SPARK – North East Link – Primary Package

Inspection and Test Plan (ITP)

ITP Title: Stormwater Drainage Pits & Pipes

ITP Number: NEL-CNT-SDC-2990-PQA-ITP-0024 Rev 0

LOT Number: _____

Primary Asset Location Code: _____

Discipline: Drainage & Civil

Security Classification: OFFICIAL

Spark NELP Approval Record

Function	Position	Name	Signature	Date
Prepared By	Quality Representative	Abiola Olulana	Abiola Olulana Digitally signed by Abiola Olulana Date: 2022.08.26 09:33:12 +10'00'	
Reviewed By	Project Engineer	Domenic Ciccone	Domenic Ciccone Digitally signed by Domenic Ciccone DN: C=AU, E=domenic.ciccone@sparknel-dc.com.au, O=SPARK, CN=Domenic Ciccone Date: 2022.08.26 09:40:07+10'00'	
Approved By	Quality Manager	Greg Iro	Digitally signed by Greg Iro Date: 2022.08.26 15:22:02 +10'00'	

Note:

1. *Ensure all Records or Checklist References are attached and that each Inspection Requirement is clearly named, signed, and dated.*
2. *Ensure every Records or Checklist References attached are legible*
3. *This Inspection Test Plan may be generic – ensure the requirement is demographically clear to your scope of work*
4. *Verification Inspections where applicable for the IREA stated as "Witness" or "Hold" shall be formally notified for their engagement and with sufficient advance notice time (i.e. 3 days or as agreed with the Sub-IREA Representative and/or the Nominated Authority)*
5. *All Nominated Authority Hold Points are Witness Points for Sub-IREA*
6. *The Sub-IREA representative is not required to physically sign-off on ITPs*

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Standards: AS 4744, 1657, 3679.1, 4671

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
1.0	**Preliminaries (Include all aspects of Materials, Approvals, IFC Drawings, etc. Ensure all required permits have been raised prior to commencing works)**											
1.1	PE	Construction Package Approval	PSDR Part F6 2 (a) to (h)	Construction Documentation shall be submitted and approved prior to commencing work at site.	R	PW	NR	**HP**	NR	NR	IFU Construction Package InEight Reference: #_____	
1.2	PE	Material Conformance Pit & Pipe	VR 701.04, 701.05, 701.06, 701.07, 701.08, 701.09, 705.04, 705.07, 705.09 IFC drawings	Complies with specified requirements. Free from defects and to drawing dimensions.	R	PW	**HP**	**HP**	NR	NR	InEight Ref # _____ Pipe delivery dockets Pit shop drawings Product Data Sheets NATA Test Results Material Conformance Certificates	
1.3	PE	Material Conformance Bedding & Backfill	VicRoads 701.09(d), Table 701.091, 701.092, 701.291, IFC drawings	No perishable matter or lumps. Grading as per table 701.091 PI as per table 701.092 Grading and PI tests to be carried out once per 1000 tones or part thereof. Minimum testing requirements as per table 701.291 see table below	R	PW	**HP**	**HP**	NR	NR	InEight Ref # _____ Material conformance certificate	
1.4	SE	Trench Shields	AS 4744	Trench shield shall be manufactured and certified in accordance with AS4744	V	PW	**HP**	**HP**	**HP**	**WP**	Engineering Certificate	
1.5	PE	Material Conformance Mortar	VR 610.07 VR610.33 IFC drawings	Grout mix designs shall be registered in accordance with the requirements of Section 610.07	R	PW	**HP**	**HP**	**HP**	**WP**	HP Release InEight Ref # _____ Grout Mix Design	

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		Grout		Mortar used in the laying of box culvert sections or as jointing for pipes shall comply with the requirements of clause 610.33.							Material conformance cert /Material delivery docket	
1.6	PE	Design status	PSDR Part F5, 2(b) & (c)(i)	Design to be IFC prior to works commencing	R	PW	NR	**HP**	NR	NR	IFC Drawings InEight Reference: #_____	
1.7	PE	All Equipment Calibrated (NATA Approved)	CQMP Section 11.1	Equipment calibration certificates filed in InEight.Document Ensure all equipment associated with the relevant works is calibrated.	V	PW	**HP**	**HP**	NR	NR	Calibration Certificates InEight Reference: #_____ [ ] Not Applicable	
1.8	SE	Survey Set Out	PSDR Part F4 Section 6 IFC Drawings	Clearly mark limit of works; Chainage, offsets, cut/fill level etc. (if required)	V	PW	**HP**	**HP**	NR	NR	Survey Record InEight Reference: #_____ This ITP Lot Map	
1.9	PE	Acceptance of Precast Reinforced Concrete Pipes & Pits	VR 619.22 VR 701.05 VR 705.07 IFC Drawings	Precast Reinforced Concrete pipes shall be of the required sizes and load classes as shown on the drawings. Aggregates for precast reinforced concrete pipes shall comply with the requirements of section 610 Any steel reinforced concrete pipes that have cracks wider than 0.2mm or are	I	PL	**HP**	**HP**	**WP**	**WP**	WP Release InEight Ref # _____ Product Data Sheets Proof load Test Results Ultimate Load Test Result	

