SPARK – North East Link – Primary Package

Inspection and Test Plan (ITP)

ITP Title: General Concrete (Footpath, Driveway, Median / Island Pavement)

ITP Number: NEL-CNT-SDC-2990-PQA-ITP-0074 Rev 0

LOT Number: _____

Primary Asset Location Code: _____

Discipline: Civil Works

Spark NELP Approval Record

Function	Position	Name	Signature	Date
Prepared By	Quality Representative	Joe Failla	Joe Failla Digitally signed by Joe Failla DN: C=AU, O=SPARK, E=joe.failla@sparknel-dc.com.au, CN=Joe Failla Date: 2022.08.02 10:14:01+10'00'	
Reviewed By	Project Engineer	Domenic Ciccone	Domenic Ciccone Digitally signed by Domenic Ciccone DN: C=AU, O=SPARK, E=domenic.ciccone@sparknel-dc.com.au, CN=Domenic Ciccone Date: 2022.08.02 10:39:07+10'00'	
Approved By	Quality Manager / Senior Quality Advisor	Joe Failla	Joe Failla Digitally signed by Joe Failla DN: C=AU, O=SPARK, E=joe.failla@sparknel-dc.com.au, CN=Joe Failla Date: 2022.08.02 10:45:11+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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Project: SPARK – North East Link Primary Package **Client:** State of Victoria and the North East Link State Tolling Corporation

ITP Title: General Concrete (Footpath, Driveway, Median / Island Pavement)

Description:

References:
NEL-CNT-CDO-2100-CTW-DPK-1000

Standards: VicRoads 703, AS 1379, AS 3610, VR 812, VR 610, AS 4671, AS 1379, AS 3798, VR 611

ITP No: NEL-CNT-SDC-2990-PQA-ITP-0074 **Rev No**: 0

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

Item No.	Responsible Person	Inspection and Test Activity	Specification Reference	Acceptance Criteria	Test Method	Test Frequency	Inspection/Verification (Name, signature & date)				Records/Documents	Field Notes / Comments
							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	IFC Drawings issued	IFC Drawings	IFC Drawings, approved plans, technical specification must be issued for construction	V	PW	NR	**HP**	NR	NR	InEight Reference Document #	
1.2	PE	All Equipment Calibrated	QMP	Equipment calibration NATA certificates filed in InEight Document. Prior performing inspections, measuring and testing tasks, ensure equipment is calibrated, if damaged or out of calibration, the user will immediately tag it "out of service" and arrange for repairs / calibration.	IP	PW	NR	**HP**	NR	NR	InEight Reference Document #	
1.3	PE	Premixed Concrete	VR 703.05 IFC Drawing	Concrete / Footpath Pavement Material to be in accordance with design requirements	R	PW	NR	WP	NR	NR	Concrete Mix Design	
1.4	PE	Survey Set-out	VR 703.17 IFC Drawings	Clearly mark limit of works; Chainage, offsets, cut/fill level etc. (if required).	V	PW	NR	WP	NR	NR	InEight Document References: Lot Map	
1.5	PE	Construction Procedure Submission	QMP	Construction Procedure submitted and in place and all required permits from the Safety and Environmental team are obtained.	R	PW	NR	WP	NR	NR	Signed ITP	

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
2.0	**Operations (Include Work Execution – Installation / Manufacturing Process step-by-step)**											
2.1	SE	Setting Out	VR 703.17 PSDR (section 9 a))	The Nominated Authority will review and confirm the set out. The work shall be constructed in accordance with the confirmed set out to the line and level and cross-sectional profiles as shown on the IFC drawings.	V	PW	NR	WP	**HP**	WP	InEight Survey Report References: Photos	
2.2	SE	Excavation and Foundation	VR 703.20	The Contractor shall box out to a sufficient depth to allow for the required compacted thickness of bedding material under the full width of concrete paving. Excavation not to extend more than 150mm from the adjacent face of existing pavement.	V	PL	NR	WP	NR	NR	Signed ITP	
2.3	SE	Bedding materials and compaction	VR 812.12 VR 703.21 IFC Drawings AS 3798	Bedding material shall be compacted 20mm Class 3 or Class 4 Crushed Rock to 98% standards compaction unless shown otherwise on the drawings Material properties, testing and testing frequency shall be in accordance with section 812.12	IP	PL	NR	WP	NR	NR	NATA Test Reports	
2.4	SE	Bedding depths (compacted)	VR 703.21 (a) (c) IFC Drawings	(a) Edgings: Where not constructed over pavement layers, bedding not less than 100 mm compacted. (c) Footpaths and other Surfacing: ▫ Bedding not less than 100 mm compacted.	IP	PL	NR	WP	NR	NR	Material Delivery Docket	

