**Inspection and Test Plan – Dense Graded Asphalt**

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| **Project no.** | | CC-0374 | **Project name** | Pakenham Roads Upgrade | | | **Date** | 04/09/2023 | **Approved by** | Damian Hagebols |
| **ITP no.** | 1630-P200-SYM-QAC-ITP-0048 | | **Revision date** | | 20/12/2023 | **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** | **Asphalt Quality Plan** | VR407.04  VR407.11  VR407.27  VR407.29 | **The Contractor shall provide an Asphalt Quality Plan that addresses the following requirements:**  **(**APPROVAL AND OTHER PRELIM REQUIREMENTS) Underlying layer conformance: Survey levels have been taken on the underlying layer. Test samples have been collected for the underlying layer. For core sample tests, the layer thickness is the mean thickness of the core samples and for nuclear gauge tests, the layer thickness is the nominated layer thickness.  Min. thickness of cores extracted from pavement are not less than values given in Table 407.27  Test roll has been completed for the underlying layer. CCTV inspection of drainage and sub-surface drainage lots has been completed. NCR (s) has been raised for any non-conformances in underlying layer and no rework required.  •sourcing, handling, and storage of constituent materials  •RAP Management plan  •asphalt production and process control  •asphalt loading and transportation to minimise segregation and achieve adequate mix temperature on delivery to site  •measuring and recording of pavement temperature, wind speed and weather conditions  •achieving a uniform application of tack coat  •achieving uniform asphalt placement including determination of paving speed and paving plans  •determination of appropriate compaction equipment, number of rollers and rolling patterns required to achieve density  •procedures to maximise density at joints.  No Reclaimed Asphalt Pavement (RAP) is added to SMA.  Reclaimed Asphalt Pavement (RAP) is limited to Maximum 10% for RGG (Regulation Gap Graded) asphalt. (VR 404.03, 417.03 and 405.02)  Hot storage of mixed asphalt:  i) Asphalt with PMB and C600 has not been stored in hot bins for more than 8 hours prior to use.  ii) Any other asphalt types have not been stored in hot bins for more than 18 hours prior to use.  iii) DTP approval has been taken to store hot asphalt more than this time in hot bins.  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Prior to start of works | R  **H** | SE/PE |  | **H** |  | HP released – see  AP 1630-SYM-AP-0052 |
| **1.2** | Check Survey Set-out | VR407.27  VR407.29  VR407.30 | Record survey set out including frame, benchmark, and recovery points in place.  1.2. Identification of lots: Lot has been created for one shift's work for homogeneous placement method, material and appearance not exceeding 4,000 Sqm.  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Prior to start of works | **H, I** | SE/PE |  | **I** |  |  |
| **1.3** | Asphalt Mix Designs Approval and Compliance | VR404.05  VR405.04  VR407.06  VR407.09  VR407.10  PS3040.06 (g) | The mix to be used shall be a VicRoads registered mix and shall comply with the requirements of clause 407.06. The Indirect Tensile Modulus of the mix is not required to be submitted.  **All** Asphalt mixes proposed for use in the works shall have a mix design registered by Department of Transport as ‘General’, unless otherwise approved by the Department of Transport.  The registration for all mixes incorporated into the works shall be current at the time of their use. Mix is registered by VicRoads as ‘General’ mix at the time of placement, unless otherwise approved by the Superintendent and submitted for Superintendent's review. For SMA (if requested); the following additional documents are submitted with mix design for SMA: i) Marshall Stability to meet the requirements of clause 404.06(d); ii) the results of the Binder Drain Off tests meeting the requirements of clause 404.06(e) and the selected maximum mixing temperature to avoid excess binder drain off; iii) the Indirect Tensile Modulus of the mix for a sample prepared at 5 ± 0.5% air voids.  The Contractor shall submit documentation to the Superintendent nominating the asphalt mixes to be supplied no less than 7 days prior to their use.  The contractor shall ensure to only use asphalt mixes that are registered by the State Road Authority as ‘General’ mixes at the time of placing the asphalt.  