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
				damaged prior to laying and backfilling shall be rejected. Concrete mix designs used for the manufacture of precast reinforced concrete pipes shall not be more than 12 months old and shall be available for review by the Superintendent. Precast steel reinforced concrete drainage pits shall be manufactured, supplied and installed in accordance with the requirements of Section 610 and Section 611.							Dimension measurement Record Measurements of clear Concrete mix design letter	
1.10	PE	Supply Precast Covers, Grates, Box Culverts, Lids and Pits	VR Clause 705.04 701.31 IFC Drawings	Complies with specified requirements. Free of defects and to IFC specifications. Concrete mix design to be approved by Superintendent Box culverts which do not comply with the requirements of clause 619.14 prior to laying and backfilling shall be rejected and removed from the site. Checks to be conducted on delivery an prior to placement to ensure the product meets the acceptance criteria.	V	PL	**HP**	**HP**	**HP**	**WP**	HP Release InEight Ref # _____ Manufacturing Compliance Certificates Incoming Material Checklist Delivery Dockets Registered Concrete mix design for precast unit	
2.0	**Operations (Include Work Execution – Installation / Manufacturing Process step-by-step)**											

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2.1	SE	Set Out	IFC drawings VR 701.10	Prior to commencement of excavation for the culverts the Contractor shall confirm the position of all culverts with the Superintendent. Pit Set out points as per IFC Design schedule. Confirm that the invert of drainage pipes on the pit schedule design drawing match the corresponding design long section drawings. Confirm that the pit set out points are the correct orientation / bearing and offset to kerb/barriers and the VicRoads Standard Drawings	V	PL	**HP**	**HP**	**HP**	**WP**	HP Release InEight Ref # _____	
2.2	SE	Installation of Culverts in fills under Construction	VR 701.13 IFC Drawings	The fill shall first be constructed and compacted to subgrade level or to a level 300mm above the top of the proposed culvert, whichever is lower, for distance of not less than 6m clear on either side of the proposed trench.	V	PL	**HP**	**HP**	NR	NR	This ITP	
2.3	SE	Waterway Diversions	VR 701.12	Before obstructing any waterway, channel, culvert, or pipe, the Contractor shall make Provisions for temporary waterway diversion of flow, and obtain prior written approval from the relevant waterway authority.	V	PL	**HP**	**HP**	NR	NR	Dewatering Permit	
2.4	SE	Construction Loading on Culverts	VR 701.14 Table 701.141	Construction Traffic shall not be allowed until the minimum cover achieved as	V	PL	**HP**	**HP**	NR	NR	This ITP	

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				per Table 701.141 (Attached Below)								
2.5	SE	Excavation of Trench for Culverts and Pits	VR 701.14 VR 701.15 Table 701.151 VR 705.05 (b) IFC Drawings	Excavate to required depth which shall also include excavation necessary to prepare the culvert/pit foundation and provide the full specified depth of culvert/pit bedding. For pipe culverts, the width of trench at and below the level of the top of the pipe shall be such that the horizontal clearance from the outside of the pipe to the wall of the trench is within the limits shown in Table 701.151. For precast pits the excavation shall provide a clearance from all external faces of the pit to each face of the excavation of not less than 400 mm. Bedding conforming to the requirements of Section 701 shall be supplied, placed and compacted to a thickness not less than 80 mm on a clay foundation or 150 mm on a rock foundation.	V	PL	WP	WP	NR	NR	This ITP	
2.6	SE	Base of Trench	VR 701.15	The base of the trench shall be compacted to refusal using mechanical plant. The Contractor shall treat or replace all soft, wet or unstable material below the level required to provide the minimum specified thickness of culvert bedding,	V	PL	WP	WP	NR	NR	Photos Material Conformance Docs (Imported Fill)	