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References:
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Standards: VicRoads 703, AS 1379, AS 3610, VR 812, VR 610, AS 4671, AS 1379, AS 3798, VR 611

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
				▫ Bedding trimmed to appropriate levels, moistened as necessary, and firmly compacted.								
2.5	SE	Ambient weather for concreting	VR 703.09 VR 610.17 (a)(b)(c) (d) VR 610.13	Restrictions and treatments to be applied for concreting in hot, cold and wet weather. The temperature of concrete, measured immediately prior to placing, shall not be less than 10˚C or greater than 32˚C. Ambient temperature not to be less than 5˚C and no more than 35˚C.	V	PL	NR	WP	NR	NR	Signed ITP QC Checklist	
2.6	SE	Steel reinforcing grade and placement	VR 703.13, VR 611 PSDR Part B Section 17.4	1/ Steel reinforcement shall comply with the relevant requirements of AS/NZS 4671 2/ Galvanising where specified shall be in accordance with the requirements of AS/NZS 4680 3/ Minimum cover shall be 50 mm unless shown on the drawings 4/ Concrete or plastic chairs to be used. Wire chairs (with or without plastic tips), bricks, pieces	V	PL	NR	WP	NR	NR	Reinforcement Steel Delivery Dockets Product Conformity Certificate QC Checklist	
2.7	SE	Formwork	VR 703.12 AS 3610.1 2018 (TableC2)	Construction and stripping of formwork shall comply with the relevant requirements of AS3610. Joints in formworks shall be constructed such that loss of mortar is prevented.	V	PL	NR	WP	NR	NR	Signed ITP QC Checklist	

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ITP Title: General Concrete (Footpath, Driveway, Median / Island Pavement) **Description:**	**References:** NEL-CNT-CDO-2100-CTW-DPK-1000 **Standards:** VicRoads 703, AS 1379, AS 3610, VR 812, VR 610, AS 4671, AS 1379, AS 3798, VR 611
	ITP No: NEL-CNT-SDC-2990-PQA-ITP-0074 **Rev No**: 0
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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
				Stripping of Formwork after casting shall not be less than: ▫ 2 days (Between 12˚C & 20˚C). ▫ 1 day (> 20 ˚C). ▫ 3 days (Between 5˚C & 12˚C). Minimum time shall also not be less than: a). 2 days for vertical formwork on external surfaces and, b). 1 day for vertical forms on permanently hidden surfaces.								
2.8	SE	Concrete Placing, Compacting	IFC Drawings AS 1379 VR 703.01 VR 703.08 VR 610.121 VR 703.11	Concrete strength to comply with detail on IFC drawings and AS1379 Concrete shall be thoroughly compacted by means of continuous tamping and internal vibration and shall be worked around any embedment and into corners of formwork or excavations to produce a dense concrete free from voids. Workable concrete mixes are exempt from vibration requirement. **Minimum testing requirements for aggregates to comply to VR Table 610.121 and VR 703.11**	IP	X1	NR	WP	NR	NR	NATA Test Result Delivery Docket QC Checklist	
2.9		Surface Finish	VR 703.25 (a) (b) IFC Drawings	Footpaths, and other surfacings: Finish with a wooden float to produce a lightly textured non-skid surface. Compact with internal vibration and worked until mortar comes to the top.	IP	PL	NR	WP	NR	NR	Signed ITP QC Checklist	

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Standards: VicRoads 703, AS 1379, AS 3610, VR 812, VR 610, AS 4671, AS 1379, AS 3798, VR 611

ITP No: NEL-CNT-SDC-2990-PQA-ITP-0074 **Rev No**: 0

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
	SE			Edgings: All edgings shall be rendered and have a steel trowel finish. Rendering applied within 30 minutes of placing or extruding concrete. Thickness not exceeding 3 mm. Mortar shall be 2 parts fine aggregate, 1 part cement & sufficient water to produce suitable consistency Surface finish to comply to VR 703.25. All discoloured concrete shall be cleaned or replaced.								
2.10	SE	Jointing between concrete elements	VR 703.26	Transverse joints shall be constructed at right angles to the back of edgings and the edge of footpaths and shared use paths. Joints in footpaths and shared use paths shall align with joints in adjacent edgings. a). Edgings (i) Transverse joints & expansion joints (ii) Expansion joints & control joints b). Footpaths, other Surfacing and Shared Use Paths (i) Expansion Joints (ii) Control Joints (c) Details on de-bonding methods Sawcut or tooled joints shall be provided at maximum 2m centres to all footpaths or pedestrian paving. A 19mm	V	PL	NR	WP	NR	NR	Signed ITP QC Checklist	