Where the Pavement Design allows the use of asphalt, the asphalt treatments must be applied in accordance with this Section PS3040.06 and the Technical References including section 407 of the VicRoads Standard Specification Sections for Roadworks.  Roller routine for compaction at procedural basis: Placement and rolling procedure validated against density test for individual mix including best practices in AS 2150 has been submitted for Superintendent's approval if total asphalt quantity of that mix type and/or size in the project is less than 300 tonnes and/or lot size is less than 50 Sqm. VR 407.27 (SMA: Placement and rolling procedure including best practices in AS 2150 has been submitted for Superintendent's approval for SMA thickness less than 25mm.) VR404.15  Incoming material: Incoming material test reports have been collected from the supplier.  Material Change: i) The Superintendent and/or Designer have reviewed and agreed to any material change request.  ii) Design Change Request (DCR) has been raised (if applicable) (1170.12)  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each Possession | **H** | SE/PE |  | **H** |  | VicRoads Approval Certificate,  Incoming Material testing (sieve analysis)  Team Binder Reference No\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **1.4** | Asphalt Placement Plan | VR407.04  VR407.13  VR407.17 | Subcontractor submission of placement and Lot Plan. Review of proposed layers, depths, paver runs, Surface Preparation, Joints and spreading.  Lot Size………………………………….  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each possession | **H** | SE/PE |  | **H** |  | Approval Correspondence if applicable……………  Check placement adheres to Compliance with IFC drawings |
| **1.5** | Cold Weather placement | VR407.13 | **Prior to commencing cold weather placement of asphalt, the contractor shall submit a job specific cold weather placement management plan to the Superintendent for review**  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each possession | **H** | SE/PE |  | **H** |  |  |
| **1.6** | Asphalt type | Table 407.21  VR407.24  IFC Drawing | Asphalt Type :  Base Course **□**  Type SF, SI, SP, SG and SS  Intermediate Course **□**  SF, SI, SS  Wearing**□**  L, N, V, H, SMAH  Regulation Courses**□**  Existing pavement has been regulated to correct the shape to make it parallel to the finished surface.  L, N, V and H  **Layer Thickness as per IFC……………….**  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each possession | R  I | SE/PE |  | **I** |  |  |
| **1.7** | Conformance of underlying lot/ Layer |  | Has the previous layer passed acceptance criteria?  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each lot | **H** | SE/PE |  |  |  | Lot no (if applicable)…………… |
| **2.0 Hot Mix Asphalt Placement** | | | | | | | | | | |
| **2.1** | Profiling (Cold Planning) and preparatory works | VR402.02  VR402.03  VR 407.21 (F) (iii) | Cold planning shall be carried out in a manner as to leave a uniform surface on a plane parallel with the ultimate finished surface of the pavement as shown on the drawings.  The nominal depth and width of pavement to be removed shall be as specified in Clause 402.06. After planning, no point on the planed surface shall lie more than 15 mm below a 3 m straightedge placed on the planed surface in any direction.  In locations where removal and replacement of asphalt or pavement is required on the same day, the rate of cold planning including clean up shall be at a rate consistent with the asphalt replacement process to minimise the pavement area closed to traffic  Removal of Temporary Ramping  Prior to commencing each day’s work, temporary ramping shall be removed via means of cutting back along a straight line to expose a vertical face of fully compacted asphalt at specified depth.  All plants have a current certificate of calibration (if requested). Cutting machines have the following characteristics:  i) standard cutting drum with cutting tool spacing of 15 mm horizontally; and  ii) fine tooth drum with a cutting tool spacing of 8 mm (or less) horizontally.  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each lot | R  I | SE/PE |  |  |  | Field Sheet  Yes□ No □ N/A □ |