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				as specified in clause 701.16. Replacement material if used, shall be compacted in accordance with clause 701.20.								
2.7	SE	Bedding – Layer Thickness, Compaction and Moisture Content requirements	VR 701.16 VR 701.20 IFC Drawings	Bedding material shall be provided and placed for the full width of the trench or, where the culvert is to be placed without trenching, to a width 0.8 m greater than the overall width of the culvert. The compacted thickness of bedding material following any shaping necessary shall be not less than: • 100 mm where D < 1500 mm • 200 mm where D ≥ 1500 mm where D is the nominal pipe diameter or culvert width. For Pits, bedding placed and compacted to a thickness not less than 80mm on clay foundations or 150mm on rock foundations. Bedding shall be compacted to refusal using hand held mechanical equipment. Bedding material which has a swell equal to or greater than 2.5% shall be maintained at a mean moisture ratio of 92% between the completion of rolling and the placement of the overlying layer.	V	PL	WP	WP	NR	NR	This ITP NATA Test Report	
2.8	SE	Laying of Pipes	VR 701.04	Laying of pipes or box culverts shall not	V	PL	**HP**	**HP**	NR	NR	This ITP Photos	

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
			VR 701.05 VR 701.17 (a), (b) IFC Drawings Construction Packages PSDR Part B Section 5.5	commence until the Contractor has verified that culvert bedding complies with the specified lines and levels and compaction requirements, and that box culverts and pipes are not damaged and comply with the requirements of clause 701.04 and Clause 701.05 respectively. Laying of pipes or box culverts shall commence from the downstream end. Rebate and socket ends of pipe sections shall be placed facing upstream and be fully entered. The lower portion of the pipe shall be in contact with the bedding for the full length of each section. The compacted bedding shall be shaped to accommodate the joint collar and ensure that the pipe is supported along its full length.							
2.9	SE	Installation of Precast Steel Reinforced Concrete Drainage Pits	VR 705.07 VR 705.09 (a), (b), (c) VR 705.10 IFC Drawings PSDR Part B Section 5.5	Precast pits shall be installed at the locations and to the dimensions shown on the IFC drawings. Subsurface Drainage Connection – Holes for subsurface drainage shall be 150mm diameter, cored only. Segments – If a precast pit is cast in segments, each section of the pit shall	V	PL	**HP**	**WP**	NR	NR	This ITP Photos	

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			Construction Package	be rebated to ensure correct alignment and to prevent horizontal movement. A minimum rebate of 15mm shall be used. All pits to comply with clauses 705.09 and 705.10 The spacing for multiple row culverts shall be as shown in Table 701.171.								
2.10	SE	Cast In Place Drainage Pit (If applicable)	VR705.06 IFC Drawings	Cast in place drainage pits shall be constructed at the locations and to the dimensions shown on the drawings. Cast in place drainage pits shall be constructed in accordance with the requirements of Section 610 and Section 611. Cast in place drainage pits shall not be constructed with fibre reinforced concrete (FRC).	V	PL	**HP**	**WP**	NR	NR	This ITP Photos	
2.11	SE	Precast Fibre Reinforced Concrete Drainage Pit (if applicable)	VR705.08 (a) to (e) IFC Drawings PSDR Part B Section 5.5	Precast fibre reinforced concrete (FRC) drainage pits shall be manufactured, supplied and installed in accordance with the requirements of Section 610 and relevant Australian Standards listed in clause705.02 The worksheet and/or report for determination of fibre content shall be submitted for review by the Superintendent.	I	PL	**HP**	**HP**	**WP**	**WP**	WP Release InEight Ref # _____ This ITP Load Test Report Fibre content Worksheet/Report [ ] Not applicable	

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2.12	SE	Drainage Pits in Shoulder (if applicable)	IFC Drawings PSDR Part B Section 5.6	Drainage pits must: (a) on the freeway carriageways, freeway ramps and the Doncaster Busway be located to avoid the intrusion of pits and grates into any traffic lane; and (b) on arterial roads and local roads be located to avoid the intrusion of pits and grates into any traffic lane or on-road bicycle lane, and be trafficable for cyclists.	I	PL	**WP**	**WP**	NR	NR	This ITP Photos	
2.13	SE	Step Iron Fitting	VR 705.04(d) VR 705.12 AS3679.1 AS4671 IFC Drawings	Drainage pits greater than 1.0 m deep shall be fitted with step irons as shown on the drawings. Steps shall be: -Located so that they do not obstruct openings and that water does not discharge onto them. -Set into a wall which has no openings, or beside an opening, or across a corner of the pit. -Installed horizontal, vertically in line and shall project uniformly from drainage pit walls. Step irons of an approved proprietary type shall be installed in accordance with the manufacturer's instructions. Where drainage pits are extended in height from the lowest pit, step irons	V	PL	**HP**	**HP**	**WP**	**WP**	WP Release InEight Ref # _____ Photos	

