**Inspection and test plan – PAINTING & ANTI CARBONATION COATING**

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| **Project no.** | | CC-0374 | **Project name** | Pakenham rd Upgrade | | **Date** |  | | **Approved by** | Reuben Samuels |
| **ITP no.** | 1630-P200-SYM-QAC-ITP-0067 | | **Revision date** | 5/08/2024/2024 | **Plant and equipment used** | | |  | | |
| **Lot no.** |  | | **Location (chainages, detailed description or marked up plan)** | | | | |  | | |

Attach Dockets, Certificates and QA Documents to ITP

|  | |  |  |  |  | **Verification of acceptance by** | | | | | | **Remarks/record (eg. Test frequency reports, certificates, checklist etc)** |
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|  | |  |  |  |  | **Symal** | | | **Superintendent** | | |
| **Item no.** | | **Activity** | **Ref docs** | **Acceptance criteria** | **Freq** | **Key** | **Resp** | **Initial/ date** | **Key** | **Sign/ date** | |
| **1.0 Pre-start activities** | | | | | | | | | | | | |
| **1.1** | | **Safety**  Ensure that the following items have been actioned:  - SWMS if applicable  - Plant Pre-start Inspection  - Service locations identified  - Traffic Management Plans (if required)  - All staff inducted | SMP | SWMS/WMS submitted reviewed and accepted if required.  Plant inspections completed and entered.  TSA training completed. Pre-work briefings completed.  Service Diagrams available and services located. | Once  (Pre-Start) | **H** | SE |  |  |  | |  |
| **1.2** | | Relevant Permits Required | SMP | |  |  | | --- | --- | | Permit to Work. | **□** | | WFH Permit | **□** | | Prior to start of works | **H** | SE |  |  |  | |  |
| **1.3** | | Define lot | VR 686 | Location & Application of Coating | Prior to start of works |  | SE |  |  |  | | Per Element |
| **1.4** | | Approval of process | 686.04 | The Contractor shall submit for review by the Superintendent not less than twenty-one (21) days prior to the commencement of the coating works, details of the concrete coating operations including information on the proposed coatings and primers, surface treatments, decorative/anti-carbonation coatings, substrate preparation, method of application, equipment, and operators, demonstrating compliance with the requirements of this specification. | Prior to start of works | **H** | SE |  | **H** |  | | Material Data Sheet  Previous product test results/ Performance |
| **1.5** | | **Material Approval** | **686.04** | **Concrete coating works shall not take place until the Contractor's proposed materials and procedures and surface preparation in accordance with Clause 686.06 have been reviewed and accepted by the Superintendent.** | Prior to start of works | **H** | **SE** |  | **H** |  | | AP…………………………………. |
| **2.0 Protective and Decorative coating systems** | | | | | | | | | | | | |
| **2.1** | | General requirements | 686.05 | The protective or decorative coating system shall be water or acrylic based and solvent free./The protective or decorative coating system shall be clear or pigmented coating to a VicRoads Grey colour, or a combination of these. All coats in the system or separate coatings/treatments making up the system shall be physically and chemically compatible with each other. | Each lot | S | SE |  |  |  | | Vic roads Grey |
| **2.2** | | Guaranteed Outdoor exposure | 686.05 | The Contractor shall supply the Superintendent with a certificate from the manufacturer in the form of a guarantee confirming that the coating system and materials comply with the requirements of this section, including a guaranteed outdoor exposure life of not less than ten (10) years prior to the need for re-coating. | Each lot | **H** | SE |  |  |  | | COC 10 Years Warranty |
| **2.3** | | Coating system Requirements | 686.05(a) | The coating system shall be capable of withstanding cleaning with hot water, in the range of 40°C to 50°C, detergent and scrubbing action without loss of adhesion, softening, or changing in colour or gloss.  Coating systems applied to highly porous and/or relatively soft concrete substrates shall include a high-quality pore-filling primer coat or sealer to be applied prior to the application of at least two coats of the protective or decorative part of the overall coating system. The primer and/or the coating system as a whole shall also offer surface binding and toughening effect.  **The Contractor shall provide evidence as to the compatibility of the proposed coating system to the nominated substrate. Such evidence shall include but not be limited to test certificates from a AS ISO/IEC 17025 accredited testing laboratory**.  Where a primer, undercoat or sealer is required as an integral part of the coating the primer, undercoat or sealer shall be a different colour to that of the final nominated colour and shall be in accordance with AS 2700. | Each lot | S | SE |  |  |  | | Test certificates.    MDS |
