimum paved area encompassed by existing Track 6 lead in, new Track 7, tank containment wall, and Perimeter Security Fence along Timberland Road South shall be 9,000m²;
- All new Project infrastructure shall have paved pedestrian access and a 1.2m paved apron around all equipment pads;
- Curb, gutter, and sidewalk adjacent to buildings and all doors on MCC building; ○ Reinstatement of drainage of area north of the canola storage tanks which is reserved for Phase 2 expansion;
- Paved and marked pedestrian access from MCC building to railcar unloading platforms across emergency access corridor and new Track 7.

- Working area between canola offloading tracks 6 & 7 shall be paved with asphalt to provide a smooth surface and minimize slip and trip hazards.

□ Utilities ○ Water:

- New firewater loop in the tank area with a minimum of three hydrants and connection to the Fraser Surrey Port Lands-Transportation Improvement (FSPL-TI) Project water line along Timberland Road South;
- Hose bib connections shall be provided at:
 - Centrepont of railcar unloading platform
 - Adjacent to each set of containment area access stairs
 - Adjacent to marine loading pumps
 - Adjacent to MCC building

○ Site drainage:

- Catch basins, conveyance piping, oil-water separator and outfall for contact water from area bounded by existing Track 5 and Terminal Security Perimeter
- Collection system and conveyance piping for containment water drainage to Oil Water Separator (OWS). The Containment water includes all water collected from:
 - Rail car unloading facility spill pans
 - Canola oil storage tank facility
 - Railcar unloading and marine loading pumps –
 - Any other process drains or outfalls.
- Contractor may consider gravity outfall for oil free water to storm system;
 - Nitrogen distribution piping, valving, and controls to utilize Employer-supplied nitrogen skid.

○ Nitrogen Skid connection, subject to be provided by the Employer prior to the completion of the Works.

○ Electrical power supply and distribution including:

- New 25/12.5kV power feed from existing Substation #10, including installation of new feeder breaker cell on switchgear;
- Dual-rated 25/12.5kV – 600V transformer;
- High-Resistance Ground;
- Medium Voltage (MV) and Low Voltage (LV) distribution;
- The underground electrical ducting does not need to be concrete encased if in accordance with Codes and other aspects in regard to pavement loading is met;
- Cable tray systems for all above ground power distribution.
- It is permissible, subject to codes and standard approval, that cables can be installed above ground in cable trays, in locations identified in sketch No. 7704-E-001-D - DE Markup in Appendix 6. ○ Security

- Full coverage comprehensive CCTV system for the Works. ○ Lighting
- All new lighting shall be LED of quality fit for industrial use.
- Communications, Control System, and Instrumentation
 - Supply of Core DCS system to operate the facility. A PLC based system may also be considered if all the design requirements can be met subject to Engineer's approval;
 - Two double-tier HMI Operator workstations located in the MCC building;
 - Provision of two harsh weather environment remote HMI's for field Operators, located at the marine loading pump area and on the marine loading platform;
 - Two sets of remote I/O racks at the same locations;
 - Set of DCS/PLC cabinets located in the MCC to house all DCS/PLC system servers, Historian and processors, including those for driving control room and local HMI's and remote I/O racks;
 - Full suite of hierarchical Operator graphics to be accessible from all HMI locations;
 - Full suite of field regulatory and ON/OFF control valves as detailed elsewhere in these Employer's Requirements;
 - Full suite of field instrumentation and cabling systems, including 2 highaccuracy flow meters for custody transfer, on the rail unloading line and the marine loading line;
 - Security, and Access Control systems as described elsewhere in these Employer's Requirements;
 - Communication distribution network;
 - All underground communications ducting does not need to be concreteencased if in accordance with Codes and other aspects in regard to pavement loading is met;
 - Cable tray systems for all above ground controls; • Fiber connection to existing terminal network.

P1.2.3 Future Expansion

A future Phase 2 expansion of the Project is planned to include two additional 15,000 MT canola storage tanks for storage of Crude Super Degummed (CSD) canola oil as well as three 2,000 MT Refined Bleached and Deodorized (RBD) product storage tanks.

To ensure that the facility has been developed in a manner that allows for future expansion, the Contractor shall be responsible to provide a general arrangement drawing and engineering memo which outlines how the future expansion considered in Volume 3 could be completed while ensuring continued operation of the construction works.

All reasonably economical efforts shall be made within the design of the Works to facilitate future expandability of the tank storage for both RBD and CSD canola oil and to minimize the cross contamination when handling products of different grades.

P1.2.4 Employer's Supplied Drawings

Definition Drawings

Definition Drawings are drawings that show elements of the scope, standards, and design criteria that must be incorporated into the Design.

The Contractor shall read the Definition Drawings in conjunction with the text in the Employer's Requirements.

The Contractor shall comply with the requirements set out in the Definition Drawings except where the Definition Drawings show parts of existing Terminal facilities, services, structures, etc., as such parts of existing facilities, services, structures, etc., including any lines, levels, dimensions, locations, etc., shall be deemed to be Site Data, as defined in the Contract.

For the avoidance of doubt, each given dimension on a Definition Drawing is a specified requirement unless such dimension is referred to as approximate. Where a dimension is not given, or is referred to as approximate, the dimension shall be determined by the Contractor and submitted to the Engineer for approval.

The Definition Drawings are listed in the drawing list and shall form part of the Contract. The drawings are included in Volume 3. Information Drawings

Information Drawings are drawings that show the existing Terminal facilities, services, structures, etc. Information Drawings form part of the Site Data. Neither the Employer, the Engineer, nor their consultants guarantee the accuracy and/or completeness of the information provided, and the Contractor shall be solely responsible for interpretation and verification.

Indicative Drawings

Indicative Drawings are drawings that show suggestive designs for the new works that would comply with the Employer's Requirements.

These drawings are provided for information only and do not form part of the Contract in any way.

The drawings contain only an indication of the level of detail for a design or partial design prepared for the Employer for the Works or part of the Works. The Contractor is not obliged to adopt all or any of the indicative design. Neither the Employer nor the Engineer give any warranty as to the adequacy of the indicative design. Should the Contractor choose to adopt all or any of the indicative design, he shall satisfy himself as to its adequacy and shall take on full responsibility for it.

P1.2.5 Errors and Omissions

Any question or discrepancies relating to the requirements needs to be communicated to the Engineer immediately after being discovered; any item omitted from the drawings and/or in the Employer Requirements, however

required for the execution and completion of the Works, shall be deemed to comprise part of the Contract.

No variation in the Contract Price will be considered due to the Contractor's failure to identify such discrepancies, nor to his having incorrectly interpreted any part of the Employer's Requirements.

P1.3 Site, Works, and Programme Constraints

P1.3.1 Site Area

The Site includes the area of the Works and the Contractor's Compound as shown on the Definition Drawings. The setting out points on the Definition Drawings defining the Site shall be confirmed on Site by the Contractor and agreed with the Engineer/Employer.

The Contractor shall be responsible for providing for or arranging all utilities required for his works and payment of any charges in association with these utilities.

The Contractor shall note that certain areas of the Site is within the active Terminal (Operational Areas), and they are in use by the Terminal operator and other Terminal users. The Contractor will schedule their work and construction sequencing in accordance with the Employer's Requirements notes on this regards and Site and temporary access drawings included in Volume 3 – ER: Drawings.

The Contractor shall liaise with the Employer to pre-arrange access to the Operational Areas. The Contractor acknowledges that to work on the Operational Areas he will have to comply with Employer and Authorities requirements that may require the Contractor to utilize specific safety or other equipment. Provision of such equipment shall be at Contractor's cost.

Although the Contractor shall be given access to these Operational Areas by the Employer, the Contractor shall allow such other Terminal users reasonable access to such areas and shall cooperate fully with the requirements of the Vancouver Fraser Port Authority and any other bodies who may require access to the Site area.

The two number trailers will be relocated in advance of the Works by the Employer.

The single IT trailer will be left in place in the IDC yard as transfer of the IT equipment contained within this trailer will not be carried out until phase 2 of the Canola Oil Transload Facility.

As part of the temporary works, the Contractor is requested to dismantle the salt tent. Once dismantled by Contractor the tent will not require to be re-erected but only placed into storage in shed 1 within the terminal.

The Contractor's obligations under the Contract for each part of the Site shall remain in place for the whole time the Contractor is in possession of that part or portion of the Site.

P1.3.2 Access to the Site

The following Site access constraints shall be observed by the Contractor at his own cost and risk:

- a) The Contractor shall note that the Terminal is under operation near the Site. The Contractor shall plan and conduct the Works in a manner which would not obstruct or endanger the use of waterways, anchorages, wharves and approaches and so that there is no interference to shipping and other users and shall ensure that all necessary precautions are taken to ensure safety of navigation.
- b) The Contractor shall note that the right of access to areas of open water will not be exclusive and that use by others, including but not limited to Terminal operations. The Contractor shall be responsible for making all reasonable allowances to accommodate such extent that they do not interfere with the construction of the Works. Such accommodation will not relieve the Contractor of any of his obligations for the care of the Works and security of the Site under the Contract.
- c) The Contractor shall be responsible for ensuring that the operations of others do not interfere with the progress of the Works and shall co-operate fully, as necessary with other Terminal users. The Contractor shall have no right to claim for extension of time or additional costs arising from disruption of his operations caused by commercial shipping and/or other Terminal users.
- d) The Contractor shall note that certain areas of the Site, at the start of the Contract, consist of areas of open water and land, which are in use by third parties. The Contractor shall allow third parties to have access to the Site to carry out their work. The Contractor shall be responsible for making all reasonable allowances to accommodate such users within the Site boundary, to such extent that they do not interfere with the construction of the Works, until such time as progress of the Works make this impractical. Such accommodation of others shall not relieve the Contractor of any of his obligations for the care of the Works and security of the Site under the Contract. The Contractor shall co-operate fully, as necessary, with other users of the VFPA;
- e) Access to the in-water construction areas, shall be granted to the Contractor by the Employer for the duration of the Contract. The Contractor should note, however, that the right of access will not be exclusive and that Terminal operations and vessels utilizing the river will continue throughout the duration of the Contract. The Contractor shall be responsible for coordinating activities with the Employer and other relevant parties regarding access within this area and obtain all necessary approvals from the Authorities;
- f) All existing berths, with the exception of Berth 10, at DP World Fraser Surrey will continue to be fully operational during the course of the execution of the Works, and the Contractor shall ensure that no disruption to normal operations occurs at these berths or elsewhere in the terminal;
- g) Access to any facility owned, operated, or maintained by the Employer, or any other utility operator or concessionaire, and which lies within the Site area, shall be maintained at all times;
- h) Fraser Surrey Terminal operations will continue during the construction of the Works. The construction schedule must ensure terminal operations can continue with minimal interruption;
- i) The Contractor shall sequence the construction of the Works so that disruption to the

Terminal is minimal. Traffic management will be the responsibility of the Contractor;

- j) Safe working access to Terminal facilities adjacent to demolition works shall be available at all times, and the Contractor shall provide protective covers/ hoardings as necessary.

Road Access

The road accesses to the Site are shown on the Definition Drawings and include the following: a)

Access 1A

- To be used as primary access to tank area when not blocked by construction of the adjacent VFPA Fraser Surrey Port Lands - Transportation Improvement Project (FSPL-TI);
- The Employer cannot guarantee duration nor timing of any closures of this access;
- The Contractor must provide flaggers for all vehicle movements on and off Timberland Road South

b) Access 1B

- To be used as access to tank area when Access 1A is blockaded by construction of the adjacent VFPA Fraser Surrey Port Lands - Transportation Improvement Project (FSPL-TI);
- The Contractor must provide flaggers for all vehicle movements on and off Robson Road

c) Access 2

- To be used as access to Yard 10
- The Contractor must provide flaggers for all vehicle movements on and off Robson Road

d) Substation 10 access

- The Contractor must erect temporary Perimeter Security Fencing around Substation 10 as per the Definition Drawings and Security section of this document

The Contractor shall be responsible for obtaining approval from the Employer and any other responsible Authority, as appropriate, for the temporary or permanent use of roads and access adjacent and within the Terminal for the movement of equipment and personnel between the different areas of the Site. Use of roads and access within existing operational areas may be denied for operational reasons.

The Contractor shall submit for Employer's approval, and as part of his Traffic Management Plan, detailed information on the Road Access configuration and security process.

The Contractor shall ensure that damage or contamination to any public or private roads, footpaths and tracks used by any vehicles or plant proceeding to or from the Site, shall be kept to a minimum.

The Contractor shall be responsible for the cost of all repairs necessary to restore such roads, tracks, or footpaths, including street sweeping and clearing debris, to the satisfaction of the Employer and relevant local authorities. The Contractor shall carry out a pre- and post-survey of applicable roads in the presence of the

representatives of the relevant Authorities to document the state of these roads. A copy of those surveys should be presented to the Engineer. All parking of the Contractor's vehicles and those of his employees and people under his direct control shall be confined within the Site.

The Contractor shall inform his sub-contractors of these restrictions and ensure that they comply with them.

Marine Access

Marine access to Berth 10 shall adhere to all marine navigation requirements as set out by the Authorities.

The Contractor shall be responsible for obtaining approval from the Employer or any other organization as appropriate, for the use of berthing facilities for mooring his vessels and floating facilities.

Otherwise, Contractor's vessels and floating facilities shall observe the existing Terminal operational areas and shall at all times comply with the rules and regulations in force within VFPA.

Emergency Access

The Contractor must maintain secondary egress from work areas such that all personnel working in a given area have the ability to safely exit the Site should the main access be blocked in an emergency situation.

P1.3.3 Weather and Tidal Conditions

The Contractor should make himself fully aware of times, ranges, depths, and currents of tides and make allowance in his manner and mode of working. The Contractor shall make provisions in preparation of any adverse forecast weather and no allowances shall be granted by the Employer for his failure to do so.

P1.3.4 Contractor's Equipment

All of the Contractor's Equipment used for the performance of the Works shall be of such type, size and of such method or working as is acceptable to the Employer. If for any reason whatsoever the Employer shall be of the opinion that any equipment of any kind employed or proposed to be employed by the Contractor for the purpose of the Works is not suitable and adequate, it shall be immediately withdrawn from use.

In particular, the Employer may prohibit or suspend the use of machinery which in the Employer's opinion is likely to remove more material than is necessary, damage or render unstable any structure, or any other property or works of any kind. Similarly, the Employer may prohibit the use of machinery causing a nuisance by noise or otherwise. Any change of the method of performing the work as a consequence of such order shall be at the cost of the Contractor who shall have neither have cause for claim against the Employer on account of having to carry out the work by another method, nor for idle equipment or removal of any equipment.

Whenever marine equipment is employed by the Contractor for the purpose of the Work, such equipment shall be maintained in a satisfactory and seaworthy

condition, shall have adequate attendance by competent seamen at all times, shall be fully provided with sound and satisfactory ropes, lines, and moorings and shall be fully equipped with lights.

At all times the Contractor shall be wholly responsible for the protection and safety of all floating craft engaged by him.

If in the opinion of a person having authority at the Port Authority, any craft is unsafe to be used to transport staff, for diving operations or as a safety boat, he may order the craft to be withdrawn and replaced by another which, in his opinion is in all respects suitable for the work.

The costs involved in such replacement shall be borne entirely by the Contractor.

All craft must be fitted with V.H.F. radio provided with channels in accordance with the requirements of the Port Authority and any statutory or other authority having jurisdiction with respect to the navigation and movement of his vessels and offshore plant, which must be operational at all times whilst the craft is under way.

The Contractor shall submit to the Engineer, within 14 days of the Commencement Date, a comprehensive Contractor's Equipment schedule that shall include the proposed dates of arrival on Site of each item. The Contractor shall obtain all the consents and approval necessary for entering and exiting his plant and equipment to the site including the permissions to be granted by the Employer.

The Contractor shall at all times, and at his own expense, comply with the requirements of the relevant Authorities, including the Employer, in respect of movement of floating facilities, The Contractor shall also at his own expense including payment of any harbor dues, import duties or tax, or any other fees as required.

The Contractor shall comply with all regulations and Authority requirements in respect of the use of noise reduction and emissions of Contractor's Equipment.

The Contractor may, for the purposes of the Contract, be permitted to provide temporary moorings for his craft, in a position and manner to the approval of the Engineer and the relevant authorities. The Contractor shall not lay moorings or anchors so as to interfere with marine access to Fraser Surrey Terminal or adjacent facilities, and any such moorings shall be removed if and when required by the relevant authorities.

If the Contract requires the temporary removal / relocation of exiting navigation buoys or navigation lights, he shall coordinate in advance to affect the removal with the relevant authority. Should the removal/ relocation of the navigation buoys be possible the relevant authority will carry out the removal/ relocation and their subsequent replacement. The Contractor shall be responsible for all costs arising from movement of buoys.

P1.3.5 Navigation, Lighting, Marking, Buoying, and Watching

The Contractor shall at all times observe the regulations of the Port Authority regarding navigation and safety and shall obey all instructions of the Port Authority in connection therewith. The Contractor shall be responsible for complying in every way with the requirements of any statutory or other authority having jurisdiction with respect to the navigation and movement of his vessels and offshore plant in and around the area of the Works.

The Contractor shall be responsible for complying in every way with the requirements of any statutory or other authority having jurisdiction so to require in respect of marking, lighting and watching the Work or any structure vessels or offshore plant which may be used in connection with the Work and for the issue of local notices to mariners.

All floating plant operated by the Contractor shall display at all times such lights and/or shapes as are laid down in the "International Regulations for Preventing Collisions at Sea" and all relevant local Authority requirements relating to such craft or its nature of work and shall keep a listening watch on an appropriate radio frequency channel so that, when necessary, they can be made aware of traffic movements in the vicinity.

The Contractor shall provide to the Port Authority information on the position of any anchors which may be laid down in the Port.

The Contractor shall be responsible for ensuring that all moorings have lights and marker buoys which conform with International Association of Lighthouse Authority Regulations and all relevant local Authority requirements.

The Contractor shall ensure that all his vessels and offshore plant carry at all times the correct lighting, markers, signals, radar reflectors, etc., as required by the said authorities commensurate with the nature of the work in which they are engaged.

The Contractor shall provide all buoys and other markers required for the proper indication of submerged work and moorings for his vessels and offshore plant. He shall also provide every description of watching, lighting and maintenance required in connection with the foregoing and he shall also provide and maintain any guards, fencing required for the protection of the site, or for the safety and convenience of the public or others.

The Contractor shall maintain all such lights, markers, buoys, guards, fencing and lighting in sound condition until either the Work is completed, or the Employer decides that such services are no longer required.

All vessels and offshore plant working or moored shall be attended at all times. If such attendance is not possible the vessel or offshore plant must be moved to an approved mooring location.

All lights required by the Contractor shall be so placed or screened so as not to interfere with or be mistaken for any navigation lights or with or for any signal lights. Should the Contractor in any way obstruct or affect lights, signals, buoys, or navigational aids then he shall at his own expense pay all costs whatsoever for the resetting and reinstating or providing alternatives for the aforesaid to the satisfaction of the said Authorities.

The Contractor shall provide all vessels and offshore plant with approved fog warning devices which shall be operated in accordance with the requirements of the said Authorities.

The Contractor shall mark all temporary underwater obstructions with buoys and lights and do all things necessary for the safety of navigation while the obstruction remains and shall remove any such obstruction at the earliest possible time.