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				shall be located such that an equidistant spacing between step irons is still maintained. Where step irons are cast in place, they shall be epoxy mortared into drilled holes using an epoxy material and method approved by the Superintendent.								
2.14	SE	Shaping the Floor	VR 705.13 VR 610.33 IFC Drawings	Drainage pit floors shall be smoothly shaped from the inlets to the outlet for a height of one third of the diameter of the outlet pipe with cementitious mortar, to provide a profile that will ensure smooth flow conditions between the invert of inlet and outlet pipes and prevent any snagging of debris. The cementitious mortar shall comply with the requirements of clause 610.33.	V	PL	**HP**	**WP**	NR	NR	This ITP	
2.15	SE	Joints and Lifting Holes	VR 610.33 VR 701.18 VR 705.15 IFC Drawings Construction Package	All interlocking (flush) joint reinforced concrete pipes shall be mortar jointed or wrapped with a 200 mm wide external joint rubber band. Where lifting holes are provided, the pipes shall be laid with the hole uppermost. Lifting holes shall be plugged or otherwise closed off in accordance with the manufacturer's	R	PL	**HP**	**WP**	NR	NR	This ITP Photos	

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				instructions after the pipe is installed. Plugs shall not impair the pipe durability or serviceability. The joints between various components such as drainage pits, access chambers and pipes shall be made watertight using a cementitious mortar in accordance with the requirements of clause 610.33. The joint areas shall be thoroughly cleaned and wetted just prior to filling.								
2.16	SE	Placement of Filling	VR 701.19 (a) VR 701.20 IFC Drawings	Bedding and backfill materials shall be placed and compacted in layers not exceeding 150 mm loose thickness. (i) Culvert under area to be paved: Where the trench has been excavated from design subgrade level or above, the trench shall be backfilled to design subgrade level with selected backfill material, and above that level with appropriate pavement material. Where the trench is excavated from below design subgrade level the trench shall be filled with selected backfill material. (ii) Culvert under areas not to be paved: The trench shall be backfilled with selected backfill material to a level 0.3	V	PL	**HP**	**WP**	NR	NR	This ITP Photos	

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				m above the top of the culvert and with ordinary backfill material above that level.								
2.17	SE	Backfill with Cement Stabilised Sand	VR 701.19 (c) IFC Drawings	Where approved by the Superintendent, culverts in trenches may be backfilled to half the pipe diameter or box culvert height with 3% cement stabilised sand with a water content sufficient to ensure penetration beneath the pipe or box culvert invert without leaving free surface water.	R	PL	**HP**	**HP**	**WP**	**WP**	WP Release InEight Ref # _____ Photos	
2.18	SE	Testing and Acceptance of Compaction and Moisture Content	VR 701.20	The number of tests per lot shall be three. A lot shall consist of one layer of bedding or backfill for a culvert between adjacent pits or end wall. A minimum of 20% of all lots for each culvert shall be tested. Backfill material which will have a nominal size after compaction of 40 mm or less shall be compacted to a mean value of density ratio of not less than 97%. Backfill material which has a swell equal to or greater than 2.5% shall be maintained at a mean moisture ratio of 92% between the completion of rolling and the placement of the overlying layer.	R	PL	**HP**	**HP**	NR	NR	NATA Test report: Compaction and Moisture Content	

