Tonkin+Taylor

Report

Level 1 Geotechnical Testing and Inspection Authority Services River Valley Estate Stage 7C East

Prepared for
CJ Arms / Yourland
Prepared by
Tonkin & Taylor Pty Ltd
Date
2 November 2022
Job Number
1003809.1000.7C East v1

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1 Introduction

Tonkin and Taylor Pty Ltd (T&T) was engaged by Yourland Pty Ltd (Yourland), to provide Level 1 Geotechnical Inspection and Testing Authority (GITA) services for the earthworks conducted within the reserve of Stage 7C of the River Valley Estate in Sunshine North between April 2021 and July 2021. The reserve of the Stage 7C is referred to herein as 'Stage 7C East'. The Western part of Stage 7C is still under construction and it will be reported separately.

Chadwick Geotechnics Pty Ltd (Chadwick Geotechnics), an associate of T&T, was utilised for the fieldwork and laboratory testing on this project.

Level 1 GITA services as defined in AS3798-2007 "Guidelines on Earthworks for Commercial and Residential Development," requires full time inspection and field and laboratory testing of earthworks in accordance with AS1289 "Methods of Testing Soils for Engineering Purposes."

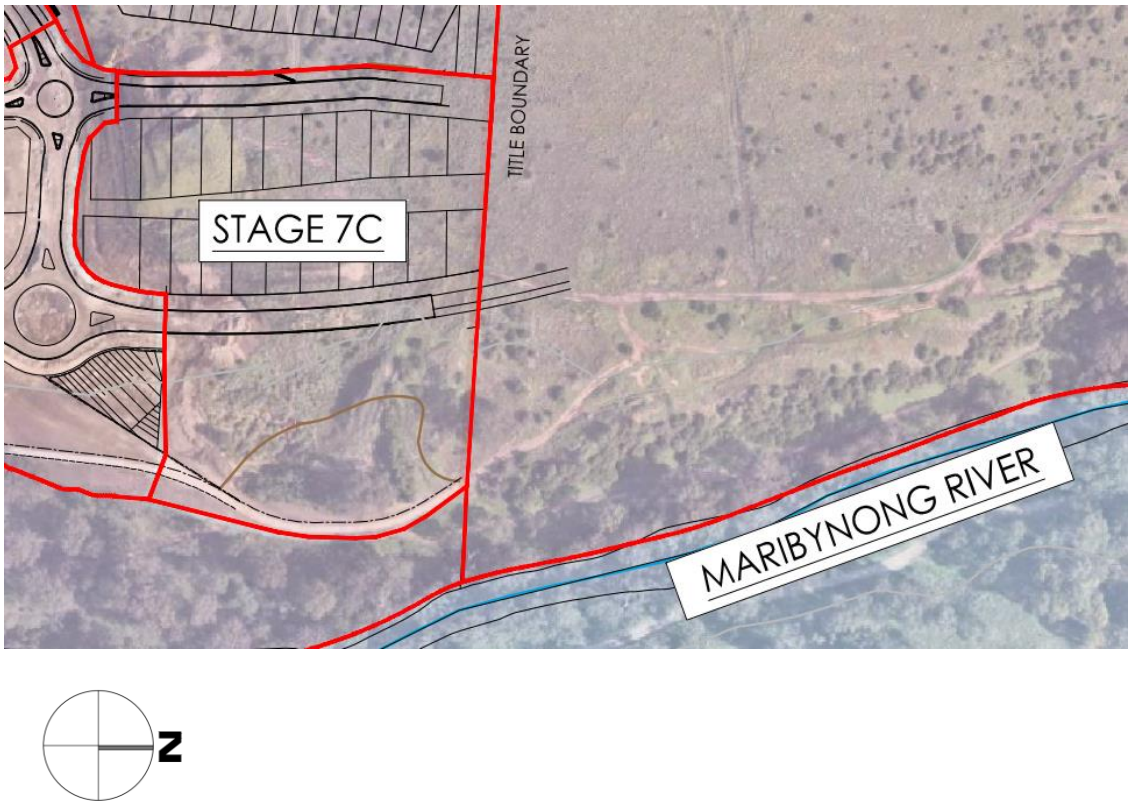
2 Project Details

2.1 Location

The project site, Stage 7C East, comprises a reserve located to the East of River Valley Boulevard and to the West of Maribyrnong River. The site is approximately 100m in North-South direction to the East of River Valley Boulevard and about 50m in East-West direction sloping down towards the river.

The included works are shown on the Site Plans in Appendices A and D. Figure 1 below is an extract from the Overall Staging Plan prepared by CJ Arms provided at the time of writing this report.

Figure 1: *Stage 7C East (Reserve)– extract from CJ Arms drawing 'Overall Staging Plan'*



2.2 Roles

The organisations and their roles are presented in Table 1.

Table 1: *Roles on the Project*

Role	Organisation
Developer	Yourland Pty Ltd
Geotechnical Engineer and Earthworks Specifications	Tonkin and Taylor Pty L:td
Geotechnical Inspection and Testing Authority (GITA)	Chadwick Geotechnics Pty Ltd
Designer / Superintendent	CJ Arms Pty Ltd
Earthworks Contractor	Winslow Constructors Pty Ltd

Chadwick Geotechnics undertook the field density testing, and the compaction control laboratory testing was conducted in the Ravenhall NATA accredited laboratory, as part of the Level 1 GITA process.

2.2 Specifications

Earthworks specifications were prepared by Tonkin and Taylor for the project in September 2020 under reference 1000780.1.S1.Rev 04 – referred to as 'T&T Specifications' herein.

The works were to be conducted in general accordance with the T&T Specifications and with the 'Guidelines on earthworks for commercial and residential developments' of AS 3798-2007.

The following items were adopted as part of the project earthworks specifications:

- All filling in excess of 200mm depth within the recreational areas shall be undertaken to specifications satisfying the requirements of AS 3798-2007 "Guidelines on Earthworks for Commercial and Residential Development".
- The fill soils to comply with the 'Suitable Material' in accordance with Section 4.4 of the AS3798-2007.
- Material be sourced from on site excavations and existing stockpiles. If an alternative source is considered, it must be approved by the Superintendent.
- Unsuitable soils are considered all organic soils, topsoil, silts, or soils containing organic matter, wood, plastics, metal or other deleterious materials, and are not acceptable.
- As per T&T Specifications, Type 2 Engineered Fill materials be used, with a maximum particle size of 75mm diameter.
- Subgrade to be proof rolled prior to placement of an engineered fill.
- Subgrade to be surveyed prior to placement of any fill, as noted in Section 3.4 of AS3798.
- Fill to be compacted in near horizontal layers not exceeding 250mm compacted thickness.
- Compaction to achieve a ratio of at least 95% Standard MDD (maximum dry density).
- Moisture content of the fill material is to be within ±3% of the soils Standard Optimum Moisture Content (SOMC).
- Frequency of testing to be in accordance with Table 8.1 of AS3798-2007.
- Finished fill surface to be surveyed prior to placement of topsoil.

2.3 Dates on Site

Geotechnical technical and engineering staff from our company were onsite for the duration of the earthworks program on the days shown in Table 2 below.

Table 2: Level 1 GITA - onsite presence

Month	Dates on site
April 2021	30
May 2021	6, 7, 8, 10, 12, 13, 14, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 31
June 2021	1, 2, 3, 4, 5, 7, 8, 9, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26, 28, 29, 30
July 2021	1, 2, 5.

2.4 Included areas

This report is applicable to material placed by Winslow on the recreational reserve within the East part of Stage 7C, as shown on the Site Plan in **Appendix A and D,** and with reference to Section 2.6 (Excluded Areas) of this report.

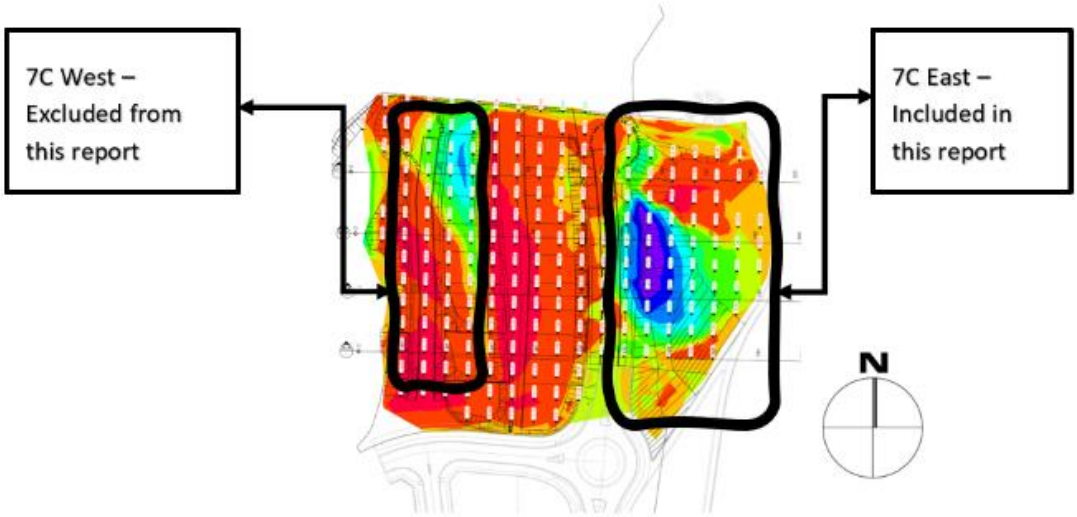
2.5 Excluded areas

This report does not include fill outside the general boundary of the filled areas as shown in **Appendix A and D** of this report. Fill for the residential lots of Stage 7C is not covered in this report.

Backfill of trenches for the underground services, fill on footpaths, driveways and roads, or placement of topsoil, were not part of the scope for the works supervised by Chadwick Geotechnics.

We note that as part of the 7C East earthworks, the adjacent area of Stage 7C West was also filled and supervised by Chadwick Geotechnics. The works for Stage 7C West will be covered in separate Level 1 GITA reports. The snapshot shown as Figure 2 indicated the general boundary of Stage 7C East and 7C West.

Figure 2: *Heatmap provided by CJ Arms - Stage 7C East and 7C West areas*



3 Inspection and Testing

The inspection and testing of earthworks have been carried out in accordance with AS3798-2007, 'Guidelines on earthworks for commercial and residential developments', with a frequency of field density tests as per Table 8.1 (explained in Section 3.5 of this report). Compaction control laboratory testing was performed in a Chadwick Geotechnics' NATA accredited laboratory in accordance with AS1289 'Methods of Testing Soils for Engineering Purposes'.

3.1 Earthworks

The earthworks for the project comprised of the following phases:

- Stripping of topsoil from the proposed fill areas;
- Assessment, remediation, and proof rolling of subgrade; and,
- Placement and compaction of engineered fill.

3.2 Earthworks Plant

The contractor used the following machinery during the earthworks:

- Screening plant – utilised in Stage 7D, preparing the source materials for use in Stage 7C.
- Excavator – utilised for removing the uncontrolled fill and topsoil from Stage 7C.
- Moxy trucks – utilised for moving the fill from the screened stockpiles in Stage 7D to the fill pads in Stage 7C, and for removal of the unsuitable soils from Stage 7C.
- Compactor – utilised for the compaction of the engineered fill.
- Water cart – used for moisture control of the engineered fill.

Below are photographs of the earthwork plant used during construction.

Figure 3: *Earthwork plant used on site*

Photo 1: Screening plant used in Stage 7D	**Photo 2:** Excavator and Moxy truck – loading screened fill material from Stage 7D
	
Photo 3: Compactor used on Stage 7C	**Photo 4:** Water truck used on Stage 7C

3.3 Fill material

Material used during the construction of the fill comprised of local gravel and silty clays won from the existing stockpiles within the adjacent Stage 7D. The materials were sorted and sieved through a 75mm screening plant in Stage 7D and brought by moxy trucks to the fill area in Stage 7C. The materials were assessed to meet the specified criteria for Type 2 engineering fill as per T&T Specifications.

Sample taken from the fill were taken for geotechnical compliance testing during the works. The material compliance test results are summarised in Table 3. The laboratory test certificates are attached in **Appendix C.**

Table 3: *Compliance test result summary*

Sample # / date	Particle Size Distribution (PSD)						Liquid Limit	Plastic Limit	Plasticity Index
	37.5 mm	13.2 mm	4.75 mm	1.18 mm	425 µm	0.75 µm			
01009 / 13.05.2021	98%	84%	75%	66%	61%	53%	84	20	64
01079 / 19.05.2021	100%	92%	81%	68%	61%	53%	75	20	55
0112 / 21.05.2021	100%	97%	93%	89%	78%	45%	33	11	22
01385 / 21.06.2021	96%	85%	71%	62%	57%	50%	78	23	55

The laboratory test results indicated material is clay of medium to high plasticity. The test results show that the clay fits the criteria for a Type 1 Engineering Fill material in accordance with the T&T Specifications for this project.

Below are photographs of the sieved fill materials used during construction.

Figure 4: *Photographs of the material used on site, screened in Stage 7D*

The soil is considered as 'Suitable Material' in accordance with Section 4.4 of the AS3798-2007.

The fill material was not tested for classification of 'Fill Material' as defined in EPA Publication IWRG621.

Any observed organic or deleterious matter including any oversize cobbles or boulders were removed from the tested areas during the fill placement.

3.4 Subgrade Assessment / Proof Roll / Benching

The subgrade of the site was progressively assessed during the period Chadwick Geotechnics personnel were on site.