P1.3.6 Liability for Damage to Shipping

The Contractor shall be held responsible for any damage or injury to shipping or craft of whatever description which may occur during the execution of the Contract through any act or omission or default of the Contractor or of any person in his employ or for whom he is responsible.

P1.3.7 Terminal Operations Interface

The Contractor shall ensure that the terminal operation is not affected during the construction Works. Contractor shall have weekly meetings with the Terminal operation team to coordinate the interface between terminal operations and construction activities. Contractor shall allow in his Tender for periodic stoppage of the construction works requested by the Terminal operator to ensure unhindered terminal operation. For clarity, no claim will be entertained for requests by the terminal operator to stop or modify the construction methodology to ensure that the terminal operation is not affected.

When appropriate the Contractor shall coordinate their work, especially in the Operational Areas, with the ongoing operations of the Employer and utilities companies/authorities. The Contractor shall ensure that access to their operations is maintained. Shut-down, re-routing, or diversions of existing sewerage, drainage, and services shall be subject to notice, and shall be coordinated by the Contractor to minimize disruption to on-going operations.

The Contractor shall comply to all Employer's safety guidelines and policies provided as Appendix 1 – Employer's Safety Manual to this document. Contractor shall ensure that he is familiar with all the Employer's guidelines and policies relevant to the Works. Contractor shall follow his own permit-to-work procedures as per WorkSafeBC regulations.

The Operational Areas will remain under the Employer's control, and any work performed in these areas will require notification and approval from the Employer prior to entry. This will apply to areas such as Substation 10, Yard 10 etc. which will be in use for existing Employer operations during the construction phase.

Such work shall be undertaken at a time to suit the Employer's operations and the Contractor shall not be entitled to any costs or an extension of time for any lack of access or any programming of such works.

P1.3.8 Coordination With Adjacent Projects

The Contractor must provide personnel and attend meetings as required to ensure coordination of the Works with any adjacent projects.

During construction of the Works, VFPA is expected to realign Timberland Road to the eastern edge of the Site as part of the Fraser Surrey Port Lands Transportation Improvement project (FSPL-TI). The Contractor will be expected to coordinate execution of the Works to avoid conflict with the FSPL-TI construction.

Metro Vancouver will be boring a new water supply tunnel under Berth 10. Should this project overlap with performance of the Works, the contractor shall perform any required coordination through the Employer's operations coordinator.

P1.3.9 Contractor's Site Compound

The Contractor shall obtain the Engineer's approvals for the Contractor's working laydown area for site offices and storage within the Site. The Contractor's use of the working area shall be subject to the following:

- The compound shall not inconvenience nor impede the Employer's operations and facilities;
- The compound shall be fenced off and properly drained;
- The compound shall be of a standard approved by the Engineer; • The compound shall be kept clean and tidy at all times; and
- No sleeping is allowed on the compound areas.

If the Contractor wishes to establish any further site compound(s) outside the Site, he shall do so entirely at his own risk and cost and be subjected to Employer's approval in writing.

At the date of issue of the Taking Over Certificate in respect of the whole of the Works, the Contractor shall clear the Contractor's working area, except the area outside the Permanent Works, previously approved by the Engineer where the Contractor will have 90 days after the date of issue of the Taking Over Certificate to complete the clearance of the Site.

Such clearance shall involve:

- Removal of all the Contractor's buildings and installations;
- Removal of all services, drainage, etc., associated with the Contractor's buildings and installations;
- Removal of all foundations, concrete slabs, etc., remaining after removal of the Contractor's installations;
- Site clearance and removal of all debris;
- Removal of all temporary fencing;
- Removal of all materials not required for the Permanent Works, surplus to requirements, or not required by the Employer; and
- Reinstatement of the site to its condition before being taken over by the Contractor.

Failure to comply with the above requirements will result in the Engineer taking whatever action is deemed necessary to ensure compliance, which shall include back-charging costs to the Contractor.

The Contractor shall provide and maintain at his own expense during the performance of the work an office in the vicinity of the work. Orders or directions, written or oral, from the Engineer or his representative delivered at such office shall be considered as delivered to the Contractor. The Contractor's office shall be fitted with all necessary communication facilities. The Contractor must obtain building permits from VFPA for all structures erected on Site.

Toilets and washrooms for the use of the Contractor's operatives employed on the Works shall be provided and maintained by the Contractor to the extent, in such a manner, and at such places as to be to the satisfaction of the Engineer. The Contractor shall make temporary arrangements for the proper removal of sewage and discharge of drainage from

or in connection with the Works and shall maintain the same to the satisfaction of the Engineer.

The Contractor shall arrange for the collection of rubbish by the provision of suitably located and regularly cleared bins.

P1.3.10 Site Electricity Supply

The Contractor may be permitted access to power services where practical for the purposes of completing the Works. Where power services are accessed, the following conditions apply:

- Connections shall be metered (with any installed meter supplied at the Contractor's cost with the readings for each meter reported separately to the Employer on a weekly basis);
- The Contractor shall be back charged for metered power on a monthly basis;
- Under no circumstances shall power connections or cables, be laid at- grade or overhead across traffic lanes;
- Temporary cable runs shall be submitted to the Employer for approval.

Where a suitable power supply is not available, the Contractor shall be responsible for providing his own electrical power supply during the Works. The Contractor shall locate his temporary generating plant in a location consented to by the Employer.

Subject to: (1) the anticipated electric demand to be presented by the Contractor and (2) the existing availability at the small substation located at the corner of the Site that supplies power to the IDC Yard, lights, cameras, and trailers, the Employer can provide temporary power for construction, on a monthly basis, with meter readings and back charges. The BC Hydro reference charge is \$0.0981/kWh for energy use at the IDC yard. The value may be subject to further charges, taxes and variations regulated by BC Hydro.

The location of transformers, distribution boards and cable routes shall be to the approval of the Engineer. The location of transformers, distribution boards and the routing of all cabling shall be noted on a site layout drawing to the satisfaction of the Engineer prior to installation work commencing. Any such approval shall not relieve the Contractor of the responsibility for the siting of his temporary electrical installation, and any additional expenses incurred by the Contractor for revising same for any reason shall be borne by the Contractor.

The whole of the Contractor's electrical installation shall comply with the Canadian Electrical Code, (CSA 22.1) and local regulations.

As soon as any or all of the Contractor's electrical installation is no longer required for the carrying out of the Work, the Contractor shall disconnect and remove the same to the satisfaction of the Engineer.

P1.3.11 Site Water Supply

The Contractor is responsible for arranging for an adequate supply of suitable quality water for his own requirements. While the Contractor will likely be able to establish a temporary connection to the Site's existing water network, this cannot be fully relied upon. The Contractor shall satisfy himself as to the suitability of the quantities and quality of the water available.

The Contractor is to provide adequate supplies of clean, fresh, chilled drinking water for the consumption of the Contractor's labour force at suitable convenient locations around the Site for the whole duration of the Contract.

The Contractor shall make such temporary connections, distribution pipework and execute such plumbing.

The Contractor shall submit details of all his proposed temporary water supply installations to the Employer for approval prior to commencement of installation work. Any such acceptance shall not relieve Contractor of the responsibility for the siting of his temporary water supply installations. Any expenses incurred by the Contractor in revising same for any reason shall be borne by the Contractor.

The water required for the hydrotest of the new storage tanks will be a large volume and from hydrant which Contractor must coordinate at his risk and cost with city/fire dept. The Contractor shall develop and submit a plan to the Employer for this activity, including (but not limited to) items such as:

- Allowance for the means and the time required to fill the first tank, which will typically be by connecting up to the nearest suitable fire hydrant. This is a large draw off from the fire water system, so this activity will have to be coordinated with and notification provided to all authorities as required
- Coordination of performance and timing of the hydrotests for the tanks so as to facilitate the reuse of the water for performing the hydrotest of the second and third tanks, as well as providing a means to do so

Treatment of the water and testing of same to verify that the water may be discharged to the stormwater system, failing which the water will need to be otherwise disposed of.

As soon as any part or the whole of the Contractor's installations is no longer required for carrying out the Work, the Contractor shall disconnect and remove the same to the satisfaction of the Employer.

P1.3.12 Site Communications

The Contractor shall arrange for the provision and maintenance of Wi-Fi and high-speed internet facilities as required for his own use. The Contractor shall pay all fees and charges in respect of his own telephones, Wi-Fi, internet, and facsimile facilities.

The Contractor 's communication system shall not at any time disrupt the communication systems of the Employer or any other operator. The Contractor shall provide and maintain a ship to ship and ship to shore radio communication system.

In order to prevent interference with essential Terminal's operational frequencies it is essential that the availability of any unused frequencies is first established with the Terminal.

The Contractor shall be responsible for all necessary communications with the Terminal and Authorities.

Notwithstanding these requirements, all radio equipment shall be operated on a private frequency which shall not interfere with any other local transmission or other equipment of any type. The Contractor shall ensure that his transmissions and equipment comply with the requirements of the appropriate Authorities.

All floating plant or other vessels navigating within the Terminal area must carry a V.H.F. radio capable of working on marine channels as required by the Terminal and Authorities.

The marine equipment masters are to keep constant watch on VHF frequencies and obey all instructions given by the harbour master. These frequencies are in addition to any the Contractor requires for communication between his pieces of equipment and shore-based offices.

The Contractor's shall obey all instructions given by the harbour master or any other responsible Authority.

P1.3.13 Hours of Work

The Contractor shall be permitted to undertake construction activities from 7am to 8pm from Monday to Saturday. The Contractor may apply to the Authorities through the Employer for variations to these construction hours, but the Employer has sole discretion over whether such variations will be permitted. Notwithstanding the limitation on construction hours set out above, the Contractor may request 24-hour work periods for the marine works, and the Employer will consider such requests, subject to receipt of a satisfactory work plan for such 24-hour work shifts from the Contractor and any required Authority approval.

P1.3.14 Temporary Works

The Contractor shall, on request, submit to the Engineer for his consent, in the form of Temporary Works method statements, all details required by the Engineer to enable him to review the suitability of the proposed Temporary Works.

Where such Temporary Works method statement has been requested the Contractor shall not commence construction on any element of the Works until the Engineer has given consent to the relevant method statements. Sufficient notice (two days) and time (seven days) shall be allowed for the proper review of the Contractor's Temporary Works method statements.

The minimum notification periods shall be provided by the Contractor with respect to requests for the critical activities described below.

- | | |
|--|---------|
| • Network infrastructure works | 14 days |
| • Power interruptions | 14 days |
| • Changes in Security Perimeter | 21 days |
| • Request to abandon utilities in place (each phase) | 30 days |
| • Works on fiber cables | 45 days |

The Contractor shall note that the Works abut, or are surrounded by, an existing operational Terminal and shall ensure that all necessary precautions are taken to protect Terminal users, property, and personnel and not obstruct Terminal or marine traffic.

The Contractor shall provide and erect such supports as may be required to protect efficiently, to the satisfaction of the responsible authority, all existing elements, structures, services, or works that might be damaged by the execution of the Works, and he

shall remove such supports on completion of the Works or otherwise take such permanent measures as might be required to protect the structures or works.

Failure to observe the above requirements will result in cessation of works until appropriate measures are installed.

P1.3.15 Site Cleanliness

The Site shall be kept safe, clean, and tidy and free from undesirable smells at all times. The activities on the Site shall not be permitted to create excessive noise, dust, water pollution, etc., in accordance with the requirements of the Contract. Waste material shall be managed in accordance with the approved Site Waste Management Plan.

The activities on the Site shall not be permitted to create excessive noise, dust, water pollution, etc., in accordance with the Employer's Requirements and in accordance with regulation of authorities having jurisdiction on the site.

In addition, the Contractor shall arrange for the collection of rubbish by the provision of suitably located and regularly cleared bins.

Floating debris and construction debris within the Site arising from any source shall be collected and disposed of by the Contractor at regular intervals and as required by the Engineer. Floating debris and construction debris shall be prevented from dispersing outside the Site.

Under no circumstances shall any material from the works be permitted to drop into the water. If material falls into the harbour accidentally, the Contractor shall recover this material from the seabed and stockpile or remove it from Site as appropriate.

All waste material taken from the Site shall only be removed, to an official disposal site, where proof of disposal shall be obtained, and records shall be provided to the Engineer.

Should the Contractor fail to comply with the Engineer's written request to keep the Site tidy and remove waste material from the Site, the Engineer may arrange a third party to perform this work. All costs of arranging and carrying out such removal of waste by the third party shall be deducted from the amount due to the Contractor.

On completion of the Works and before the Engineer issues the Taking-Over Certificate, the Contractor shall clear away and remove from the Site all equipment, surplus materials, rubbish, temporary buildings, and Temporary Works of every kind, and leave the whole of the Site clean and tidy to the satisfaction of the Engineer.

On completion of the Works, all roads and waterways which have been affected by the execution of the Works shall be cleared of all rubbish and materials all to the satisfaction of the Engineer and shall be reinstated to their original condition or better as applicable.

In the event that the Contractor fails to remove all rubbish, surplus materials etc. from the Site to the satisfaction of the Engineer within 28 days of completion of the Works, these will be removed by the Employer and all associated costs will be contra charged to the Contractor.

Failure to comply with the above requirements will result in the Employer taking whatever action is deemed necessary to ensure compliance, which shall include back-charging costs to the Contractor.

The Contractor shall minimize the amount of material carried from the site on the wheels of vehicles. An efficient road sweeper is to be available at short notice to ensure the roads near to the site are kept clean without inconvenience or annoyance to other users. If necessary, a wheel wash is to be installed and operated.

P1.3.16 Emergency Arrangements

The Contractor shall maintain arrangements whereby he can quickly call out labour outside normal working hours to carry out work needed for an emergency associated with the Work. The Employer shall be provided at all times with a list of emails and telephone numbers of the Contractor's staff who are currently responsible for organizing emergency work. The Contractor shall acquaint himself and his employees with any relevant local arrangements which are in existence for dealing with emergencies.

P1.3.17 Temporary Drainage

The Contractor shall install and maintain as necessary all temporary drainage facilities to ensure the Site and the Works, the adjacent land and existing facilities are adequately drained during the course of the Works, and that drainage of the adjacent land is unaffected by the Works.

P1.3.18 Work Off-Site

The Contractor shall give the Engineer written notice of the preparation or manufacture, at a place not on the site, of any pre-constructed or manufactured units or parts of units to be used in the Works stating the place and time of the preparation or manufacture so that the Engineer might make inspection at all stages of the work.

Any units or parts that are prepared or manufactured without such prior notice having been given to the Engineer might be rejected if the Engineer considers that his inspection was necessary during the progress of the preparation or manufacture.

P1.3.19 Protection of the Works

The Contractor shall carefully protect all finished work.

The Contractor shall provide and maintain warning signs, temporary fencing, hoardings, fans, planked footways, guard rails, gantries and the like as may be necessary for protecting the public and others, for the proper execution of the Work or for meeting the requirements of any local or other Authority.

The Contractor shall safeguard the Employer's Site, Plant, and materials from damage and theft and shall take all reasonable precautions to prevent unauthorized access.

P1.3.20 Removal of Sunken Vessels and Offshore Plant

The Contractor shall forthwith and with dispatch raise and remove any vessel or offshore plant belonging to him or to any Subcontractor or to any person employed by him which may be sunk or stranded or gone adrift in the course of the Work or otherwise deal with the same as Employer may direct until the same shall be raised, removed, or recovered.

The Contractor shall buoy and light and do such things for the safety of navigation as may be required by Employer or any statutory or other authority having jurisdiction.

In the event of the Contractor not carrying out the obligations imposed upon him by this clause or in the event of the said authorities electing to buoy and light such sunken vessels and offshore plant and raise and remove or otherwise recover the same, the Employer shall deduct the amount of such costs from the Contract price.

The fact that the vessel and offshore plant sunk, stranded, or gone adrift is insured or has been declared an actual or constructive loss shall not absolve the Contractor from his obligations under this clause. The Contractor shall give both the Employer and the said authorities immediate notice of the occurrence of any such sinking, stranding, or going adrift as is referred to in this clause.

The Contractor shall, at his own expense, remove from the sea, the seabed and foreshore any floating or submerged debris caused by the demolition and by the construction of the Work. He shall not discharge into the water area any oil, solid, noxious, or floating material and all water discharged into the sea shall be reasonably free from impurities.

On completion of the Works, the Contractor shall guarantee that the area around the jetty is clear of all debris, etc.

P1.3.21 Scaffolding

Where necessary the Contractor shall provide, erect, maintain, dismantle, and clear away on completion proper and adequate scaffolding. The Contractor shall be entirely responsible for all safety precautions and any required engineering in connection with the scaffolding and for its entire sufficiency for the work.

P1.3.22 Third Party Approvals and Notices

The Contractor's responsibility shall be to design, carry out, and complete the whole of the Works to comply as a minimum with the requirements of each and every relevant statutory, regulatory, and utilities Authority, and that the Works are fit for purpose.

Related to the design works to be approved by the Authorities and for any additional requirement from the Engineer, other than the design obligations defined in the Contract and/or these Employer's Requirements, the Contractor shall consider an allowance of 100 hours of additional design services, over and above any efforts required to produce and

deliver such submissions to the mandatory standards required by the Contract and Authorities for such documentation, that may be requested by the Engineer or the Authorities.

The obligations of the Contractor to comply with all permits, licenses, and consents for implementing part of the Works are set out in the Conditions of Contract.

Should the Contractor for any reason whatsoever cause such approvals, permits, consents, etc., to be withdrawn, the Contractor shall be fully responsible for their reinstatement or re-issuance, irrespective of whether such were originally procured by the Employer. This includes responsibility for any or all costs incurred by the Employer in obtaining reinstatement of approvals/ permits/ consents, etc. which only he can obtain.

The Contractor shall not commence any element of the Works, until he has obtained written approval from the relevant statutory, regulatory, and utilities Authorities, and a copy of that approval has been submitted to the Engineer.

The time required to obtain all necessary permits shall be deemed to be included within the programme.

The Contractor is solely responsible for obtaining all required construction work permits.

The Contractor shall obtain approval in advance for the lighting and mooring of all floating equipment and for the lighting of Temporary Works from the relevant statutory, regulatory, and utilities authorities, and submit all relevant approvals in advance to the Engineer.

The Contractor shall liaise with relevant parties and all competent Authorities in obtaining the necessary approvals, permits and licenses both for the design and for the construction, such as, but not limited to, the approval of:

- WorkSafeBC Notice of Project;
- BC 1 Call;
- Business licenses;
- Any Transport Canada requirements;
- VFPA permits including building permits for any work not included under Project PER 22-017.

The Contractor's general obligations shall include, without limitation:

- Obtaining all design and construction permits from Authorities having jurisdiction on the project;
- Obtaining Building Permits for all required Work;
- Occupation certificate or similar is to be obtained by the contractor for the project;
- Obtaining the necessary approvals/ permits/ consents, etc., for disposal of spoil;
- The submission of the Contractor's designs/ drawings to the relevant Authorities and obtaining their approval;
- Complying with the requirements of the VFPA PER permit;
- Complying with the relevant requirements for, and obtaining approvals for, navigation within the Fraser River;

- Complying with relevant regulations relating to the performance of the Works, and in particular with the requirements of the local authority; and
- Establishment of measures to control pollution and clean up contamination and spillages.

P1.3.23 Communication with Relevant Authorities

The Contractor shall provide to the Engineer, copies of all correspondence between the Contractor and Authorities, utility companies, environmental groups, stakeholders, or other organizations and the Employer.