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
2.19	SE	Testing – Backfill Material	VR 701.19 VR 701.29 Table 701.291 IFC Drawings	Grading and Plasticity Index testing	R	X1	**HP**	**HP**	NR	NR	NATA Test Report: Grading and PI	
2.20	SE	Fitting of Covers	VR 705.04(c) VR 705.17 IFC Drawings	Frames for drainage pit covers shall be cast into the top of the drainage pit or bedded on fresh mortar, 5 mm thick, consisting of two parts of sand, one part of cement and sufficient water to produce a mix of suitable consistency. The level at every point of the perimeter shall be within 10 mm of the design level for that point, and the line of the cover shall be within 10 mm of the design kerb line.	R	X1	**HP**	**HP**	NR	NR	This ITP Photos	
2.21	SE	Flushing of Culverts	VR 701.28	All culverts shall be flushed clean from end to end on completion and maintained in proper working order.	R	PL	**HP**	**WP**	NR	NR	This ITP	
2.22	SE	Inspection of Drainage Lines	VR 701.30 PSDR Part B Section 5.5	All drainage lines constructed shall be inspected, after completion of earthworks to subgrade level and prior to construction of pavement layers, and after completion of landscaping by an independent testing organisation using closed circuit television (CCTV) to verify that the flow of water is not obstructed	V	PL	**HP**	**HP**	**HP**	**WP**	HP Release InEight Ref # _____ CCTV Footage and Report	

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INSPECTION AND TEST PLAN (ITP)

Project: SPARK – North East Link Primary Package **Client:** State of Victoria and the North East Link State Tolling Corporation

ITP Title: Stormwater Drainage Pits & Pipes

Description: This ITP covers stormwater drainage installation, pits and pipes

References:
VicRoads 610, 611, 619, 687, 689 701, 705, IFC Drawings, Design Management Plan, Quality Management Plan (CQMP), Project Scope and Delivery Requirement (PSDR)

Standards: AS 4744, 1657, 3679.1, 4671

ITP No: NEL-CNT-SDC-2990-PQA-ITP-0024 **Rev No**: 0

Lot No: **Location**: **Ch**: **to** **Offset:** **to** **Layer**:

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
				by waste construction material left inside and to check for visible signs of defects.								
2.23	SE	Repairs to Damaged Pipes	VR 701.31 PSDR Part B Section 5.5	Any steel reinforced concrete pipes that have cracks wider than 0.2 mm or are damaged prior to laying and backfilling shall be rejected. Any Defects identified by the visual inspection of drainage pipes must be rectified before pavement construction commences. Where inspections after backfilling identify any of the following defects they shall be notified as a non-conformance: • cracks wider than 0.5 mm • spalling of concrete • exposed reinforcement • joints that are not fully engaged. The Contractor shall submit details of proposed rectification treatments including manufacturer's product specifications and warranties, the area and thickness of repair treatment, detailed repair procedures, and inspection and test plans. No repairs shall be undertaken without the Superintendent's approval of the repair materials and procedures.	V	X1	**HP**	**HP**	**HP**	**WP**	HP Release InEight Ref # _____	

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3.0	**Post Operations (Include Inspection and Testing)**											
3.1	PE	Survey As-Builts	IFC Drawings Design Management Plan NEL-CNT-SDC-2990-PDM-MPL-0001 Section 5.4	▫ Survey pickup of finished level ▫ Ensure As-Built survey is compared within the required tolerance to Design specification. ▫ Minimum depth of piling pad to be confirmed by as-built ▫ Ensure all locations and work area highlighted as per Construction Lot in Work Lot Map	V	PL	WP	WP	NR	NR	As-Built Survey Report InEight Reference: #_____ Work Lot Map	
3.2	PE	Redline Drawings	Design Management Plan NEL-CNT-SDC-2990-PDM-MPL-0001 Section 5.4	Redline Drawings submitted to Project for creation of As-Built Drawings.	V	PL	**HP**	**HP**	NR	NR	Red-Line Marked Up IFC Drawing(s)	
3.3	PE	Operations / Service & Maintenance Manuals	Completions Management Plan	Ensure all Operation and Maintenance Manuals are provided prior asset handover. Ensure all Warranty, Brochures, Product Data Sheets, Certificates and / or any relevant documents are provided prior asset handover.	R	PL	**HP**	**HP**	NR	NR	Completion Document O&M Manual	
3.4	PE	Verification and Lot Records complete	CQMP Section 8.3	Progressive monitoring and signoff of Checklists occurs, and test records are collected. Ensure completed work checklists, inspection and test results and Subcontractor conformance records are progressively and permanently saved and stored as soon	V	PL	**HP**	**HP**	NR	NR	This ITP Lot Record	