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
				expansion joint shall be provided where rigid pavements abut fixed structures or at max 15m centres to footpaths.								
2.11	SE	Curing of concrete	VR 703.10 (a), (b)	Exposed concrete surfaces shall commence curing treatment immediately after finishing operations are progressively completed and shall continue uninterrupted for a period of not less than 7 days (a) General (b) Geopolymer concrete	IP	PL	NR	WP	NR	NR	Signed ITP QC Checklist	
2.12	SE	Marking of Conduit Positions	VR 703.28	Existing conduits passing under edgings shall be marked by a chase in the edge immediately above the conduit together with a suitable identification mark.	V	PL	NR	WP	NR	NR	Photos	
2.13	SE	Tolerances on line, level, and shape	VR 703.15	All surfaces shall be finished in conformity with the lines, grades, thicknesses and cross sections shown on the drawings or as specified, within the following limits: (a) Paving within 5mm (b) Departure of finished work from line & level shall not exceed 10mm at any point (c) Section dimensions overall width shall not exceed >15mm	V	PL	NR	WP	NR	NR	Tick Off to confirm compliance as per the required acceptance criteria: (a) Paving [ ] (b) Finished work [ ] (c) Dimension [ ] (d) Median Surface [ ]	

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
				(d) Median surfacing cross fall between 1% and 3% towards the edges							QC Checklist	
2.14	SE	Concrete repairs	VR 703.08 VR 703.30 Crack Repair Procedure	Any concrete repairs shall be carried out using a method and materials accepted by the Superintendent.	V	PL	NR	WP	**HP**	WP	Crack Repair Procedure QC Checklist	
3.0	**Post Operations (Include Inspection and Testing)**											
3.1	PE	Red-Line	VR 703.15 IFC Drawings	▫ Ensure As-Built survey is compared within the required tolerance to Design specification. ▫ Ensure all locations and work area highlighted as per Construction Lot in Work Lot Map.	V	PL	NR	WP	NR	NR	Red-Line Mark-Up Drawings	
3.2	PE	Final Inspection Site Walk	QMP	Ensure at the end of each work conducted that Quality Control conduct an Inspection walk with Engineer to identify potential defects.	IP	PL	NR	WP	**HP**	WP	[ ] Surveillance Report [ ] Punch List Report	
3.3	PE	RFI's, DRFI's & DCN's	QMP DMP	▫ Ensure all Design Change(s) are noted within the scope of the Construction Lot. ▫ Link all relevant RFI's included only to the specific Construction Lot.	V	PL	NR	WP	NR	NR	[ ] RFI's InEight Reference Form #	

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
				▫ Ensure RFI's are closed out prior to Construction Lot close out.								
3.4	PE	NCR Close out	QMP	All NCR's presented for closure	V	PL	**HP**	**HP**	**HP**	WP	[ ] NCR InEight Reference Form #	
4.0	**Quality**											
4.1	QSR	Identification and control of non-conforming products or services (if applicable)	CQMP	Review and confirm closure of NCR's and associated RFI's prior to closing of construction lot	R	PL	NR	**HP**	NR	NR	NCR closed with related documentation	
4.2	QSR	Check all quality records for lot closure	CQMP	All applicable quality records are complete	R	PL	NR	**HP**	NR	NR	Compiled documents (all data reports and records)	

Legend:

Responsibility		Method	Inspection / Verification	Test Frequency	Other
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

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							Sub-Contractor	Spark NEL Engineer	Nominated Authority	IREA		
Supplier/Subcontractor: (If applicable)		**Name**		**Signature and Date**	**Spark-NELPP REP**		**Name**					**Signature and Date**

Lot closure comments:

Spark NELP QA Rep:

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

Quality Control Checklist

Process: General Concrete Checklist		
Lot No.	**ITP No.**	**Date opened:**

**Where possible record actual results achieved, e.g. density test numbers, measured dimensions, test pressure etc*
***ITP nominates who may release HP/WP. This should be transferred into the 'Initials' box to ensure the correct people are releasing*