Subgrade assessment was conducted following the removal of the topsoil and the uncontrolled fill that was present on site. Some of the excavated uncontrolled fill comprised suitable materials that were stockpiled and re-used in controlled manner as engineered fill within Stage 7C.

Once the subgrade area was stripped of the fill, the approved surface comprised natural clay of medium to high plasticity (See photo 1 in Figure 5).

The subgrade inspections were performed in accordance with the Level 1 guidelines presented in AS 3798–2007 Section 5.5, and in accordance with Section 8.5 of the T&T Specifications. No soft spots or deflections were encountered during the inspections and proof rolling of the area.

Generally proof rolling was conducted using a loaded water truck or a moxy (See photo 2 in Figure 5), by conducting minimum of 2 passes in all stripped areas.

Following the satisfactory proof roll and the acceptance of the subgrade, the area was scarified and compacted by 6 passes of the Compactor prior to the placement of the first layer of fill (See photos 3 and 4 in Figure 5).

Below photographs show the subgrade area preparation undertaken on Stage 7C.

Figure 5: *Subgrade assessment photographs*

Photo 1: Subgrade surface following removal of the uncontrolled fill	**Photo 2:** Proof roll using a loaded water truck
	
Photo 3: Scarified subgrade surface prior to filling	**Photo 4:** Compaction of the scarified subgrade prior to filling
	

A surveyor engaged by CJ Arms undertook a survey of the approved subgrade levels prior to placement of any fill (discussed further in Section 3.7).

3.5 Engineered Fill Construction

All fill material was brought by moxy truck from the sieved stockpiles in Stage 7D. The fill was spread and compacted with a compactor. A water cart was present onsite during the works for moisture conditioning of the materials.

As the site is on a grade sloping from West (River Valley Boulevard) towards the East (Maribyrnong River), benching was undertaken on maximum 0.5m high increments. Benches were not exceeding the specified 0.5m height and were not less than 1m width.

All fill material was placed in lift sequences comprising horizontal layers not exceeding 250mm thickness after compaction. Chadwick Geotechnics verified that the surface of the stripped area, and that of additional lifts, was thoroughly scarified and moisture conditioned prior to placement of additional layers to prevent delamination at the layer interface. Once the placed fill was approved, the layer was compacted accordingly.

Chadwick's Geotechnics personnel were on site on a fulltime basis during the placement, moisture conditioning, compaction and testing of the fill on the dates noted in Table 2 of this report.

3.6 Density testing

Field density and moisture content testing was undertaken progressively during construction on the compacted fill using a calibrated portable density and moisture gauge in accordance with AS 1289.5.8.1. The HILF rapid compaction test was used for peak converted wet density determinations in accordance with AS 1289.5.7.1. Test locations were recorded using a handheld GPS unit. A site plan showing the field density test locations is provided in **Appendix A**.

Testing was undertaken under the frequencies listed below, subject to the area and volume worked on the day of testing:

- 1 test per material type per layer per 2500m² or 1 test per 500m³ distributed reasonably evenly or 3 tests per lot – whichever requires the most tests in accordance with Type 1 Earthworks (large scale operations) as defined in Table 8.1 of the AS 3798-2007;
- 1 test per layer per 1,000m² or 1 test per 200m³ distributed reasonably evenly or 1 test per residential lot - whichever requires the most tests in accordance with Type 2 Earthworks (small scale operations) as defined in Table 8.1 of the AS 3798-2007;
- 1 test per layer per 500m² or 1 test per 100m³ distributed reasonably evenly or 3 tests per visit - whichever requires the most tests in accordance with Type 3 Earthworks (concentrated scale operations) as defined in Table 8.1 of the AS 3798-2007; and
- 1 test per 2 layers per 50m² distributed reasonably evenly throughout the fill depth –in accordance with Type 4 Earthworks (confined operations) as defined in Table 8.1 of the AS 3798-2007.

A total of sixty-three (63) tests were performed during the filling process. One (1) of the tests did not achieve the required moisture ratio initially. This area was reworked and retested accordingly. The retest returned a passing density and moisture test result.

A summary table of HILF density tests is provided in **Appendix B** and the laboratory test reports are provided in **Appendix C**.

3.7 Fill thickness analyses

CJ Arms provided a copy of a survey drawing in a heat map format, showing the fill thickness placed on the site. The drawing is presented in **Appendix D** under reference 'Volume Comparison, As – Built Bulk Level VS Existing Ground Level', No 9502, Rev P01, dated 22.10.2022.

The data presented in the drawing has been analysed and compared against our Level 1 GITA daily records. A summary of the analysis is provided in Table 4. Random points were selected for the analysis, and it is assumed the fill between the analysed survey points is of a similar thickness.

Table 4 Fill data analyses

Area	Fill Thickness shown on map (mm)	No. of Layers	Average Layer Thickness <250mm	Meet Project Requirements
Section BB, Ch 120	2400	17	Yes	Yes
Section BB, Ch 130	5900	38	Yes	Yes
Section BB, Ch 140	4700	30	Yes	Yes
Section CC, Ch 120	3000	27	Yes	Yes
Section CC, Ch 130	6400	40	Yes	Yes
Section CC, Ch 140	4200	40	Yes	Yes
Section CC, Ch 150	1800	16	Yes	Yes
Section CC, Ch 160	1000	14	Yes	Yes
Section DD, Ch 120	400	3	Yes	Yes
Section DD, Ch 130	1200	6	Yes	Yes
Section DD, Ch 140	Cut	n/a	n/a	Yes
Section DD, Ch 150	Cut	n/a	n/a	Yes

Table Notes:

- Specified layer thickness of 250mm was proposed in the Technical Specifications for this project. After compaction, each layer should have resulted in less than 250mm compacted thickness – as shown in Table 4.
- It is noted that our records show high number of layers for some areas, resulting in each layer thickness to be less than 100mm. This is because the layer numbering started at the lowest point in the eastern parts of the reserve and continued to the top of the fill adjacent to River Valley Boulevard in the West. A total of 40 layers were placed and based on our observations each layer was between 200m and 250mm thick.

4 Conclusion

On the basis of our inspections and after considering all test results relating to the project, it is our opinion, so far as it is able to be determined, that:

- The materials used by the earthworks contractor met the geotechnical property requirements of the specification.
- The sourced fill was considered to be clean and suitable for use at the site.
- The fill material placed was tested at a suitable frequency in accordance with AS 3798-2007-Table 8.1 and the results indicate the compacted clay achieved the density requirement of the specification.
- Given the consistent construction practices followed by the earthworks contractor and as witnessed by the Chadwick Geotechnics, combined with the satisfactory verification of test results achieved, it is inferred that areas of the site between test locations were performed to the same standard as those areas that have been tested.
- Based on observations made by Chadwick Geotechnics Level 1 personal and the results of field and laboratory tests, we consider that the engineered fill within the reserve area (noted in Section 2.5), of Stage 7C as indicated to the levels indicated in the survey drawing in **Appendix D**, constructed by Winslow, as far as we have been able to reasonably determine, have been placed in general accordance with the intent of the specification.

- It is our opinion that the earthworks undertaken have been performed in accordance with the requirements of Section 8.2 – Level 1 Inspection and Testing - AS3798-2007 Guidelines on Earthworks for Commercial and Residential Developments.

5 Applicability

This report has been prepared for the exclusive use of our client Yourland Pty Ltd in good faith and in accordance with the Tonkin and Taylor and Chadwick Geotechnics quality system for the earthworks filling at the site.

This report is based on the nature of the project and the prevailing conditions between 30 April 2021 and 5 July 2021. No responsibility or liability will be accepted, and Tonkin and Taylor is indemnified to the full extent permitted by law in respect of the use of this report where there has been a change in the nature of the project or the conditions on site that may alter or affect the conclusions of this report.

Should you require any further information regarding this report, please do not hesitate to contact the undersigned on (03) 8796 7900.

Tonkin and Taylor Pty Ltd

Report prepared by:

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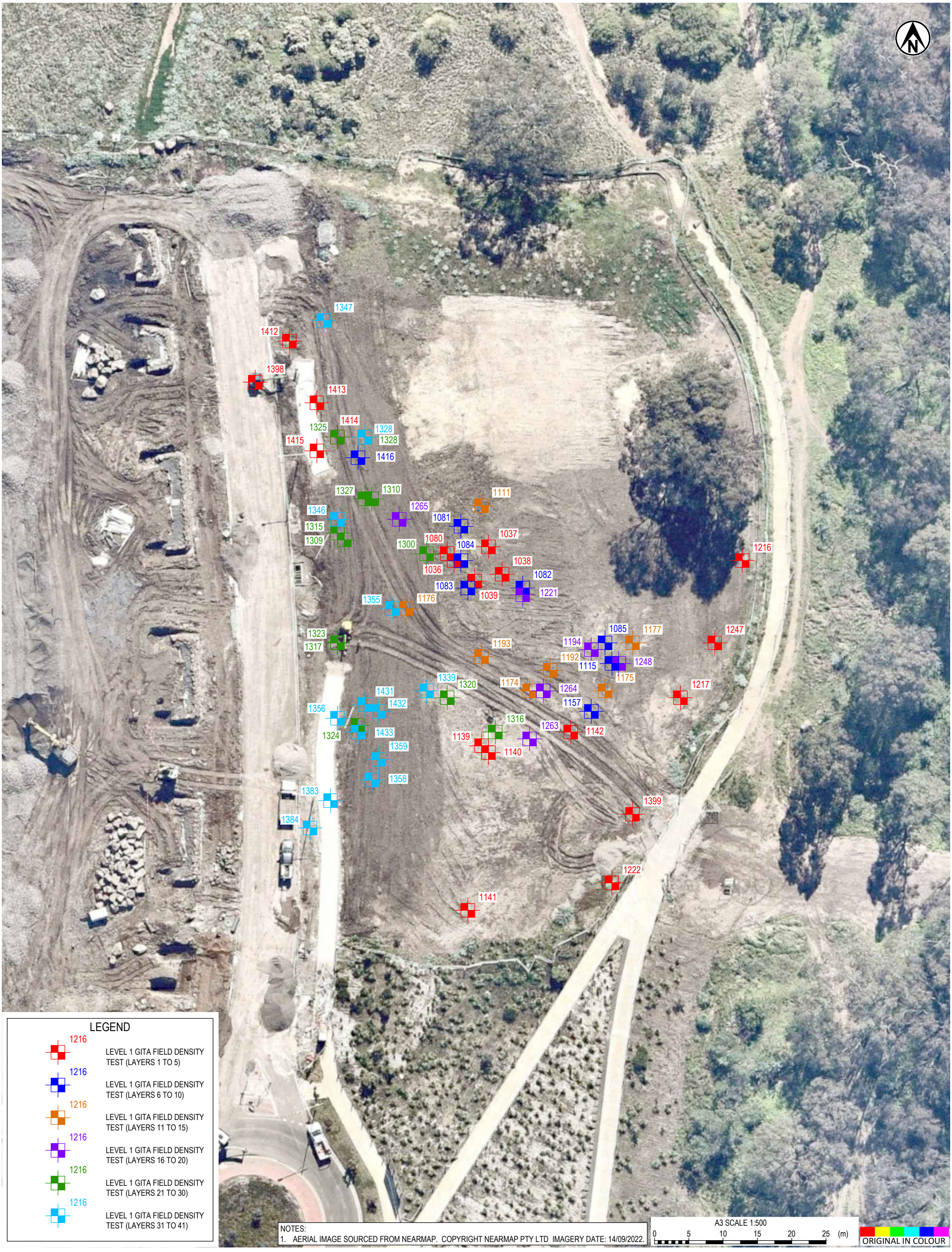
Sotir Stojcevski
Project Manager

Authorised for Tonkin and Taylor Pty Ltd by:

.....

