# SPARK – North East Link – Primary Package

## Inspection and Test Plan (ITP)

ITP Title: Unbound Flexible Pavements

ITP Number: NEL-CNT-SDC-2990-PQA-ITP-0029 Rev 3

LOT Number: _____

Primary Asset Location Code: _____

Discipline: _____

**OFFICIAL: Sensitive**

**Spark NELP Approval Record**

| Function | Position | Name | Signature | Date |
|---|---|---|---|---|
| Prepared By | Quality Representative | Abiola Olulana | Abiola Olulana Digitally signed by Abiola Olulana Date: 2023.05.04 15:25:25 +10'00' | |
| Reviewed By | Project Engineer/Site Engineer | Ali Alfahdawi | Ali Alfahdawi Digitally signed by Ali Alfahdawi DN: CN=Ali Alfahdawi, OU=Spark NEL Users, DC=sparknel, DC=corp Date: 2023.05.05 11:58:01+10'00' | |
| Approved By | Quality Manager | Greg Iro | Greg Iro Digitally signed by Greg Iro Date: 2023.05.08 09:58:50 +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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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Subcontractor | 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<br>InEight Reference:<br>#_____ | |
| 1.2 | PE | Design status | PSDR Part F5, 2(b) & (c)(i) | Design to be IFC prior to works commencing | V | PW | NR | **HP** | NR | NR | IFC Drawings<br>InEight Reference:<br>#_____ | |
| 1.3 | SE | All Equipment calibrated | CQMP Plan Section 11.1 | Equipment calibration certificates filed in InEight<br><br>Ensure all equipment associated with the relevant works is calibrated | R | PW | **HP** | **HP** | NR | NR | Calibration Certificates<br><br>InEight Reference:<br>#_____ | |
| 1.4 | 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<br>InEight Reference:<br>#_____<br>Lot Map | |
| 1.5 | PE | Crushed Rock Mix Registration | VR812.04 RC500.02 IFC Drawings | All crushed rock proposed for use on VicRoads funded works shall be current registered mixes in accordance with VicRoads Code of Practice RC500.02 and conform to specified | V | PW | **HP** | **HP** | NR | NR | CRFI<br>InEight Reference:<br>#_____ | |

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| | | | | | | | Subcontractor | Spark NEL Engineer | Nominated Authority | IREA | | |
| | | | | requirements applicable to that class of product. Mixes registered by VicRoads as 'General' may be used in the construction of roadworks. Mixes registered as 'Conditional' may be used provided the conditions are complied with. Mixes registered as 'Experimental' shall only be used with written approval from Design (CRFI from CPS). | | | | | | | | |
| 1.6 | PE | Materials Conformance | VR 304.03, VR801, VR812 VR 811, VR 818, IFC Drawings | Material supplied complies with the Class of material required on the IFC drawing. Prior to the commencement of work, the Subcontractor shall nominate the material source from which the crushed rock and aggregate will be obtained. Material sources used in the production of crushed rock shall comply with the relevant requirements of Section 801 Source Requirements for the Production of Crushed Rock and Aggregates. Sand, Gravel and soft or ripped rock material shall meet the relevant requirements of Tables | V | PW | **HP** | **HP** | NR | NR | CRFI InEight Reference:<br><br>#_____<br>Grading Figures Material Delivery Dockets | |

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| | | | | | | | Subcontractor | Spark NEL Engineer | Nominated Authority | IREA | | |
| | | | | 811.041 and 811.042 and shall be free from vegetable matter and lumps or balls of clay or other deleterious matter. Verify conformance via CRFI to Design. | | | | | | | | |
| 1.7 | PE | Water Source | VR304.03 | Any water added to the pavement material must meet the following criteria:<br>Clean and substantially free from oils, salts, acids, alkalis and vegetable substances.<br>Maximum of 1000 mg/L of suspended solids.<br>Where dissolved salts are known or likely to be present, electrical conductivity less or equal 3500 µS/cm.<br>Potable water is exempt from these requirements. | V | PL | WP | WP | NR | NR | [ ] Test Results<br><br>[ ] Quantity of Water Added (L): _____ | |
| 1.8 | PE | Sub-Subcontractor(s) quality documents + Inspection Test Plan (if required) | CQMP Section 8.2.2.4 | Ensure Sub-subcontractor(s) have submitted signed ITP's and checklists along with all relevant supporting documents.<br>Ensure ITP Review Checklist is complete (only applicable to Sub-Subcontractors ITP). | V | PL | WP | WP | NR | NR | Approved Subcontractor's Quality Documentation | |
| **2.0** | **Operations (Include Work Execution – Installation / Manufacturing Process step-by-step)** | | | | | | | | | | | |