No.	Inspection / Test Point	Result*	Pass/Fail	Hold/Witness Point Release**		NCR # (if req'd)
				Initials	Date	
1.0 Pre-Pour Concrete Inspection Concrete pre-pour check completed in accordance with applicable procedures, drawings, specifications and approved changes						
1.1	Concrete supply	**Concrete Mix on Docket Checked.** All concrete delivered has a delivery docket. Tester onsite. Visual assessment of quality.	☐Yes ☐No	(WP)		
1.2	Ambient weather for concreting	Restrictions and treatments to be applied for concreting in hot, cold and wet weather. The temperature of concrete, measured immediately prior to placing, shall not be less than 10˚C or greater than 32˚C. Ambient temperature not to be less than 5˚C and no more than 35˚C.	☐Yes ☐No	(WP)		
1.3	Steel reinforcing grade and placement	Minimum cover shall be 50 mm unless shown on the drawings Concrete or plastic chairs to be used. Wire chairs (with or without plastic tips), bricks, pieces	☐Yes ☐No	(WP)		
1.4	Formwork	<u>Stripping of Formwork after casting shall not be less than:</u> ▫ 2 days (Between 12˚C & 20˚C). ▫ 1 day (> 20 ˚C). ▫ 3 days (Between 5˚C & 12˚C). <u>Minimum time shall also not be less than:</u> a). 2 days for vertical formwork on external surfaces and, b). 1 day for vertical forms on permanently hidden surfaces.	☐Yes ☐No	(WP)		
2.0 Concrete Placement Concrete Pour completed in accordance with applicable procedures, drawings, specifications and approved changes						
2.1	Concrete Placing, Compacting	Concrete shall be thoroughly compacted by means of continuous tamping and internal vibration and shall be worked around any embedment and into corners of formwork or excavations to produce a dense concrete free from voids. Workable concrete mixes are exempt from vibration requirement. **<u>Minimum testing requirements for aggregates to comply to VR Table 610.121 and VR 703.11</u>**	☐Yes ☐No	(WP)		

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Inspection / Test Point</th><th rowspan="2">Result*</th><th rowspan="2">Pass/Fail</th><th colspan="2">Hold/Witness Point Release**</th><th rowspan="2">NCR # (if req'd)</th></tr>
<tr><th>Initials</th><th>Date</th></tr>
<tr><td></td><td></td><td>
Table 610.121
<table>
<tr><th>Test</th><th>Minimum Frequency of Testing</th></tr>
<tr><td>Grading of Fine Aggregates</td><td>On each day one per 500 tonne or part thereof</td></tr>
<tr><td>Grading of Coarse Aggregates</td><td>On each week one per 1500 tonne or part thereof</td></tr>
<tr><td>Water Absorption of Fine and Coarse Aggregates</td><td>At 3 monthly intervals</td></tr>
<tr><td>Unsound Rock Content</td><td>On each day one per 500 tonne or part thereof</td></tr>
<tr><td>Flakiness Index of Coarse Aggregate 10 mm and Larger</td><td>At monthly intervals</td></tr>
<tr><td>Degradation Factor of Crusher Fines</td><td>At monthly intervals</td></tr>
<tr><td>Organic Impurities other than sugar</td><td>At monthly intervals</td></tr>
<tr><td>Alkali Reactivity of Aggregate Sources</td><td>At 3 yearly intervals</td></tr>
<tr><td>Wet and Dry Strength and Sodium Sulphate Soundness for Pebble Aggregates</td><td>At 3 monthly intervals</td></tr>
</table>
Table 703.11
<table>
<tr><th>Portland Cement Concrete Strength Grade</th><th>Geopolymer Binder Concrete Strength Grade</th><th>Minimum Compressive Strength at 28 days (MPa)</th></tr>
<tr><td>N20</td><td>20</td><td>20</td></tr>
<tr><td>N25</td><td>25</td><td>25</td></tr>
<tr><td>N32</td><td>32</td><td>32</td></tr>
<tr><td>VR330 / 32</td><td>32</td><td>32</td></tr>
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<tr><th>Initials</th><th>Date</th></tr>
<tr><td>2.2</td><td>Testing</td><td>Compressive Strength Testing

3 cylinders (1 x 7day, 2 x 28 Day) taken for each sample, minimum no. of samples:

Where less than 50 m³ is provided for any one day then one sample shall be tested of each strength grade.

