Inspection and Test Plan – Earthworks Type A

Project no. CC – 0374 **Project name** Pakenham Roads Upgrade **Date** _____ **Approved by** Damian Hagebols

ITP no. 1630-P200-SYM-QAC-ITP-0012 **Revision date** 17/04/2023 **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)
					Symal			Superintendent		
Item no.	Activity	Ref docs	Acceptance criteria	Freq	Key	Resp	Initial/ date	Key	Sign/ date	
1.0 Pre-start activities										
1.1	Site excavation and Material classification and supply (Site only)	VR Clause 204.06 (c) 204.04 (b)	**For site-won material**: Prior to commencing excavation in any area and during excavation work, the Surveillance Officer and the Contractor shall inspect each type of material encountered and subject to verification by appropriate laboratory testing, agree on the category of the material in accordance with Clause 204.04. **Material classified as silt** prior to compaction shall not be used as Type A material without stabilisation to the satisfaction of the Surveillance Officer.	Each Lot	**H**	SE		**H**		Compliance Certificates/ Test Reports **Yes** ☐ **No** ☐ NATA Test Reports: CBR, Swell, Permeability, Grading, PI **Yes** ☐ **No** ☐
2.0 Set out										
2.1	Set out and survey land appropriately for intended works.	VR Clause 204.03 (a) VR Clause 204.14 Table 204.142	Set out pegs in place and clearly mark out limits of works as per design IFC drawings. Lot size to be one day's production or 5,000 m^2, whichever is the lesser. **Has all of the above been completed per standard?** **Yes** ☐ **N/A** ☐	Each lot	R	SE				

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3.0 Placement of Type A Material										
3.1	Underlying Layer Conformance	VR Clause 204.10(b) 204.06	Areas upon which fills are to be constructed shall be prepared for test rolling by the Contractor. Any unstable areas detected by test rolling shall be rectified. Where ground water or seepage is encountered the Contractor shall notify the Superintendent and submit the proposed action to be taken to the Superintendent for review. The Contractor shall submit any necessary approvals from relevant authorities for the treatment and disposal of this groundwater. The Contractor shall not commence playing any fill on the prepared areas until the area has been reviewed by the Superintendent. **Approval to proceed granted?** **Yes** ☐ **No** ☐	Each lot	**H**	SE		**H**		Ref..... ....
3.2	Placing of Geotextiles (If applicable)	VR Clause 210.05 IFC Drawing	The placement of geotextile is not permitted without the written approval from the relevant Surveillance Officer. Geotextile shall be placed to the limits as shown on IFC Drawings without punctures or tears. If these occur, they shall be rectified, or the entire roll of geotextile replaced prior to covering. Geotextiles in subsurface drains shall be placed to conform to the approximate shape of the excavation and fully envelop the drainage material. All joints shall be overlapped or sewn in accordance with the Geotextile Record. Geotextiles shall be covered by filling within 48 hours of placement.	Each lot	H	SE		**H**		
3.3	Placing of Fill	VR Clause 204.10(d)	Spread and compact in uniform layers not exceeding a compacted thickness of 200 mm. Visual Inspection for maximum particle dimension. Where a fill is to be constructed on steep sideling ground or against an existing embankment with side slope steeper than 4H:1V, benches shall be progressively cut	Each lot	R	SE				Verification Records: Layer Thickness at least every three layers **Yes** ☐ **No** ☐

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			over the full area to be covered by new fill. The width of each bench shall be not less than 1 m.							
3.4	Keyed Fill Layers	VR Clause 204.10(d) Construction Work Pack	Placement surface textured to ensure layers keyed into each other.	Each lot	R	SE				
3.5	Test Roll of Type A fill layer.	VR Clause 204.12 173.03 Construction Work Pack (Test roll procedure in specification 173.03)	Each layer should be test rolled immediately following completion of compaction **but if test rolling is carried out at a later time** the surface of the layer shall be watered and given a minimum of three passes with the test roller prior to commencement of test rolling. Surface shall withstand test rolling without visible deformation or springing.	Each lot	H	SE		H		
3.6	Fill at Structures (if applicable)	VR Clause 204.11 (b) Table 204.111 Construction Work Pack	No Fill to be placed within 3 m of structure until the foundation is reviewed by the relevant Surveillance Officer. Culverts with an opening height greater than 1200 mm, shall be material of at least Type A material quality.	Each Lot	H	SE		H		
3.7	Fill within 300 mm of structures	VR Clause 204.11 Construction Work Pack	Use of geo-composite drainage material or Permeable Fill in accordance with 204.04(f). Compaction plant shall not be operated within the minimum distances from structures shown in Table 204.111. The difference in level of any fill being placed on opposite sides of a structure or structural component shall not exceed H/4 or 500 mm, whichever is the lesser, where H is the height of the structure.	Each Lot	R	SE				
3.8	Fill Material against Concrete Structures	VR Clause 204.11 Construction Work Pack	No material shall be placed against concrete within 14 days of casting. **Has all of the above been completed per standard?** **Yes** ☐ **N/A** ☐	Each Lot	R	SE				Concrete Pour Recorded **Yes** ☐ **No** ☐ NATA Compressive Strength **Yes** ☐ **No** ☐