The Engineer and the Employer shall be entitled to attend all meetings held relating to the gaining of any permit, licenses, and consents.

This information shall not relieve the Contractor of its responsibility for any permit, licenses, and consents.

The Contractor shall not amend the conditions of the approvals without approval of the Engineer and the Employer.

P1.3.24 Laws, Rules, and Regulations

The Contractor shall be responsible for the compliance of his staff with all Terminal regulations, federal laws, provincial laws, and municipal by-laws. The Employer and/or Engineer shall bear no responsibility for any failure on the part of the Contractor to enforce such rules or regulations.

Throughout the period of the Contract, both within and outside the Contractor's working area and Site, the Contractor shall fully comply with rules, regulations, and requirements of any Authority having jurisdiction over the local waterways. The Contractor shall install all necessary navigation aids for the safe navigation of their vessels or those of their Subcontractors, and vessels belonging to others, throughout the duration of his Contract. The Contractor shall have due regard to all existing navigation channels and maneuvering areas and shall leave clear all existing waterways used for navigation or maneuvering of vessels.

The Contractor shall be responsible for arranging for the issue of any relevant Notices to Mariners or other notices to responsible authorities and shall supply copies to the Employer, and the Engineer.

The Contractor shall comply with all instructions of the Harbour Master and Coastguard and any other responsible authority regarding his craft or floating equipment.

P1.3.25 Publicity and Public Relations

Within one week of commencing work on Site, the Contractor shall supply and erect a notice board (dimensions to be confirmed), showing name and logo of the Employer, the name of the Project, the name and logo of the Contractor and after-hours telephone numbers. The layout and location of the Notice Board shall be agreed between the Employer and the Contractor.

P1.4 Contractor's Documents

P1.4.1 Design Documents

The design of the Works is the responsibility of the Contractor and shall satisfy the Employer's Requirements contained within the Contract.

Document submissions shall be prepared for the various elements of the project before finalizing the detail of the construction drawings and commencement of the physical work.

The Contractor shall adopt the VFPA Naming Convention for all documents and drawings. Refer to the "Record Drawing Standards for Infrastructure Projects - Version 3 - June 04, 2021" in Appendix 4.

The Contractor shall submit his documents in pdf and in editable formats (Word, Excel, AutoCAD, PowerPoint etc.).

The Contractor's Documents will not be considered as complete until the Operation Manuals, Maintenance Manuals, and documents regarding the warranty period are submitted and approved by the Engineer.

The submissions shall cover, but not be limited to, the following elements:

- a) Detailed survey plan and specifications
- b) Detailed testing & commissioning plan and specifications
- c) Detailed monitoring plan and specifications
- d) Technical and workmanship specifications
- e) Demolition works
- f) Earthworks including ground improvement
- g) Marine works
- h) Onshore works
- i) Electrical works
- j) Power supply and complete electrical system
- k) Potable water systems, wastewater systems, fire water systems
- l) Pavement and roads
- m) All minor works

The design submissions shall include as a minimum the following (not required to submit simultaneously, can be separate documents):

- a) Site data interpretation and results of additional surveys
- b) Design basis statement covering all assumptions, codes and standards used and demonstrating how the design complies with the Employer's Requirements.
- c) Design reports, with checked calculations with input, output, and detailed analysis.
- d) Preliminary engineering design models or drawings including dimensions and setting out of structures.
- e) Detailed and final detailed engineering design models or drawings of all structures and facilities

- f) Construction drawings of all structures and facilities
- g) Method Statements
- h) Risk assessments for the execution of the works

The Design drawings produced by the Contractor shall include, without limitation:

- a) General arrangement and layout drawings
- b) Detail drawings
- c) Survey drawings and charts
- d) Single line flow diagrams of all services
- e) Services drawings, for each individual utility
- f) Combined services drawings
- g) Mechanical equipment drawings
- h) Erection drawings
- i) Cable and conduit routes
- j) Electrical circuit diagrams
- k) Schematics (line diagrams) of control systems
- l) Logic diagrams
- m) Equipment list with sizing
- n) Cable schedules
- o) Spare parts list

The drawings shall, without limitation:

- a) Show the general arrangement, lines, levels, and layouts of the whole of the Works, including buildings, identifying each structure, item of plant, and service facility
- b) Show the interface between the existing and the current phase of work
- c) Indicate the arrangement profiles and details of earthworks, and surfacing
- d) Indicate the final layout and details of any piled foundations
- e) Indicate the arrangement and details of structures including pre-cast elements, cast- in items and furniture, appended bar-bending schedules, types/ quality of materials, and protective systems
- f) Indicate the final layout and details of surface features including line-marking, signage, operational safety lights, etc.
- g) Indicate sizes and positions of all plant, equipment, pipes, cables, conduits, trenching, ducting, manholes, pits, cable trays, etc., together with all inspection points, cable joints, and lubrication points, etc.
- h) Show the colour coding, labelling, and identification of all services, and full working details of size, load, duty, and capacity of each item of plant. The drawings shall also clearly indicate the positions of drains, valves, and test points.
- i) The diagrams of control systems and the electrical circuit diagrams shall indicate the type, location, and function of each component and,

together with the inter- connecting wiring and piping, the terminal connection reference numbers, or letters of the actual equipment.

- j) Indicate the circuit reference for all equipment and each outlet shown. All references shall agree with the charts and labels in distribution boards fixed to the switchgear.
- k) Show the location and depth of all pipes and cables, whether buried directly in the ground, or drawn through ducts/manholes, to a scale of not less than 1:500.
- l) The positions of cables or pipes shall be physically measured from visible permanent features. All changes of cable or pipe direction shall be shown.
- m) Recommend servicing and maintenance schedules and include schedules showing the recommended types of lubricant, particulars of maker's types, serial number and rating, replacement parts, and a statement of the basic data on which the design of the plant has been based.
- n) Show the position and nature of all ground electrodes installed, and the routing of copper ground wiring.

Drawings shall be in the English language, use SI units, and follow recognized international standard for drafting in respect of drawing size, scale, format, etc.

The Contractor shall provide, as part of his submissions, complete and clear detailed Technical Specifications, Method Statements, and risk assessment for the execution of the works, including testing and monitoring, which describe all plant, manufactured items and materials which will be incorporated, details of the fabrication and construction of the Works including phasing and interface with Employer operations, and the maintenance regime for the Works. The Technical Specifications shall form part of the Contractor's Documents and shall be reviewed by the Engineer; however, his review and approval does not absolve the Contractor of full responsibility.

The Engineer will undertake a detailed review of the Contractor's design, including calculations when requested to verify compliance with the Employer's Requirements.

An Engineer will be appointed by the Employer. The Engineer will review and sign off the major milestone accomplishments of the Contractor. The Contractor shall allow in his tender price and program for the coordination and reviews from the Engineer.

For clarity, Contractor's Documents approvals will be required from the Engineer, Employer, and relevant stakeholders such as, but not limited to, the Vancouver Fraser Port Authority, etc.

The Contractor shall prepare, install, and maintain a unified industry standard documentation control system available to data warehouse and administer the design, construction, and commission phases of the project on a common IT platform. The system shall be available to all stakeholders and be remotely accessible to all users. The system implemented shall be the same for document preparation, management of comments, and correspondence related to the entire phase of the Works execution. The system shall be submitted for approval of the Employer.

The Contractor shall accept full responsibility for the adequacy of the design, including any design/details prepared by or on behalf of the Employer. Nothing in the Engineer's reviews, comments, or recommendations shall relieve the Contractor of his design and construction obligations.

The Contractor shall ensure that, during the design process, the appropriate risk assessments are undertaken demonstrating that health, safety, environmental, operational maintenance and constructability issues have been fully considered and mitigated as required by the Employer's Requirements.

Prior to any design works commencing and no later than 28 days from the Commencement Date, the Contractor shall submit for approval a plan that outlines how he intends to manage, control, programme, and carry out the necessary design work in accordance with his obligations under the Contract (the "Design Management Plan").

In addition, at the start of the Contract, the Contractor shall prepare and submit a design package schedule (the "Design Schedule") that shall identify deliverables for each design package and state document number, document title, brief description of contents, and date of submission.

The Programme shall identify consent periods for each Contractor's Document.

The Programme, Design Schedule, Design Management Plan, and design submissions are part of the Contractor's Documents and shall be proposed by the Contractor and agreed by the Engineer.

If resubmission of a document is required, the Contractor shall be solely responsible for mitigating any delays incurred to the Contract Programme resulting from the rejection and subsequent resubmission and shall not be entitled to an extension of any required completion dates due to such rejection and subsequent resubmission.

The design Documents shall be submitted in two distinct stages, comprising:

- 1) Full Design Package issued for review (FDP)
- 2) Issued for Construction (IFC)

For Request for Information's (RFI), material submissions and other documents not listed with a prescribed review period, the time required for response should be based on the importance, the complexity, and the number of submissions. RFIs should be prioritized to minimize any potential for impact. The Engineer should be given reasonable notice of any item that may impact the programme.

The Contractor shall produce, maintain, update, and issue at weekly intervals a register of all drawings in circulation identifying current status. Superseded drawings are to be clearly so marked (S/S) and removed from Site except where copies are maintained in the office for record purposes.

If requested by the Engineer, the Contractor shall furnish to the Engineer before erecting any part of the Temporary Works, complete drawings of the temporary work and staging required for carrying out the Works. The Contractor shall at the same time, if required by the Engineer, furnish calculations relating to the strength and anticipated deflections, in respect of such Temporary Works. The Contractor shall also furnish to the Engineer drawings showing the methods proposed for the erection of the various parts of the Temporary Works.

Excluded

P1.4.2 Full Design Package

The Full Design Package (FDP) issued for review shall be submitted after being checked and authenticated by the Engineer of Record in accordance with Engineers and Geoscientists of British Columbia (EGBC) standard of practice. The package shall include, but not limited to:

- a) Basis of design document. This document shall contain relevant references to compliance with the Employer's Requirements and shall clearly outline the design inputs, parameters, standards, philosophies and summarise the composition of the Full Design Package and how the design of the Works meets the provisions of the Employer's Requirements.
- b) Detailed design calculations and risk assessments
- c) Engineering drawings, sketches, and specifications
- d) Material and Plant data sheets and specifications
- e) Work method statements and risk assessments
- f) Inspection and Test Plans
- g) Other relevant construction documents relating to the design package

The Engineer of Record shall undertake a review of the design, which shall substitute the requirements for the Contractor's obligation to undertake an independent third party review with an independent design consultant. For the avoidance of doubt, the Engineer of Record shall be required to confirm that the design of the Works satisfies the requirements under these Employer's Requirements.

P1.4.3 Issued for Construction

The Contractor shall provide a document set titled Issued for Construction (IFC) as a detailed set deemed to be complete and comprehensive prior to the commencement of any element of work scope. These documents shall only reach IFC status once all the Engineer's reviews, Regulatory Authority approvals and permit processes have been completed.

P1.4.4 Review of Documents

The Contractor shall submit his design documents for review by the Engineer only after they have been verified by his Designers and Engineer of Record as having completed an internal quality assurance checking and sign-off.

The Contractor's Documents are to be submitted for review through the Autodesk Construction Cloud website, or similar if agreed by both Parties

The Programme and Design Schedule shall allow for a separate period of 2 weeks for the assessment and review of each package by the Engineer in accordance with Volume 1 - Particular Conditions of the Contract, Sub-Clause 5.2 – [Contractor's Documents]

Specific items that require a reduced timeline are noted below:

- i) Marine Piling Works – 3 days
- ii) On shore piling – 7 days

If the Engineer fails to reply within the review periods mentioned above, the Contractor may proceed with the Works at their own risk. However, in the event that the Engineer identifies any aspects of the design of the Works which do not conform to the Contract requirements during the Contractor's execution of the Works (after the periods listed above and within the contractual periods), the Engineer shall notify the Contractor with comments and the Contractor shall be solely responsible to address and resolve them accordingly (including any abortive parts of any works completed) within the Works.

Upon completion of the review by the Engineer or at the expiry of the review window, whichever comes first, the drawing or document will be revised accordingly and issued as final or Issued for Construction.

Subject to the provisions of Sub-Clause 5.2 [*Contractor's Documents*], any re-submitted documents will be checked to ensure comments have been properly addressed or to identify where documents do not comply with the Contract, if this is the case.

If a design package needs to be reviewed and approved by an Authority, the necessary duration shall be considered on the Design Schedule and Contractor's Programme.

The Contractor shall allow a minimum of 2 weeks following submission before consents are required to be given. If large submissions are made, such as contractor submitting simultaneously more than two design packages, the Contractor shall indicate the order in which consents are to be given and increase the two-week period accordingly. The Contractor's programme shall include adequate time for consents to be given.

The Engineer reserves the right to extend the review period if more than 2 design packages are submitted by the Contractor within one week. Alternatively, the contractor shall submit a deliverable schedule indicating the submission dates for each of the packages at least three weeks in advance of the submittal date for Engineer to allocate resources for the timely review. All documents submitted shall be fully checked and reviewed in accordance with the Employer's Requirements.

If it becomes necessary to revise the document submission programme the revised programme shall be submitted 2 weeks before any further design package is submitted. The number and scope of the packages shall be subject to the approval of the Employer.

The Engineer will review the document submissions, including design submissions and provide comments if any. Replies from the Engineer will be categorized as shown below:

- Code 1: The Contractor's Document is acceptable without comment. The Contractor's shall submit the Contractor's Document for further review if any changes are made to the Contractor's Document
- Code 2: The Contractor's Document is acceptable subject to changes or clarification requested by the Engineer. Consent subject to implementation of Engineer's comments/ notation without re-submission.
- Code 3: The Contractor's Document is unacceptable for the reasons given by the Engineer. No consent and being subject to full re-submission in response to the Engineer's comments/notation. The Contractor shall revise the document and re-submit to the Engineer for further review.

- Code 4: The Contractor's Document does not require review by the Engineer.

Submission and required resubmissions of any deliverable shall be at the Contractor's cost without any entitlement to any extensions of time.

The Employer or the Engineer reserves the right to request additional information, including but not limited to: design calculations, vendor information, and data sheets. These documents shall be provided by the Contractor within 1 week of request.

The Contractor will provide access for the Engineer/Employer to specific sections of codes and standards as required to support the design work and discussions that may arise during the reviews.

P1.4.5 The Contractor's Designer

Design shall be carried out by designers named in the Design Management Plan. The Engineer may approve the use of alternative designers if the Contractor can demonstrate to the satisfaction of the Engineer that the proposed alternative designer has equivalent competence and relevant experience to the named designer and carries the professional indemnity (PI) insurance required by the Contract.

The designer shall be qualified as defined in Clause 5.1 of the Conditions of Contract (Volume 1) and expanded upon below. In this respect qualified designers shall be recognized specialists in the type of design required for the Works.

The Contractor shall employ designers as required to carry out the design work who meet the following requirements:

- a) The professionals employed by the designer shall be registered Professional Engineers in British Columbia with at least 10 years post-graduate experience and at least 3 (No.) previous projects undertaken in last 5 years of a similar complexity and nature. For the marine works, ground improvement, and foundation the designer shall have at least 10 years specific experience in the design of similar works.
- b) They shall have sound and demonstrable ability in the relevant engineering design work together with the applicable codes and standards.
- c) They shall have relevant regional experience with understanding of applicable local construction methods and materials and regulations.
- d) They shall hold satisfactory Professional Indemnity Insurance, which shall be not less than the cover required under the Contract.
- e) For each designer the Contractor proposes to employ, who meets the above requirements, he shall submit the following documentation for the approval of the Engineer:
 - Profile, details, and experience of the design organization.
 - Full and detailed CVs of key persons proposed to be employed.
 - Statement on proposed organization and programme of the design work, QA certification, and procedures.

There shall be a single nominated project design manager, who shall be responsible for the overall management and production of the design work. The

design manager shall have a minimum of 20 years' experience managing project of similar value and complexity.

The approval of Designer(s) and design manager shall be subject to the specific written approval of the Engineer.

As construction proceeds, and as part of any procedures implemented for offering up elements of the Works for acceptance, the Contractor's Designer shall verify the adequacy and accuracy of that element of the Works and that such element has been constructed as described elsewhere in these documents.

The Contractor's Engineer shall issue Schedules and other documentation, at the end of the Works, as required by the relevant Authorities.

P1.4.6 Independent Design Verification

The Contractor shall engage at his own cost an Independent Design Verifier (IDV), who shall be responsible for checking all of the Contractor's design documents (detailed design, final detailed design, for construction, as built, etc.), including temporary works, testing, monitoring and surveys, and shall Sign Off and Certify that the design meets all the functional and technical requirements in accordance with the Employer Requirements including but not limited to any Authority requirements and any local conditions and requirements from the Design Codes and Standards .

The role of the Independent Design Verifier shall be completed by the Engineer of Record who shall follow the requirements of EGBC and these Employer's Requirements.

P1.4.7 Record and As-Built Drawings

Record and as-built drawings shall follow the EGBC standard practice and shall be prepared and sealed by a credited engineer as each element of the Works is completed.

To ensure that this requirement is met, the Engineer shall be allowed to inspect the drawings on request. Drawings shall be produced in the English language using AutoCAD version 2017 or later.

In addition to the above general requirements, as-built drawings shall indicate deviations from original consents.

Any failure of the Contractor to submit the As-built Drawings and final calculations within the stipulated period will entitle the Employer to have such drawings and calculations prepared by others at the expense of the Contractor.

The Contractor shall submit, in addition to the requirements of this clause, copies of all final or most recent versions of the Contractor's Documents, in electronic form. The electronic format for these submissions shall be submitted for approval to the Employer.

The Contractor shall also be required to prepare and submit to the Engineer all as-built drawings required by VFPA for the Works.

P1.4.8 Asset Hierarchy

A functional asset hierarchy and asset tag list shall be developed by the Contractor for approval by the Employer. This hierarchy and associated tag numbers shall be used to organize all asset information on the Project including drawings and manuals. This tag list shall be in a format that can easily be uploaded into an enterprise assets management system and shall have the following minimum attributes:

- a) Asset Code;
- b) Description; and,
- c) OEM Part Number (if applicable).

Any changes to the asset during the final few months of construction and commissioning that impact the asset tag list shall be communicated by the Contractor to the Engineer and be updated in the asset tag list.

The following assets shall be physical tagged by the Contractor with their asset code:

- a) Mechanical devices (pumps, fans, generators, etc.);
- b) Electrical devices (transformers, panels, switches, circuit breakers, etc.);
- c) Instrumentation (valves, flow meters, gauges, sensors etc.);
- d) Control panels (access control, fire control, electrical control etc.);
- e) Terminal lighting;
- f) Access control.

Tags will need to be a minimum of 12 mm wide and made out of durable material capable of lasting the life of the asset. Where practical, asset codes should be etched into the material as opposed to being printed and the number must be readable for the duration of the asset life. Black on white, or white on dark blue are acceptable colours. They shall be affixed appropriately either on the item in question or in close proximity. The process of tagging items shall be ongoing by the Contractor and not left to the end of the project. This will assist testing, commissioning, and handover.

P1.4.9 Operation and Maintenance Manuals

The Contractor shall supply Operation and Maintenance Manuals for the Works, covering all installed equipment and setting out of maintenance activities required.