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| | **Lot No**:..... **Location**:..... **Ch**:..... **to**..... **Offset:**..... **to**..... **Layer**: | | | | | | | | | | |
| **Item No.** | **Resp. Person** | **Inspection and Test Activity** | **Specification Reference** | **Acceptance Criteria** | **Test Method** | **Test Frequency** | **Inspection/Verification (Name, signature & date)** | | | | **Records/Documents** | **Field Notes / Comments** |
| | | | | | | | **Subcontractor** | **Spark NEL Engineer** | **Nominated Authority** | **IREA** | | |
| 2.1 | SE | Subgrade Preparation | VR204, VR210, VR304.04 | Prior to placing subbase material, the subgrade shall meet the requirements of Section 204.<br><br>The subgrade has been prepared for placement and Earthworks Excavation ITP signed off.<br><br>Confirm that subgrade compaction testing, level conformance and proof roll have passed. | V | PW | **HP** | **HP** | NR | NR | [ ]Subgrade Lot Number:<br>_____ | |
| 2.2 | SE | Verify Conformance of Previous Layer | VR304.06, VR304.10, Table 304.101, IFC Drawings | Previous layer completed. Documentation available and complying.<br>1 Testing rolling -<br>2 Compaction testing<br>• Refer VicRoads 204 for subgrade,<br>• Table 304.101 (below) for previous controlled product layer<br>3. Level survey conformance, As-built Records for all lots immediately below this new layer. | R | PL | **HP** | **HP** | NR | NR | [ ]Subgrade Lot Number:<br>_____ | |
| 2.3 | SE | Placement of Material | VR 304.06 & VR304.08 & IFC Drawings | Material has been spread and compacted such that the material is properly mixed | V | PL | WP | WP | NR | NR | This ITP | |

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| | | | | | | | Subcontractor | Spark NEL Engineer | Nominated Authority | IREA | | |
| | | | | both transversely and longitudinally to produce a homogeneous material for each lot.<br><br>During compaction shall have a moisture content of not less than 85% of optimum.<br><br>Surface finish to be:<br>• Smooth and uniform.<br>• Free of segregated areas.<br><br>Base layer shall not exceed 150mm.<br>Sub-base layer shall not exceed 200mm | | | | | | | | |
| 2.4 | SE | Material of Nominal Size Greater than 40mm (if required) | VR304.08 (c) | The first lot shall be placed as a trial section. Following acceptance of the trial section, the Subcontractor shall then confirm the moisture control and compaction procedure and submit the procedure to the Nominated Authority for review and record. | V | X1 | **HP** | **HP** | **HP** | WP | HP Release InEight Reference:<br><br>#_____ | |
| 2.5 | SE | Jointing | VR304.07 | • Joints have been minimised.<br>• Transverse - Offset by >2m to any underlying pavement layers. | V | PL | WP | WP | NR | NR | This ITP<br>Lot Map showing construction joints | |