| **2.2** | Commencement of Placing | VR402.04  VR404.14  VR407.23  VR407.26  VR408.08  VR407.22  VR407.30 | The placement of asphalt on the sub-base or granular base for a new pavement or for an overlay of an existing bituminous surfaced pavement shall not commence until approval to proceed is obtained from the Superintendent.  Binder: A product quality certificate and test report from the manufacturer is obtained for each delivery of material or shift (if requested). Binder sample is collected from the supplier and supplied to MRPV (if requested). Unmodified bitumen is conforming to AS 2008. Modified bitumen (PMB) is conforming to ATS 3110.  Asphalt placement trial (if requested) to trial the mix, plants, procedures and personnel has been completed for each nominated mix and the completed ITP as well as test reports have been submitted for Superintendent's review.  All manhole and valve covers are to be raised or lowered to the new surface level and temporarily ramped where required.  Preparation of exposed granular pavement: For smaller areas as required, exposed granular pavement material is watered, re compacted and primed or heavily tack coated prior to asphalting.  ii) For larger areas, a bitumen emulsion primerseal is applied prior to placing asphalt.  Rolling: Vibratory rollers are not used to compact asphalt on bridge decks.  i) Pneumatic tyred rollers are not used for SMA.  ii) Vibratory rollers are not used for more than 2 passes and immediately ceased if any breakdown of SMA aggregates are occurred.  **Approval to proceed?**  **Yes □ No □ N/A** **□** | Each lot | **H**  R  I | SE/PE |  | **H**  **I** |  |  |
| **2.3** | Ambient conditions for Placing | VR407.06  VR407.07  VR407.17  VR407.18  Table 407.171 | * Intermediate and Base Course Asphalt not to be placed with surface temperature < 5˚C. * Asphalt mixes with PMB and Class 600 binder in intermediate or base course layers shall not be placed when the majority of area to be paved has a surface temperature < 10°C. * Wearing Course Asphalt not to be placed with surface temperature < 10˚C,   Ambient condition for asphalt placement:  i) Surface is dry and free from surface water;  ii) Rain is not imminent;  iii) Majority of the area to be asphalted have minimum pavement temperature as per Table 407.171  Aggregates: Aggregates are conforming to asphalt type specific requirements.  **Approval to proceed?**  **Yes □ No □ N/A** **□** | Each Possession | R  I  W | SE/PE |  | **I** |  |  |
| **2.4** | Approval of Tack Coat Used | VR407.08 | **The Contractor shall submit (if requested) the details of the trackless tack coat proposed to be used in the works.**  **Approval to proceed?**  **Yes □ No □ N/A** **□** |  | R  **H**  I | SE/PE |  | **H** |  |  |
| **2.5** | Application of Cationic Bitumen Emulsion ‘Tack Coat’ | VR407.08  VR407.11  VR407.18  VR407.19  VR407.21  AS1160 | Before tack coating and asphalt placement, contractor shall remove dangerous and loose material from site and sweep the area clean.  Bitumen emulsion used for tack coating shall be a cationic rapid setting type complying with AS 1160. Emulsion diluted with water shall have a bitumen content of not less than 30%.  ii) Emulsion diluted with water have a bitumen content of not less than 30%.  iii) if requested, demonstration will be provided prior to using proprietary grades of bituminous tack coat for it's superiority over CRS60 emulsion tack coat.  iv) Tack coating material contain no more than two parts of cutter or other hydrocarbon solvent  Proprietary grades of bituminous tack may also be used where it can be demonstrated they will provide an equivalent or better bond between pavement layers compared to an emulsion tack and can be applied in a uniform distribution at the residual rates specified in Clause 407.19.  Bituminous tack shall contain no more than two parts of cutter or other hydrocarbon solvent.  From 1 July 2022 only trackless tack coat will be permitted.  The application rate for the tack coat shall be 0.15 to 0.30 L/m2 of residual bitumen (except for joints and chases where rates shall be doubled).  i) A tack coat has been applied to all asphalt (where applicable), concrete or sprayed seals on which asphalt is to be placed except where asphalt is to be spread over a clean, un-trafficked, freshly laid asphalt, or over a clean primed surface, or on a granular material where the overall asphalt depth is 150mm or greater;  ii) The application rate for the tack coat is 0.15 to 0.30 L/m2 of residual bitumen (except for joints and chases where rates are doubled);  iii) Tack coat is uniform over the entire surface and intact during asphalt placement;  iv) Photographic evidence that includes an identifiable landmark relevant to the lot, has been supplied to show that tack has been applied uniformly over the lot.  v) Before asphalt is placed, sufficient time has been allowed for emulsion based tack coats to break.  vi) All cold joints, abutting concrete edges and vertical joints with granular pavement are heavily tack coated.  Degree of particle coating: Min. 95% of the coarse aggregate particles are fully coated with binder. (VR 407.11b)  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** |  | R  **H**  I | SE/PE |  | **I** |  |  |