| **2.4** | | Applied Coating system requirements. | 686.05  AS 1580.408.5  ASTM D 4262-83:2005. | The applied coating system shall also satisfy the following requirements:  **(i)** bond strength greater than 0.75 MPa when tested fourteen (14) days after application in accordance with AS 1580.408.5;  **(ii)** ability to bridge cracks up to 0.3 mm wide;  **(iii)** ability to be recoated within 24 hours;  **(iv)** have minimum pot life of 1 hour;  **(v)** not to sag or run when applied correctly to vertical surfaces;  **(vi)** compatibility to an alkaline surface in accordance with ASTM D 4262-83:2005. | Each lot | S | SE |  |  |  | | Test Certificates |
| **2.5** | | Performance Requirements for Decorative/Anti-Carbonation Coatings | 686.05  AS/NZS 2311  Clause 686.05(a)  Table 686.051  AS/NZS 4548.5 and  AS 1580.108.2 | Where required, concrete surfaces shall be painted with at least two coats of an approved decorative/anti-carbonation coating system (VicRoads Grey or approved alternative colour) in accordance with AS/NZS 2311 and the manufacturer’s specification to achieve a uniform colour and texture. The primer which forms an integral part of the coating system shall be applied onto the concrete substrate prior to the application of subsequent coats of the approved decorative/anti-carbonation coating. If a uniform colour and texture is not achieved the Contractor shall take remedial measures at his own expense to produce the required surface finish.  In addition to the general requirements of Clause 686.05(a), approved coatings shall also satisfy the minimum performance criteria shown in Table 686.051, as determined by testing in accordance with the requirements of AS/NZS 4548.5 and AS 1580.108.2. | Each lot | S | SE |  |  |  | | Test Certificates |
| **3.0 Trial application** | | |  |  |  |  |  |  |  |  | |  |
| **3.1** | General | | 686.06, 686.07, 686.11, 686.14, and 686.15 | A trial application of the coating system, including any primers and undercoats shall be conducted on a test area of the actual substrate of not less than 10 m² or a test panel made from the same substrate, fourteen (14) days prior to the commencement of coating work. The test area or test panel shall be prepared and coated by the Contractor to satisfy the requirements of Clauses 686.06, 686.07, 686.11, 686.14, and 686.15, and in accordance with the material manufacturer’s recommendations. | Each lot | W | SE |  |  |  | |  |
| **3.1** | **Review of trial** | | **686.13** | **The Contractor shall not proceed with the full-scale coating works until the trial coating application has been carried out and the outcomes reviewed and approved by the Superintendent.** | **Each lot** | **H** | **SE** |  | **H** |  | | Record of testing Sample |
| **3.2** | Event of trial failure | |  | In the event that the trial application is rejected, the Contractor shall remove and dispose of any work deemed as unacceptable by the Superintendent, submit a new proposal to rectify the deficiencies (including prequalification testing of any new materials/methods) and repeat the trial application as described above. Any delays caused through rejection shall not constitute justification for extension of time. | Only in event of failure | W | SE |  |  |  | |  |
| **4.0 Surface preparation** | | | | | | | | | | | | |
| **4.1** | | General | VR 686(a) | The surface preparation shall be in accordance with the manufacturer’s recommendations for the coating system to be applied and as specified in this section. | Each lot | S | SE |  |  |  |  | |
| **4.2** | | Uncoated concrete preparation | VR 686(b)  AS 1627.1  AS 1627  VR 689 | Concrete surfaces shall be dry unless otherwise approved by the Superintendent, and shall be free from oil (e.g. from release oils), grease, laitance and loose particles, remnants of curing compounds and organic contaminants (i.e. moss, algae etc). The concrete surface shall be prepared by high pressure jetting with potable water, either with or without added abrasive (i.e. up to 3000 psi or 20.7 MPa), steam cleaning, wire brushing, abrasion with angle grinder, or by other means to provide a strong, hard surface. Areas of persistent contamination shall be removed from the surface by the use of appropriate solvents or detergents followed by washing with potable water in accordance with AS 1627.1. Any abrasive blast cleaning shall be carried out in accordance with AS 1627.4 and other AS 1627. Any other OH&S and Environmental regulations imposed by the local government authority and the EPA. | Each lot | S | SE |  |  |  |  | |