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| | | | | | | | Subcontractor | Spark NEL Engineer | Nominated Authority | IREA | | |
| | | | | • Longitudinal - Offset by >150mm to any underlying pavement layers.<br>• longitudinal joints shall be located within 300 mm of the planned position of traffic lanes lines or within 300 mm of the centre of a traffic lane. | | | | | | | | |
| 2.6 | SE | Testing – Stability (Proof Roll) | VR304.08<br>VR173 | During testing, material has a moisture content of >85% OMC.<br><br>The Subcontractor shall provide for the Nominated Authority to be present during all test rolling.<br><br>Testing frequency shall be in accordance with Appendix A of this ITP. | V | PL | **HP** | **HP** | **HP** | WP | HP Release InEight Reference:<br><br>#_____ | |
| 2.7 | SE | Post Compaction | VR173,<br>VR304.08, Table VR304.081<br>VR304.10, Table 304.101, Table 304.103<br>VR304.11, Table 304.111<br>IFC Drawings | During testing, material has a moisture content of >85% OMC<br>Any segregated areas have been rectified.<br>Tests performed using Modified compactive effort to Scale A. Six tests per lot.<br>Requirements:<br>Subbase Layers – CBR not less than 98% | V | X1 | **HP** | **HP** | NR | NR | NATA Compaction Report Number<br>_____ | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Subcontractor | Spark NEL Engineer | Nominated Authority | IREA | | |
| | | | | Base Layer - Characteristic Density Ratio not less than 100% directly beneath bituminous surface or 99% for other layers.<br><br>The test samples to be used for post-compaction grading and PI tests shall be a combined sample made up from six randomly selected increments extracted from the lot of pavement construction being assessed.<br>Post compaction PI for:<br>Class 1 Crushed Rock shall be between 2 and 6<br>Class 2 Crushed Rock shall be between 0 and 6<br>Class 3 Crushed Rock shall be between 0 and 10<br>Post compaction grading based on sieve analysis. See Table 304.101 for grading requirements. | | | | | | | |
| 2.8 | SE | Protection of Compacted Layer | VR304.09 | Surface of each compacted layer has been kept moist, in good order/condition & free from contamination until the subsequent pavement work is to commence. | V | PL | WP | WP | NR | NR | This ITP | |
| 2.9 | SE | Reuse of trimmed material (if required) | VR304.06 | Any material that has been compacted and then trimmed | V | X1 | **HP** | **HP** | WP | WP | WP Release InEight Reference: | |

| | |
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| | | | | | | | Subcontractor | Spark NEL Engineer | Nominated Authority | IREA | | |
| | | | | from the compacted surface to conform to the correct level or thickness as shown on the drawings shall not be re-used in the pavement construction without the approval of the Nominated Authority. | | | | | | | #_____ | |
| **3.0** | **Post Operations (Include Inspection and Testing)** | | | | | | | | | | | |
| 3.1 | SE | Survey Conformance | VR304.06 Design Management Plan NEL-CNT-SDC-2990-PDM-MPL-0001 Section 5.4 | Each pavement course has been finished to smooth and uniform surfaces, free of segregated areas, and conforming to the limits for level, line, grade, thickness and cross section shown on the drawings or as specified.<br>• Width and Alignment:<br>Is not less than the specified offset width or >50mm outside when measured at right angle from the design line<br>Shape:<br>Surface does not vary by >8mm from a 3m straight edge, or 10mm from a 6m straight edge, placed in any direction. Water cannot pond on the surface of any pavement layer.<br>The surface level of the pavement courses has been | V | PL | WP | WP | NR | NR | As-Built Survey Report InEight Reference:<br><br>#_____ | |

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| | | | | | | | Subcontractor | Spark NEL Engineer | Nominated Authority | IREA | | |
| | | | | measured in accordance with the requirements of Scale A (80pts per lol less than 4000m2)<br>Surface Level – Scale A:<br>Lower Subbase<br>Range (mm) +6 to -10<br>Max. S (mm) 10<br>Upper Subbase<br>Range (mm) +4 to -8, Max. S (mm) 8<br>Base<br>Range (mm) +5 to -5, Max. S (mm) 8 | | | | | | | | |
| 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 | 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 as possible after they are received. Completed construction lot records are | V | PL | **HP** | **HP** | NR | NR | This ITP<br>Lot Record | |

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| | | | | | | | Subcontractor | Spark NEL Engineer | Nominated Authority | IREA | | |
| | | | | transferred to the project Quality Team for final record verification prior to being closed | | | | | | | | |
| **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 |
|---|---|---|---|---|---|
| SS: Site Supervisor<br>SE: Site Engineer<br>PE: Project Engineer<br>SPE: Senior Project Engineer<br>GE: Geotechnical Engineer<br>PS: Project Surveyor | PSM: Project Systems Manager<br>QSR: Quality Site Rep.<br>STR: Structural Engineer<br>SSR: Site Safety Rep.<br>EMR: Environmental Management Rep.<br>NA: Nominated Authority (Release of HP)<br>IREA: Independent Reviewer (Observer) | V: Verify<br>I: Inspection<br>R: Review<br>T: Test | HP: Hold Point<br>WP: Witness Point<br>NR: Not Required | PW: Prior to Works<br>PL: Per Lot<br>F: Full or 100% Inspection or Testing<br>X1: Inspect or Test at Specified Frequency<br>X2: Random Inspection or Test | QP: Quality Plan<br>RFI: Request for Information<br>NCR: Non-Conformance<br>VC: Verification Checklist<br>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:** _____