Tim Chadwick
Project Director

Appendix A Location Plan



CHADWICK GEOTECHNICS
www.chadwickgeotechnics.com.au

PROJECT No.	1003809.1000	
DESIGNED	SOST	Oct.22
DRAWN	KMJA	Oct.22
CHECKED		
APPROVED	DATE	

CLIENT **YOURLAND/CJ ARMS**
PROJECT **RIVER VALLEY ESTATE STAGE 7C - EAST**
TITLE LEVEL 1 GITA FIELD DENSITY TEST LOCATIONS SITE PLAN
UNDER REVISION 1
SCALE (A3) 1:500 FIG No. APPENDIX B REV 1

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Appendix B Hilf Density Test Plans

CHADWICK GEOTECHNICS

HILF Summary Table

River Valley Estate - Stage 7C (East)

Chadwick Geotechnics
25 Metcalf Street
Dandenong South VIC 3175
Tel : (03) 8796 7900
Fax: (03) 8796 7944

Think Act Be Safe

Report No	Sample No	Date	East / West	Location [E]	Location [N]	Layer	Density Ratio HILF test (≥95%)	Moisture Variation From OMC (±2%)	Pass / Fail	Remarks
HDR:W21MD00291	1036	19/05/2021	East	310459	5819250	FSL -3.45m (L1)	102	0.6 dry	Pass	Reserve
HDR:W21MD00291	1037	19/05/2021	East	310464	5819252	FSL -3.2m (L2)	95	0.4 dry	Pass	Reserve
HDR:W21MD00291	1038	19/05/2021	East	310466	5819248	FSL -3.0m (L3)	95.5	0.5 dry	Pass	Reserve
HDR:W21MD00291	1039	19/05/2021	East	310462	5819247	FSL -2.764m (L4)	96	1.5 dry	Pass	Reserve
HDR:W21MD00296	1080	20/05/2021	East	310458	5819251	FSL -2.342m (L5)	100.5	0.7 wet	Pass	Reserve
HDR:W21MD00296	1081	20/05/2021	East	310460	5819255	FSL- 2.086m (L6)	100.5	0.8 wet	Pass	Reserve
HDR:W21MD00296	1082	20/05/2021	East	310469	5819246	FSL -1.86m (L7)	101	0.6 wet	Pass	Reserve
HDR:W21MD00296	1083	20/05/2021	East	310461	5819246	FSL -1.7m (L8)	100.5	1.9 wet	Pass	Reserve
HDR:W21MD00296	1084	20/05/2021	East	310460	5819250	FSL -1.442m (L9)	101	2.2 dry	Pass	Reserve
HDR:W21MD00296	1085	20/05/2021	East	310481	5819238	FSL -1.219m (L10)	101	2.0 wet	Pass	Reserve
HDR:W21MD00307	1111	21/05/2021	East	310463	5819258	FSL -1.009m (L11)	100	0.2 dry	Pass	Reserve
HDR:W21MD00314	1139	24/05/2021	East	310463	5819223	FSL -6.27m (L1)	103	0.3 wet	Pass	Reserve
HDR:W21MD00314	1140	24/05/2021	East	310464	5819222	FSL -6.057m (L2)	100.5	0.7 dry	Pass	Reserve
HDR:W21MD00314	1141	24/05/2021	East	310461	5819199	FSL -5.81m (L3)	100.5	0.6 dry	Pass	Reserve
HDR:W21MD00314	1142	24/05/2021	East	310476	5819225	FSL -5.56m (L4)	101	0.2 dry	Pass	Reserve
HDR:W21MD00319	1157	25/05/2021	East	310479	5819228	(L6)	102.5	2.0 wet	Pass	Reserve
HDR:W21MD00326	1174	28/05/2021	East	310470	5819231	FSL -4.9m (L12)	100	0.3 wet	Pass	Reserve
HDR:W21MD00326	1175	28/05/2021	East	310481	5819231	FSL -4.615m (L13)	100	0.3 wet	Pass	Reserve
HDR:W21MD00326	1176	28/05/2021	East	310452	5819243	FSL -4.35m (L14)	101	1.7 wet	Pass	Reserve
HDR:W21MD00326	1177	28/05/2021	East	310485	5819238	FSL -4.10m (L14)	101	0.6 wet	Pass	Reserve
HDR:W21MD00330	1192	31/05/2021	East	310473	5819234	FSL -4.389m (L15)	100.5	0.8 wet	Pass	Reserve
HDR:W21MD00330	1193	31/05/2021	East	310463	5819236	FSL -4.389m (L15)	100.5	0.5 wet	Pass	Reserve
HDR:W21MD00330	1194	31/05/2021	East	310479	5819237	FSL -4.150m (L16)	102.5	0.3 dry	Pass	Reserve
HDR:W21MD00337	1216	1/06/2021	East	310501	5819250	FSL -0.6m (L1)	101	2.2 wet	Pass	Reserve
HDR:W21MD00337	1217	1/06/2021	East	310492	5819230	FSL -0.4m (L2)	101.5	0.1 dry	Pass	Reserve
HDR:W21MD00339	1221	2/06/2021	East	310469	5819245	(L17)	101.5	1.5 wet	Pass	Reserve
HDR:W21MD00339	1222	2/06/2021	East	310482	5819203	(L3)	101	1.8 wet	Pass	Reserve (BB - CC)
HDR:W21MD00346	1247	3/06/2021	East	310497	5819238	RL 7.729m (FSL)	102.5	2.2 dry	Pass	Reserve
HDR:W21MD00346	1248	3/06/2021	East	310483	5819235	RL 8.382m (L18)	104	2.2 dry	Pass	Reserve
HDR:W21MD00351	1263	4/06/2021	East	310470	5819224	FSL -2.989m (L19)	101	1.5 wet	Pass	Rest of Reserve
HDR:W21MD00351	1264	4/06/2021	East	310472	5819231	FSL	100.5	1.3 wet	Pass	Reserve (AA -BB)
HDR:W21MD00352	1265	5/06/2021	East	310451	5819256	FSL -2.6m (L20)	103.5	0.6 wet	Pass	Reserve

CHADWICK GEOTECHNICS

HILF Summary Table

River Valley Estate - Stage 7C (East)

Chadwick Geotechnics
25 Metcalf Street
Dandenong South VIC 3175
Tel : (03) 8796 7900
Fax: (03) 8796 7944

Think Act Be Safe

Report No	Sample No	Date	East / West	Location [E]	Location [N]	Layer	Density Ratio HILF test (≥95%)	Moisture Variation From OMC (±2%)	Pass / Fail	Remarks
HDR:W21MD00363	1300	7/06/2021	East	310455	5819251	FSL -2.7m (L21)	99.5	3.3 wet	Fail	Reserve
HDR:W21MD00366	1309	8/06/2021	East	310443	5819253	FSL -2.7m (L21)	102	2.1 wet	Pass	Retest of S21MD-01300
HDR:W21MD00366	1310	8/06/2021	East	310447	5819259	FSL -3.609m (L22)	101	1.9 wet	Pass	Reserve
HDR:W21MD00368	1315	15/06/2021	East	310442	5819254	RL 3.60m (L23)	105	2.7 dry	Pass	Reserve
HDR:W21MD00368	1316	15/06/2021	East	310465	5819225	RL 2.80m (L23)	97.5	1.7 dry	Pass	Reserve
HDR:W21MD00369	1317	16/06/2021	East	310442	5819238	(L24)	108.5	0.8 dry	Pass	Reserve
HDR:W21MD00371	1320	17/06/2021	East	310458	5819230	FSL -1.5m (L25)	103	0.0	Pass	Reserve
HDR:W21MD00373	1323	18/06/2021	East	310442	5819238	FSL -2.3m (L26)	104	0.5 wet	Pass	Reserve
HDR:W21MD00374	1324	21/06/2021	East	310445	5819226	FSL -0.652m (L27)	103.5	0.2 wet	Pass	Reserve
HDR:W21MD00374	1325	21/06/2021	East	310442	5819268	FSL -0.352m (L28)	100.5	0.2 wet	Pass	Reserve
HDR:W21MD00376	1327	22/06/2021	East	310446	5819259	FSL -2.05m (L29)	101.5	1.9 dry	Pass	Reserve
HDR:W21MD00376	1328	22/06/2021	East	310446	5819268	FSL	101.5	0.5 wet	Pass	Reserve
HDR:W21MD00381	1339	23/06/2021	East	310455	5819231	FSL -2.307m (L31)	106	2.1 dry	Pass	Reserve
HDR:W21MD00386	1346	25/06/2021	East	310442	5819256	RL 14.125 (L32)	102	0.8 dry	Pass	Reserve
HDR:W21MD00386	1347	25/06/2021	East	310440	5819285	RL 13.089 (L32)	101.5	0.6 dry	Pass	Reserve
HDR:W21MD00389	1355	28/06/2021	East	310450	5819243	FSL -950mm (L33)	103	0.1 wet	Pass	Reserve
HDR:W21MD00389	1356	28/06/2021	East	310442	5819227	FSL -1350mm (L34)	101.5	0.3 dry	Pass	Reserve
HDR:W21MD00391	1358	29/06/2021	East	310447	5819218	FSL -1450mm (L35)	98.5	0	Pass	Reserve
HDR:W21MD00391	1359	29/06/2021	East	310448	5819221	FSL -1070mm (L36)	99.5	0.0	Pass	Reserve
HDR:W21MD00400	1383	30/06/2021	East	310441	5819215	FSL -0.834m (L37)	99	2.1 wet	Pass	Reserve
HDR:W21MD00400	1384	30/06/2021	East	310438	5819211	FSL -0.5m (L38)	102	0.2 wet	Pass	Reserve
HDR:W21MD00405	1398	1/07/2021	East	310430	5819276	FSL - 800mm (L1)	101.5	0.1 wet	Pass	Reserve Entrance
HDR:W21MD00405	1399	1/07/2021	East	310485	5819213	FSL	102	0.1 dry	Pass	Batter at Reserve
HDR:W21MD00411	1412	2/07/2021	East	310435	5819282	FSL -1.418m (L2)	104	0.3 wet	Pass	Reserve Entrance
HDR:W21MD00411	1413	2/07/2021	East	310439	5819273	FSL -1.127m (L3)	103	0.9 wet	Pass	Reserve Entrance
HDR:W21MD00411	1414	2/07/2021	East	310442	5819268	FSL -0.845m (L4)	103	0.2 wet	Pass	Reserve Entrance
HDR:W21MD00411	1415	2/07/2021	East	310439	5819266	FSL -0.546m (L5)	104	0.3 wet	Pass	Reserve Entrance
HDR:W21MD00411	1416	2/07/2021	East	310445	5819265	FSL -0.257m (L6)	102.5	0.9 dry	Pass	Reserve Entrance
HDR:W21MD00416	1431	5/07/2021	East	310446	5819229	FSL -400mm (L39)	101.5	0.1 dry	Pass	Reserve
HDR:W21MD00416	1432	5/07/2021	East	310448	5819228	FSL -200mm (L40)	102	0.7 wet	Pass	Reserve
HDR:W21MD00416	1433	5/07/2021	East	310445	5819225	FSL	103	0.1 wet	Pass	Reserve

Appendix C NATA Endorsed Laboratory Reports

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: MAT:S21MD-01009/1
Issue No: 1

Material Test Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 25/05/2021

Sample Details

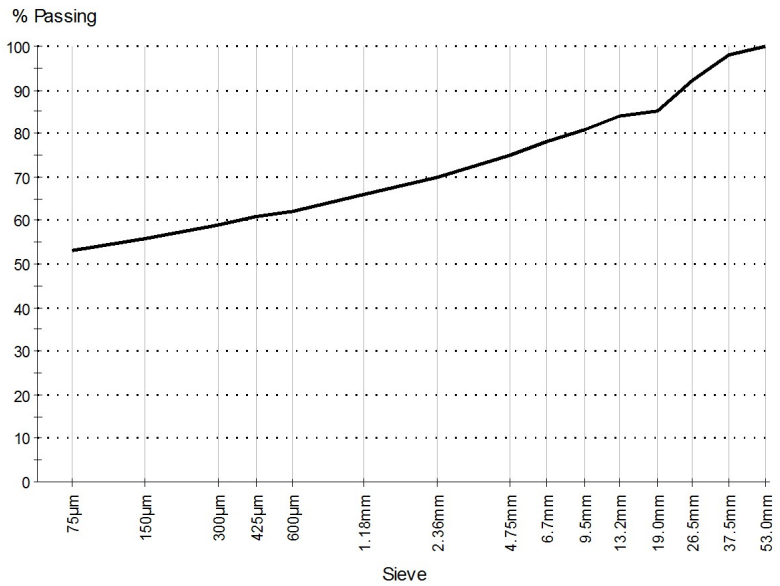
Location	Stage 7C
Sample Location	Lot AA, E 310370, N 5819299
Field Sample ID	1
Date Sampled	13/05/2021
Source	Site Derived
Material	Gravelly Clay
Specification	AS Grading
Sampling Method	AS1289.1.2.1 Clause 6.4 (b)
Sample ID	S21MD-01009

Other Test Results

Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	14.0	
Mould Length (mm)		250	
Crumbling		No	
Curling		No	

Particle Size Distribution

AS 1289.3.6.1



Drying by: Oven
Date Tested: 22/05/2021

Note: Sample Washed

Sieve Size	% Passing	Limits
53.0mm	100	
37.5mm	98	
26.5mm	92	
19.0mm	85	
13.2mm	84	
9.5mm	81	
6.7mm	78	
4.75mm	75	
2.36mm	70	
1.18mm	66	
600µm	62	
425µm	61	
300µm	59	
150µm	56	
75µm	53	

Comments

N/A

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: MAT:S21MD-01009/1
Issue No: 1

Material Test Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 25/05/2021

Other Test Results

Description	Method	Result	Limits
Cracking		Yes	
Liquid Limit (%)	AS 1289.3.1.2	84	
Plastic Limit (%)	AS 1289.3.2.1	20	
Plasticity Index (%)	AS 1289.3.3.1	64	
Date Tested		17/05/2021	

Comments

N/A

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: MAT:S21MD-01079/1
Issue No: 1

Material Test Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 2/06/2021

Sample Details

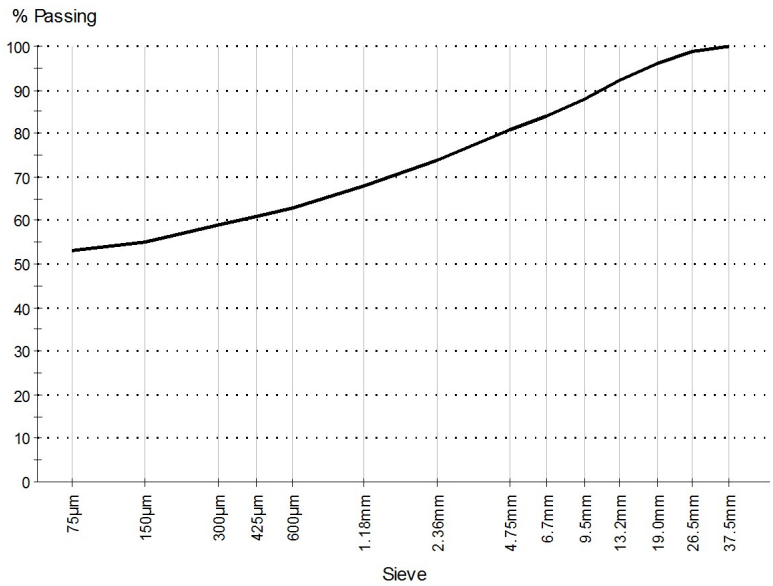
Location	Stage 7C
Sample Location	Lot 19, E 310368, N 5819281
Field Sample ID	1
Date Sampled	19/05/2021
Source	Site Derived
Material	Gravelly Clay
Specification	AS Grading
Sampling Method	AS1289.1.2.1 Clause 6.4 (b)
Sample ID	S21MD-01079