| **4.3** | | Uncoated concrete with defects Preparation | VR 686  VR 689 | Any blow holes, areas of honeycombing, loose surface layers and weak concrete, shrinkage cracks of width less than 0.2 mm or other defects, either revealed by a grinding process or exposed by other surface preparation methods, shall be filled with a suitable fairing coat cementitious repair material in accordance with the requirements of Section 689. If the surface of the concrete is weak, more material shall be removed and repaired in accordance with the requirements of Section 689. Such repairs shall be sufficient to result in a strong, sound substrate suitable for the intended protective or decorative coating system.  Projecting fins, rough spots and sudden steps shall be removed by light abrasion with an angle grinder to provide a surface which can be easily coated.  Inactive cracks of width equal to or greater than 0.20 mm shall be sealed by resin injection in accordance with Section 687. Active cracks equal to or greater than 0.20 mm shall be treated by methods approved by the Superintendent and in accordance with Section 687. | Each lot | W | SE |  |  |  | |  |
| **5.0 Method of application** | | |  |  |  |  |  |  |  |  | |  |
| **5.1** | | Dry concrete surfaces | 686.07(a)(i) | All concrete surfaces to receive a coating shall be dry at the time of application. Sufficient drying time shall be allowed after wet preparation methods to satisfy the requirements of Clause 686.14.  The coating shall be applied following the manufacturer’s recommended application methods, overcoating times and coverage rates, mixing requirements, current materials safety data sheets and as specified in this section. The coating may be applied by brush, spray, roller, hand/glove or other technique to achieve the desired surface finish. Coverage rates shall be checked for compliance with the manufacturer’s requirements. The surface area of the concrete structure subject to application.  The coating system shall be applied as soon as possible (i.e. within 24 hours unless otherwise expressed in writing by the manufacturer) after the preparation of the concrete surface. The prepared surface shall be protected against contamination if it is left uncoated for more than 24 hours.  For multiple coat applications, the manufacturer’s stated minimum and maximum overcoating times for the prevailing weather conditions shall be satisfied, and successive coats shall have slightly different colour shades to assist in achieving uniform coverage. The difference in colour shall be such that a coat when either wet or dry shall be clearly distinguishable by means of colour difference, from the preceding coat. | Each lot | S | SE |  |  |  | |  |
| **5.2** | | Specific requirements | 686.07 | All multi-part coating materials shall be mixed according to the coating material manufacturer’s instructions. The components shall be mixed in the specified proportions. The specified reaction period shall be allowed from the time the components are mixed until the application begins. No coating material shall be excessively thinned and any thinners used shall be the correct type as specified by the material manufacturer. The coating material shall be strained as specified by the material manufacturer.  **No coating material shall be applied after its pot life has expired.**  Where quantities of coating material are being applied by spraying successive batches of premixed multi-part material, the equipment shall be flushed and purged with clean solvent after 2/3 of the pot life of the material has expired from either the mixing of the first batch or since the last purge and cleaning of the equipment. Coating material ingredients shall be kept properly mixed in the spray pots or container during the application of the material whether by continuous mechanical agitation or intermittent manual agitation as required.  Where brush or roller techniques are used, the brushes or roller heads shall be used for the day only and then discarded. The equipment shall not be cleaned for re-use.  All coating operations shall be performed in a neat and workmanlike manner by personnel with experience in the use of protective coatings and application methods.  Each coat shall have the required colour, gloss and opacity.  Each coat shall have the specified DFT. This film thickness shall be applied to all edges and corners. Coats which, in the opinion of the Superintendent, show excessive film builds shall be removed.  Each coat shall be smooth, uniform and free from sags, runs, mud cracking, wrinkling, fat edges, blisters, pinholes, holidays, dry spray, entrapped foreign bodies and heavy brush marks. | Each lot | S | SE |  |  |  | |  |