- a) The operation and maintenance manuals shall be prepared, for civil, buildings, electrical, and mechanical work elements, in the English language as soon as consent has been given by the Engineer to the relevant Contractor's/Construction Documents. The Contractor shall ensure that technical authorship of the Manuals commences at the outset of the Works to enable the documents to proceed with the Site Works and be completed and handed over to the Employer at the same time as applying to the Engineer for handover of each element.
- b) The Contractor shall train the staff of the Employer to make sure that the Employer is capable of properly operating all the capital equipment and the works. Training sessions shall be scheduled well ahead of the hand-over of the works and shall continue until all the relevant staff of the Employer is capable of operating the Works in an adequate manner.

- c) For the avoidance of doubt, capital equipment shall include, but not be limited to, all transformers, switchgear, rail unloading equipment, pumps, marine loading equipment, nitrogen system, wastewater treatment system, associated instrumentation and control systems, lighting, and fire-fighting equipment / systems.
- d) The manuals shall include a description of the layout and function of the system, schedules of components comprising every item of equipment including manufacturer's name and contact details, reference and serial number, and detailed operating and maintenance instructions including electrical protection device settings. The Works will not be considered substantially complete until this documentation has been submitted and approved.
- e) Operation and Maintenance Manuals, Material Test Reports (MTRs), Factory Acceptance Testing (FAT), and datasheets, etc. shall be provided in accordance with Employer's requirements. Manual text shall be in the English language and in SI units.
- f) Legible reduced scale copies (11x17) of the record and as built drawings are to be inserted in the manuals. This may require oversize printing and wide spacing of pipe runs, etc., on the drawing to allow for reduction in size. Such adjustments shall be in accordance with recognized standards.
- g) The drawings prepared by the Contractor, his Designers, and any Subcontractors/Supplier, shall be forwarded to the Engineer on digital media with register, and with four hard copy sets of the drawings. Drawings supplied on digital media shall be in both AutoCAD (.dwg) and Adobe Acrobat (.pdf) formats.
- h) Record and as-built drawings bound into manuals shall be arranged to fold out from their position and be entirely readable and visible when any part of the manual is being read.
- i) The manuals shall be encased in loose-leaf ring binders covered in a plastic material with title and description. All manual(s) provided shall be similar in presentation and format to form a suite of project documentation. The format of the manuals shall be agreed with the Engineer. The manuals shall lie flat when open. Four hard copies of approved operating and maintenance manuals shall be submitted.
- j) Maintenance manuals and details of all materials used shall be prepared for all civil, buildings, electrical and mechanical items included in the works.
- k) Included with the manuals shall be lists of spare parts for each item, a list of long lead-in items, and a list of local agents able to supply the parts, giving full contact details.
- l) The Contractor shall comply with all of Employer manuals which are included as appendix in this report.
- m) The Works will not be considered substantially complete until the Operation and Maintenance Manuals have been submitted and approved by the Engineer.

The Operation and Maintenance Manuals form part of the Contractor's Documents.

P1.4.10 Works Design Coordination

The layouts shown in Volume 3: Drawings are schematic, and the Contractor shall coordinate the designs of the various services to ensure that:

- a) New structures, pipe, duct, conduit, and cable runs do not clash with existing services that are to be retained,
- b) Structures, pipe, duct, conduit, and cable runs do not clash with each other, in terms of alignment or level,
- c) The services are generally laid parallel to each other and that minimum appropriate separation distances between services are maintained,
- d) All services shall be designed such that they can be easily and effectively maintained, and,
- e) Pipe conduit and duct runs shall be designed to accommodate any ground movement whether or not due to ground improvement under this, or future phases of development.

The Contractor's Designer shall prepare and maintain a BIM model that depicts all underground structures, pipe, duct, conduit, and cable runs.

These BIM model shall be kept up to date throughout the Works and shall be made available to the Engineer to review within 24 hours upon request. At completion of the Works, the Contractor shall be responsible for preparing composite utility plans for the entire Site area which depict both the new and existing underground Works with relevant plan views and cross sections indicating horizontal and vertical separation.

P1.5 Surveys

P1.5.1 Site Data

The utilization of any Site Data referenced in the Contract, including any referenced in these Employer's Requirements, shall be subject to the provisions of Sub-Clause 4.10 [*Site Data*] and the associated Sub-Clauses in the Conditions of Contract in respect of the use of "Reliable Information", which is defined hereunder in this Sub-Clause 1.5.1 of the Employer's Requirements.

The Employer has performed several surveys, provided to the Tenderers during the Tender stage, including:

- a) Bathymetric survey
- b) Topographic survey
- c) Geotechnical survey

The Contractor shall verify, interpret, and take ownership of all site data and survey results. the Employer is not liable for the information provided, and no additional cost or extension of time will be accepted from the Contractor due to any information related to Site Data.

A soil investigation has been undertaken in the seabed. The location of all the boreholes is shown on the Indicative Drawing. The geotechnical survey report is included within Volume 5: Information provided by the Employer. The Contractor shall be responsible for assessing the adequacy of the information and Contractor shall undertake any additional surveys that he deems to be necessary to validate site data.

The Contractor shall be deemed to have satisfied himself as to the conditions expected to be encountered in constructing the Works, whether from the information provided or from his own investigations.

The Contractor shall be responsible for seeking any additional data which may be available, and for undertaking at his own costs any additional surveys, geotechnical or other investigations which may be necessary for undertaking the Works, also taking into account the sections below. The extent of the additional surveys and investigations shall be such that Contractor is able to demonstrate to the satisfaction of the Engineer the validity of the parameters used in his design.

The Contractor shall be considered to have visited the Site and to have taken into account all Site conditions such as means of access, security requirements, adjacent properties and their ongoing marine operations, facilities for transport, storage and movement of Plant and Materials, existing services, requirements of the Canadian legislation and the customs, immigrations, environmental, labour and local regulations, environmental conditions, including seismic hazard, weather conditions and the like, risks and other contingencies which will affect his rates. The Contractor is deemed to have included for all these in the Accepted Contract Amount and no claim for extras cost or extension of time in connection with this matter will be entertained.

The Contractor shall refer to the Definition Drawings for the location and extent of the Site and of the Works covered by this Contract.

The working space for the storage of Plant, Materials and temporary buildings and for other purposes shall be within the Site, as shown in the Definition Drawings. The Contractor shall restrict his operations entirely to the area allotted to him. Any additional areas required by the Contractor such as for storage of materials and equipment or for site offices shall only be at locations approved by the Engineer.

Any areas used outside of the Site, and which are arranged by the Contractor to facilitate the execution of the Works, shall be subject to review by the Engineer and shall be considered as part of the Site.

The “**Reliable Information**” as defined, and referred to, in Sub-Clause 4.10 [*Site Data*], is limited following documents and listed below, which are attached hereunder in Appendix 7 to these Employer’s Requirements:

1. CIVIL

- Hatch Annacis Water Supply Tunnel Drawing 2020
- VFPA Timberland Road Realignment Drawings 2022
- Delcan Drainage Plan 2004
- Delcan IDC Drawings 2004
- Hatch PARY Drawings 2016

2. GENERAL

- Sacre-Davey Location Plan 2022
- Stantec Terminal GA 2021

3. GEOTECHNICAL

- Thurber Geotechnical Report 2022



- 1. Thurber009_20230329_ DP World Canola Oil Transload Facility_Pile Loading Test Report_34098
 - 11-002-GEOTECH-MEG-171012 Geotech report
4. STRUCTURAL
- Seabulk Berth 10 Drawings 2001
5. ELECTRICAL
- Pacific Powertech Single Line Drawings 2018
 - PBA Substation 10 Drawings 2008
6. IT & SECURITY
- PBA Communications Drawings 2010

For the avoidance of doubt, where it should have been possible for an experienced Contractor to have surveyed and validated any information within the above documents, such information shall not be considered Reliable Information.

P1.5.2 Datum

The vertical datum for all marine works shall be the local Chart Datum (CD).

The land side vertical datum shall use geodetic elevations based on CVD28GVRD2018.

The conversion between local Chart Datum and geodetic elevations used in the reference design is 0.0m CD equals negative 1.38m geodetic.

The horizontal coordinate system used is the UTM Zone 10 (NAD 83 CSRS).

Contractor shall verify all reference levels including both the land and seaside Chart Datum and shall clearly note on all documents what reference level is used.

P1.5.3 Setting Out of the Works

The Contractor shall set out the Works and shall be responsible for true and perfect setting out and for correctness of the direction, levels, dimension, and alignment of all parts thereof. If at any time any error and any consequences of the error in this respect shall appear during the progress of the Works, the Contractor shall, at his own expense, rectify the error to the satisfaction of the Engineer. The Contractor shall construct accurate benchmarks so that the lines and levels can easily be checked by the Engineer.

The Contractor shall take all necessary precautions during the progress of the Works to ensure that coordinated points are not disturbed and/or damaged.

Control points and benchmarks exist in the Terminal development area, and these will be made known to the appointed Contractor.

The Contractor shall establish a permanent benchmark on the site and arrange for the benchmark to be independently verified by an approved authority or survey company. The Contractor shall protect and maintain all permanent benchmarks until the end of the Defects Notification Period.

Temporary setting out stations and benchmarks shall be checked and agreed with the Engineer prior to any construction commencing. These shall be kept intact and undisturbed. The Contractor shall from time to time verify their relationship to the permanent stations. The temporary benchmarks and stations shall be located on stoutly constructed concrete bases.

Details of methods and equipment to be used in setting out the Works shall be submitted and approved by the Engineer before use.

All dimensions and levels both on the drawings and the Site shall be checked, particularly the correlation between components and the work in place. Materials and components shall not be ordered, or work carried out, until any discrepancies have been resolved with the Engineer.

The Contractor shall, before commencing work, check, verify and satisfy himself as to the existing levels, coordinates and alignment of the Site and existing structures and facilities and agree them with the Employer. Before any excavation or breaking out, the Contractor shall define reference lines for setting out the Plant.

P1.5.4 Geotechnical Survey

Subject to the provisions of Sub-Clause 4.10 [*Site Data*], no responsibility is taken by Employer for the adequacy or accuracy of the borehole logs or other information in the geotechnical investigation data, including the "Geotechnical Interpretation Report" provided in Volume 5 and no responsibility is accepted for any opinion or conclusion drawn by the Contractor from the information presented by the Employer during the Tender stage.

The Indicative design as presented in Volume 3 is based on the available geotechnical information from CPT's, SPTs and laboratory testing. One of the critical factors in the design of the Works (especially the land works) are the soil improvement works to ensure slope stability under seismic conditions, downdrag on piles caused by consolidation, risk of liquefaction of intermediate sand layers below and behind the tank area to limit residual settlements.

Following above, the Contractor shall perform additional soil investigations to support the design, and construction works, including a specific focus on spatial variation in the properties and layering of soils, the strength parameters, deformation parameters, liquefaction risk assessment and with sufficient depth to ensure information is available for deep foundation piles.

The Contractor shall be deemed to have satisfied himself as to the conditions expected to be encountered in constructing the Works, whether from the information provided or from his own investigations.

The Contractor shall be responsible for seeking any additional data, which may be available, and for undertaking any additional geotechnical or other investigations that may be necessary for the Works.

P1.5.5 Condition Survey

The Contractor shall carry out a visual, and photographic condition survey of all elements of the existing services, facilities, and adjacent areas not being demolished, buildings, access roads (including internal and external dilapidation surveys to establish existing conditions, e.g., cracks (including width), etc.) or as otherwise required by the Engineer, within two weeks of the Commencement Date and prior to the commencement of any demolition or construction work. The Contractor will also establish the levels of these areas.

The originals of the survey report and the photographs shall be handed over to the Engineer within two weeks of the completion of the survey, one copy retained by the Contractor, and one copy handed over to the Employer at the same time. Copies of the reports, photographs, and CCTV surveys shall be provided to the Engineer in electronic format.

The Contractor shall ensure that damage or contamination to any public or private roads, footpaths and tracks used by any vehicles or plant proceeding to or from the Site, shall be kept to a minimum to the satisfaction of the Employer, the Engineer and associated third parties. The Contractor shall be responsible for the cost of all repairs necessary to restore such roads, tracks, or footpaths, including cleaning clearing of any debris, to the satisfaction of the Engineer and relevant local authorities. The condition survey undertaken at the start of the Contract shall be used as the basis of assessing any damage.

The Contractor shall be responsible for the financial cost for the physical repair, reinstatement, or replacement of any of the existing facilities, services, drainage, and adjacent areas damaged as a result of their activities. Any such repair, reinstatement, or replacement shall be undertaken by the Contractor to the satisfaction of the Engineer and relevant third parties.

The Contractor shall monitor impact on existing infrastructure during construction; including but not limited to vibration monitoring.

P1.5.6 Survey Plan

The Contractor shall prepare as part of the QA Manual a fully detailed survey plan (the "Survey Plan") for approval by the Employer including but not limited to:

- a) Type of surveys, including applicable standards
- b) Method statements
- c) Frequency of surveys
- d) Program and planning
- e) Risk assessment and mitigating measures
- f) Program for attendance by Employer, so-called "witness" points and "hold" points requiring presence of Employer before commencement of survey and works

The Survey Plan shall be submitted to the Employer for review no less than fourteen (14) days before commencement of Works on site.

The type of surveys, included in the Survey Plan shall contain at least the following, but not limited to:

- a) Bathymetric survey before and after the Works
- b) Topographic survey
- c) Geotechnical survey
- d) Dimension survey of existing structures
- e) Condition survey of existing structures, roads, rails, and other Terminal or off-site infrastructure before and after the Works
- f) Survey of structures to be demolished

A preliminary Survey Plan shall be included in the Tender Submission, with at least the following:

- a) Type of Surveys, including applicable Standards
- b) Frequency of surveys
- c) Preliminary risk assessment and mitigating measures
- d) Preliminary program for attendance by Employer, so-called “witness” points and “hold” points requiring presence of Employer before commencement of survey and works.

The Survey Plan shall be signed off and certified by the Contractor’s Engineer and the Independent Design Verifier.

The Engineer may request to be present at any survey, other than marked as “witness” and “hold” points. If the Engineer requests to attend surveys, but they are carried out without his presence, the results will be void. The result of such surveys shall be submitted to the Engineer at the times specifically stated or if none is stated as soon as possible.

The preliminary and final Survey Plans form part of the Contactor’s Documents.

P1.5.7 Integration Into Existing Terminal Infrastructure

The Works shall be integrated into the existing Terminal surroundings. Surveys shall be performed to ensure all new structures and facilities shall fit and be fully integrated in the existing Terminal infrastructure.

No Variation (additional cost or extension of time) will be recognized to the Contractor due to integration with existing Terminal infrastructure.

P1.5.8 Reporting

The Contractor shall submit, within 1 week after a survey, a preliminary report with results, analysis, mitigating measures, recommendations for follow-up or design changes, conclusions, etcetera for review by the Engineer.

A final report shall be submitted within 3 weeks after a survey.

A separate Geotechnical Interpretation Report shall be submitted, including assessment of all relevant soil parameters under normal, seismic, and post-seismic conditions.

The survey results and final report shall be signed off and certified by the Contractor’s designer and the Independent Design Verifier.



The final reports shall be submitted before or during the CIP stage and prior to the FDP stage of the structures and facilities that may be affected by the survey results.

The test reports are part of Contractor's Documents.

P1.5.9 Existing Services, Structures, and Facilities

The Contractor shall make his own investigations to establish the exact location of existing services, structures and facilities which may affect or be affected by the construction of the Work. Where works are to be undertaken in areas containing existing services, the Contractor shall establish their location by hand- digging trenches or by other suitable means such as electronic scanning before laying any of the adjacent new service. The Contractor shall provide such information regarding existing services to the Employer and shall include such details on his record and as-built drawings.

The Contractor shall carry out a survey of existing services within 28 days of the Commencement Date and provide a copy of the survey results to the Engineer prior to the commencement of Works.

Surveying of the location and levels of the services shall be to recognized survey standards as approved by the Engineer. All survey results shall be provided in AutoCAD 2017 format.

The Contractor shall be wholly responsible for confirming the locations of all services and conduits to which connections are to be made.

At the interface between the Works and the existing facilities, the Contractor shall ensure that all drainage and services, roadways, surfacing, fencing and the like, constructed under this Contract, are joined or terminated (where required) in a neat fashion, and tie in with existing services and facilities in such a way that ensures the integrity and functionality of the new and existing works and systems, and ensures that existing services and facilities and operations are not adversely affected.

The Contractor shall make provision in his design for accommodating differential movements between new and existing works.

Where the Contractor is required to interface with existing electrical supplies, they shall ensure that work is carried out in a safe manner and that electrical supplies are maintained to the unaffected services and facilities of the continuously operating terminal. A minimum of 14 days' notice shall be given to the Employer before undertaking any interruption to normal supplies. Work may only progress provided the Engineer has confirmed in writing that the shutdown is acceptable to the Employer and will not substantially impact operations at the terminal.

In such an event, re-confirmation of the shutdown shall be obtained 24 hours in advance from the Engineer and shall be subject to vessel schedule changes.

The Engineer shall provide to the Contractor the Employer's written approval for the shut down before these works commence.

Any intrusions into existing operational cabling under this Contract shall be made good by reterminating or jointing in a safe and secure fashion and in such a way that ensures the integrity and functionality of the existing supplies.

All drains, pipes, and cables, whether above or below ground, that are encountered during the course of the work shall be left in position and be

carefully supported and guarded from damage by Contractor to the satisfaction of all owners and proper authorities so that such drains, pipes and cables may continue in use until the completion of the Works or until no longer required.

The Contractor shall exercise the greatest care during the construction of the Works to avoid damage to or interference with any existing services and shall be responsible for any such damage caused by him or his agents directly or arising indirectly from anything done or omitted to be done. The Contractor shall carry out all temporary works necessary to adequately support and protect any existing services.

Any damage to mains or services shall be notified immediately to the Employer.

The Contractor shall ensure that existing services within the Site area which are the property of service providers or others are adequately protected or relocated. In the event of damage to such service it shall be repaired, replaced, or relocated at the Contractor's cost.

P1.5.10 Interface with Existing Services and Facilities

At the interface between the Works and the existing Terminal facilities, the Contractor shall ensure that all drainage and services, crane tracks, trailing cable slots, roadways, surfacing, fencing and the like, constructed under this Contract, are terminated or joined in a neat fashion, and tie in with existing services and facilities in such a way that ensures the integrity and functionality of the new and existing works and systems, and ensure that existing services, including surface water run-off, and facilities and operations are not adversely affected. Measures shall include the use of flush curbs at exposed edges of block paving, vertical saw-cutting of edges of existing asphalt surfacing and the like. Removal or retention of any existing curbs will be subject to their condition on the Site. Steps in levels and/ or alignment shall not be permitted.

The Contractor shall make provision in his design for accommodating differential movements between new and existing works by, inter alia, adopting steeper-than-required gradients/ transition slab construction to compensate for predictable future settlement, careful placing of manholes and other service/utility chambers and making provision for short 'rocker pipes' to increase flexibility in pipelines at areas of expected differential settlement.

The Contractor shall make provision for maintaining existing electrical supplies either for the duration of the Works, or until they are replaced by new supplies, as applicable. Where the Contractor is required to interface with existing electrical supplies, he shall ensure that work is carried out in a safe manner and that electrical supplies are maintained to the unaffected services and facilities of the continuously operating terminal. A minimum of seven days' notice shall be given by the Contractor to the Engineer before undertaking any interruption to normal supplies. Any disruption to power supplies shall be programmed, agreed, and carried out in accordance with the Fraser Surrey Terminal permit to work procedure.