Other Test Results

Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	13.0	
Mould Length (mm)		250	
Crumbling		No	
Curling		Yes	

Particle Size Distribution

AS 1289.3.6.1



Drying by: Oven
Date Tested: 26/05/2021

Note: Sample Washed

Sieve Size	% Passing	Limits
37.5mm	100	
26.5mm	99	
19.0mm	96	
13.2mm	92	
9.5mm	88	
6.7mm	84	
4.75mm	81	
2.36mm	74	
1.18mm	68	
600µm	63	
425µm	61	
300µm	59	
150µm	55	
75µm	53	

Comments

N/A

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: MAT:S21MD-01079/1
Issue No: 1

Material Test Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 2/06/2021

Other Test Results

Description	Method	Result	Limits
Cracking		Yes	
Liquid Limit (%)	AS 1289.3.1.2	75	
Plastic Limit (%)	AS 1289.3.2.1	20	
Plasticity Index (%)	AS 1289.3.3.1	55	
Date Tested		26/05/2021	

Comments

N/A

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: MAT:S21MD-01121/1
Issue No: 1

Material Test Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 2/06/2021

Sample Details

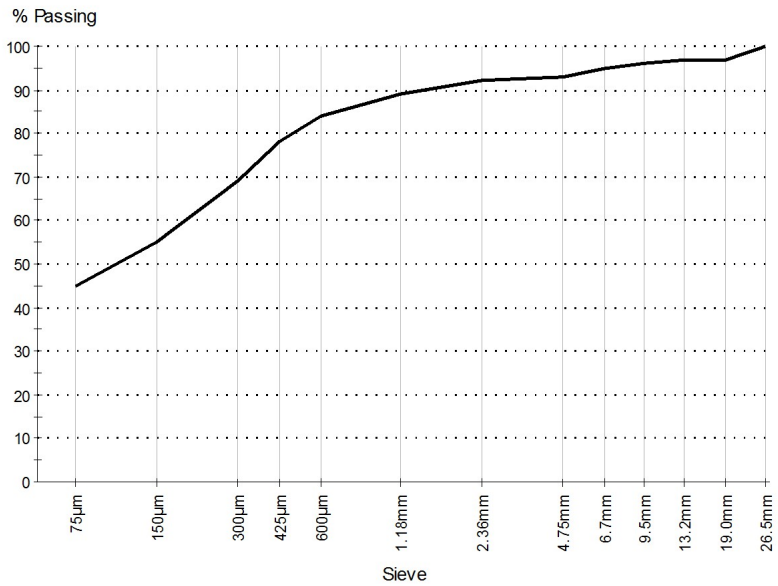
Location	Stage 7C
Sample Location	Reserve , E 310463, N 5819253
Field Sample ID	1
Date Sampled	21/05/2021
Source	Site Derived
Material	Gravelly Clay
Specification	AS Grading
Sampling Method	AS1289.1.2.1 Clause 6.4 (b)
Sample ID	S21MD-01121

Other Test Results

Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	6.0	
Mould Length (mm)		250	
Crumbling		No	
Curling		No	

Particle Size Distribution

AS 1289.3.6.1



Drying by: Oven
Date Tested: 1/06/2021

Note: Sample Washed

Sieve Size	% Passing	Limits
26.5mm	100	
19.0mm	97	
13.2mm	97	
9.5mm	96	
6.7mm	95	
4.75mm	93	
2.36mm	92	
1.18mm	89	
600µm	84	
425µm	78	
300µm	69	
150µm	55	
75µm	45	

Comments

N/A

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: MAT:S21MD-01121/1
Issue No: 1

Material Test Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 2/06/2021

Other Test Results

Description	Method	Result	Limits
Cracking		Yes	
Liquid Limit (%)	AS 1289.3.1.2	33	
Plastic Limit (%)	AS 1289.3.2.1	11	
Plasticity Index (%)	AS 1289.3.3.1	22	
Date Tested		1/06/2021	

Comments

N/A

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: MAT:S21MD-01385/1
Issue No: 1

Material Test Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 16/07/2021

Sample Details

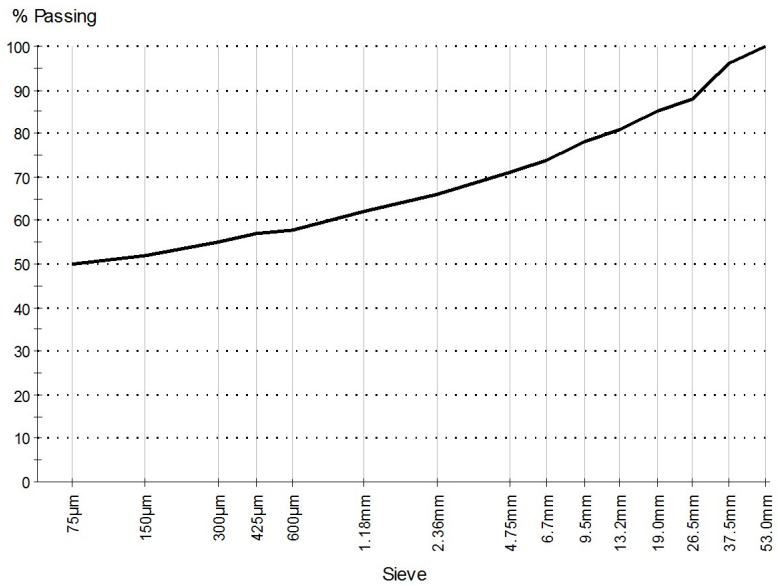
Location	Sunshine North
Sample Location	Reserve , E 310331, N 5819041, Layer 27
Field Sample ID	1
Date Sampled	21/06/2021
Source	Onsite
Material	Gravelly CLay
Specification	AS Grading
Sampling Method	AS1289.1.2.1 Clause 6.4 (b)
Sample ID	S21MD-01385

Other Test Results

Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	16.5	
Mould Length (mm)		250	
Crumbling		No	
Curling		No	

Particle Size Distribution

AS 1289.3.6.1



Drying by: Oven
Date Tested: 30/06/2021

Note: Sample Washed

Sieve Size	% Passing	Limits
53.0mm	100	
37.5mm	96	
26.5mm	88	
19.0mm	85	
13.2mm	81	
9.5mm	78	
6.7mm	74	
4.75mm	71	
2.36mm	66	
1.18mm	62	
600µm	58	
425µm	57	
300µm	55	
150µm	52	
75µm	50	

Comments

N/A

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: MAT:S21MD-01385/1
Issue No: 1

Material Test Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 16/07/2021

Other Test Results

Description	Method	Result	Limits
Cracking		Yes	
Liquid Limit (%)	AS 1289.3.1.2	78	
Plastic Limit (%)	AS 1289.3.2.1	23	
Plasticity Index (%)	AS 1289.3.3.1	55	
Date Tested		7/07/2021	

Comments

N/A

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00291
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 29/05/2021

Sample Details

Location: Stage 7C
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures: AS 1289.5.8.1
Laboratory Test procedures: AS 1289.5.7.1
Sampling Method: AS1289.1.2.1 Clause 6.4 (b)
Source: Site Derived
Material: Gravelly Clay

Sample Data

Sample ID	S21MD-01034	S21MD-01035	S21MD-01036	S21MD-01037	S21MD-01038	S21MD-01039
Field Sample ID	1	2	3	4	5	6
Client Sample ID	14	15	16	17	18	19
Date Tested	19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Location	Lot 20	Lot 18	Reserve	Reserve	Reserve	Reserve
	E 310366	E 310360	E 310459	E 310464	E 310466	E 310462
	N 5819266	N 5819269	N 5819250	N 5819252	N 5819248	N 5819247
	Layer 7	Layer 8	Layer 1	Layer 2	Layer 3	Layer 4
	FSL -2.25m	FSL -1.9m	FSL -3.45m	FSL -3.2m	FSL -3.0m	FSL -2.764m
Field and Laboratory Data						
Depth of Test (mm)	225	225	225	225	225	225
Depth of Layer (mm)	250	250	250	250	250	250
AS Sieve Size (mm)	19.0	19.0	19.0	19.0	19.0	19.0
Oversize Wet (%)	9	12	9	0	0	0
Field Wet Density (t/m³)	1.96	2.01	1.97	1.96	1.99	2.00
Peak Converted Wet Density (t/m³)	1.97	1.96	1.93	2.06	2.09	2.08
Compactive Effort	Standard	Standard	Standard	Standard	Standard	Standard
Moisture Variation (%)	1.0 dry	1.0 dry	0.5 dry	0.5 dry	0.5 dry	1.5 dry
Hilf Density Ratio (%)	**99.5**	**102.5**	**102.0**	**95.0**	**95.5**	**96.0**

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00296
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location: Stage 7C
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures: AS 1289.5.8.1
Laboratory Test procedures: AS 1289.5.7.1
Sampling Method: AS1289.1.2.1 Clause 6.4 (b)
Source: Site Derived
Material: Gravelly Clay

Sample Data

Sample ID	S21MD-01080	S21MD-01081	S21MD-01082	S21MD-01083	S21MD-01084	S21MD-01085
Field Sample ID	1	2	3	4	5	6
Client Sample ID	20	21	22	23	24	25
Date Tested	20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Location	Reserve	Reserve	Reserve	Reserve	Reserve	Reserve
	E 310458	E 310460	E 310469	E 310461	E 310460	E 310481
	N 5819251	N 5819255	N 5819246	N 5819246	N 5819250	N 5819238
	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9	Layer 10
	FSL -2.342m	FSL- 2.086m	FSL -1.86m	FSL -1.7m	FSL -1.442m	FSL -1.219m
Field and Laboratory Data						
Depth of Test (mm)	225	225	225	225	225	225
Depth of Layer (mm)	250	250	250	250	250	250
AS Sieve Size (mm)	19.0	19.0	19.0	19.0	19.0	19.0
Oversize Wet (%)	4	4	5	4	3	4
Field Wet Density (t/m³)	2.09	2.08	2.07	2.09	2.08	2.09
Peak Converted Wet Density (t/m³)	2.08	2.07	2.06	2.07	2.05	2.07
Compactive Effort	Standard	Standard	Standard	Standard	Standard	Standard
Moisture Variation (%)	0.5 wet	1.0 wet	0.5 wet	2.0 wet	2.0 dry	2.0 wet
Hilf Density Ratio (%)	**100.5**	**100.5**	**101.0**	**100.5**	**101.0**	**101.0**

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00307
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Sandy Clay

Sample Data

Sample ID	S21MD-01111	S21MD-01112	S21MD-01113	S21MD-01114	S21MD-01115
Field Sample ID	1	2	3	4	5
Client Sample ID	26	27	28	29	30
Date Tested	21/05/2021	21/05/2021	21/05/2021	21/05/2021	21/05/2021
Location	Reserve	Lot 18	Lot 20	Lot 17	Lot 16
	E 310463	E 310351	E 310360	E 310367	E 310482
	N 5919258	N 5819286	N 5819286	N 5819253	N 5819235
	Layer 11	Layer 10	Layer 11	Layer 1	Layer 2
	FSL -1.009m	FSL -1.447m	FSL -0.22m	FSL -1.410m	FSL -1.228m
Field and Laboratory Data					
Depth of Test (mm)	225	225	225	225	225
Depth of Layer (mm)	250	250	250	250	250
AS Sieve Size (mm)	19.0	19.0	19.0	19.0	19.0
Oversize Wet (%)	5	9	11	12	11
Field Wet Density (t/m³)	2.05	2.08	2.06	2.07	2.07
Peak Converted Wet Density (t/m³)	2.05	2.06	2.07	2.05	2.03
Compactive Effort	Standard	Standard	Standard	Standard	Standard
Moisture Variation (%)	0.0	1.0 wet	1.5 wet	0.0	0.0
Hilf Density Ratio (%)	**100.0**	**101.0**	**99.5**	**101.0**	**101.5**

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00314
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01139	S21MD-01140	S21MD-01141	S21MD-01142		
Field Sample ID	1	2	3	4		
Client Sample ID	36	37	38	39		
Date Tested	24/05/2021	24/05/2021	24/05/2021	24/05/2021		
Location	Reserve	Reserve	Reserve	Reserve		
	E 310463	E 310464	E 310461	E 310476		
	N 5819223	N 5819222	N 5819199	N 5819225		
	Layer 1	Layer 2	Layer 3	Layer 4		
	FSL -6.27m	FSL -6.057m	FSL -5.81m	FSL -5.56m		
Field and Laboratory Data						
Depth of Test (mm)	225	225	225	225		
Depth of Layer (mm)	250	250	250	250		
AS Sieve Size (mm)	19.0	19.0	19.0	19.0		
Oversize Wet (%)	8	6	6	15		
Field Wet Density (t/m³)	2.05	2.10	2.05	2.04		
Peak Converted Wet Density (t/m³)	1.99	2.09	2.03	2.02		
Compactive Effort	Standard	Standard	Standard	Standard		
Moisture Variation (%)	0.5 wet	0.5 dry	0.5 dry	0.0		
Hilf Density Ratio (%)	**103.0**	**100.5**	**100.5**	**101.0**		

