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

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| **Project no.** | | CC-0374 | **Project name** | Pakenham Roads Upgrade | | | **Date** |  | **Approved by** | Damian Hagebols |
| **ITP no.** | 1630-P200-SYM-QAC-ITP-0048 | | **Revision date** | | 06/10/2023 | **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** | Check Survey Set-out |  | Record survey set out including frame, benchmark, and recovery points in place.  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Prior to start of works | **H** | SE |  |  |  |  |
| **1.2** | Asphalt Mix Designs Approval and Compliance | VR404.05  VR405.04  VR407.06  VR407.09  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.  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.  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each Possession | **H** | SE |  | **H** |  | VicRoads Approval Certificate,  Incoming Material testing “sieve analysis”  Team Binder Reference No\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **1.3** | 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  In addition to meeting the requirements of Section 160, the Contractor shall provide an asphalt quality plan  The Contractor shall have a detailed Department of Transport approved RAP management plan and inspection and test plan  No asphalt containing RAP shall be supplied until the Department of Transport approved RAP Management Plan has been submitted at least 14 days prior to the asphalt works commencing and approval to proceed is given by the Superintendent  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 |  | **H** |  | Check placement adheres to Compliance with IFC drawings |
| **1.4** | Asphalt Type Wearing and Regulation Courses | Table 407.021  IFC Drawing | Dense graded asphalt types L, N, V and H series in accordance with the IFC Drawing  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each possession | R | SE |  |  |  |  |
| **1.5** | Asphalt Type Intermediate Courses | Table 407.21  IFC Drawing | Type SI, SP, SG and SS as per the IFC Drawing  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each possession | R | SE |  |  |  |  |
| **1.6** | Asphalt Type Base Course | Table 407.21  IFC Drawing | Type SF or SI – as per the IFC Drawing  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each possession | R | SE |  |  |  |  |
| **1.7** | Conformance of previous layer |  | Has the previous layer passed acceptance criteria?  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each lot | **H** | SE |  |  |  |  |
| **2.0 Hot Mix Asphalt Placement** | | | | | | | | | | |
| **2.1** | Profiling (Cold Planning) and preparatory works | VR402.02  VR402.03 | 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  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each lot | R  I | SE |  |  |  |  |
| **2.2** | Commencement of Placing | VR407.23 | 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.  **Approval to proceed?**  **Yes □ No □ N/A** **□** | Each lot | **H**  R  I | SE |  | **H** |  |  |
| **2.3** | Ambient conditions for Placing | VR407.17 | * 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,   **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 if applicable.**  **Approval to proceed?**  **Yes □ No □ N/A** **□** | Each Possession | R  I  W | SE |  | **S** |  |  |
| **2.4** | Application of Cationic Bitumen Emulsion ‘Tack Coat’ | VR407.08  VR407.18  VR407.19  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%.  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 Contractor shall submit the details of the trackless tack coat proposed to be used in the works.**  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).  The tack coat shall be:   * applied only to a clean, essentially dry surface, free from surface water * applied uniformly over the entire road surface * intact at the time of placing the asphalt.   Photographic evidence that includes an identifiable landmark relevant to the lot, shall be supplied to show that tack has been applied uniformly over the lot.  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** |  | R  **H**  I | SE |  | **H** |  |  |
| **2.5** | 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. |  |  |  |  |  |  |  |
| **2.6** | 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 VR407.211 Table 407.211.  (iii) 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.  **Has all of the above been completed?**  **Yes □ No □ N/A** **□** | Each lot | R  I | SE |  | R |  |  |
| **2.7** | 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 |  |  |  |  |
| **2.8** | Spreading | VR407.25 | 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.  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 |  |  |  |  |
| **2.9** | 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)  **Has all of the above been completed?**  **Yes □ No □**  **N/A** **□** | Each lot | R  I | SE |  |  |  |  |
| **3.0 Performance Testing** | | | | | | | | | | |