| **5.3** | | Damp concrete surfaces | 686.07(b) | Coatings for application on damp concrete substrates shall be specifically formulated for tolerance to moisture during application, curing and subsequent service.  All concrete surfaces to receive coating shall be surface-dry at the time of application. Where this requirement is not satisfied, temporary protection shall be provided to encase the concrete and coating applicator and prevent moisture penetration, ensuring adequate ventilation is provided. Deposits of salt crystals which collect on coated surfaces shall be washed off with potable water and the surface allowed to dry, prior to further coating application.  With the exception of the surface moisture condition of concrete the coating shall be applied in accordance with Clause 686.07(a). | Each lot | S | SE |  |  |  | |  |
| **6.0 Spray equipment** | | |  |  |  |  |  |  |  |  | |  |
| **6.1** | General requirements | | 686.08 | The spray equipment shall be suitable for the work intended. It shall be capable of properly atomising the coating material to be applied and shall be equipped with accurate pressure regulators and gauges. The spray gun, nozzles and needles shall conform to the coating material manufacturer’s recommendations for the coating to be applied. The spray equipment shall be kept in such condition to permit efficient and effective coating material application. An efficient airline filter shall be fitted as close as possible to the pressure pot to eliminate line condensate and oil in the air supply to the spray gun. | Each lot | W | SE |  |  |  | | Photos |
| **7.0 Drying and curing** | | |  |  |  |  |  |  |  |  | |  |
| **7.1** | General requirements | | 686.08 | The Contractor shall adhere to the manufacturer’s instructions regarding drying and curing requirements, and overcoating time intervals, for the prevailing weather conditions. | Each lot | WP | SE |  |  |  | |  |
| **8.0 Clean up and protection of works and property** | | | | |  |  |  |  |  |  | |  |
| **8.1** | Preparations protocols | | Clauses 686.11(b) and 686.11(c)  Clause 686.11 | The Contractor shall protect already painted or galvanized surfaces, services, bearings, joints, painted signs and nameplates during abrasive blasting operations or any other surface preparation process and during coating application processes.  The Contractor shall remove all coating drips and droppings, smudges and over spray from all surfaces, including surfaces not being treated. The Contractor shall remove from the site all spent abrasive and all other rubbish accumulated during the work. The Contractor shall dispose of such wastes to the satisfaction of the Superintendent and by a means which conforms to Clauses 686.11(b) and 686.11(c).  The Contractor shall ensure that the coated works are protected from adverse conditions, dust and debris during the curing period of the coating system in accordance with the requirements of Clause 686.11. | Each lot | W | SE |  |  |  | |  |
| **8.2** | **Protection of property** | | **686.10** | **No spray painting shall be carried out within ten (10) metres of buildings, footpaths, roadways, pedestrians or vehicles without protective measures or methods being used which shall be submitted to the Superintendent for approval, a minimum of two working days in advance of the proposed works.** | **Each lot** | **H** | **SE** |  | **H** |  | |  |
| **9.0 Environmental conditions** | | |  |  |  |  |  |  |  |  | |  |
| **9.1** | General | | 686.11 (a) | Coating systems shall not be applied under any of the following conditions:  (i) windy conditions where over spray and/or spatter may be generated;  (ii) when wind-borne debris is likely to contaminate the uncured surface of the freshly applied coating;  (iii) when the ambient temperature exceeds 35°C or is below 10°C unless otherwise expressed in writing by the manufacturer;  (iv) when the relative humidity exceed 85% or where it may be expected to exceed 85% during the subsequent 12 hour curing period;  (v) when rain spatter or run-off, including leakage through deck joints, contaminating the surface and adversely affecting the adhesion to the substrate, may occur;  (vi) when the substrate surface is wet or damp, unless the coating is specifically required to be applied on a damp concrete surface in accordance with the requirements of Clause 686.07(b);  (vii) the surface temperature of the substrate is less than 3°C above the dew point calculated in accordance with AS/NZS 2312 (Fig. 8.1) or exceeds 40°C. | Each lot | S | SE |  |  |  | |  |
| **9.2** | Measurement of conditions | | 686.11 (a) | The environmental conditions shall be measured, recorded and assessed against the requirements above once every four hours of each shift. A calibrated commercially available hygrometer (psychrometer) or electronic climatic measuring gauge shall be used to determine the parameters which require readings (i.e. items (i), (iii), (iv), (vi) and (vii)). | Each lot | S | SE |  |  |  | |  |
| **10.0 Handling and storage** | | |  |  |  |  |  |  |  |  | |  |