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00319
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01157					
Field Sample ID	1					
Client Sample ID	40					
Date Tested	25/05/2021					
Location	Reserve					
	E 310479					
	N 5819228					
	Layer 6					

Field and Laboratory Data

Depth of Test (mm)	225					
Depth of Layer (mm)	250					
AS Sieve Size (mm)	19.0					
Oversize Wet (%)	7					
Field Wet Density (t/m³)	2.03					
Peak Converted Wet Density (t/m³)	1.98					
Compactive Effort	Standard					
Moisture Variation (%)	2.0 wet					
Hilf Density Ratio (%)	**102.5**					

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00325
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly CLay

Sample Data

Sample ID	S21MD-01173					
Field Sample ID	1					
Client Sample ID	41					
Date Tested	27/05/2021					
Location	Reserve					
	E 310364					
	N 5819255					
	Layer 11					

Field and Laboratory Data

Depth of Test (mm)	225					
Depth of Layer (mm)	250					
AS Sieve Size (mm)	19.0					
Oversize Wet (%)	13					
Field Wet Density (t/m³)	2.09					
Peak Converted Wet Density (t/m³)	2.07					
Compactive Effort	Standard					
Moisture Variation (%)	0.5 wet					
Hilf Density Ratio (%)	**101.0**					

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00326
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01174	S21MD-01175	S21MD-01176	S21MD-01177		
Field Sample ID	1	2	3	4		
Client Sample ID	42	43	44	45		
Date Tested	28/05/2021	28/05/2021	28/05/2021	28/05/2021		
Location	Reserve	Reserve	Reserve	Reserve		
	Layer 12	Layer 13	Layer 14	Layer 14		
	E 310470	E 310481	E 310452	E 310485		
	N 5819231	N 5819231	N 5819243	N 5819238		
	FSL -4.9m	FSL -4.615m	FSL -4.35m	FSL -4.10m		
Field and Laboratory Data						
Depth of Test (mm)	225	225	225	225		
Depth of Layer (mm)	250	250	250	250		
AS Sieve Size (mm)	19.0	19.0	19.0	19.0		
Oversize Wet (%)	5	3	8	14		
Field Wet Density (t/m³)	2.08	2.05	2.11	2.05		
Peak Converted Wet Density (t/m³)	2.08	2.05	2.09	2.04		
Compactive Effort	Standard	Standard	Standard	Standard		
Moisture Variation (%)	0.5 wet	0.5 wet	1.5 wet	0.5 wet		
Hilf Density Ratio (%)	**100.0**	**100.0**	**101.0**	**101.0**		

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00330
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01192	S21MD-01193	S21MD-01194			
Field Sample ID	1	2	3			
Client Sample ID	51	52	53			
Date Tested	31/05/2021	31/05/2021	31/05/2021			
Location	Reserve	Reserve	Reserve			
	E 310473	E 310463	E 310479			
	N 5819234	N 5819236	N 5819237			
	Layer 15	Layer 15	Layer 16			
	FSL -4.389m	FSL -4.389m	FSL -4.150m			
Field and Laboratory Data						
Depth of Test (mm)	225	225	225			
Depth of Layer (mm)	250	250	250			
AS Sieve Size (mm)	19.0	19.0	19.0			
Oversize Wet (%)	12	11	14			
Field Wet Density (t/m³)	2.05	2.06	2.07			
Peak Converted Wet Density (t/m³)	2.04	2.04	2.02			
Compactive Effort	Standard	Standard	Standard			
Moisture Variation (%)	1.0 wet	0.5 wet	0.5 dry			
Hilf Density Ratio (%)	**100.5**	**100.5**	**102.5**			

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00337
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01216	S21MD-01217				
Field Sample ID	1	2				
Client Sample ID	54	55				
Date Tested	1/06/2021	1/06/2021				
Location	Reserve	Reserve				
	E 310501	E 310492				
	N 5819250	N 5819230				
	Layer 1	Layer 2				
	FSL -0.6m	FSL -0.4m				
Field and Laboratory Data						
Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	15	15				
Field Wet Density (t/m³)	2.09	2.10				
Peak Converted Wet Density (t/m³)	2.07	2.07				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	2.0 wet	0.0				
Hilf Density Ratio (%)	**101.0**	**101.5**				

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00339
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01221	S21MD-01222				
Field Sample ID	1	2				
Client Sample ID	56	57				
Date Tested	2/06/2021	2/06/2021				
Location	Reserve	Reserve (BB - CC)				
	E 310469	E 310482				
	N 5819245	N 5819203				
	Layer 17	Layer 3				
Field and Laboratory Data						
Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	12	12				
Field Wet Density (t/m³)	2.06	2.07				
Peak Converted Wet Density (t/m³)	2.03	2.05				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	1.5 wet	2.0 wet				
Hilf Density Ratio (%)	**101.5**	**101.0**				

Comments

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00346
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 4/06/2021

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01247	S21MD-01248				
Field Sample ID	58	59				
Date Tested	3/06/2021	3/06/2021				
Location	E 310497	E 310483				
	N 5819238	N 5819235				
	Layer 4	Layer 18				
	FSL	FSL -0.043m				
	RL 7.729	RL 8.382				

Field and Laboratory Data

Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	15	19				
Field Wet Density (t/m³)	2.14	2.22				
Peak Converted Wet Density (t/m³)	2.08	2.13				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	2.0 dry	2.0 dry				
Hilf Density Ratio (%)	**102.5**	**104.0**				

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00351
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01263	S21MD-01264				
Field Sample ID	1	2				
Client Sample ID	60	61				
Date Tested	4/06/2021	4/06/2021				
Location	Rest of Reserve	Reserve (AA -BB)				
	E 310470	E 310472				
	N 5819224	N 5819231				
	Layer 19	Layer 19				
	FSL -2.989m	FSL				
Field and Laboratory Data						
Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	13	15				
Field Wet Density (t/m³)	2.11	2.08				
Peak Converted Wet Density (t/m³)	2.09	2.06				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	1.5 wet	1.5 wet				
Hilf Density Ratio (%)	**101.0**	**100.5**				

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00352
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01265					
Field Sample ID	1					
Client Sample ID	62					
Date Tested	5/06/2021					
Location	Reserve					
	E 310451					
	N 5819256					
	Layer 20					
	FSL -2.6m					

Field and Laboratory Data

Depth of Test (mm)	225					
Depth of Layer (mm)	250					
AS Sieve Size (mm)	19.0					
Oversize Wet (%)	14					
Field Wet Density (t/m³)	2.09					
Peak Converted Wet Density (t/m³)	2.02					
Compactive Effort	Standard					
Moisture Variation (%)	0.5 wet					
Hilf Density Ratio (%)	**103.5**					

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00363
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly CLay

Sample Data

Sample ID	S21MD-01300					
Field Sample ID	1					
Client Sample ID	63					
Date Tested	7/06/2021					
Location	Reserve					
	E 310455					
	N 5819251					
	Layer 21					
	FSL -2.7m					

Field and Laboratory Data

Depth of Test (mm)	225					
Depth of Layer (mm)	250					
AS Sieve Size (mm)	19.0					
Oversize Wet (%)	0					
Field Wet Density (t/m³)	2.12					
Peak Converted Wet Density (t/m³)	2.13					
Compactive Effort	Standard					
Moisture Variation (%)	3.5 wet					
Hilf Density Ratio (%)	**99.5**					

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00366
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01309	S21MD-01310				
Field Sample ID	1	2				
Client Sample ID	64	65				
Date Tested	8/06/2021	8/06/2021				
Location	Reserve	Reserve				
	E 310443	E 310447				
	N 5819253	N 5819259				
	Layer 21	Layer 22				
	Retest of S21MD-01300	FSL -3.609m				
Field and Laboratory Data						
Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	13	16				
Field Wet Density (t/m³)	2.10	2.12				
Peak Converted Wet Density (t/m³)	2.06	2.09				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	2.0 wet	2.0 wet				
Hilf Density Ratio (%)	**102.0**	**101.0**				

Comments

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00368
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 17/06/2021

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01315	S21MD-01316				
Field Sample ID	1	2				
Client Sample ID	66	67				
Location	Reserve	Reserve				
	E 310442	E 310465				
	N 5819254	N 5819225				
	Layer 23	Layer 23				
	RL 3.60	RL 2.80				

Field and Laboratory Data

Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	12	14				
Field Wet Density (t/m³)	2.03	2.05				
Peak Converted Wet Density (t/m³)	1.94	2.11				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	2.5 dry	1.5 dry				
Hilf Density Ratio (%)	**105.0**	**97.5**				

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00369
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly CLay

Sample Data

Sample ID	S21MD-01317					
Field Sample ID	1					
Client Sample ID	68					
Date Tested	16/06/2021					
Location	Reserve					
	E 310442					
	N5819238					
	Layer 24					

Field and Laboratory Data

Depth of Test (mm)	225					
Depth of Layer (mm)	250					
AS Sieve Size (mm)	19.0					
Oversize Wet (%)	11					
Field Wet Density (t/m³)	2.16					
Peak Converted Wet Density (t/m³)	1.99					
Compactive Effort	Standard					
Moisture Variation (%)	1.0 dry					
Hilf Density Ratio (%)	**108.5**					

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00371
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01320					
Field Sample ID	1					
Client Sample ID	69					
Date Tested	17/06/2021					
Location	Reserve					
	E 310458					
	N 5819230					
	Layer 25					
	FSL -1.5m					

Field and Laboratory Data

Depth of Test (mm)	225					
Depth of Layer (mm)	250					
AS Sieve Size (mm)	19.0					
Oversize Wet (%)	7					
Field Wet Density (t/m³)	2.08					
Peak Converted Wet Density (t/m³)	2.02					
Compactive Effort	Standard					
Moisture Variation (%)	0.0					
Hilf Density Ratio (%)	**103.0**					

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00373
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly CLay

Sample Data

Sample ID	S21MD-01323					
Field Sample ID	1					
Client Sample ID	70					
Date Tested	18/06/2021					
Location	Reserve					
	E 310442					
	N 5819238					
	Layer 26					
	FSL -2.3m					

Field and Laboratory Data

Depth of Test (mm)	225					
Depth of Layer (mm)	250					
AS Sieve Size (mm)	19.0					
Oversize Wet (%)	13					
Field Wet Density (t/m³)	2.10					
Peak Converted Wet Density (t/m³)	2.02					
Compactive Effort	Standard					
Moisture Variation (%)	0.5 wet					
Hilf Density Ratio (%)	**104.0**					

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00374
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01324	S21MD-01325				
Field Sample ID	1	2				
Client Sample ID	71	72				
Date Tested	21/06/2021	21/06/2021				
Location	Reserve	Reserve				
	E 310445	E 310442				
	N 5819226	N 5819268				
	Layer 27	Layer 28				
	FSL -0.652m	FSL -0.352m				
Field and Laboratory Data						
Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	5	5				
Field Wet Density (t/m³)	2.07	2.05				
Peak Converted Wet Density (t/m³)	2.00	2.04				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	0.0	0.0				
Hilf Density Ratio (%)	**103.5**	**100.5**				

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00376
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01327	S21MD-01328				
Field Sample ID	1	2				
Client Sample ID	73	74				
Date Tested	22/06/2021	22/06/2021				
Location	Reserve	Reserve				
	E 310446	E 310446				
	N 5819259	N 5819268				
	Layer 29	Layer 30				
	FSL -2.05m	FSL				
Field and Laboratory Data						
Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	18	10				
Field Wet Density (t/m³)	2.06	2.06				
Peak Converted Wet Density (t/m³)	2.04	2.03				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	2.0 dry	0.5 wet				
Hilf Density Ratio (%)	**101.5**	**101.5**				

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00381
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01339					
Field Sample ID	1					
Client Sample ID	75					
Date Tested	23/06/2021					
Location	Reserve					
	E 310455					
	N 5819231					
	Layer 31					
	FSL -2.307m					

Field and Laboratory Data

Depth of Test (mm)	225					
Depth of Layer (mm)	250					
AS Sieve Size (mm)	19.0					
Oversize Wet (%)	10					
Field Wet Density (t/m³)	2.05					
Peak Converted Wet Density (t/m³)	1.94					
Compactive Effort	Standard					
Moisture Variation (%)	2.0 dry					
Hilf Density Ratio (%)	**106.0**					

Comments

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00386
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 28/06/2021

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01346	S21MD-01347				
Field Sample ID	1	2				
Client Sample ID	76	77				
Date Tested	25/06/2021	25/06/2021				
E	Reserve	Reserve				
N	E 310442	E 310440				
	N 5819256	N 5819285				
	Layer 32	Layer 32				
	RL 14.125	RL 13.089				
Field and Laboratory Data						
Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	15	11				
Field Wet Density (t/m³)	2.05	1.99				
Peak Converted Wet Density (t/m³)	2.01	1.96				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	1.0 dry	0.5 dry				
Hilf Density Ratio (%)	**102.0**	**101.5**				

Comments

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00389
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 29/06/2021