Slump (AS 1379-2007)

<table><tr><th>Specified Slump, mm</th><th>Tolerance, mm</th></tr><tr><td>< 60</td><td>±10</td></tr><tr><td>≥ 60 ≤ 80</td><td>±15</td></tr><tr><td>>80 ≤ 110</td><td>±20</td></tr><tr><td>>110 ≤ 150</td><td>±30</td></tr><tr><td>>150</td><td>±40</td></tr></table></td><td>☐ Yes ☐ No</td><td>(WP)</td><td></td><td></td></tr>
<tr><td colspan="8">3.0 Post Pour Check Post Pour Check completed in accordance with applicable procedures, drawings, specifications and approved changes</td></tr>
<tr><td>3.1</td><td>Surface Finish</td><td><u>Footpaths, and other surfacings:</u> Finish with a wooden float to produce a lightly textured non-skid surface. Compact with internal vibration and worked until mortar comes to the top.

<u>Edgings:</u> All edgings shall be rendered and have a steel trowel finish. Rendering applied within 30 minutes of placing or extruding concrete. Thickness not exceeding 3 mm. Mortar shall be 2 parts fine aggregate, 1 part cement & sufficient water to produce suitable consistency

Surface finish to comply to VR 703.25.

After finishing, all work shall present a consistently neat appearance of uniform colour. <u>All discoloured concrete shall be cleaned or replaced.</u></td><td>☐ Yes ☐ No</td><td>(WP)</td><td></td><td></td></tr>
<tr><td>3.2</td><td>Jointing between concrete elements</td><td>Transverse joints shall be constructed at right angles to the back of edgings and the edge of footpaths and shared use paths. Joints in footpaths and shared use paths shall align with joints in adjacent edgings.
<u>a). Edgings</u>
(i) Transverse joints & expansion joints
(ii) Expansion joints & control joints
<u>b). Footpaths, other Surfacing and Shared Use Paths</u>
(i) Expansion Joints
(ii) Control Joints
<u>(c) Details on de-bonding methods</u>
Sawcut or tooled joints shall be provided at maximum 2m centres to all footpaths or pedestrian paving. A 19mm expansion joint shall</td><td>☐ Yes ☐ No</td><td>(WP)</td><td></td><td></td></tr>
</table>

No.	Inspection / Test Point	Result*	Pass/Fail	Hold/Witness Point Release**		NCR # (if req'd)
				Initials	Date	
		be provided where rigid pavements abut fixed structures or at max 15m centres to footpaths.				
3.3	Curing of concrete	Exposed concrete surfaces shall commence curing treatment immediately after finishing operations are progressively completed and shall continue uninterrupted for a period of not less than 7 days (a) General (b) Geopolymer concrete **Concrete edgings** which shall be cured for a period of not less than three days after placing the concrete. The curing compound shall be applied in two coats using a fine spray at the rate stated on the certificate of compliance. The curing membrane shall be maintained intact for not less than the specified period of curing. Any damage to the curing membrane during the period of curing shall be repaired immediately at the original rate of application.	☐Yes ☐No	(WP)		
3.4	Tolerances on line, level, and shape	All surfaces shall be finished in conformity with the lines, grades, thicknesses and cross sections shown on the drawings or as specified, within the following limits: (a) Paving within 5mm (b) Departure of finished work from line & level shall not exceed 10mm at any point (c) Section dimensions overall width shall not exceed >15mm (d) Median surfacing cross fall between 1% and 3% towards the edges	☐Yes ☐No	(WP)		
4.0 Completion						
4.1	Inspection of repairs	Patch repairs conducted as per relevant ITP and procedure, where required	☐Yes ☐No ☐N/A	(**HP**)		
4.2	Concrete repairs	Any concrete repairs shall be carried out using a method and materials accepted by the Superintendent.	☐Yes ☐No	(**HP**)		
4.3	Crack Monitoring	Cracks greater than acceptable widths as per PSDR (section 16.1(e)) are mapped and repaired in accordance with VR 687 and approved methodology specific to location. Cracks requiring repairs monitored.	☐Yes ☐No ☐N/A	(**HP**)		

Comments:

□ PSDR (section 16.1 (e)) – for corresponding Exposure Classification

a). 0.25mm for exposure classification B2, C1, C2 or U

b). 0.30mm for exposure classification B1 ***(** section 16.1(e) supersedes crack widths in VR610 Table 610.241)***

Work Completed:

Activity Owner Sign Off: ..... Position: .....

Lot Qty: ..... Units: ..... Date: .....