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4.0 Geotechnical Testing										
4.1	CBR / Swell	VR Clause Table 204.041 204.141 Table PS3020.051	Unless otherwise specified: **CBR: ≥ 6%,** **Swell: ≤ 1.5% (1.0% for Verge Material).** **Initial testing frequency:** 1 Lot test to determine Assigned CBR and swell. Continued acceptance of the material will be assessed against the Assigned CBR and percentage swell values of a single CBR and single percentage swell test. However, if the material fails single CBR, swell testing then another assigned CBR to be conducted. **Have the ideal results been achieved?** **Yes** ☐ **No** ☐	Each Lot	R	SE				NATA Test Report: Assigned CBR, Swell **Yes** ☐ **N/A** ☐ NATA Test Report: Single CBR, Swell **Yes** ☐ **No** ☐
4.2	Post Compaction Grading	VR Clause Table 204.041	Sieve 75.0 mm – **100% passing by mass,** Sieve 4.75 mm – **40 - 80% passing by mass,** Sieve 0.075 mm – **10 - 40% passing by mass.** **Initial testing frequency:** 1 test for each lot tested for compaction until 3 consecutive lots achieve specified requirements. **Have the ideal results been achieved?** **Yes** ☐ **No** ☐	Each Lot	R	SE				NATA Test Report: Grading **Yes** ☐ **No** ☐ Visual Inspections for Maximum Particle Dimension **Yes** ☐ **No** ☐
4.3	Plasticity Index	VR Clause Table 204.041	PI: **6 - 25**, PI x % Passing 0.425mm: **1000 Max.** **Initial testing frequency:** 1 test per 2 lots until 3 consecutive lots achieve specified requirements. **Have the ideal results been achieved?** **Yes** ☐ **No** ☐	Each Lot	R	SE				NATA Test Report: Atterberg Limits **Yes** ☐ **No** ☐
4.4	Permeability (Capping & Verge Material only)	VR Clause Table 204.041	Permeability: 5E-9 m/s **Initial testing frequency:** 1 test per 2 lots until 3 consecutive lots achieve specified requirements. **Have the ideal results been achieved?** **Yes** ☐ **No** ☐	Each Lot	R	SE				NATA Test Report: Permeability **Yes** ☐ **No** ☐

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4.5	Compaction Testing	VR Clause Table 204.131 173.04(d)	Minimum Characteristic Value of Density Ratio: **99% (Scale A), 98% (Scale B).** **For small areas (<500 m2):** Mean value of density ratio: **101% (Scale A), 100% (Scale B).** **Initial testing frequency:** Each lot until 3 consecutive lots meet compaction requirements. **Have the ideal results been achieved?** **Yes** ☐ **No** ☐	Each Lot	R	SE				NATA Test Report: Compaction and Moisture Content **Yes** ☐ **No** ☐
4.6	Reduced Frequency of Testing	VR Clause 204.14 – Table 204.141	Unless otherwise specified: **Material properties (Scale A):** Test at the initial testing frequency, if compliant, seek approval from Surveillance Officer for minimum testing frequency. **Material Properties (Scale A):** CBR/Swell: 1 test every 2 lots. Grading: 1 Test for every 2nd lot PI: 1 test every 4 lots Permeability: 1 test every 4 lots **Material properties (Scale B):** Test initial lot and no further testing required until changes in physical property/material source are observed. **Compaction / Moisture Content:** Reduced frequency: Test every 2nd lot. **Have the ideal results been achieved?** **Yes** ☐ **No** ☐	Each Lot	R	SE		**R**		NATA Test Reports: CBR / Swell Grading PI (Atterberg Limits) Permeability Compaction **Yes** ☐ **No** ☐
5.0 Completion										
5.1	Conformity with Drawings	VR Clause 204.03 Table 204.031	Earthworks shall be finished to conform to the levels, lines, grades and cross-sectional specified or shown on the drawings with the following requirements. • Scale A: mean +5 / -15 mm Max S 12 mm. • Scale B: mean +5 / -25 mm Max S 15 mm. • Alignment: ±50 mm.	Each Lot	R	SE				