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01355	S21MD-01356				
Field Sample ID	1	2				
Client Sample ID	78	79				
Date Tested	28/06/2021	28/06/2021				
Location	Reserve	Reserve				
	E 310450	E 310442				
	N 5819243	N 5819227				
	FSL -950mm	FSL -1350mm				
	Layer 33	Layer 34				
Field and Laboratory Data						
Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	15	15				
Field Wet Density (t/m³)	2.08	2.03				
Peak Converted Wet Density (t/m³)	2.02	2.00				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	0.0	0.5 dry				
Hilf Density Ratio (%)	**103.0**	**101.5**				

Comments

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00391
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 30/06/2021

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01358	S21MD-01359				
Field Sample ID	1	2				
Client Sample ID	80	81				
Date Tested	29/06/2021	29/06/2021				
Location	Reserve	Reserve				
	E 310447	E 310448				
	N 5819218	N 5819221				
	FSL -1450mm	FSL -1070mm				
	Layer 35	Layer 36				
Field and Laboratory Data						
Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	6	8				
Field Wet Density (t/m³)	1.90	1.95				
Peak Converted Wet Density (t/m³)	1.93	1.95				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	0.0	0.0				
Hilf Density Ratio (%)	**98.5**	**99.5**				

Comments

Western Region Laboratory
Base Laboratory Accreditation No. 12719
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00400
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Senior Technician)
Date of Issue: 1/07/2021

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01383	S21MD-01384				
Field Sample ID	1	2				
Client Sample ID	82	83				
Date Tested	30/06/2021	30/06/2021				
Location	Reserve	Reserve				
	E 310441	E 310438				
	N 5819215	N 5819211				
	Layer 37	Layer 38				
	FSL -0.834m	FSL -0.5m				
Field and Laboratory Data						
Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	8	7				
Field Wet Density (t/m³)	1.97	1.98				
Peak Converted Wet Density (t/m³)	1.99	1.94				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	2.0 wet	0.0				
Hilf Density Ratio (%)	**99.0**	**102.0**				

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00405
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

Sample Data

Sample ID	S21MD-01398	S21MD-01399				
Field Sample ID	1	2				
Client Sample ID	84	85				
Date Tested	1/07/2021	1/07/2021				
Location	Reserve Entrance	Batter at Reserve				
	E 310430	E 310485				
	N 5819276	N 5819213				
	Layer 1	Layer 1				
	FSL - 800mm	FSL				
Field and Laboratory Data						
Depth of Test (mm)	225	225				
Depth of Layer (mm)	250	250				
AS Sieve Size (mm)	19.0	19.0				
Oversize Wet (%)	12	14				
Field Wet Density (t/m³)	2.04	2.04				
Peak Converted Wet Density (t/m³)	2.01	2.00				
Compactive Effort	Standard	Standard				
Moisture Variation (%)	0.0	0.0				
Hilf Density Ratio (%)	**101.5**	**102.0**				

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00411
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location: Stage 7C
Client Request ID:
Specification Requirements: Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures: AS 1289.5.8.1
Laboratory Test procedures: AS 1289.5.7.1
Sampling Method: AS1289.1.2.1 Clause 6.4 (b)
Source: Site Derived
Material: Gravelly CLay

Sample Data

Sample ID	S21MD-01412	S21MD-01413	S21MD-01414	S21MD-01415	S21MD-01416
Field Sample ID	1	2	3	4	5
Client Sample ID	86	87	88	89	90
Date Tested	2/07/2021	2/07/2021	2/07/2021	2/07/2021	2/07/2021
Location	Reserve Entrance	Reserve Entrance	Reserve Entrance	Reserve Entrance	Reserve Entrance
	E 310435	E 310439	E 310442	E 310439	E 310445
	N 5819282	N 5819273	N 5819268	N 5819266	N 5819265
	Layer 2	Layer 3	Layer 4	Layer 5	Layer 6
	FSL -1.418m	FSL -1.127m	FSL -0.845m	FSL -0.546m	FSL -0.257m
Field and Laboratory Data					
Depth of Test (mm)	225	225	225	225	225
Depth of Layer (mm)	250	250	250	250	250
AS Sieve Size (mm)	19.0	19.0	19.0	19.0	19.0
Oversize Wet (%)	7	6	7	6	6
Field Wet Density (t/m³)	2.04	2.05	2.03	2.04	2.04
Peak Converted Wet Density (t/m³)	1.96	1.98	1.97	1.96	1.99
Compactive Effort	Standard	Standard	Standard	Standard	Standard
Moisture Variation (%)	0.5 wet	1.0 wet	0.0	0.5 wet	1.0 dry
Hilf Density Ratio (%)	**104.0**	**103.0**	**103.0**	**104.0**	**102.5**

Comments

Western Region Laboratory
ACN 143 009 330
Factory 1/7 Katherine Drive
Ravenhall VIC 3023

Report No: HDR:W21MD00416
Issue No: 1

HILF Density Ratio Report

Client: Tonkin & Taylor (Aus) Pty Limited
Address: Level 3, 99 Coventry Street
SOUTH MELBOURNE VIC 3006
Project: River Valley Stage 7C
Project No.: 1003809.1000
Order No.: **CG Request No.:**
TRN: **Lot No.:**

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 12719
Site Number: 23249
Approved Signatory: B. Taseski (Ravenhall Laboratory Manager)
Date of Issue: 21/10/2022

Sample Details

Location:	Stage 7C
Client Request ID:	
Specification Requirements:	Minimum Hilf Density Ratio of 95% (+- 3% of OMC)
Field Test procedures:	AS 1289.5.8.1
Laboratory Test procedures:	AS 1289.5.7.1
Sampling Method:	AS1289.1.2.1 Clause 6.4 (b)
Source:	Site Derived
Material:	Gravelly Clay

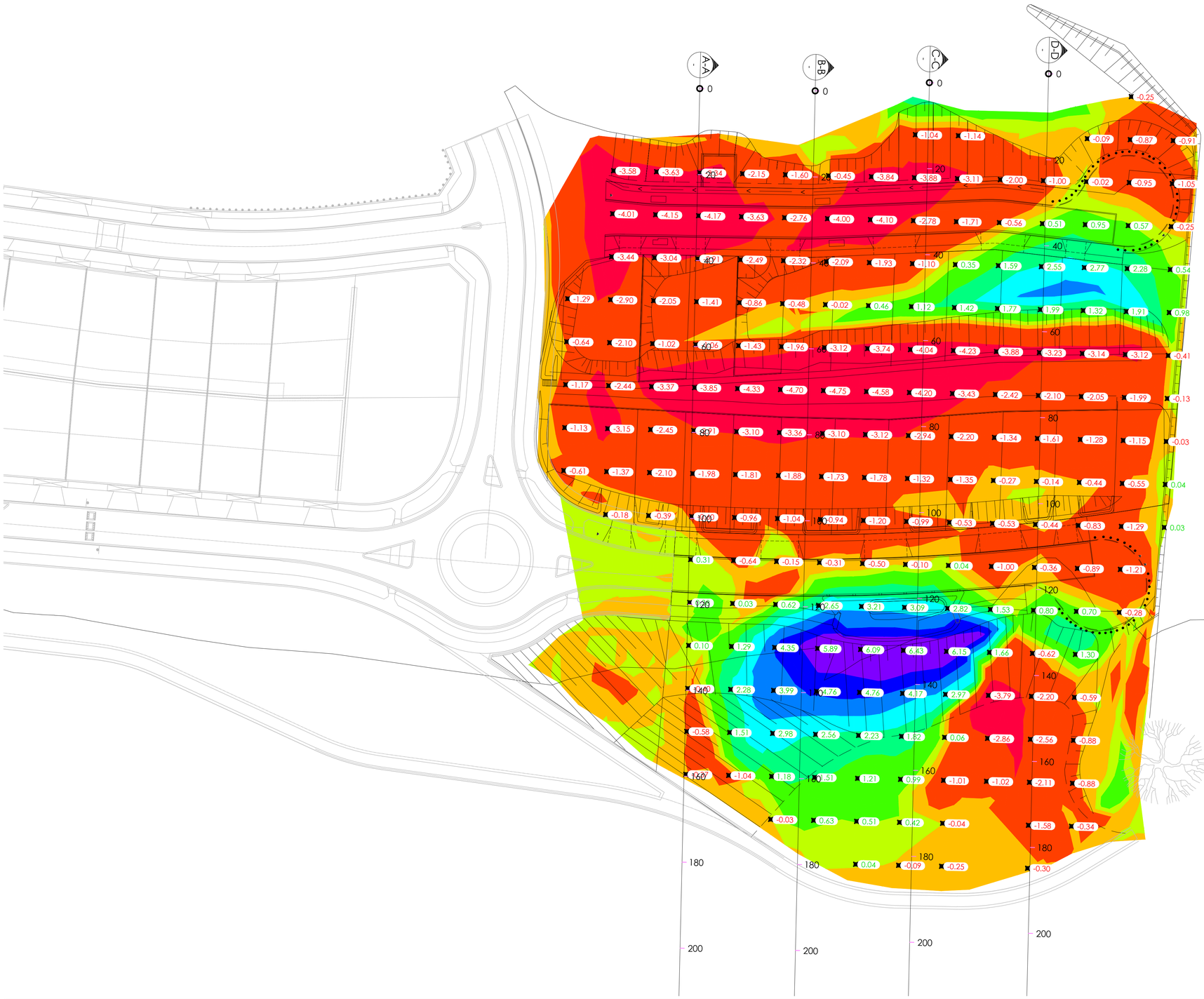
Sample Data

Sample ID	S21MD-01431	S21MD-01432	S21MD-01433			
Field Sample ID	1	2	3			
Client Sample ID	91	92	93			
Date Tested	5/07/2021	5/07/2021	5/07/2021			
Location	Reserve	Reserve	Reserve			
	E 310446	E 310448	E 310445			
	N 5819229	N 5819228	N 5819225			
	Layer 39	Layer 40	Layer 41			
	FSL -400mm	FSL -200mm	FSL			
Field and Laboratory Data						
Depth of Test (mm)	225	225	225			
Depth of Layer (mm)	250	250	250			
AS Sieve Size (mm)	19.0	19.0	19.0			
Oversize Wet (%)	11	11	9			
Field Wet Density (t/m³)	2.02	2.04	2.03			
Peak Converted Wet Density (t/m³)	1.99	2.00	1.97			
Compactive Effort	Standard	Standard	Standard			
Moisture Variation (%)	0.0	0.5 wet	0.0			
Hilf Density Ratio (%)	**101.5**	**102.0**	**103.0**			

Comments

Appendix D Survey Drawings

A1 File Reference D - 15019 - 7C - 9502 - AS BUILT - 7C BULK EARTHWORKS vs EG.dwg



VOLUMETRIC ANALYSIS				
NUMBER	COLOUR	MIN ELEVATION (m)	MAX ELEVATION (m)	2D AREA (m²)
1		-5.841	-3.000	3147.6
2		-3.000	-0.500	9381.8
3		-0.500	0.000	4092.8
4		0.000	0.500	2458.2
5		0.500	1.500	1686.6
6		1.500	2.500	993.2
7		2.500	3.500	722.6
8		3.500	4.500	482.2
9		4.500	5.500	325.2
10		5.500	6.630	312.4

BULK EARTHWORKS NOTES

THE APPROXIMATE SITE EARTHWORKS VOLUMES BASED ON THE AS-BUILT BULK EARTHWORKS SURFACE COMPARISON TO THE EXISTING NATURAL GROUND SURFACE ARE:

- VOLUME OF CUT: 27 358m³
- VOLUME OF REMAINING FILL: 11 540m³

VOLUMES REQUIRED TO ACHIEVE AS-BUILT BULK LEVELS

0 2 5 10 15 20 25 35 50m
1:500

N

Revision	Date	Revision	Drawn	Checked
P01	20.10.22	FOR INFORMATION	TS	VR

Note for Contractors
The works described on this drawing must be undertaken by competent Contractors with an appropriate level of experience who have prepared appropriate Safe Work Method Statements (SWMS) relating to these works. The contractor is responsible for the management of all risks associated with the construction activities stated on this drawing.

This drawing should not be issued in part and must be read in conjunction with all appropriate specifications, notes pages, details and authority drawings as appropriate.

Dial before you dig. BEWARE OF UNDERGROUND SERVICES. The location of underground services are approximate only and their exact position should be proven on site. No guarantee is given that existing services are shown.