The Contractor's attention is drawn to the works required to maintain supply of electricity to the Employer's operations and adjacent properties during the course of the Works.

The Contractor shall make provision in his programme for obtaining all necessary permits, certificates, licenses, and approvals from all relevant statutory, regulatory, and utilities authorities.

Any intrusions into existing operational cabling under this Contract shall be made good by re-terminating or jointing in a neat fashion and in such a way that ensures the integrity and functionality of the existing supplies.

The Contractor shall ensure that existing services within the Site area which are the property of others are adequately protected or relocated. All existing services that fall under the footprint of the Site shall be rerouted around the perimeter of the Site. In the event of damage to such service it shall be repaired, replaced, or relocated at the Contractor's cost.

P1.6 Progress Control

P1.6.1 Programme

In amplification of Sub-Clause 8.3 of the Conditions of Contract, a programme shall be prepared by the Contractor, clearly indicating relationship between activities, the critical path and the float (slack) on other activities within 14 days after Commencement of the Works for the Engineer's approval.

The Programme shall form part of Contractor's Documents.

The Time for Completion of the Works is defined in Volume 1 - Conditions of Contract.

The Contractor will be required to have made allowance for the approved working hours, holiday delays, religious festivals, normal seasonal hot / wet / windy / rainy weather delays and associated delays due to the aftereffects of rain in preparing its programme.

The Contractor shall not be entitled to additional cost and/or extension of time for delays or rectifying works that have been damaged as a result of the weather conditions.

The work headings to be shown in the programme shall be the main elements of the Work and the structure shall be aligned with the work breakdown structure established and agreed with the Employer.

The programme shall be produced using industry-standard programming software. 4 (No.) Software licenses are to be provided by the Contractor to the Engineer and Employer and Contractor shall allow in his tender for installing this software on four (4) of the Employer and Engineer computers. If software other than Microsoft Project is used by the Contractor, he shall provide licensed copies of the software for use by the Engineer and his representatives. The Contractor shall also provide and maintain Three (3) networked licenses for use locally. All licenses shall enable full functionality of the software for an unlimited duration. The Contractor shall employ a qualified planning engineer to monitor and update the programme.

The highest-level work headings to be shown in the programme shall be the main elements of the Works. The programme shall clearly show the inter-relationship between design, procurement, fabrication, delivery, construction, testing, and commissioning of each work heading. Long lead-in items and their lead-in times shall also be identified. The programme format shall be to the approval of the Engineer.

Subject to provisions elsewhere, the programme shall identify and allow adequate time for the design submission consent process for Regulatory Authority requirements.

Each work heading shall be split into detailed activities. Work to be undertaken by statutory undertakers and other third parties shall be shown as separate activities. The duration of activities to be undertaken by the Contractor shall be broken down into periods not exceeding one (1) week.

The Engineer may permit some activities to be longer than one week where the Contractor is able to demonstrate that the progress of this increased duration activity can be measured on a weekly basis against the volume of work involved.

Each activity shall be uniquely referenced. Bar charts, logic diagrams/ tables and any other necessary tabular and graphical reports shall be submitted to show the following information for each activity on the network:

- a) Reference;
- b) Description;
- c) Duration;
- d) Relationship with other activities;
- e) Early and Late Start and Finish Dates; and
- f) Resources or Unit Production Time.

The programme shall show the mobilization, use and demobilization of key items of equipment including heavy lift cranes.

The Contractor shall provide not less than 6 months advance notice of the proposed start of the Commissioning.

P1.6.2 Progress

In addition to the requirements of Volume 1, progress against the programme shall be updated by the Contractor at monthly intervals or whenever the previous programme is inconsistent with actual progress or the Contractor's obligations so that the progress of the Works can be adequately scrutinized by the Engineer. For this purpose, the Contractor shall hold, as a minimum and unless otherwise required by the Engineer, monthly progress meetings with the Employer and the Engineer not more than seven days after the monthly progress update.

The Contractor shall assess and report progress on each activity and all other input data not more than four days after the scheduled time for an update and prior to the monthly progress meeting. The Engineer will review the initial schedule submission (baseline schedule). The Contractor will provide monthly updates to the project schedule for information with details of any changes to the network logic.

The Contractor shall submit to the Engineer a monthly report showing actual progress and comparison with the programme, at least three (3) days prior to the progress meeting. This report shall be in accordance with the Employer's Requirements and include but not be limited to:

- a) A summary of the main activities undertaken in the last month;
- b) A summary of work to be undertaken during the following month;
- c) Details on the equipment and labour on site;
- d) Details on the procurement status of all Plant and Materials;
- e) Details of Health and Safety issues including the number and details of any incidents;
- f) Quality report containing the information required by the Employer's Requirements;
- g) Payment report for the Project;
- h) Progress photos of work undertaking during the last month;
- i) Aerial photos of the site; and
- j) Updated risk register;

k) S-curve of the progress.

The format of the Monthly report shall be submitted from the Contractor and approved by the Engineer in advance. An electronic copy of the updated programming data showing actual progress and comparison with the programme will accompany the report. Where slippage has occurred, the Contractor shall give explanations together with his proposals for recovery of critical activities. Where required by the Engineer, the Contractor shall update and submit for review the programme to show how he intends to complete the Works within the Contract period. The Engineer will review the schedule submission (revised baseline schedule).

The weekly progress reports, to be used in the progress meetings and submitted by noon on the Monday of each week, shall show at least:

- a) Progress of designs;
- b) Progress of procurement;
- c) Progress of critical construction activities;
- d) Any difficulties faced and steps taken to overcome these difficulties
- e) 3-week look ahead including programme and summary of equipment and labour to be used

Where slippage has occurred, the Contractor shall give explanations together with his proposals for recovery of critical activities.

The Contractor shall supply by noon on every working day (unless otherwise stated in the Conditions of Contract), such returns as may be required by the Engineer, which may include:

- a) A list of the labour employed on each day specifying the number employed in each trade and subcontract labour;
- b) Total daily output of main production centers for the previous day; and
- c) Labour, including the operatives name and trade, plant, and materials used on daywork.

P1.6.3 Progress Meetings

Progress meetings are to be held weekly or at shorter intervals as may be instructed by the Engineer.

P1.6.4 Progress Photographs

The Contractor shall, during the progress of the works, have photographs taken of such parts of the Works as the Engineer may from time to time direct at approximately weekly intervals.

Aerial photographs indicating the progress of works shall be submitted as a minimum every three (3) days. The Contractor shall also submit on a weekly basis a single aerial photograph covering the whole of the working area and individual photographs showing detail of each particular area of interest (current area of progress or interface areas or areas that are subject to discussion).

The Contractor grants the Employer the right to reproduce the photographs. No other photographs shall be taken without prior permission obtained from the Employer in writing.

The Contractor shall install a minimum of four time-lapse cameras to monitor the work progress. The camera location and coverage shall be approved by the Engineer before installation and shall aim at covering the construction areas. The necessary license and approval for the installation of the camera shall be obtained by the Contractor at Contractor's cost. The cameras shall be connected to the internet and the Contractor shall create a web page with a password to allow any person connected to the internet to access the photos. The cameras shall be installed by Contractor within 1 month from the Commencement Date and Contractor shall allow in his tender for moving these cameras to 2 different locations within the duration of the project to ensure that the cameras are covering the critical construction activities on site.

Should the Contractor fail to comply with the installation of the 4-time-lapse cameras to monitor the work progress within the one-month period after the Commencement Date, the Engineer shall be at liberty to arrange a third party to perform this work. All costs of arranging and carrying out such installation by the third party shall be deducted from the amount due to the Contractor.

P1.7 Taking Over

P1.7.1 General

The Works will not be considered to be substantially completed for the purposes of the Taking Over Certificate until the following conditions precedent have been met (to the extent the same are applicable):

- a) Any outstanding works or defects or remedial Works are such that their completion will not interfere with the said full scale continuous operation.
- b) All necessary permits and certificates shall be available for the Employer's use and occupation.
- c) Certification by the Contractor's designer and Independent Design Verifier that the Works have been designed in accordance with the Contract and the certificates have been submitted to the Employer.
- d) Certification by the Contractor that the Works have been constructed in accordance with the drawings and specifications and the certificates have been submitted to the Employer.
- e) All fencing, gates, barriers, and hoardings, both permanent and temporary, shall be in place and complete.
- f) The Engineer has approved As-Built Drawings, commissioning reports, training execution compliance, Operating and Maintenance Manuals, and QA/QC reports appropriate to the Section of Works being taken over submitted by the Contractor.
- g) The Contractor has fulfilled his obligations in respect of setting to work all items of Plant and equipment within the part or Section, and in respect of the instruction of Employer's staff in the operation, servicing and maintenance of such Plant and Equipment.

The Taking-Over Certificate shall not be issued until the Contractor has fulfilled its obligations in respect of the Contractor's Documents as detailed in the Employer's Requirements.

P1.7.2 Completion Inspection

When the Contractor notifies the Engineer in accordance with the provisions of Clause 10 of the Conditions of Contract that the relevant part or Section of the Works is complete and ready for taking over, the Engineer will inspect the relevant part or Section and identify to the Contractor any work that does not comply with the Employer's Requirements.

At the completion of the Works or any increment thereof established by a completion time stated in the Contract, the Engineer together with the Contractor shall conduct an inspection of Works and develop a list with the schedule of outstanding works of items which do not conform to the Contract. Such a list of deficiencies shall be included in the documentation and shall include the estimated date by which the deficiencies will be corrected. The list will include the following categories:

- a) List of all Outstanding Defects
- b) List of Major / Minor Outstanding Works
- c) Completion of Tests on the Works after Completion
- d) Outstanding Contractor's Documents

The Contractor shall make a second inspection to ascertain that all deficiencies have been corrected and so notify the Engineer. These inspections and any deficiency corrections required by this paragraph will be accomplished within the time stated for completion of the entire Works.

P1.7.3 Training of Employer's Staff

Prior to the issue of each Taking Over Certificate, the Contractor shall provide the services of competent engineers, who shall instruct such of the Employer's staff, or others as the Employer may nominate, in the operation, servicing, and maintenance of the Plant, including items supplied by Subcontractors. The Contractor shall submit for approval his proposed durations of training for each element of the Works. The Contractor shall provide staff training manuals and videos as appropriate.

P1.7.4 Access To Site After Handover

The Contractor shall liaise with the Engineer to pre-arrange access to the Site to carry out defect's resolution, monitoring, maintenance, and completion of outstanding work. Such work shall be undertaken at a time to suit the Employer and the Employer's ongoing operations and the Contractor shall not be entitled to any costs or an extension of time for any lack of access or any programming of such works. Compliance with Employer and stakeholder requirements for working in operational areas may require the Contractor to utilize specific safety or other equipment. Provision of such equipment shall be at Contractor's own cost.

P1.7.5 Use By Employer and Other Contractors

For the avoidance of doubt, transient access to any part or Section of the Works from time to time by vehicles, plant or personnel of the Employer or his agents or contractors shall not constitute 'Used' by the Employer in the meaning of Clause 10.2 of the Conditions of Contract.

The Contractor is aware that other Employer's Contractors might need to have access and execute works on site such as, but not limited to, IT, CCTV and security facilities. etc.

The Employer will need access and use of the facilities for some training activities (if required). If so, this will not be considered a use of the facilities and intitle the Contractor to request a TOC.

The Contractor shall make himself aware of the existence of other contractors (including "Third-Party Contractors" under Sub-Clause 1.1.2.12) engaged by the Employer, or others, who may be undertaking works and maintenance within or adjacent to the Site and shall make allowance for such. These may include but are not limited to:

- a) Maintenance dredging of the existing berths;
- b) Other utility works on the site (except where specifically identified to be covered by this Contract);
- c) Works associated with the installation, testing and commissioning of IT and data systems for the operational terminal;
- d) Works associated with the installation, testing and commissioning of IT and data systems for the new buildings planned as part of this facility;

- e) A contract for the design, supply and installation of security solutions to provide security facilities for the operational terminal;
- f) Terminal Security and security personnel associated with adjacent tenants;
- g) Any person, entity or contractor employed in the development of Metrovancouver tunnel; and
- h) Any person, entity or contractor employed in the development of Timberland Road.

The Contractor shall allow the above contractors on site and these activities shall not entitle the Contractor to request a Taking-Over Certificate.

Should the Employer occupy any part of the Works / Site, it shall not constitute taking over of the Works until the aforementioned documents, as built records and operations and maintenance manuals are submitted in the accepted format to the Engineer.

P1.8 Health and Safety

P1.8.1 Regulations

The Contractor shall comply with all requirements in the Employer's Safety Manual, HSE requirements detailed in the Employer's Requirements, and the requirements of the Conditions of Contract.

The Contractor shall be the Prime Contractor in accordance with the WorkSafeBC Regulations and shall be responsible for completing a Notice of Project when required by the Regulations.

All works shall comply with all statutory requirements and the relevant legislation of WorkSafeBC and any other statutory Authorities.

P1.8.2 Personnel

The Contractor shall appoint a suitably qualified Site Safety Officer who shall be responsible for site safety and for creating and regularly updating the Occupational Health and Safety Plan. The person proposed by the Contractor as Site Safety Officer will be subject to the approval of the Engineer.

In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, and sick bay are available at all times. The Contractor shall provide ambulance service available at all times at the Site should the Contractor's risk assessment determine that locally available ambulance services are insufficient. All medical facilities must make any accommodation for Contractor's and Employer's Personnel and suitable arrangements must be made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

P1.8.3 Design

During the design process and the preparation of the Occupational Health and Safety Plan, the Contractor shall consider the hazards and risks that may arise during design, construction, operation, and maintenance of the Terminal, and design accordingly to avoid risks to health and safety as far as is reasonably practicable. If avoidance of risk is not possible, the Contractor shall reduce the risks at source. The Designer shall highlight any significant risks to the Contractor, Terminal operators, staff or maintenance teams with notes on the drawings and design risk assessments.

P1.8.4 Safety Meetings

The Contractor and Subcontractors shall attend weekly Site Safety Meetings. The meetings shall be chaired by the Engineer or his designated representative. The Contractor and all Subcontractors shall be represented at senior management level, including the Contractor's Representative together with their nominated Site Safety Officers. Additional meetings may be required to review incident investigations and/or corrective action plans.

P1.8.5 Occupational Health and Safety Plan

The Design Builder shall develop, maintain, submit and update a comprehensive Occupational Health and Safety Plan in accordance with the Submittal Procedures, which details the Design Builder's approach; procedures and specific safe work plans required to safely perform the Works and satisfy the Prime Contractor requirements.

This plan shall be submitted to the Engineer for his consent within 14 days before commencement of any Works on Site and shall include coordinated emergency evacuation procedures for both land and marine based activity.

It shall be coordinated with Third Party Contractors and operators working on Site or on adjacent sites and including the Employer. The Contractor shall identify, as part of the plan, all potential risks and hazards, and his proposed procedure for dealing with them should they arise during construction. In consultation with the Employer the plan shall be reviewed and developed/updated as necessary during the construction phase.

The Occupational Health and Safety Plan shall be produced in a format acceptable to the Engineer and shall include as a minimum the following:

- a) Proof of WorkSafe BC registration and coverage;
- b) Copies of WorkSafeBC experience rating assessment (ERA) letters for the previous 5 years, including all sub-classes for which the Design Builder received an ERA;
- c) Copies of WorkSafeBC claims cost summary for the previous 5 years;
- d) Details of any penalties, orders, or directives assessed against the Design Builder, including copies of the relevant inspection reports and action taken to address the penalty, order, or directive;
- e) Copy of the Design Builder's Contractor Safety Program;
- f) Copy of a recent safety audit findings and corrective action plan;
- g) Safety personnel, including their qualifications, and nominated Safety Coordinator;
- h) Safety organization structure including lines of reporting;
- i) Safety communications plan and protocol;
- j) Safety coordination plans for working with the terminal operators, railways, and other stakeholders;
- k) Site specific hazards;
- l) Hazard mitigation measures including potential encounters with hazardous materials (i.e. asbestos, lead, mercury, etc.);
- m) Protocols for issuance of Permits (e.g. hot work permits, confined space entry);
- n) Draft metrics reporting format for approval;
- o) Site Orientation Plan;
- p) Safety Training Records;
- q) Marine Safety Plan;

- r) Spill Response and Emergency Response Plans, in accordance with the requirements within the Traffic Management Plan, and the Construction Environmental Management Plan; s) Site Evacuation Plan;
- t) Safe Work Procedures and Plans;
- u) Incident Management Plan, in accordance with the requirements within the Traffic Management Plan.

The plan shall be updated as necessary during the construction phase. All safety procedures and advice shall be available to all of the Contractor's and Subcontractor's employees, the Engineer and visitors on site in English.

The Design Builder, as Prime Contractor, will be required to ensure that all persons that are on the Site are in compliance with the Occupational Health and Safety Plan.

P1.8.6 Health and Safety File

The Contractor shall prepare and maintain a health and safety file, the purpose of which shall be to record all matters relevant to safe maintenance and operation of the completed Works. The health and safety file shall be produced in a format acceptable to the Engineer.

The Contractor and his Subcontractors shall maintain detailed up to date records of construction and shall use this information in the preparation of as-built drawings and technical data to be included within the health and safety file.

Any services (electrical, water, drainage, telephone, etc.) found during the execution of the works shall be notified to the Engineer. The Contractor shall record the location of such services on a drawing for later inclusion in the health and safety file.

The Contractor shall maintain current BC 1 Call tickets for all areas of the Site where ground disturbance is to be performed. These tickets must be made available to the Engineer at all times.

The Contractor shall ensure that any relevant information to be included in the health and safety file is in the form of self-contained documents. Submission of such documents shall be a condition precedent for the issue of the relevant Handover Certificate.

P1.8.7 Risk Assessments

The Contractor shall ensure that risk assessments are carried out for all work activities on the Site, and these are to be included in the Contractor's Occupational Health and Safety Plan. Risk assessments shall be substantiated by Contractor's method statements. The risk assessments shall be updated in monthly basis.

P1.8.8 Method Statements

The Contractor and all Subcontractors shall prepare detailed and specific method statements prior to the commencement of work on Site, and these are to be included in the Contractor's Occupational Health and Safety Plan.

The method statement will identify the specific methods to be used to control the risks identified.

The Contractor shall co-ordinate the preparation of method statements where the activities and risks related to one or more Subcontractors.

Method statements shall be provided to Terminal with a programme for acceptance include full particulars of the methods, timing and sequence of construction including the use and design of temporary works, Materials and Plant and Equipment proposed by the Contractor.

Method statements shall contain sufficient information to enable the Engineer to assess any likely detriment to either the proposed or the existing works or to the Employer's overall objectives.

The Contractor shall submit method statements to the Engineer sufficiently in advance of carrying out items of work to allow for the period for reply with acceptance or rejection of the method statements. Work shall not commence until the Engineer has accepted the relevant method statement. The Contractor shall carry out the work in accordance with the accepted method statement. The Contractor shall provide the method statements to the Contractor's staff and employees and to any Subcontractor's staff and employees who may be working on that particular section of the works. The method statements shall be available in English. The method statements shall be concise to allow them to be easily understood. Method Statements shall be provided in compliance with Worksafe BC guidelines and good practice.