| **2.6** | Verification of Delivery Dockets | VR407.20 | Asphalt deliveries to be made only during hours listed for possession of site.  Check asphalt upon delivery for specification, segregation, separated binder, evidence of exposure to temperatures which are too hot or too cold to retain adequate workability and strength, and uncoated particles. Reject all non-compliant asphalt.  At point of delivery, delivery dockets must be sighted to conform with the requirements of VR Section 407.20(b). Reject unconforming loads.  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** |  | I | SE/PE |  | **I** |  | Delivery docket **□**  Tonnage report if applicable **□** |
| **2.7** | Construction - Jointing | VR407.17  VR407.21 | All transverse joints shall be offset from layer to layer by at least 2 m.  Location of all joints shall be planned before work commences and provided to the Superintendent.  Longitudinal joints in the wearing course shall coincide with the location of intended traffic lane lines.  Longitudinal joints shall be parallel to the traffic lanes.  Longitudinal joints in intermediate and base courses shall be offset from layer to layer by not less than 150 mm and shall be within 300 mm of the traffic lane line or the centre of traffic lane.  Cold joints shall be avoided  Upon completion of each work day, and prior to opening to traffic, the following shall be adopted for treatment of exposed asphalt edges:   1. Longitudinal edges   All longitudinal joints within the trafficked area shall be matched up between paver runs, except for a short section required to achieve minimum offset between transverse joints, unless otherwise approved by Superintendent. Exposed longitudinal edges within trafficked area are to be ramped down at a slope of not steeper than 5 horizontal to 1 vertical, by means of constructing a temporary wedge of dense graded or cold mixed asphalt.   1. Transverse edges   At the end of paving run in the transverse directions, new asphalt mat shall be squared up to a straight line and ramped down by constructing a temporary wedge of dense graded or cold mixed asphalt. Ramping shall not be exceed grade indicated in VR407.21  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each lot | R  I | SE/PE |  | I |  |  |
| **2.8** | Matching Existing Pavement Surface at Junctions | VR407.21 (e) | New Asphalt Layer to match the existing pavement surface.  A chase shall be cut from existing pavement by removal of a wedge of asphalt tapering from zero to a depth of 2.5 times.  The width of the chase shall be as follows.   1. at side streets and median openings – 600 mm 2. on through carriageways with a speed limit of 80 km/h or less – 3 m   On through carriageways with a speed limit of more than 80 km/h – 6 m.  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each lot | R  I | SE/PE |  |  |  |  |
| **2.9** | Spreading | VR407.25  VR407.30 | Asphalt shall be spread in layers at the compacted thicknesses shown on the drawings or specified. All asphalt shall be spread with an asphalt paver except for small areas where use of a paver is not practicable.  All asphalt shall be spread with a purpose designed asphalt paving machine to form a uniformly smooth asphalt mat complying with the requirements of Clause 407.29 without segregation, tearing or gouging. In areas that are not accessible by a paver placement of asphalt by other means is permitted.  Paving of asphalt:  i) The width of a single paving run is not exceeding 6 metres unless paving in echelon is proposed in 407.30g or procedures are in place to ensure that a uniform asphalt layer free of segregation can be achieved;  ii) A transverse joint is constructed if the temperature of the asphalt in front of the paver has cooled down below 120°C due to any delay or stopping;  iii) Hand spreading is only used for areas where paver can not be used;  Hand spreading shall only be used for small areas where it is not practical to use a paver.  **Has all of the above been completed?**  **Yes □ No □**  **N/A** | Each lot | R  I | SE/PE |  | **I** |  |  |