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SKETCHES
MELBOURNE
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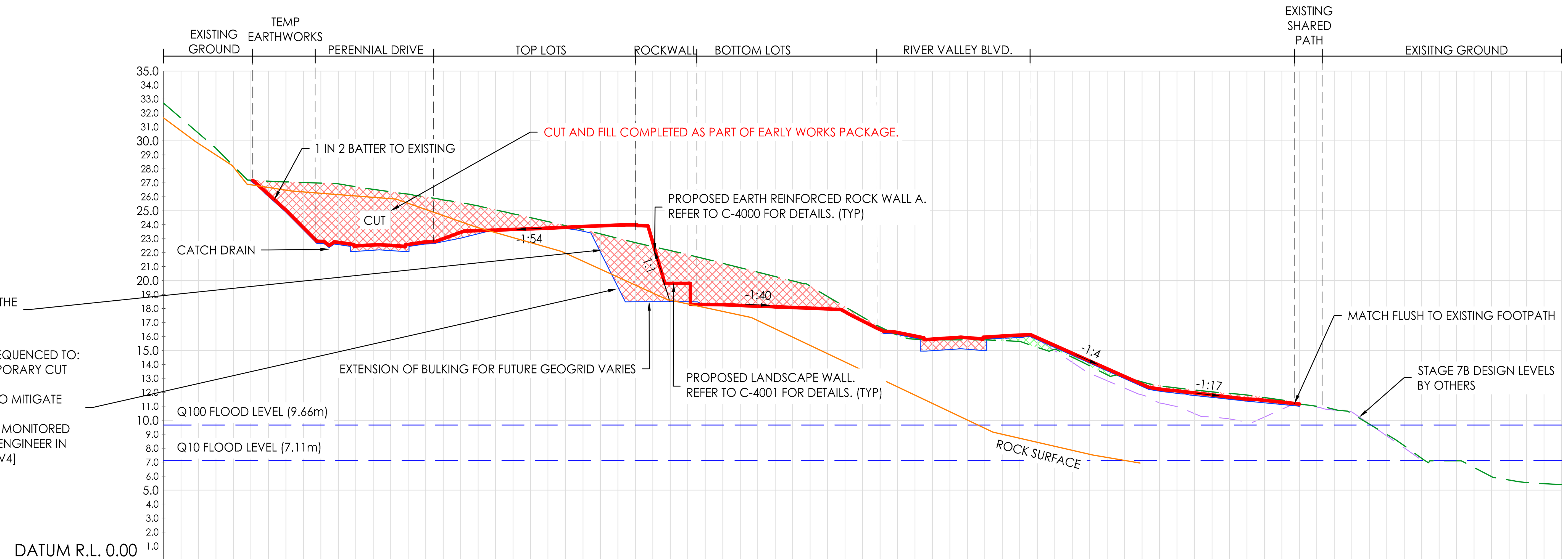
Project
RIVER VALLEY - STAGE 7C
Client
YOURLAND
Purpose of Issue
FOR INFORMATION
Drawing Title
VOLUME COMPARISON
AS-BUILT BULK LEVEL VS EXISTING GROUND LEVEL

Drawn By	Checked By	Drawn Scale	Date of First Issue
TS	VR	1:500 @ A1	20.10.22

Project Number	Origin	Zone	Level	File Type	Role	Number	Revision
15019	CJA	7C	XX	SK	C	9502	P01

A1 File Reference | Plot Date

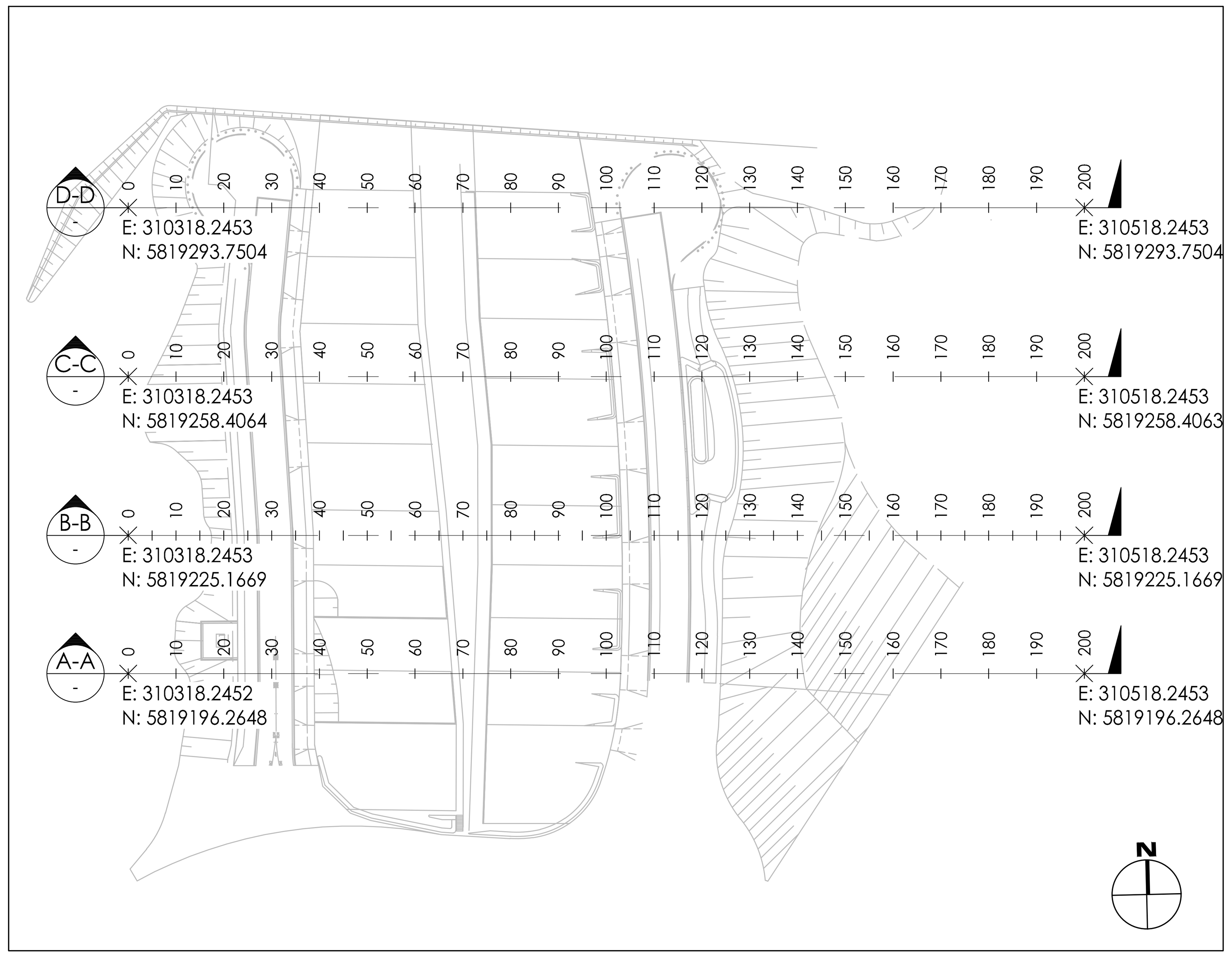


PLACEMENT OF FILL TO OCCUR IN SEQUENCE WITH THE CONSTRUCTION OF THE RETAINING IN FRONT.

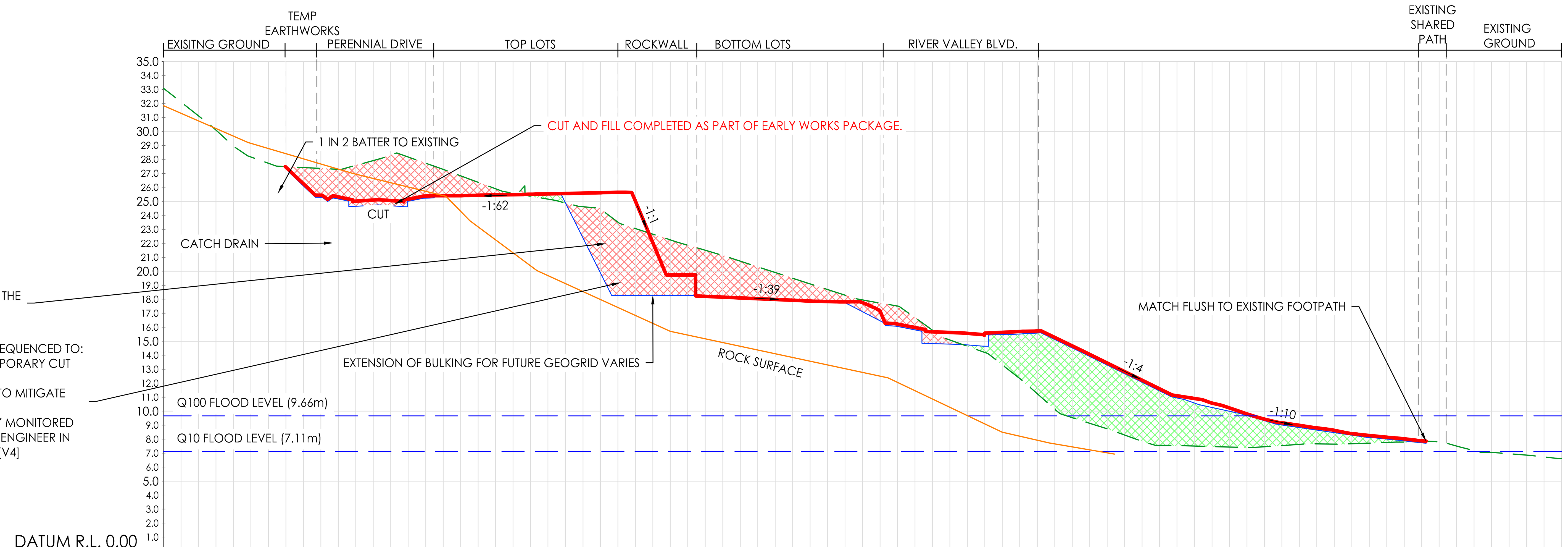
EXCAVATION OF TEMPORARY CUT FACE SHALL BE SEQUENCED TO:
- REDUCE THE DURATION OF THE EXPOSED TEMPORARY CUT FACE
- IMPLEMENT CONTRACTOR WH&S MEASURES TO MITIGATE ACTIVITY AROUND THE EXPOSED CUT FACE
- THE EXPOSED CUT FACE SHALL BE REGULARLY MONITORED BY THE LEVEL 1 SUPERVISING GEOTECHNICAL ENGINEER IN ACCORDANCE WITH T+T LETTER 1000780.L26 [V4]

CHAINAGE	DESIGN LEVEL	BULKING LEVEL	EXISTING LEVEL	LEVEL DIFFERENCE
0.00			32.70	
2.50			31.62	
5.00			30.54	
7.50			29.46	
10.00			28.20	
12.50		27.11	27.18	-0.08
15.00	26.17	26.02	27.11	-1.10
17.50	25.05	24.90	27.06	-2.17
20.00	23.78	23.63	27.02	-3.39
22.50	22.81	22.66	26.98	-4.32
25.00	22.73	22.58	26.92	-4.34
27.50	22.47	22.09	26.72	-4.63
30.00	22.54	22.17	26.53	-4.36
32.50	22.52	22.15	26.35	-4.21
35.00	22.59	22.07	26.19	-4.11
37.50	22.76	22.61	25.98	-3.37
40.00	23.00	22.79	25.77	-2.98
42.50	23.46	23.04	25.57	-2.53
45.00	23.57	23.35	25.35	-2.00
47.50	23.61	23.61	25.06	-1.45
50.00	23.66	23.65	24.78	-1.13
52.50	23.70	23.68	24.51	-0.82
55.00	23.75	23.72	24.22	-0.50
57.50	23.81	23.73	23.93	-0.20
60.00	23.87	23.53	23.64	-0.11
62.50	23.92	22.04	23.34	-1.30
65.00	23.97	19.54	23.03	-3.48
67.50	23.99	18.48	22.71	-4.23
70.00	22.72	18.48	22.43	-3.95
72.50	19.80	18.48	22.15	-3.67
75.00	19.80	18.48	21.86	-3.38
77.50	18.28	18.28	21.55	-3.27
80.00	18.28	18.24	21.23	-2.99
82.50	18.22	18.21	20.92	-2.71
85.00	18.17	18.17	20.60	-2.44
87.50	18.12	18.12	20.29	-2.17
90.00	18.07	18.07	19.98	-1.91
92.50	18.02	18.02	19.60	-1.59
95.00	17.97	17.97	18.86	-0.89
97.50	17.77	17.78	18.13	-0.35
100.00	17.11	17.14	17.40	-0.25
102.50	16.50	16.50	16.68	-0.18
105.00	16.29	16.14	16.08	0.06
107.50	16.04	15.89	15.80	0.08
110.00	15.81	14.98	15.75	-0.77
112.50	15.89	15.07	15.75	-0.69
115.00	15.91	15.08	15.76	-0.67
117.50	15.95	15.01	15.76	-0.75
120.00	16.03	15.88	15.70	0.18
122.50	16.10	15.92	15.65	0.28
125.00	15.92	15.77	15.22	0.55
127.50	15.36	15.21	15.08	0.13
130.00	14.81	14.66	14.51	0.14
132.50	14.25	14.10	13.89	0.20
135.00	13.69	13.54	13.25	0.29
137.50	13.14	12.99	13.09	-0.11
140.00	12.58	12.43	12.75	-0.32
142.50	12.23	12.09	12.48	-0.39
145.00	12.11	11.93	12.32	-0.39
147.50	11.96	11.77	12.17	-0.39
150.00	11.81	11.64	12.04	-0.40
152.50	11.65	11.51	11.92	-0.41
155.00	11.52	11.37	11.81	-0.44
157.50	11.43	11.25	11.63	-0.38
160.00	11.29	11.13	11.45	-0.32
162.50	11.16	11.01	11.16	-0.15
165.00			11.00	
167.50			10.78	
170.00			10.48	
172.50			9.73	
175.00			8.99	
177.50			8.19	
180.00			7.28	
182.50			7.10	
185.00			7.10	
187.50			6.62	
190.00			5.97	
192.50			5.72	
195.00			5.54	
197.50			5.47	
200.00			5.40	

A-A - LONG SECTION
SCALES: HORIZONAL 1:250 VERTICAL 1:125 (2x)



KEY PLAN
SCALE 1:1000



PLACEMENT OF FILL TO OCCUR IN SEQUENCE WITH THE CONSTRUCTION OF THE RETAINING IN FRONT.