Specific work method statements shall not be required for small minor aspects of the works of duration less than one week unless the Contractor deems it necessary. This will not waive any risk assessment required to be performed by the Contractor for all works activities for the Project.

Method statements submitted together with a programme for acceptance shall include but are not limited to the following matters:

- a) Health and Safety measures;
- b) Extent of Working Areas and protective barriers;
- c) Access to, and egress from Working Areas, including confined spaces;
- d) The implementation of relevant statutory regulation;
- e) The design and construction of temporary works and de-watering measures;
- f) How the potential environmental impacts of the activities will be managed (prevent where possible and minimize);
- g) Contractor's equipment requirements, siting, and mode of operation;
- h) Labour requirements and supervision responsibility;
- i) Delivery and storage of materials;
- j) Provision of access to third parties;
- k) Details of the construction sequence;
- l) Details of working methods;
- m) Detailed programme with key dates;
- n) Result of any consultation with third parties;
- o) Health and safety measures to monitor the health of staff and employees onsite and at the employee accommodations due to the pandemic;

- p) Contingency plans in the event of flooding, power outages, other difficulties, or emergencies; and
- q) Risk assessments.

P1.8.9 Warning Signs

Signs warning of the dangers of construction sites shall be prominently displayed around the inside and outside of the Site, to serve as a notice to the Employer's staff and agents who may visit the Site, and the general public who may be present outside the Site.

P1.8.10 Visitors to the Site

Procedures must be developed for the reception of all visitors to the Site that includes recording persons on and off the Site, and suitable Site induction and guidance by experienced staff during such Site visits. Visitors must also be provided with such personal protective equipment as may be required to comply with the accepted Occupational Health and Safety Plan.

All visitors entering the Terminal Security Perimeter must complete the DP World Fraser Surrey visitor orientation as per the instructions in the Employer's Safety Manual and provide a minimum of 48 hours' notice before arrival to the Employer's operations coordinator. Upon arrival to the security gate, they will be required to present proof of orientation and the Terminal security will offer a temporary visitor pass in exchange for their government-issued photo identification along a temporary vehicle permit valid only for the duration of that particular visit.

Once through security, all visitors will require escort while travelling anywhere within the Terminal Security Perimeter by one of the Contractor's designated escorts. These designated escorts must be submitted to the Engineer for approval.

P1.8.11 First Aid and Emergency Procedures

The Contractor must ensure that first aid facilities, together with trained first aiders, are available in accordance with local legislation and good practice. The Contractor shall take into account in his considerations of requirements, the location and nature of the Site and the type of potential injury therein. He shall also take into account the location of the nearest hospital/ambulance facility, access to communications and personnel on Site.

The Contractor shall address these issues in his Occupational Health and Safety Plan. The contractor must also prepare, as part of his Occupational Health and Safety Plan, an Emergency Action Plan, which must at minimum meet or exceed the Fraser Surrey Emergency Response Plan. The Emergency Action Plan must also include a map of all proposed emergency access and egress points, which shall be submitted to the Engineer for approval.

The Contractor shall not assume that he will have access to Fraser Surrey Terminal medical facilities.

The Contractor shall acquaint all personnel on Site, including those of the Employer and of the Engineer, with any relevant emergency arrangements and install signs on gates indicating emergency accesses and egresses.

P1.8.12 Traffic Management

The Contractor shall liaise with the Employer, Authorities, and relevant stakeholders to determine what special traffic considerations must be made with regard to traffic management. All access routes used by the Contractor and traffic operations within the Site must be in accordance with the Particular Conditions.

All access routes used by the Contractor shall be marked with direction signs and route arrows.

All roads and access tracks affected by the Contractor's operations shall be maintained in a clean condition and passable by two-wheel drive motor vehicles and all speed restrictions shall be strictly observed.

For any traffic operations within the Site, a Traffic Management Plan must first be prepared and submitted to the Engineer for acceptance at least 48 hours before such operations will commence.

The Contractor shall be responsible to provide and utilize certified flagging personnel for all truck movements and all left turns by light vehicles either to or from Robson Road, Timberland Road North, and Timberland Road South.

P1.8.13 Vibration, Noise, and Dust

The Contractor shall use Equipment and adopt working methods to minimize the risk of damage to property caused by vibrations transmitted through the ground.

The Contractor shall ensure that:

- a) Construction related noise is monitored and controlled to approved levels and within hours that are permitted by the Vancouver Fraser Port Authority;
- b) Mitigation measures as set out in the Project CEMP are implemented and adhered to;
- c) All Equipment is fitted with effective exhaust silencers, maintained in good repair and in accordance with the manufacturer's instructions, and operated as to minimize noise emissions;
- d) Only 'sound reduced' compressors or other alternatives accepted by the Engineer are used, and any parts fitted by the manufacturer for the purpose of noise reduction are maintained and used to minimize noise;
- e) Any pneumatic operated percussive tools are fitted with accepted mufflers or silencers that are kept in good repair;
- f) Any machinery which is intermittent in use is shut down in intervening periods of non- use, or where this is impractical, is throttled back to a minimum;
- g) Stationary Equipment (e.g., pumps, compressors, generators) are situated as far as possible from residential property and acoustic screens are erected if required by the Engineer. Other Equipment is screened if necessary;
- h) Equipment known to emit noise strongly in one direction is, where practical, orientated so that noise is directed away from noise-sensitive areas; and

- i) As far as possible, construction operations are not as noisy as to be a danger to those on or about the works or to be a nuisance to the neighborhood.

The Contractor shall take all reasonable measures to control the generation of dust and mud resulting from his activities, including:

- a) Implementation of measures outlined in the Project CEMP;
- b) Watering exposed surfaces using mobile bowsters equipped with sprinkler bars;
- c) Limiting vehicle speeds to 10mph on Site and on unsurfaced roads;
- d) Covering dust creating materials being delivered to or removed from Site by truck;
- e) Cleaning vehicles leaving Site; and
- f) Immediately removing any debris deposited on the Terminal roads or public roadways.
- g) Dust or particulate monitoring if deemed required

The Contractor may be required to implement additional noise or dust (particulate) monitoring in the event of any issues with potential impacts to neighboring businesses or residential areas (e.g., complaints) and shall make provision for this accordingly.

P1.8.14 Training

The Contractor shall ensure that all personnel employed on or about the Works receive appropriate daily training by way of toolbox talks and the like, such that they understand the work being undertaken, the risks involved in the works being undertaken, the safe use of tools and equipment, and the relevance of personal protective equipment (PPE) and environmental awareness and management measures to be implemented. All staff shall receive a site induction prior to commencing work on the project outlining the site safety protocol and the health, safety and environmental risks involved in the works being undertaken. This site induction shall be extended as appropriate to personnel from other organizations that are given access onto the Site.

P1.8.15 Precautions Against Fire

The Contractor shall take all reasonable precautions to prevent outbreaks of fire on the Works, Temporary Works, and in all offices, stores and other places and things connected therewith or premises adjacent thereto and especially with respect to the safe and secure storage of petroleum products, paints, explosives and all other dangerous or hazardous goods. This shall include the preparation of a fire-hazard Risk Assessment.

The Contractor shall provide and maintain in good order and hold available at all times and in all places connected with the Works appropriate and effective firefighting equipment together with personnel trained in its use.

The Contractor shall give all authorized Fire Officers or equivalent personnel all necessary facilities to inspect the fire prevention arrangements on the Site and shall, at his own cost, remove all surplus materials and equipment and take such steps as the Employer may require reducing the risk of fire.

The Site Safety Officer shall assess the degree of fire risk and include the identified risks and prescribed safeguard within the Occupational Health and Occupational Health and Safety Plan as construction proceeds.

P1.8.16 Personal Protective Equipment

The Contractor shall comply with Fraser Surrey Terminal requirements and the following standard requirements for the wearing of PPE, from which there shall be no exclusions:

- a) Hardhat, reflective vest (except when operating rotating tools), gloves, safety boots/shoes;
- b) Sanitizers, Hearing, and eye protection when required; and
- c) Life jackets when working over water or within 2m from the edge of shore or berth.

The Contractor shall comply with local government requirements for PPE and or restrictive working conditions as imposed by the local authorities in case of a local health concern such as may arise due to a pandemic.

The Contractor may be required to remove from Site any personnel who repeatedly ignore these requirements.

P1.8.17 Diving Operations

In addition to the requirements in the Conditions of Contract, the Contractor's diving operations shall be carried out in strict accordance with the occupational diving requirements set out by WorkSafeBC and other Authorities.

The Contractor shall appoint a diving specialist who shall be one clearly identified person or company. Details of the diving specialist's experience, professional registration, diving rules, references, and evidence of insurance coverage, shall be submitted to the Engineer for assessment of their suitability.

The Contractor shall provide to the Engineer two copies of divers' certificates of training/qualifications, medical fitness, and diving first aid prior to commencing diving operations.

The Contractor shall submit to the Engineer a dive plan incorporating a full risk assessment and method statement for all diving operations, identifying particular techniques, types of equipment, floating plant, and general arrangements of the Site set-up, including nearest decompression facilities, the provision of records of performance, for approval prior to commencement of diving operations. Due account shall be taken of water quality and turbidity in assessing dive requirements.

Where other simultaneous operations, such as piling or maneuvering of vessels or barges, could cause a hazard to a diving operation, particular safe working practices and established permit-to-work systems to be adopted must be stated prior to commencing diving operations.

Diving work shall be carried out using surface-supplied air with full-face masks or helmets complete with two-way communications. All divers, when underwater, shall be connected to the surface by means of a safety line. Safe access/ egress to and from the water shall be provided at all times with particular regard to the recovery of an injured/unconscious diver.

All equipment shall be, and maintained in, test and certified whilst on site. Records of test certificates and expiry dates shall be kept on site and made readily available.

The Contractor shall keep the Employer's operations department, the Harbour Master, the Terminal Authority if appropriate, and the Engineer informed of all diving operations and associated equipment movements.

The Contractor shall ensure that emergency services including medical equipment are available for the duration of the diving operation and that the Engineer is notified accordingly. The Contractor shall also ensure that there is effective communication between the work Site and emergency services and the persons responsible for operations that might present a hazard to the Site.

The Contractor shall provide diving assistance to the Engineer as and when required in supervising of the Works.

P1.8.18 Alcohol and Drugs Policy

The Contractor shall prepare and adhere to an Alcohol and Drugs Policy that meets or exceeds the Employer's Alcohol and Substance Abuse Policy and Procedure found in the Employer's Safety Manual. This requirement shall also apply to any Subcontractors.

P1.8.19 Safety Boat

The Contractor shall be responsible for gaining all necessary maritime clearances and access requirements for the safety boat and for all floating craft required for the Works.

Unless otherwise agreed by the Engineer and the Employer, the safety boat shall:

- a) Be in good working condition
- b) Be large enough to allow one person on a stretcher to be attended by four personnel.
- c) Be fitted with two life belts (one with a buoyant line), first aid kit, VHF radio for communications with any applicable Authority and Contractor's shore staff

P1.9 Environmental Requirements

P1.9.1 Regulations and Documentation

The Contractor must identify and comply with all relevant local and national environmental legislation, regulations, policies, regulatory guidance and best management practices, including any environmental restrictions that are applicable to the management of the Works.

The Contractor shall comply with these Environmental Requirements, the approved Project Environmental Review (PER), provided in the Appendix 3 - PER 22-017 Issued Permit and Report, and associated conditions and the Project Construction Environmental Management Plan (Project CEMP), provided in the Appendix 2, prepared by Stantec Consulting Ltd. for the Employer, as well as the requirements of any other Environmental Approval(s).

The Project CEMP was prepared by Stantec Consulting Ltd. for the Employer to provide the Contractor with guidance on best management practices (BMPs) to maintain regulatory compliance and to avoid or limit potential adverse environmental effects and to support project planning and permitting.

In case the Environmental Approval must be updated or modified as a result of the Contractor's detailed design or requirements for the execution of the Works, it is the Contractor's full responsibility to obtain approval of the modification from the Engineer and as required by any relevant Authorities. If such a case arises, the Contractor shall identify this to the Employer and share supporting assessment and proposed mitigation measures, where required, for review. No extension of time or additional cost will be recognized for any (partial) update or modification due to the result of the Contractor's detailed design or requirements for the execution of the Works.

During the Tender phase, the Contractor shall prepare and submit the following documents to the Employer:

- a) Outline of the Project, including construction and operational activities and a Construction Method Statement (CMS);
- b) Outline of a Contractor Construction Environmental Management Plan (Contractor CEMP) to demonstrate the Contractor's understanding of the potential environmental impacts and the specific requirements of the project, as well as an outline of the general systems and procedures the Contractor has in place to manage and review the environmental performance of its activities, including roles and responsibilities.

28 days after the Commencement Date, or earlier if Environmental Approvals and associated conditions require, the Contractor shall prepare and submit the following documents to the Employer:

- a) Detailed Description of the Project, including construction and operations activities and a Construction Method Statement (CMS);
- b) Detailed Contractor CEMP

The Contractor CEMP shall provide additional details regarding the controls to be used to ensure that the works will not adversely affect the environment. The plan shall not relieve the Contractor of his environmental obligations under the contract.

During construction the Contractor shall carry out environmental monitoring and disclosure in accordance with the Contractor CEMP. The results of the monitoring program shall be submitted to the Employer on a monthly basis or as required by the Contractor CEMP.

The documents required for environmental clearance to commence the works will form part of the Contractor's Documents and shall be reviewed by the Engineer. Each submission shall be a complete package, fully indexed and referenced.

If the Contractor is responsible for non-compliance, any related penalties will be transferred to the Contractor.

The Contractor shall ensure that all in-water work (marine piling works as described as Section 1 of the Works in the Appendix to Tender under the Contract) is performed as per the restrictions and recommendation provided in the DFO Project requirements.

The Contractor shall ensure all vegetation clearing is performed in compliance with bird nesting restrictions of the Authorities.

P1.9.2 Construction Environmental Management Plan

The Contractor shall comply with:

- a) The PER and associated conditions
- b) The Construction Environmental Management Plan (Project CEMP and Contractor CEMP), including the Marine Mammal and Underwater Noise Monitoring and Mitigation Plan
- c) Requirements of any other Environmental Approvals required for the Works.

The Contractor shall execute the Works with the implementation of suitable environmental control and mitigation measures to meet the environmental requirements of the project, but without in any way limiting the Contractor's other environmental obligations under the Contract.

In this respect, the Contractor shall prepare a Contractor CEMP as required by the Employer's Requirements that will include, inter alia, measures to be adopted to mitigate the effects of noise, dust, vehicle emissions, lighting, water pollution, air or ground pollution, traffic management, etc., and the monitoring and testing regime to be implemented. The Contractor CEMP is to be submitted to the Engineer within 28 days after the Commencement Date for his consent.

The Contractor shall not commence any part of the Works until the Contractor CEMP has been submitted to the Engineer and agreed and all necessary pre-Works commencement conditions of any Environmental Approval have been satisfied. The Contractor shall obtain all relevant approvals from the Authorities having jurisdiction on the project Site.

The Contractor shall ensure that it has read and understood the PER and Project CEMP and any other supporting information to aid the development of the Contractor CEMP. The Project CEMP outlines mitigation measures that are to be implemented during construction, including, but not limited to: a) General Practices

- b) Air Quality
- c) Fish Protection

- d) Pile Installation
- e) Concrete Work
- f) Construction Noise and Vibration
- g) Vegetation and Terrestrial Wildlife Management
- h) Invasive Plant Management
- i) Archaeological Resources
- j) Waste Management
- k) Soil and Groundwater Management Plan
- l) Spill Prevention and Response
- m) Monitoring Requirements and Reporting

It is envisaged that the Contractor CEMP will refer to/incorporate the Project CEMP but will provide clarification and details as to how environmental requirements will be achieved and implemented by the Contractor and integrated into method statements and risk assessments for the Works.

The results of the monitoring program shall be submitted to the Employer on a monthly basis or as required by the Project CEMP and any conditions of Environmental Approvals.

The Marine Mammal and Underwater Noise Monitoring and Mitigation Plan is provided as appendix A to the Project CEMP.

P1.9.3 Environmental Personnel

The Contractor shall provide a suitably qualified environmental officer dealing only with environmental matters, for the duration of the Works. This environmental officer may be supported by other environmental personnel as required to manage and monitor the Works. The environmental officer shall be made known to all employees by the posting of their name, designation, and photograph in prominent positions on Site.

During construction the Contractor shall employ the services of a Qualified Environmental Professional(s) (QEP) to support development of plans and permit applications, as required, and carry out environmental monitoring and disclosure in accordance with the Project CEMP, PER conditions and other Environmental Approval(s) that may be required.

Environmental monitoring personnel shall have the authority to issue instructions and take protective measures necessary to prevent and limit potential adverse environmental effects from construction activities.

The Project CEMP provides further information regarding the roles and responsibilities for environmental oversight, management and monitoring of the Works.

P1.9.4 Environmental Aspects

The Contractor shall demonstrate that his proposals to minimize environmental impacts comply with environmental best practice. This shall be achieved principally through the content of, and adherence to, his method statements.

In executing the works the Contractor shall take all necessary precautions to secure the efficient protection against pollution.

The Contractor shall take all necessary precautions to protect all watercourses, together with water in underground strata, against silting, erosion, and pollution.

The Contractor shall take all necessary precautions to ensure that no polluting discharge either of solid or liquids is made to any watercourse or to the underground strata and that no work carried out in any watercourse is done in such a manner as to cause pollution. Any materials which accidentally fall into any watercourse are to be removed immediately by the Contractor.

The Contractor's equipment, which leaks any fuel, lubricant, or hydraulic fluid is not to be used. Static equipment using fuel oil is to be located as far away as reasonably possible from the river and any watercourse and surrounded with oil-absorbent material to contain spills or leaks.

Refueling or servicing of equipment shall be undertaken in designated locations away from watercourses or drains. Refueling shall be supervised and carried out by pumping through a trigger type delivery nozzle.

An adequate supply of oil-absorbent materials is to be readily available on Site at all times. Any spillage is to be immediately contained, removed from Site, and disposed of to a suitable tip in a safe manner, and the Engineer promptly informed. The Contractor shall comply with the Spill Prevention and Response Plan established in the approved CEMP.

All waste arising from the site, site accommodation, or delivery packaging shall be immediately disposed of offsite in a safe and approved manner.

Fuel tanks shall be placed in bunded areas suitable for spill containment and with adequate fire protection, oil spill mops, and other clean-up material. Fuel tanks shall have provisions for easy maintenance.

P1.9.5 Disposal Licenses

The Contractor shall be responsible to ensure that all necessary disposal licenses are obtained in respect of any materials that are to be removed.

P1.9.6 Abatement of Pollution and Nuisance

The Contractor shall take all precautions necessary to prevent and minimize nuisance and the risk of pollution from the Works, including noise, vibration, light, dust (including that from cement and fly ash), use of potentially polluting substances, and the like. Works shall be strictly controlled within specified limits. The environmental requirements of the Works shall be communicated to all workers during site induction training.

Diesel and petrol engines shall be fitted with efficient silencers which are not necessarily those supplied by the plant manufacturers, and, if required, the plant shall be screened with acoustic materials. Compressed air-operated road breakers, tools, ventilation

equipment, piling equipment, and the like shall be effectively muffled or shall be of a design with acceptably low

noise frequency. This shall be to the acceptance of the Employer, the Engineer, or associated third parties.