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Item No.	Resp. Person	Inspection and Test Activity	Specification Reference	Acceptance Criteria	Test Method	Test Freq.	Inspection/Verification (Name, signature & date)				Records/Documents	Field Notes / Comments
							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
				as possible after they are received. Completed construction lot records are transferred to the project Quality Team for final record verification prior to being closed								
3.5	PE/ QSR	NCR Close out (if applicable)	CQMP Section 8.3	All NCR's presented for closure	R	PL	**HP**	**HP**	**HP**	WP	HP Release InEight Reference: #_____ NCR InEight Reference: #_____ NCR Module	
4.0	**Quality**											
4.1	QSR	Identification and control of non-conforming products or services (if applicable)	CQMP Section 8.3	Review and confirm closure of NCR's and associated RFI's prior to closing of construction lot	R	PL		**HP**			NCR closed with related documentation	
4.2	QSR	Check all quality records for lot closure	CQMP Section 8.3	All applicable quality records are complete	R	PL		**HP**			Compiled documents (all data reports and records)	

Legend:

Responsibility	**Method**	**Inspection / Verification**	**Test Frequency**	**Other**

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INSPECTION AND TEST PLAN (ITP)

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		

SS: Site Supervisor SE: Site Engineer PE: Project Engineer SPE: Senior Project Engineer GE: Geotechnical Engineer PS: Project Surveyor	PSM: Project Systems Manager QSR: Quality Site Rep. STR: Structural Engineer SSR: Site Safety Rep. EMR: Environmental Management Rep. NA: Nominated Authority (Release of HP) IREA: Independent Reviewer (Observer)	V: Verify I: Inspection R: Review T: Test	HP: Hold Point WP: Witness Point NR: Not Required	PW: Prior to Works PL: Per Lot F: Full or 100% Inspection or Testing X1: Inspect or Test at Specified Frequency X2: Random Inspection or Test	QP: Quality Plan RFI: Request for Information NCR: Non-Conformance VC: Verification Checklist XXXX: Sequential Number from Doc Control

DDD – Types: B – Building, C – Civil, G – General, M – Mechanical & Electrical, I – Motorway Operations System (ITS), S – Structure, O – Tolling, T – Tunnel, U – Urban Design & Landscape

Supplier/Subcontractor: (If applicable)	Name	Signature and Date	Spark-NELP REP	Name	Signature and Date

Lot closure comments:

Spark NELP QA Rep:

Name_____ **Signature:** _____**Date:** _____

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Table 701.091

Material	Sieve Size - AS (mm)				
	75.0	37.5	19.0	2.36	0.075
	Percentage Passing (by mass)				
Bedding	-	-	100	-	5-40
Selected Backfill	-	100	-	-	5-40
Ordinary backfill	100	-	-	40-100	-

Table 701.092

Test	Test Value
Plasticity Index (Max.)	20

Table 701.291

Test	Minimum Frequency of Testing
Grading	One per 1000 tonnes or part thereof
Plasticity Index	One per 1000 tonnes or part thereof

Table 701.151

Pipe Type	Nominal Pipe Diameter or Width (mm)	Horizontal Clearance to Wall of Trench	
		Min. (mm)	Max. (mm)
Corrugated Metal Culvert	All	300	1,000
Other	All	300	600

Table 701.141

Range of Axle or Track Loading (tonne)	Required Cover Thickness (Metre) (Min.)							
	Type, Size, and Class of Culvert							
	Pipe						Corrugated Metal	Box Culvert 90 kN Proof Load
	Pipe Class						D 1200-3600 mm	
	2		3		4			
	D<1.2m	D>1.2m	D<1.2m	D>1.2m	D<1.2m	D>1.2m		
0 – 9	0.4	0.4	0.4	0.4	0.4	0.4	-	0.1
9 – 20	0.4	0.4	0.4	0.4	0.4	0.4	1.2	0.6
20 – 35	0.7	0.4	0.4	0.4	0.4	0.4	1.5	0.9
35 – 50	0.9	0.7	0.6	0.5	0.5	0.4	1.8	1.2
50 – 60	#	#	0.8	0.8	0.7	0.7	2.1	1.5

\# This range of loading not permissible.
D Nominal Pipe diameter
D less than 1200 mm not permitted, D more than 3600 mm as directed by the Superintendent.

Table 701.171

Pipe Type	Corrugated Metal		Corrugated Metal Pipe Arch		Other		
Nominal Diameter (D) or Width (mm)	Less than 2,400	Over 2,400	Less than 3,600	Over 3,600	Less than 600	600 to 1,800	Over 1,800
Clear space between rows	D/2	1.2 m	D/3	1.2 m	0.3 m	D/2	0.9 m

Table 701.291

Test	Minimum Frequency of Testing
Grading	One per 1000 tonnes or part thereof
Plasticity Index	One per 1000 tonnes or part thereof