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			Scale C - random levelling not required, no point > +10 / -30 mm. **Does the final product conform to the above criterial?** **Yes** ☐ **No** ☐							
5.2	Preparation of Final Surface. (For Underside of Pavement Layers and the surface of the Cut Floor).	VR Clause 204.15	Surface is Smooth, Hard, Tightly Bound and Free from Depressions Capable of Holding Water. Material within 150 mm of subgrade shall be maintained such that its moisture content is not less than 70% of OMC prior to the placement of any pavement layers. **Does the final product conform to the above criterial?** **Yes** ☐ **No** ☐	Each Lot	R	SE				
6.0 Work Lot Close Out										
6.1	Test Reports	VicRoads Specifications	All Test reports received and Reviewed	Each Lot	R	SE				NATA Endorsed Test Reports **Yes** ☐ **No** ☐
6.2	Product Non-Conformance	CQMP	All Product Non-Conformance(s) recorded and closed (if applicable)	Each Lot	R	SE				NCR reports **Yes** ☐ **No** ☐
6.3	Quality Representative to check the above criteria and records to confirm	CQMP Lot Records	All above criteria met, and records identified attached.	Each Lot	R	SE				Completed Checklist (if applicable) and reports and other compliance records attached.

Works complete (signer SE) _____ **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, **SO-** Surveillance Officer

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

Table 204.142 Minimum Frequency of Testing for Compaction and Moisture Content

Material	Acceptable Lot Size in a Single Layer of Work	Minimum Testing Frequency
Type A Material	One day's production or 5,000 m², whichever is the lesser	Every second lot of like material and work
Type B Material		
• ripped and re-compacted below Cut Floor Level	One day's production or 10,000 m², whichever is the lesser	Every second lot of like material and work
• placed within 400 mm of top of Type B Material	One day's production or 10,000 m², whichever is the lesser	Every second lot of like material and work
• placed more than 400 mm below top of Type B material	One day's production	Every third lot of like material and work
Type C Material	One day's production	Every sixth lot of like material and work

Table 204.041

Location and Use of Type A Material	Physical Properties			Limits of Grading (% passing by mass) Post Compaction Sieve Size AS (mm)					PI x % passing 0.425 mm Post Compaction (max)	PI Range Post Compaction
	Assigned CBR (min) % (1)	Swell % (1)	Permeability (max) m/s (2)	75.0	37.5	4.75	0.425	0.075		
Capping Layer	##:6	≤ 1.5	5×10^{-9}	##:100	##:-	##:40-80	##:–	##:10-40	##:1000	##:6-25
Selected Material	##:6	≤ 1.5	Not Applicable	##:100	##:-	##:40-80	##:–	##:10-40	##:1000	##:6-25
Verge Material	##:6	≤ 1.0	5×10^{-9}	##:100	##:-	##:40-80	##:–	##:10-40	##:1000	##:6-25
Structural Material	##:6	≤ 1.5	Not Applicable	##:100	##:-	##:40-80	##:–	##:10-40	##:1000	##:6-25
Other Type A Material	##:6	≤ 1.5	Not Applicable	##:100	##:-	##:40-80	##:–	##:10-40	##:1000	##:6-25
##:										

Notes: (1) The Assigned CBR and percentage swell values are to be determined in accordance with VicRoads Code of Practice RC 500.20. Sampling for CBR testing shall be undertaken after field compaction.

(2) The permeability value is to be determined in accordance with VicRoads Code of Practice RC 500.16. The permeability value is to be determined on specimens manufactured from that fraction of material which passes a 19.0 mm AS sieve, compacted at optimum moisture content and 98% of maximum dry density as determined by testing using standard compactive effort for CBR and swell.