| **10.1** | General Contractor handling | | 686.12 | All material shall be brought to site in the original unopened cans clearly labelled with the manufacturer’s name, product type, reference and batch numbers.  The Contractor shall provide a certificate from the manufacturer for each batch of coating and primer material confirming:  (a) manufacturer’s name and address;  (b) product reference;  (c) batch number of identification;  (d) quantity manufactured in the batch; and  (e) date of manufacture.  The Contractor shall maintain records showing which elements were treated with each coating batch. These records shall be handed over to the Superintendent before the Date of Practical Completion. | Each lot | W | SE |  |  |  | | Incoming Material Checklist  Certificate of batch information |
| **11.0 Testing before and after application** | | | | |  |  |  |  |  |  | |  |
| **11.1** | Testing before application | | 686.14(a) | All concrete surfaces prepared for coating shall be sampled and tested in accordance with the requirements of this section. Each sample of prepared concrete surface shall be tested as required for surface moisture condition, moisture content of concrete, environmental conditions and cross-cut adhesion of previously painted surfaces as specified in this section.  At least one test per sample shall be carried out immediately prior to the commencement of each day’s coating application to ensure that:  **(i)** surface moisture conditions of concrete or other substrates satisfy the manufacturer’s recommendations.  **(ii)** moisture content of concrete and other substrates is free of water back pressure to satisfy the manufacturer’s recommendations, in accordance with ASTM D4263-83:2012;  **(iii)** the environmental conditions, as specified in Clause 686.11, are satisfied. | Each lot | W | SE |  |  |  | |  |
|  | Testing after application | | VRS 686.14(b) | All applied coating shall be sampled and tested with calibrated equipment in accordance with the requirements of this section. Each sample of applied coating shall be tested as required for bond strength, WFT and DFT, amount of penetration of pore-lining penetrant and water absorption, as specified in this section.  At least three measurements per sample of each of the following tests shall be carried out after the application of materials to demonstrate compliance with this section.  Sections Listed in VR 686.14 | Each lot | W | SE |  |  |  | | Record of Testing per Bridge Element |
| **12.0 Testing before and after application** | | | | | | | | | | | | |
| **12.1** | Requirements for future maintenance of coatings | | 686.18 | The Contractor shall provide the manufacturer’s recommendations as follows:  (a) The methods of preparation to be used in the event that re-coating of the coated surface is required.  (b) Which types of coating, other than the original product, are compatible with the finish coat for re-coating purposes.  (c) The technique which can be used to repair local damage to the coating, with particular reference to colour and gloss matching of finish coats applied after a time lapse of 5 years. | For all works | R | SE |  |  |  | |  |

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| **13.0 Coating repairs** | |  |  |  |  |  |  |  |  |  |
| **13.1** | Coating repairs if required | 686.17 | Should any of the coating application work not comply with the provisions of this specification then the areas concerned shall be repaired to the satisfaction of the Superintendent. Such repair work may include removal of the coating, followed by surface preparation and application of a new coating. The procedure for any repair work shall be reviewed by the Superintendent.  For the purpose of this clause, non-complying work shall include coating failure due to yellowing, loss of adhesion, and colour change during the contract liability period. | Only if Repairs are required | S | PE |  |  |  |  |
| **14.0 Work lot close out** | |  |  |  |  |  |  |  |  |  |
| **14.1** | Test Reports | DoT Specs | All tests received and passed | Each lot | s | SE |  |  |  |  |
| **14.2** | Product Non-Conformance | QMP | All product non-conformance(s) recorded closed (if applicable) | Each lot | s | SE |  |  |  |  |

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| **Works complete (signer SS)** | |  | | | **Date works complete** | |  | | | |
| **Lot conforms (signer PE)** |  | | **Date lot closed** |  | | **NCR/s no. raised** | |  | **Date NCR closed for this lot** |  |

**Responsibility (Resp.) Key**: **PM**-Project Manager, **PE**-Project Engineer, **SE**- Site Engineer, **CS**-Civil Superintendent, **SS**-Site Supervisor, S**V**-Surveyor, **CR**-Client Representative

**Inspection**

**Key : W –** Witness, **H –** Hold Point, **S –** Surveillance