**Appendix A**

*** **Table 304.103 Post-Compaction Requirements for Plasticity Index**
## in the table below, delete all # symbols - Limits after # symbols may be changed if required:

| Material | Plasticity Index | |
|---|---|---|
| | Minimum | Maximum |
| Class 1 Crushed Rock | 2 | 6 |
| Class 2 Crushed Rock | 0 | 6 |
| Class 3 Crushed Rock | 0 | 10 |
| Gravel, Sand or Ripped Rock Base Material | 2 | ##:6 |
| Gravel, Sand or Ripped Rock Upper Sub-base Material | 2 | ##:12 |

**Table 304.081 Acceptance Limits for Scale A and Scale B Standards of Compaction**

| Compaction Scale | Characteristic Density Ratio % (six tests) | | | |
|---|---|---|---|---|
| | Lower Subbase Layers | Upper Subbase Layers | Base Layers | |
| | | | Layer directly beneath the Bituminous Surfacing | Other Layers |
| A | Not less than 98.0 | Not less than 98.0 | Not less than 100.0 | Not less than 99.0 |
| B | Not less than 97.0 | Not less than 97.0 | Not less than 98.0 | Not Less than 98.0 |

**Table 304.101 Post-Compaction Grading Requirements for Crushed Materials**

| Sieve Size (mm) | Post-Compaction Grading Limits (% Passing by Mass) | | |
|---|---|---|---|
| | Class 1 or Class 2 Crushed Rock Crushed Scoria Base Class CC2 Crushed Concrete | Class 3 Crushed Rock Crushed Scoria Upper Subbase Crushed Concrete Class CC3 | |
| | Nominal Size (mm) | Nominal Size (mm) | |
| | 20 | 20 | 40 |
| 53.0 | - | - | 100 |
| 37.5 | - | - | 95 - 100 |
| 26.5 | 100 | 100 | 75 - 95 |
| 19.0 | 95 – 100 | 95 – 100 | 64 - 90 |
| 13.2 | 78 – 92 | 75 - 95 | - |
| 9.5 | 63 – 83 | 60 – 90 | 42 - 78 |
| 4.75 | 44 – 64 | 42 – 76 | 27 - 64 |
| 2.36 | 30 – 49 | 28 – 61 | 20 - 51 |
| 0.425 | 14 – 23 | 14 – 29 | 10 - 24 |
| 0.075 | 6 – 12 | 6 – 14 | 6 - 13 |

*** **Table 304.111 Maximum Lot Size and Minimum Frequency of Testing for Compaction, Post-compaction Grading and PI (after passing the minimum number of qualifying lots)**

## in the table below, the limit after # symbol may be changed if required

:## in the table below, at the * symbol, strikethrough if further PI testing is not required after the first lot is accepted for PI:

| Pavement Layer | Maximum Allowable Lot Size for a Single Layer of Work | Minimum Frequency of Testing for Compaction | Minimum Frequency of Testing for Scale A Post-compaction Grading | Minimum Frequency of Testing for Scale A Post-compaction PI |
|---|---|---|---|---|
| Upper Base Layer | The lesser of ##:4000 $m^2$ or one day's production | One per ##:2 lots | One per ##:2 lots | One pair per ##:4 lots |
| Lower Base Layer | The lesser of ##:4000 $m^2$ or one day's production | One per ##:2 lots | One per ##:2 lots | * One pair per ##:8 lots |
| Upper Subbase | The lesser of ##:4000 $m^2$ or one day's production | One per ##:2 lots | One per ##:4 lots | * One pair per ##:8 lots |
| Lower Subbase | The lesser of ##:4000 $m^2$ or one day's production | One per ##:2 lots | | |