The Contractor shall be responsible for ensuring that noise and light levels remain within acceptable limits at all times, which must take account of noise and light levels generated by existing operations and new operations after taking over various Sections of the Works. This shall be to the acceptance of the Employer, the Engineer, or associated third parties.

In the event that the aggregate of noise and light levels generated by the Contractor's construction and the Employer's operations exceed the acceptable limits, the Contractor shall be required to reduce such levels arising from his construction to remain within acceptable limits. Under no circumstances will the Employer be required to reduce noise and light levels generated from his operations (existing and new).

The Contractor shall take measures to minimize marine pollution resulting from his activities, particularly in relation to clearing, piling, and other construction operations, and in so doing shall comply with all statutory requirements and the requirements of local authorities.

P1.9.7 Site Waste Management Plan

The Contractor will be responsible for producing, maintaining, and complying with a Site Waste Management Plan (SWMP), that meets the requirements of local legislation as well as the requirements set out below. The first issue of the plan is to be submitted four (4) weeks prior to construction commencement and shall as a minimum include the following:

- a) Description of each waste type expected to be produced in the course of the project;
- b) Estimation of the quantity of each different waste type expected to be produced; and
- c) Identification of the waste management action proposed for each different waste type, including re- using, recycling, recovery, and disposal.

It must contain a declaration that the Contractor will take all reasonable steps to ensure that:

- a) All waste from the Site is dealt with responsibly and to the requirements of the appropriate authorities;
- b) Materials will be handled efficiently, and waste managed appropriately.

The Contractor shall update the SWMP as often as necessary to ensure the plan accurately reflects the progress of the project, and in any event not less than every three (3No.) months, the Contractor must:

- a) Review the plan.
- b) Record the types and quantities of waste produced.
- c) Record the types and quantities of waste that have been:
 - i. Re-used (and whether this was on-Site or off-Site);
 - ii. Recycled (and whether this was on-Site or off-Site);

- iii. Sent for another form of recovery (whether this was on-Site or off-Site); iv. Sent to landfill; and
- v. Otherwise disposed of.
- d) Update the plan to reflect the progress of the project.
- e) Maintain records of waste classification and disposal in accordance with local legislation and provide information on request.

Within three (3) months of the work being completed the Contractor must add to the plan:

- a) Confirmation that the plan has been monitored on a regular basis to ensure that work is progressing according to the plan and that the plan was updated in accordance with this regulation.
- b) A comparison of the estimated quantities of each waste type against the actual quantities of each waste type.
- c) An explanation of any deviation from the plan.
- d) An estimate of the cost savings that have been achieved by completing and implementing the plan.

P1.9.8 Archaeological Compliance

The Contractor shall prepare and submit for approval a section within the Contractor CEMP detailing his plans and procedures for the potential discovery of archaeological artifacts. These plans and procedures must meet or exceed the requirements submitted in the Employer's PER submission and any requirements of the VFPA or other Authorities.

P1.10 Security

P1.10.1 General Security Requirements

The Contractor shall be solely responsible for the security of the Site, including control of all access for Plant, Materials, and all personnel.

The Contractor shall contain his activities wholly within the allocated areas, except with the express written approval of the Engineer.

The Contractor shall also ensure that the overall security of the Site is maintained.

The Contractor shall ensure the security of the marine works and shall prevent access of any personnel into the Site from boats or from the marine perimeter.

The Contractor shall, in connection with the Works, provide and maintain all lights, guards, fencing and watching when and where necessary or as required by the Engineer or by any competent statutory or other authority for the protection of the Works or for the safety and convenience of the public or others.

The Contractor is to provide and install security poles as per indicative drawings or similar approved by the Engineer for all cameras detailed in Volume 3 Security Layout drawings. This will be required in the case that there is no suitable light mast available in the locations indicated.

The Contractor shall be responsible for the after-hours security of the Site.

All personnel working within on the Terminal will require a valid port pass, issued by the Chamber of Shipping. The Design-Builder is responsible for ensuring that all personnel engaged by the DesignBuilder, including any sub-contractors and trades, have valid port passes.

a) On-Terminal Security Requirements:

- i. The Terminal is a CBSA Customs Sufferance Area for the parts of the Terminal used for the storage of containers. All personnel working for, and on behalf of the Design Builder, passing through the CBSA boundary from (to) the Terminal to (from) the construction areas, are required to comply with CBSA requirements, which include the registration and approval by Transport Canada of all personnel requiring access the Terminal.
- ii. Approval of personnel permitted to access the Terminal is granted by CBSA following the submission of a request for access to CBSA via the Owner on behalf of the Design Builder.
- iii. The Design Builder shall submit to the Owner, the necessary information, using the form supplied by the Owner, at least three weeks before access is required. It is expected that the approval process with CBSA will take up to two weeks, provided that there are no issues with the application; however, the Owner accepts no responsibility for any delays as a result of delays by CBSA in processing applications or denying any application for access.

b) Site Specific Orientations:



- i. Before entering the Terminal, the Design Builder, its employees, and subcontractors shall be required to attend a site orientation for that site. It is the Design Builder's responsibility to confirm any orientation requirements with the terminals and railway companies.
- c) Marine Transportation Security Clearance (MTSC):
 - i. Performance of the Work may require accessing areas identified as Restricted Area 2 (R2 Areas) under Transport Canada regulations. Restricted areas include, but are not limited to server rooms, electrical rooms, communication cabinets and kiosks, and fibre vaults.
 - ii. The Work includes the connection to existing equipment, and the construction of new security and network infrastructure, subject to security restrictions.
 - iii. All work within R2 Areas must be performed by technicians and electricians holding MTSC. Note that airport clearances (RIAC) may be transferable to marine clearances.

P1.10.2 Terminal Perimeter Security Fencing

The Terminal requires continuous Perimeter Security Fencing around those parts of the Terminal where vertical wharfs are not present, to be in compliance with International Ship and Port Facility Security (ISPS), Canadian Border Services Agency (CBSA), and Transport Canada requirements. This perimeter must remain in place; however, any temporary or permanent alterations shall be identified to Transport Canada. The Contractor shall notify the Employer in accordance with the notification periods of 21 days prior to making any alterations to the perimeter fence to allow for Transport Canada to be notified.

This fencing shall comprise:

- a) 3.05 m high, 6 gauge galvanized chain-link with bottom boulevard rail to match existing security perimeter fencing;
- b) Posts mounted as follows:
 - Bolted to concrete median barriers (CMB);
 - Set in concrete footings; and
 - Where mounted to CMB, the chain-link panel height can be reduced to maintain the 3.05m height;
- c) Topped with six strands of v-shaped galvanized barbed wire;
- d) The top of the fence shall present a smooth line parallel to finished ground levels, with no discernible dips, humps, or sudden differences in alignment; and
- e) Straining posts shall be provided at all ends and corners of the fence, at changes of direction and at intervals not exceeding 30 m on straight lengths of fence

An alternate fencing shall be used for a temporary perimeter alteration: Moduloc System:

- a) 8' high x 10' steel panel fence (fence structure consists of 1 1/4" x 1 1/4" x 2.5 mm thick square tube vertical posts, 1" x 1" x 2.5 mm thick square tube horizontal top and bottom rails and 3/4" x 3/4" x 1.5 mm thick square tube horizontal mid-rail)



- b) Posts are connected to the top surface of the cast concrete traffic barrier (810mm high) via steel saddle plate with 2 – 216 mm vertical steel tubes.
- c) Topped with six strands of v-shaped galvanized barbed wire;

P1.10.3 Security Guards

All security guards employed as part of work on the Terminal, shall be sourced, at the Contractor's expense, from the Terminal Operator's current security service supplier for the Terminal. All security guards obtained by the Contractor shall communicate with the other Terminal security personnel.

P1.10.4 Fencing of Construction Area

Immediately following being given access to the Site, the Contractor shall provide, erect, and maintain such temporary hoarding, fencing, gates, and the like as are necessary to exclude members of the public and other intruders from the Site and to adequately protect the Works. The Contractor shall install hard barriers such as lock blocks or concrete median barriers in areas with high traffic or operational risk to the satisfaction of the Engineer.

The Contractor will be designated Prime Contractor in the area as per WorkSafeBC requirements. The Contractor, as Prime Contractor, will be required to ensure that all persons that are on the Site are in compliance with the Occupational Health and Safety Plan.

The Contractor shall secure the Works by providing and maintaining fencing, lighting, guarding, and watching until completion and Handover. The Contractor shall adjust the perimeters of fencing as required to secure the Works and minimize obstruction to the Employer's operations.

Any area enclosed within Site fencing will be a restricted area. In case the Contractor has to perform works outside a restricted area, he shall obtain the necessary work permits (general work permit, hot works, electrical works, etc.) from the Employer.

Access to the Site shall be controlled by the Contractor as might be required by the Employer, or other relevant authorities.

P1.11 Quality Assurance

P1.11.1 General

In amplification of Clause 4.9 of the conditions of contract (Volume 1), the Works (including any investigations, design, construction, provision, erection, setting to work, testing, monitoring, and maintenance) shall be executed under the control of a quality assurance system which satisfies the requirements of ISO 9001 (or equivalent) and the particular requirements of this document.

The Contractor shall prepare a Quality Plan, which shall be submitted to the Engineer for consent. No work shall commence on any part of the Works until the Quality Manual and Procedures and the first edition of the Quality Plan have been submitted to the Engineer.

The Quality Plan shall describe the quality system to be implemented for the Contract. The Contractor's Quality Plan shall describe in detail the quality

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management policies, organization, responsibilities, and procedures to be applied and identify the applicable provisions of ISO 9000 and ISO 9001 (or equivalent) to be used. The Contractor's Quality Plan shall be prepared and submitted to the Engineer for approval within four (4) weeks of the Commencement Date.

The Contractor's designer shall also operate a quality system, and that system shall comply with ISO 9001 (or equivalent). Details of the proposed quality system shall be provided with the tender information.

The Contractor shall ensure that the approved Quality Plan (QA Manual) for the project is subject to a full internal audit at least two times during the course of the project. The timing of such audits shall be clearly indicated on the programme of the Works. The Employer shall be supplied with a copy of each audit report.

The Employer shall be entitled to audit the Contractor's Quality Management System at any time subject only to giving the Contractor's Project Quality Manager 24 hours' notice of his intention. Where the Contractor has employed a firm of Consulting Engineers to carry out the design of the Works, they shall ensure that his agreement with this firm contains a provision for the Employer to similarly audit their Quality Management System at any time.

The following sub-sections describe the additional or specific quality assurance requirements in relation to this project. Due reference should be made to the requirements for the quality documentation in respect to the need to define particular arrangements.

P1.11.2 Standards

The design, manufacture, provision, installation, and construction of all temporary and permanent works shall comply with the latest editions of local, national, or other internationally recognized Codes of Practice, all statutory regulations and international (ISO) Specifications when appropriate and agreed with the Engineer.

A consistent, coherent, and compatible set of standards shall be used, appropriate to the form of construction and the environment. In the event of any conflict between this document and codes specified the most onerous requirement shall be adopted within the design.

The Contractor shall provide the Employer and his representative with copies or online access to copies, as mentioned in section 7.9 in English language, of all codes and standards used to design and construct the works.

Plant and Materials specified to conform to a local, national, or other internationally recognized Codes of Practice, all statutory regulations and international (ISO) Specifications shall be clearly and indelibly marked with the reference to which they comply wherever possible. Where this is impracticable the relevant advice/delivery notes shall include the reference with which they are to comply. Certificates of compliance shall be submitted to the Engineer.

Plant and materials shall be of new manufacture.

All materials and items of plant shall be of good quality and be able to operate in and withstand the environment in which they will be working.

In the absence of a specified reference code or standard, the Contractor may propose other recognized international codes and standards, and in such a case the Contractor shall provide a copy in the English language and demonstrate to the satisfaction of the Engineer, suitability and equivalence of the substitute codes and standards as well as provide proof of previous successful use. Work specified by reference to the published standard or specification of a government agency, technical association, trade association, professional society or institute, testing agency, or other organization shall conform to or surpass the minimum standards of quality for materials and workmanship established by the designated standard or specifications.

Where the specific date of issue of the standard is not included with the reference to the standard, the latest edition, including all amendments published and available on the date 28 days prior to the latest date for submission of the Tender shall apply.

Where two or more standards are specified to establish quality, the product and workmanship shall conform to or surpass the requirements of both. In case of conflict between referenced standards, the more stringent shall apply.

Where a standard and a brand name are both specified for a product in the Contract Documents, the proprietary product named shall conform to or surpass the requirements of the specified reference standard.

The listing of a trade name in the Contract Document shall not be construed as warranting that such product conforms to the respective reference standard.

Copies of applicable referenced standards have not been bound in the Contract. Where copies of standards are needed by the Contractor for superintendent and quality control of the work, he shall obtain a copy or copies, at his own cost, directly from the publication source and maintain in an orderly manner at the job site available to the Contractor's personnel, Subcontractors, and the Engineer's staff.

The Contractor shall clearly identify and submit for acceptance any request use products conforming to printed standards or publications with a different publication date from that effective under the Contract.

The Contractor shall clearly indicate the changes in product or workmanship quality involved in the proposed change, if any, and reasons for the request.

The Contractor shall be responsible for acquainting himself with and observing all current Statutes, Ordinances, By-laws, or Regulations including those relating to safe working practices, training, levies, and similar taxes.

In the event of a conflict between the requirements of statutory authorities and of these Employer's Requirements, the highest standard requirement shall take precedence. Any such conflict identified by the Contractor shall be reported to the Engineer.

ISO 9000 and ISO 9001 - Quality Systems (or acceptable equivalent; wherever reference to ISO follows herein this may be taken to mean the relevant clause of an acceptable alternative to ISO).

Where alternatives to ISO are proposed, the Contractor shall demonstrate the suitability of the alternative quality management system standard.

Unless otherwise defined, for the purposes of this Contract the definitions given in ISO 8402 and definitions in Clause 1 of the Conditions of Contract shall apply.

P1.11.3 Quality System Requirements

The Contractor shall nominate a senior member of his personnel to act as his Project Quality Manager. The Contractor's Project Quality Manager shall maintain all Quality Documentation and be available at all times to deal with enquiries from the Employer or from the Engineer regarding the Contractor's Quality Management System.

The Project Quality Manager with clearly defined responsibilities. The overall control of the activities on the project shall be the responsibility of a Project Director.

A Project Engineer reporting to the Project Director shall be responsible for developing and implementing the project-specific Quality Documentation.

The particular requirements for implementing the Contractor's Quality System shall be described in the Contractor's Quality Documentation (usually contained in or referenced by a quality manual, quality plan or plans, the latter should in general, follow ISO 10005). The Quality Documentation shall cover the requirements of the relevant part of the ISO 9000 series and describe how the requirements will be met for his contractual obligations with the Employer in this particular instance, and define or refer to the location of:

- a) The written quality procedures which will be followed to ensure the effective management of the Contractor's activities for this contracted obligation to the Employer;
- b) Details of the scope of his work and deliverables to be provided;
- c) A list of procedures and method statements which will be followed to ensure the effective management of the activities covered by this Quality System, including design control;
- d) Details of his main contractual arrangements including a list of his Subcontractors and of related quality documentation;
- e) Details of his organizational structures and lines of communication;
- f) Contact details of the Engineer and other interfacing parties;
- g) Job descriptions of the key staff and the specific experience required for these positions;
- h) Details of the person with defined authority for establishing, maintaining and reporting on his Quality Management System.
- i) Details of the on-Site quality management staff and responsibilities;
- j) The particular arrangements for auditing of his own and his Subcontractor's activities (including programme), and for management review;
- k) The particular arrangements for quality control of his work including hold points for relevant parties including a list of inspection and test plans or like items and identifying the pro-forma and/or databases to be used for recording the inspection and test results and the certification of compliance of all items of the Works by authorized key personnel;

- l) The particular arrangements for the quality control of the work of Subcontractors and suppliers both on and off site including a list of the Contractor's inspection and test plans or like items and for records of compliance;
- m) The Contract documents in which the qualities of materials, workmanship and performance are described;
- n) List of relevant standards and specifications that form part of the Contract or Agreement between the Contractor and the Employer;
- o) List of the documentation necessary to demonstrate the achievement of the Employer's Requirements;
- p) The particular review, liaison and document control arrangements with the Employer, Engineer, relevant authorities, and other interested parties including arrangements to allow the Engineer to designate specific or random witness points;
- q) Detailed method statements for each major activity whether directly controlled or subcontracted;
- r) A list of the work instructions or other like detailed documentation describing process control;
- s) A list of and the retention arrangements for particular quality records;
- t) The Quality Documentation submitted by his Subcontractors and suppliers which define:
 - 1) The quality objectives to be attained including quality records;
 - 2) The specific allocation of responsibilities and authority during different phases;
 - 3) The specific procedures, methods, and work instructions to be applied;
 - 4) Suitable testing, inspection, examination, and audit programs at appropriate stages;
 - 5) Method for changes and modifications in the quality documentation as the work proceeds;
 - 6) Other measures necessary to meet objectives;
 - 7) The particular health and safety arrangements;
 - 8) Particular arrangements for the purchasing and control of Subcontractors, materials, and products;
 - 9) A programme for the Works that shows project phasing;
 - 10) Particular handling, storage, package, preservation, and delivery arrangements;
 - 11) Particular arrangements for reporting, review, and disposition of non-conforming work or products;
 - 12) Particular arrangements for corrective and preventive action;
 - 13) Particular servicing and/ or statistical technique requirements;
 - 14) Particular contract review requirements;
 - 15) A description of the method for controlling changes and modifications to their quality documentation; and
 - 16) Details of any other particular measures necessary to meet their quality objectives and those imposed by the Employer.

P1.11.4 Design Control

Emphasis shall be placed on planning, verification, and timely validation at appropriate stages in the project.

The documented procedures shall include measures which control and co-ordinate the design process activities of the Contractor and detail the specific design criteria for the project.

The Contractor shall review and report on the following:

- a) Evaluation of the project brief, including review of the tender design, Employer's
- b) Requirements, and any changes thereto between the Contractor and the Employer.
- c) Perform risk assessment on the safety of users in shipping, aviation, and railways.
- d) Conceptual and detailed design statements and review;
- e) Design Basis Statement.
- f) External technical services.
- g) Statutory requirements, specifications, and standards.
- h) Environmental consideration.
- i) Identification, coordination, and control of design interfaces.

The Contractor shall carry out the following Design output, review, and verification tasks: a)

Calculations;

- b) Computer programs, design aids, and prototype or model testing;
- c) Drawings and specifications;
- d) Detailed specifications; and
- e) Reports and advice;
- f) Evaluation of design reviews;
- g) Verification methods;
- h) Validation requirements;
- i) Identification of hold points; and
- j) Project-specific requirements.

The Contractor shall perform design verification as per EGBC and the Employer's requirements.

The Contractor shall detail design change control procedures.

P1.11.5 Document and Data Control

The documented procedures shall include measures that control documentation in hard copy and in digital form including drawings, calculations, reports, communications, computer programs, procedures, instructions, and other relevant documents

The procedures shall include registers to identify the issue status, source, and location of all incoming and outgoing drawings, schedules, and other relevant documentation affecting the quality.

Amendments to the list of relevant standards and specifications that become part of the Contract or Agreement between the Contractor and the Employer shall only be made on instruction from or by agreement with the Engineer

A library shall be maintained by the Contractor providing access to current information, including technical data as follows:

- a) Statutory Requirements;
- b) Other relevant professional, industrial, and international codes and specifications; c) Relevant product data;
- d) Design techniques;
- e) Defects and failures, including analysis and rectification; and
- f) General technical information relating to civil and structural Engineering and related Engineering disciplines relevant to the design, construction, maintenance, and operation activities.