| **3.1** | Compaction Testing– (For Six Tests Lot) | Table  407.271 | Thickness < 50 mm: 95.0% Characteristic Value of the Density Ratio. Accept lot subject to no other non-conformances raised for the lot.  Thickness < 50 mm: 94.9% to 93.0% Characteristic Value of the Density Ratio. Lot will be accepted at a reduced rate calculated by P = 15 Rc -132  Thickness < 50 mm: 92.90% or less Characteristic Value of the Density Ratio. Remove and replace asphalt.  Thickness > 50mm: 96% Characteristic Value of the Density Ratio. Accept lot subject to no other non-conformances raised for the lot.  Thickness > 50mm: 95.9% to 94.0% Characteristic Value of the Density Ratio. Lot will be accepted at a reduced rate calculated by P = 15 Rc - 1340  If Characteristic Value of the Density Ratio is less than 93.9.0% then the layer shall be removed and replaced  **Has all of the above been completed?**  **Yes □ No □**  **N/A** **□** | Each lot | R | SE |  |  |  | NATA Test Report: Compaction Tests  Yes **□**  No **□** |
| **3.2** | Compaction Testing – (Less than Six Test) | Table  407.273 | Thickness < 50 mm: 95.5% Mean Density Ratio  Thickness > 50 mm: 97.0% Mean Density Ratio  Signed Test Certificate  If Mean Value of the Density Ratio is less than 92.5% for < 50 mm layer or is less than 92.0% for > 50 mm layer then the layer shall be removed and replaced.  **Has all of the above been completed?**  **Yes □ No □**  **N/A** **□** | Each lot | R | SE |  |  |  | NATA Test Report: Compaction Tests  Yes **□**  No **□** |
| **3.3** | **Compaction Testing on a Lot Basis** | VR407.27  PS3040.06 | All asphalt layers are to be tested and accepted for compaction on a Lot basis, unless otherwise specified by Superintendent,  Small Lots are to be assessed under the clauses of Section 173 of the VicRoads Standard Specification Sections for Roadworks and Bridgeworks.  Test Requirements:  A lot which has been presented for testing shall consist of an asphalt layer which is placed in one shift under uniform conditions and is essentially homogenous in respect to placement methods, materials and appearance.  Sites presented for density testing of the lot shall be randomly selected as per RC 500.16. No sites are to be selected that are within 200 mm of a joint constructed against a cold edge.  Lots > 500 m2 shall have density testing of the longitudinal edge strips of the wearing course and have results reported as a separate lot. Sites for this testing shall be as laid out in VR407.27 (b).-  Lot Size:  For Lot < 50 m2,the acceptance of compaction shall be based on the contractor’s own asphalt quality procedures.  For 50 m2 < Lot < 500 m2, the procedure for testing small areas specified in VR173.04 shall apply.  For lots exceeding 500 m2, compaction is to be assessed using the characteristic value of density ratio.  Minimum thickness of cores extracted from the pavement:   * For asphalt of size 7, the individual core thickness extracted from pavement must be >20 mm * For asphalt of size 10, the individual core thickness extracted from pavement must be >25 mm * For asphalt of size 14, the individual core thickness extracted from pavement must be >35 mm * For asphalt of size 20, the individual core thickness extracted from pavement must be >50 mm   **Has all of the above been completed?**  **Yes □ No □**  **N/A** **□** | Each Lot | R | SE |  |  |  |  |
| **4.0 Completion and Compliance** | | | | | | | | | | |
| **4.1** | Finished Surface Levels | VR407.29  Table  407.292  Table  407.293  PS3040.023 | 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 407.232 and 407.231.  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).  The minimum number of level measurements to be taken per lot is specified in table 407.292. Mean surface level tolerances for sub-base and pavement courses are specified in Table 407.293.  Sub-base  Scale A: +4 to -8 Max.S 8mm (80 points min.)  Scale B: +6 to -12 Max. S 13mm (40 points min.)  **Rectification of surface levels shall not commence until approval to proceed is obtained from the Superintendent.**  Scales for measurement of surface level are to be taken as specified:   * Scale A – 80 random measurements with statistical assessment   **Has all of the above been completed?**  **Yes □ No □**  **N/A** **□** |  | R  **H** | SV  SE |  | **H** |  | Conformance Report (Finished surface level and thickness)  Yes **□**  No **□** |
| **4.2** | Finish Surface/Shape | 407.29 (a)  407.29 (a) (iv)  407.29 (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 | SV |  |  |  | Conformance report on finish surface/shape  Yes **□**  No **□** |
| **4.3** | Perform Ride Quality (Final Layer Only) | PS3040.02 | (i) The finished pavement surface including the surface of any open graded asphalt must  be measured in accordance with the Technical References, including section 180 of  the VicRoads Standard Specification Sections for Roadworks and Bridgeworks.  (ii) The measured ride quality expressed in terms of the international roughness  index (IRI) must meet the maximum values for individual lane roughness and mean  lane roughness as specified in Table PS3040.021 (fig 7).  (iii) The locations shown in Table PS3040.022 (fig 8) are exempt from ride quality assessment.  (iv) Ride quality measurements must be undertaken as follows:  (A) within 1 month after the application of the final surfacing and prior to opening of each completed section of new carriageway to traffic;  (B) within 12 months following the Date of Practical Completion for any area that exceeded the specified maximum values for ride quality and was accepted by the Superintendent; and  (C) no earlier than 3 months and no later than 1 month before the end of the Defects Liability Period.  **Has all of the above been completed?**  **Yes □ No □**  **N/A** **□** | Each lot | R | SE |  |  |  | Ride Quality Completion  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