| **2.10** | Trafficking or placement of asphalt over Type SF asphalt  (If applicable) | VR407.28 | Trafficking or placement of asphalt over Type SF asphalt is not permitted unless the majority of the Type SF asphalt has a surface temperature of 50˚C or less and falling. (Table 407.281)  Trafficking: i) No traffic is placed on SF asphalt until the Superintendent has agreed that the temperature of the asphalt is less than 50ºC and is trafficable.  ii) Traffic (including construction traffic) is ceased immediately if SF asphalt deformed/damaged after trafficking. No traffic is placed on SMA until the Superintendent has agreed that the temperature of the asphalt is less than 40ºC and is trafficable.  **Has all of the above been completed?**  **Yes □ No □**  **N/A** **□** | Each lot | R  I | SE/PE |  | **I** |  |  |
| **3.0 Performance Testing** | | | | | | | | | | |
| **3.1** | Compaction Testing | VR407.27  Table 404.141  Table  407.271 | The minimum number of tests to be conducted for each lot should be six. **□**  Acceptance criteria:  Thickness < 50 mm: CDR 95.0%**□**  Thickness > 50 mm: CDR 96.0%**□**  **Is this CDR Achieved?**  **Yes □ No □**  **N/A** **□** | Each lot | R | SE/PE |  |  |  | NATA Test Report: Compaction Tests  Yes **□**  No **□**  NCR No………………. |
| **3.2** | Compaction Testing – (Less than Six Test) | VR404.14  Table  407.273 | Acceptance criteria:  Thickness < 50 mm: MDR 96.5%**□**  Thickness > 50 mm: MDR 97.0%**□**    **Is this MDR Achieved?**  **Yes □ No □**  **N/A** **□** | Each lot | R | SE/PE |  |  |  | NATA Test Report: Compaction Tests  Yes **□**  No **□**  NCR No………………. |
| **4.0 Completion and Compliance** | | | | | | | | | | |
| **4.1** | Finished Surface Levels | VR407.29  Table  VR407.292  Table  VR407.293  VR402.03  PS3040.023 | Refer table at the end of the ITP for reference.  The mean surface level and the variation in surface level for the base, intermediate and wearing courses within each lot shall meet the requirements of Table 407.292 and 407.293  Asphalt Layers:  Scale A: ± 5 Max. S 8mm (80 points min.) **□**  Scale B: 8 Max. S 8mm (40 points min.) **□**  Where min. average or nominal thickness of overlay specified, average thickness to be calculated as per VR 407.23 (c).  Cleaning and disposal of material: The planed surface is swept clean prior to either diverting traffic onto the planed surface or placing asphalt.  **Has all of the above been completed?**  **Yes □ No □**  **N/A** **□** |  | R  I  **H** | SV  SE/PE |  | **I** |  | Conformance Report (Finished surface level and thickness)  Yes **□**  No **□** |
| **4.2** | Rectification of surface levels | VR407.29 | Rectification of surface levels shall not commence until approval to proceed is obtained from the Superintendent.  **Has all of the above been completed?**  **Yes □ No □**  **N/A** **□** | Each lot | R  **H** | SE/PE |  | **H** |  |  |
| **4.3** | Finish Surface/Shape | VR407.29 (a)  VR407.29 (a) (iv)  VR407.29 (a) (v) | * Uniform in appearance, free of dragged areas, cracks, open textured patches, and roller marks. * Flush or not more than 5mm above lip of channel * No point on the finished surface of wearing course to be greater than 4 mm below a 3 m straight edge. * Where asphalt pavement is not placed against a concrete edging, the edge of asphalt layers shall not be more than 50 mm inside nor more than 100 mm outside. * Where asphalt pavement is not placed against a concrete edging, the width of asphalt layers shall not be less than the design or specified width of layer by more than 50 mm or greater than the design or specified width by more than 100 mm. * The average width over any 300 m shall not be less than the design or specified width.   For intermediate and base course layers, the distance below the straight edge shall not exceed 6 mm and 10 mm, respectively.  **Has all of the above been completed?**  **Yes □ No □**  **N/A** **□** | Each lot | R | SE/PE  SV |  |  |  | Straight edge checks involved.  Yes**□**  No **□**  N/A **□**  Conformance report on finish surface/shape  Yes **□**  No **□** |

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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, **SV**-Surveyor, **CR**-Client Representative

**Inspection Key: W –** Witness, **H –** Hold Point, **S –** Surveillance, **R –** Review Point, **I –** Inspection Point

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