Other records that need to be maintained and documented include records showing factual evidence that require quality control activities have been performed. These records shall include the work of Subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- a) Contractor/Subcontractor and their area of responsibility.
- b) Operating plant/equipment with hours worked, idle, or down for repair;
- c) Work performed each day, giving location, description, and by whom;
- d) Test and/or control activities performed with results and references to Specifications/ Drawings. The control phase should be identified (Preparatory, Initial, and Follow-up). List deficiencies noted along with corrective action;
- e) Quantity of materials received at the site with a statement as to acceptability, storage and reference to Specification/Drawings requirements;
- f) Submittals reviewed, with Contract reference, by whom, and actions taken;
- g) Off-site surveillance activities, including actions taken;
- h) Job safety evaluations stating what was checked, results and instructions or corrective actions;
- i) Instructions given/received and conflicts in plan and/ or Specifications;
- j) Contractor's verification statement.

Changes to documents shall be subject to review in accordance with documented procedures. Changes to documents shall be reviewed and approved by the originating body. The Engineer and Employer shall have access to this library at all times.

Internal Quality Audits shall be undertaken by personnel independent of those having direct responsibility for the activity being audited and shall be carried out at regular three monthly' intervals. The Internal Quality Audits shall cover the activities of the Contractor and where applicable his Subcontractors.

The Contractor shall provide training of personnel performing activities affecting quality to ensure that suitable proficiency is achieved and maintained and to promote quality consciousness throughout the organization.

The Quality Records shall be retained by the Contractor for a minimum period of 12 years after the end of the Contract Period.

P1.11.6 Testing and Monitoring

The Contractor shall for the purpose of checking the compliance of materials and workmanship with the requirements of the Technical Specifications, carry out tests at the frequencies stated in the approved QA Manual, Testing and Monitoring Plan, the Codes and Standards, the Design Report and the Technical Specifications and as required by the Engineer and independent Design Verifier.

The Contractor shall carry out testing of all material to be used in the Works. The Contractor shall state the type and number of tests required in order to establish material properties and demonstrate compliance with the Contractor's design and the Employer's Requirements.

The Contractor shall use an independent testing company with testing laboratory suitable and equipped for ongoing testing in association with the construction of all elements of the Works. The Contractor shall implement a quality system which satisfies the requirements of ISO/IEC17025, or equivalent international or national standards.

The laboratory shall be fully equipped, staffed by qualified materials engineers and technicians operating in accordance with ISO 9000 and its related documents, and shall comply with the accreditation requirements described above. The laboratory shall be subject to external audits at fourmonthly intervals or any other time by an approved accreditation body or equivalent independent testing agency at the Contractor's expense.

In order to achieve the required quality of the works and to ensure adjacent structures and facilities do not suffer any damage, deformations and/or reduced safety, the Contractor shall carry out the continuous monitoring of existing structures and facilities adjacent to the works. Monitoring shall continue for at least 6 months after the complete handover of the works.

Notwithstanding tests specified under the relevant Codes and Standards and in these Employer's Requirements, the Contractor shall carry out any further tests and monitoring required by the Employer under the provisions of Clause 7.4 of the Conditions of Contract, at his own cost.

The Engineer may, under Clause 13 [Variations and Adjustments], vary the location or detail of specified tests, or instruct the Contractor to carry out additional tests. If these varied or additional tests show that the tested Plant, Material, or workmanship is not in accordance with the Contract, the cost of carrying out this Variation shall be borne by the Contractor, notwithstanding other provisions of the Contract.

The Contractor shall then promptly make good the defect and ensure that the rejected item complies with the Contract.

If the Engineer requires this Plant, Materials, design, or workmanship to be retested, the tests shall be repeated under the same terms and conditions. If the

rejection and retesting cause the Employer to incur additional costs, the Contractor shall, subject to Sub-clause 2.5 [Employer's Claims] pay these costs to the Employer.

P1.11.7 Testing and Monitoring Plan

Inspection and Test Plans shall be produced where applicable. These shall include hold or witness points. The Contractor shall prepare as part of the QA Manual a fully detailed Testing and Monitoring Plan for approval by The Employer with full details including but not limited to:

- a) Type of testing and monitoring, including applicable Standards
- b) Method statements
- c) Frequency of testing and monitoring in accordance with applicable Standards and Contractor's design
- d) Program and planning
- e) Risk assessment and mitigating measures
- f) Program for attendance by Employer, so-called "witness" points and "hold" points requiring the presence of Employer before commencement of tests and works therefore the Contractor must notify the Employer no later than 14 days prior to the commencement of any individual or set of tests

The testing and monitoring plan shall be submitted to the Employer for review no less than fourteen (14) days before the commencement of Works on site.

A preliminary Testing and Monitoring Plan shall be included in the Tender Submission with at least the following:

- a) Type of testing and monitoring, including applicable Standards
- b) Frequency of testing and monitoring in accordance with applicable Standards and Contractor's design
- c) Preliminary risk assessment and mitigating measures
- d) Preliminary program for attendance by Employer, so-called "witness" points and "hold" points requiring the presence of Employer before the commencement of tests and works

The Testing and Monitoring Plan shall be signed off and certified by the Contractor's Engineer and the Independent Design Verifier.

It is emphasized that the preliminary Testing and Monitoring Plan will be an important part of the evaluation of the Tender Submission in view of the quality of the works.

The Employer may request to be present at any test or all tests, other than marked as "witness" and "hold" points. If the Employer requests to attend tests, but they are carried out without his presence, the results will be void. The result of such tests shall be submitted to the Employer at the times specifically stated or if none is stated as soon as possible.

The Preliminary and Final Testing and Monitoring Plans form part of the Contactor's Documents.

The tests and monitoring to be carried out by The Contractor shall include at least the following, but not limited to:

- a) First pile driving
- b) Subsequent pile driving
- ~~Static Static pile testing~~
- c) Dynamic pile testing
- d) Testing of coatings and cathodic protection
- e) Concrete testing
- f) Steel testing
- g) Fender testing
- h) Compaction testing

Confirmation is required that the Contractor's Engineer of Record is satisfied with the level of pile testing proposed prior to the commencement of piling works and that Static pile testing is not required.

Extensive soil improvement works are required. A detailed testing and monitoring methodology shall be prepared to ensure the required quality of work will be achieved. This shall include testing before, during and after execution of the works, for instance to determine (but not limited to):

- a) Prior to the execution of the works the required characteristics and extent of soil improvement
- b) During the execution of the works whether the extent is matching the requirements
- c) During and after execution of the works whether the required characteristics of soil improvement are reached

The execution of the work will take place close to and adjacent to existing structures and facilities. Mechanical works, pile driving, excavation, soil improvement works, etcetera may have an effect on the existing structures and facilities. A detailed monitoring program shall be prepared to ensure the safety, functionality and integrity of the existing structures and facilities. This shall include monitoring before, during and after execution of the works, including but not limited to:

- a) Plans showing instrumentation types and locations
- b) Continuous monitoring of structures and surroundings – the raw data shall be provided
- c) Plots for each instrument or monitoring point showing actual behaviour superimposed over predicted (theoretical) behaviour over time.
- d) Assessment of limitations of deformations with "green" (e.g. within first 75% of the safe limits), "yellow" (within 75%-90% of the safe limits) and "red" (beyond the 90% of the safe limits).
- e) Mitigating actions in case of "yellow" and "red" signals (e.g. stop of work, change methodology, change design).

On completion of each test or batch of tests, the Contractor shall submit within 2 days after a specific test, or daily in case of monitoring, a report with full material description with associated laboratory testing. Results of all tests conducted, documentation of site activities, analysis including, where appropriate, interpretation of the data from the tests in graphical form with supporting text, mitigating measures and required actions should the testing show that the material does not comply with the Contractor's design

requirements, recommendations for follow-up or design changes, conclusions, etcetera for approval by the Employer. A final report shall be submitted within 1 week after a specific test.

The Testing and Monitoring results and final report shall be signed off and certified by the Contractor's Engineer and the Independent Design Verifier.

The Test Reports are part of the Contractor's Documents.

P1.11.8 Defective Work

If, as a result of an examination, inspection, measurement or testing, any Plant, Materials, design carried out by the Contractor or workmanship does not comply with all the relevant requirements of this Specification, that part of the Plant shall be classed as defective work. All work classed as defective work shall be cut out and removed from the Plant and replaced so as to be acceptable to the Employer.

The extent of the work to be removed and the methods to be used in the removal of this work shall be in accordance with the Engineer's directions.

In all cases, cutting out of defective concrete work shall be carried back to form satisfactory construction joints before the replacement of defective work and any other work thereby affected is commenced at the Contractor's cost.

P1.11.9 Supply of Material and Plant

As soon as possible after the Commencement Date, the Contractor shall submit a list of suppliers from whom he intends to purchase all Materials and Plant required for the Works. Thereafter, copies of orders shall be furnished in accordance with the Employer's Requirements.

Where more than one manufacturer is able to supply any particular material or article, the Contractor shall obtain the whole quantity required to complete the work from one manufacturer or supplier or inform the Engineer of his intention to multi-source or to any change in source of supply.

Before ordering any Plant and Materials of any description for the Permanent Works, the Contractor shall submit the names of the proposed makers and suppliers to the Engineer for their acknowledgement, and shall, in due course, send to the Engineer, copies (not necessarily priced) of the orders given by the Contractor for such Plant and Materials.

The Employer has listed in Volume 2 Part 2 a list of preferred suppliers and will only consider the Contractor's application for an alternative supplier if:

- a) The Contractor can demonstrate that the proposed alternative equipment/ material is superior or equivalent to that supplied by the approved subcontractor/ supplier; and
- b) Cost and/or time benefits to the Employer are identified.

Other suppliers can only be used after written approval from the Employer at the Employer's sole discretion.

The Contractor shall request each supplier to admit the Engineer to their premise as required for inspections. This access is not guaranteed. The contractor will facilitate access for witness and inspections as agreed in the Inspection and Test

Plans. Alternatively, if required by the Engineer, the Contractor shall deliver the samples of the Goods and Materials to the Engineer's office or to a laboratory nominated by the Engineer. Reporting the testing and transport of the material shall be at the Contractor's cost. Samples shall be taken in accordance with the relevant Standard where applicable or otherwise as described in the Contract. Goods and Materials subsequently used in the Works shall be consistent with the samples as tested and/or approved by the Engineer.

The Contractor shall ensure that samples are supplied to the Engineer in sufficient time for them to be satisfactorily tested.

The information regarding the names of the suppliers may be submitted at different times, as may be convenient, but no sources of supply shall be changed without the Engineer's prior consent.

The Contractor shall submit to the Engineer test certificates of the goods and materials indicating compliance with the relevant Standard or other requirements of the Specification for goods and materials for which there is no safety mark accepted quality assurance scheme or other accepted independent certificate scheme.

The Contractor shall maintain a detailed record of all materials received on the Site or in his stores or storage and working areas in the vicinity of the Site and shall make such records available to the Engineer at such times as the latter may require.

The Contractor shall supply to the Engineer two copies (both hard copies and electronic copies) in English of the manufacturers' current instructions and explanatory brochures for all proprietary materials, or processes specified or proposed by the Contractor, at least four (4) weeks prior to the incorporation of the materials or processes in the Works.

The Contractor shall submit to the Engineer copies of all orders for materials to be incorporated in the Works (including CIF details for Materials on Site evaluations).

All Materials, Plant, etc., shall be used and installed in accordance with the instructions of the manufacturer or supplier unless otherwise specified in the Employer's Requirements. Copies of manufacturer's instructions shall be provided to the Engineer prior to incorporation of the Materials and Plant into the Works.

Where the Contractor has to employ the services of a supplier who is required by the Employer to operate a Third-Party Certification scheme, then the Contractor shall obtain details and ensure compliance.

Materials and manufactured goods shall be identified in Maintenance Manuals and other records that the Employer may require. Records shall be maintained of each delivery or batch of materials used and their location in the structure.

The Contractor shall inform the Engineer when a Nonconforming Product is identified.

P1.12 Facilities for the Engineer and Employer

P1.12.1 Assistance for the Engineer

The Contractor shall provide boatmen, divers, and surveyors (including the surveying equipment) to assist the Employer and the Engineer as and when required. The Contractor shall include all costs for such assistance within his price.

The Contractor shall possess a boat (other than the safety boat), and qualified boatman, appropriate for use in monitoring construction, that can be used by the Employer and Engineer, or other Employer's contractor whenever required to do an inspection. The Contractor shall have the boat available every day during daylight hours within 2 hours of receiving the notice from the Employer or Engineer. It is anticipated this facility will be required at all times during the execution of the marine works.

P1.12.2 Office Facilities for the Employer and Engineer

The offices for the Employer and the Engineer shall be provided adjacent to the Contractor's main site base office. The accommodation shall be for the sole use of the Employer and the Engineer.

The Contractor shall provide, erect, and maintain, within 6 weeks of award of contract and prior to starting any major construction works, at a location to the satisfaction of the Employer, the accommodation, furniture, and equipment as indicated below, which shall be for the exclusive use of the Employer, Engineer and the Employer's other stakeholders:

The office for the Employer shall be subdivided into:

- a) Conference room (not less than 15m²);
- b) PM office (not less than 12m²);
- c) Project engineer's office (not less than 12m²)
- d) Shared office with not less than 12m² each;
- e) Filing room (not less than 12m²);
- f) Kitchen;
- g) Male and female toilets;
- h) Parking for 5 vehicles.

The office for the Engineer shall be subdivided into:

- a) Conference room (not less than 15m²);
- b) RE office (not less than 12m²);
- c) ARE office (not less than 12m²)
- d) Shared office with not less than 12m² each;
- e) Filing room (not less than 12m²);
- f) Kitchen;
- g) Male and female toilets;
- h) Parking for 5 vehicles.

The offices shall be substantial, weather tight, insulated and have ample window provision. Windows shall be weather and dust proof and shall be fitted with sunshades and blinds. Doors to offices shall be half-glazed. These offices shall be lined internally and shall be equipped with desks, plan chests, tables, bookcases, filing cabinets, drawing boards, shelves, stools, chairs, floor coverings and furnishings.

Each office and the conference room shall be fitted with a whiteboard. They shall be provided with water, electric lighting, split-unit air conditioning, water closets, and hand washbasins.

The kitchen is to be provided with sinks, dishwasher, an electric kettle for hot drinks, microwave cooker and one 340 liter split refrigerator/freezer.

Outside the offices a hose pipe connection and hosepipe shall be provided for washing boots etc.

The office shall be provided with air conditioning, electric lighting, ventilation, power, water, drainage, internet, plumbing, water, and fire protection equipment.

The Contractor shall provide details of his proposals for the office for the Engineer's approval.

The offices are to have suitable locks with keys available to the Engineer and his staff only.

The Contractor shall be fully responsible for the provision, operation, cost, and maintenance of all required services, including daily cleaning, consumables, stationery, and all telecommunication costs until two months after issue of the Taking-Over Certificate for the last Section / part of the Works.

The contractor shall be responsible for the supply, erection, furnishing, maintenance, and cleaning of the offices to the satisfaction of the Engineer for the construction period, together with all rates, charges and costs incurred in lighting and other power supplies, heating and air conditioning, provision of water supply (including drinking water), regular cleaning on a daily basis, and supply of paper towels and toilet consumables etc.

These offices are to be maintained for a period of up to two months beyond the issue of the TakingOver Certificate for the whole of the Works.

The Contractor shall make available to the Employer, the Engineer, and his authorized staff full use of first aid equipment and any other medical facilities provided on Site for use by the Contractor's own senior site staff.

P1.12.3 Office Equipment

The Contractor shall install within the office facilities described above the following new equipment for the use of the Employer and Engineer and his staff.

The minimum specifications are as follows:

- a) Printers, modem, scanner & network etc.
- b) The Contractor shall deal promptly with any defects on request by the Engineer within 24 hours of such a request and shall maintain all the equipment in good order.
- c) The Contractor shall also supply, as required by the Employer and the Engineer, two (2) electrostatic high-speed auto-feed

photocopiers/printer/scanner, office stationery and supplies, including replacement print cartridges for photocopier, etc. and all other consumable items.

- d) The accommodation shall be outfitted with new equipment as detailed below. All chairs shall be upholstered.

Conference rooms shall be equipped with:

- a) Table/tables and chairs capable of hosting meetings of 16 people;
- b) Projector and screen to which a PC can be connected for the purpose of making MS Power Point presentations;
- c) Teleconference System with video capability;
- d) Whiteboard;
- e) Large notice boards (approximately 2m x 1m) fixed to the walls for the purposes of displaying A1 drawings and programmes.

Offices shall be provided with a workstation for each occupant comprising:

- a) Desk with drawers;
- b) Table of the same style and height (in order that tables and desks align in height) for laying out drawings;
- c) Fully adjustable, rotating office chairs on star bases;
- d) Chair for visitors;
- e) Bookcase no less than one meter high by 750mm wide with three shelves;
- f) Three drawers and a lockable filing cabinet;
- g) Three tier filing trays;
- h) Wastepaper baskets.
- i) Each office shall be provided with coat hooks.

APPENDIX 1:

Employer's Safety Manual

Appendix 1 - Employer's Safety Manual

APPENDIX 2:

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Project CEMP

Appendix 2 - Construction Environmental Management Plan_Oct 2022



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APPENDIX 3:

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VFPA – Project and Environmental Review Permit

Appendix 3 - PER 22-017 Issued Permit and Report

APPENDIX 4:

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APPENDIX 4:

**VFPA - Record Drawing Standards for Infrastructure Projects - Version 3 -
June 04, 2021**

Appendix 4 - VFPA-Record-Drawing-Standards



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Canola Oil Transload Facility
Design & Build Contract
Volume 2 – Employer's Requirements
Part 1 - General Requirements



APPENDIX 5:

PER Conditions Matrices

Appendix 5 - 06-23-002J_PER Conditions Matrix R1

Appendix 5 - 06-23-002J_Permit Matrix

APPENDIX 6:

Electrical Cabling Above Ground - sketch

Appendix 6 - 7704-E-001-D - DE Markup

APPENDIX 7:

Drawings/Documents that are the Reliable Information, subject to the provisions of Sub-Clause 4.10 [Site Data] of the Conditions of Contract and Sub-Clause 1.5.1 [Site Data] above in these Employer's Requirements:

1. CIVIL

- Hatch Annacis Water Supply Tunnel Drawing 2020
- VFPA Timberland Road Realignment Drawings 2022
- Delcan Drainage Plan 2004
- Delcan IDC Drawings 2004
- Hatch PARY Drawings 2016

2. GENERAL

- Sacre-Davey Location Plan 2022
- Stantec Terminal GA 2021

3. GEOTECHNICAL

- Thurber Geotechnical Report 2022
- 1. Thurber009_20230329_ DP World Canola Oil Transload Facility_Pile Loading Test Report_34098
- 11-002-GEOTECH-MEG-171012 Geotech report

4. STRUCTURAL

- Seabulk Berth 10 Drawings 2001

5. ELECTRICAL

- Pacific Powertech Single Line Drawings 2018
- PBA Substation 10 Drawings 2008

6. IT & SECURITY

- PBA Communications Drawings 2010