EXCAVATION OF TEMPORARY CUT FACE SHALL BE SEQUENCED TO:
- REDUCE THE DURATION OF THE EXPOSED TEMPORARY CUT FACE
- IMPLEMENT CONTRACTOR WH&S MEASURES TO MITIGATE ACTIVITY AROUND THE EXPOSED CUT FACE
- THE EXPOSED CUT FACE SHALL BE REGULARLY MONITORED BY THE LEVEL 1 SUPERVISING GEOTECHNICAL ENGINEER IN ACCORDANCE WITH T+T LETTER 1000780.L26 [V4]

CHAINAGE	DESIGN LEVEL	BULKING LEVEL	EXISTING LEVEL	LEVEL DIFFERENCE
0.00			33.08	
2.50			32.09	
5.00			31.11	
7.50			30.09	
10.00			28.95	
12.50			28.17	
15.00			27.72	
17.50	27.44	27.41	27.48	-0.07
20.00	26.26	26.10	27.41	-1.31
22.50	25.44	25.29	27.35	-2.06
25.00	25.32	25.17	27.29	-2.12
27.50	25.02	24.65	27.57	-2.92
30.00	25.09	24.72	27.91	-3.19
32.50	25.05	24.68	28.30	-3.62
35.00	25.15	25.00	28.17	-3.16
37.50	25.38	25.23	27.73	-2.50
40.00	25.40	25.37	27.28	-1.91
42.50	25.40	25.39	26.82	-1.43
45.00	25.43	25.43	26.36	-0.92
47.50	25.45	25.45	25.89	-0.44
50.00	25.47	25.47	25.58	-0.11
52.50	25.51	25.50	25.37	0.13
55.00	25.53	25.52	25.16	0.37
57.50	25.56	24.88	24.88	0.00
60.00	25.59	22.37	24.61	-2.24
62.50	25.62	19.88	24.46	-4.59
65.00	25.64	18.27	23.51	-5.24
67.50	25.02	18.27	23.05	-4.79
70.00	22.04	18.27	22.65	-4.38
72.50	19.74	18.27	22.24	-3.98
75.00	19.74	18.27	21.87	-3.60
77.50	18.20	18.22	21.50	-3.28
80.00	18.15	18.15	21.13	-2.98
82.50	18.09	18.09	20.73	-2.63
85.00	18.04	18.04	20.32	-2.28
87.50	17.98	17.99	19.91	-1.92
90.00	17.93	17.94	19.50	-1.56
92.50	17.87	17.89	19.10	-1.21
95.00	17.84	17.84	18.70	-0.86
97.50	17.82	17.76	18.29	-0.54
100.00	17.76	17.11	17.95	-0.84
102.50	17.17	16.46	17.73	-1.26
105.00	16.23	16.06	17.52	-1.46
107.50	15.98	15.81	16.69	-0.88
110.00	15.67	14.83	15.80	-0.97
112.50	15.62	14.79	15.09	-0.30
115.00	15.56	14.74	14.64	0.09
117.50	15.58	14.64	14.19	0.45
120.00	15.63	15.48	13.31	2.17
122.50	15.69	15.52	12.33	3.18
125.00	15.73	15.58	11.25	4.34
127.50	15.28	15.13	10.15	4.98
130.00	14.68	14.53	9.54	4.99
132.50	14.07	13.92	9.14	4.78
135.00	13.45	13.30	8.74	4.57
137.50	12.84	12.69	8.30	4.39
140.00	12.22	12.07	7.85	4.22
142.50	11.60	11.45	7.56	3.89
145.00	11.10	10.94	7.54	3.40
147.50	10.91	10.58	7.51	3.08
150.00	10.58	10.27	7.47	2.80
152.50	10.23	10.00	7.43	2.56
155.00	9.80	9.68	7.40	2.28
157.50	9.44	9.32	7.46	1.86
160.00	9.17	9.01	7.54	1.47
162.50	8.99	8.83	7.63	1.20
165.00	8.80	8.65	7.66	0.99
167.50	8.63	8.46	7.64	0.82
170.00	8.39	8.28	7.67	0.61
172.50	8.26	8.12	7.72	0.40
175.00	8.14	8.00	7.76	0.24
177.50	8.03	7.87	7.79	0.08
180.00	7.88	7.74	7.84	-0.11
182.50			7.80	
185.00			7.51	
187.50			7.18	
190.00			7.06	
192.50			6.96	
195.00			6.86	
197.50			6.72	
200.00			6.60	

B-B - LONG SECTION
SCALES: HORIZONAL 1:250 VERTICAL 1:125 (2x)

Revision	Date	Reason	Drawn	Checked
0	30.09.21	ISSUED FOR CONSTRUCTION	JSS	AK

Note for Contractors
The works described on this drawing must be undertaken by competent Contractors with an appropriate level of experience who have prepared appropriate Safe Work Method Statements (SWMS) relating to these works. The contractor is responsible for the management of all risks associated with the construction activities stated on this drawing.

STOP This drawing should not be issued in part and must be read in conjunction with all appropriate specifications, notes pages, details and authority drawings as appropriate.

Dial before you dig. BEWARE OF UNDERGROUND SERVICES. The location of underground services are approximate only and their exact position should be proven on site. No guarantee is given that existing services are shown.

BULK EARTHWORKS COMPLETED UNDER EARLY WORKS PACKAGE & APPROVAL. REFER ENDORSED EARLY WORKS PACKAGE FOR FURTHER INFORMATION.

SITE SECTIONS ARE PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY AND ARE NOT TO BE USED TO SET OUT THE WORKS.

ISSUED FOR CONSTRUCTION

www.cjarms.com

CIVIL SITEWORKS
MELBOURNE
T : (03) 9285 2800 | E : info@cjarms.com | W : www.cjarms.com

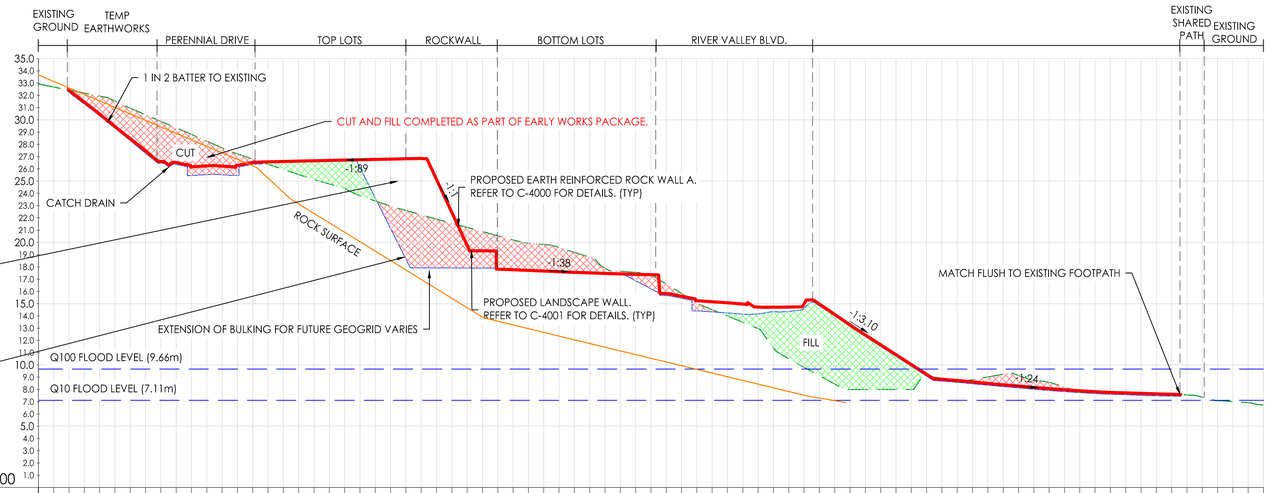
Project: RIVER VALLEY - STAGE 7C
Client: YOURLAND
Purpose of Issue: ISSUED FOR CONSTRUCTION
Drawing Title: TYPICAL SECTIONS - SITE SECTIONS SHEET (1 OF 2)

Drawn By	Checked By	Drawn Scale	Date of First Issue
JSS	AK	1:500 @ A1	17.04.20

Project Number	Origin	Zone	Level	File Type	Role	Number	Revision
15019	CJA	7C	XX	DR	C	2100	0

File Reference

Plot Date



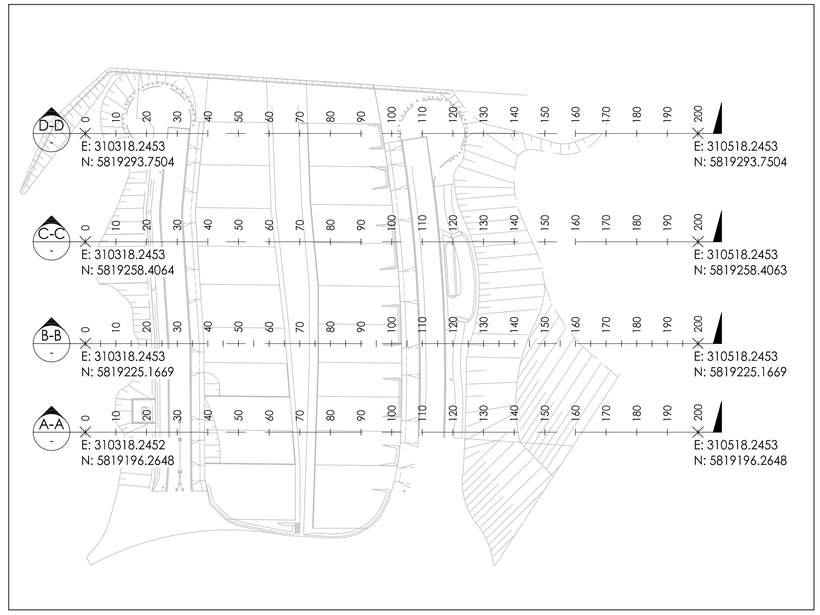
PLACEMENT OF FILL TO OCCUR IN SEQUENCE WITH THE CONSTRUCTION OF THE RETAINING IN FRONT.

EXCAVATION OF TEMPORARY CUT FACE SHALL BE SEQUENCED TO:
- REDUCE THE DURATION OF THE EXPOSED TEMPORARY CUT FACE
- IMPLEMENT CONTRACTOR WH&S MEASURES TO MITIGATE ACTIVITY AROUND THE EXPOSED CUT FACE
- THE EXPOSED CUT FACE SHALL BE REGULARLY MONITORED BY THE LEVEL 1 SUPERVISING GEOTECHNICAL ENGINEER IN ACCORDANCE WITH T+T LETTER 1000780.L26 [V4]

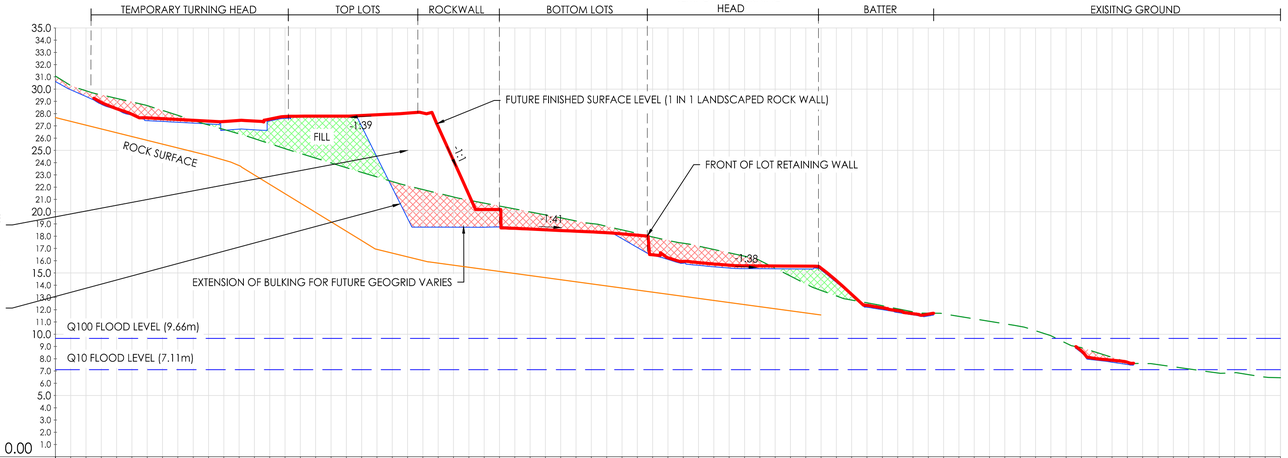
DATUM R.L. 0.00

CHAINAGE	DESIGN LEVEL	BULKING LEVEL	EXISTING LEVEL	LEVEL DIFFERENCE
0.00	32.40	32.25	32.68	-0.44
2.50	32.40	32.25	32.68	-0.44
5.00	31.45	31.30	32.19	-0.89
7.50	30.47	30.33	31.94	-1.62
10.00	29.46	29.32	31.53	-2.22
12.50	28.46	28.30	30.96	-2.66
15.00	27.46	27.28	30.42	-3.13
17.50	26.61	26.46	29.88	-3.42
20.00	26.51	26.36	29.35	-2.98
22.50	26.15	25.46	28.81	-3.36
25.00	26.25	25.53	28.26	-2.73
27.50	26.23	25.51	27.71	-2.20
30.00	26.28	26.38	27.23	-1.77
32.50	26.53	26.38	26.80	-0.42
35.00	26.58	26.38	26.38	0.20
37.50	26.60	26.60	25.96	0.65
40.00	26.63	26.63	25.53	1.10
42.50	26.63	26.66	25.13	1.53
45.00	26.66	26.69	24.76	1.92
47.50	26.71	26.72	24.40	2.32
50.00	26.74	26.11	23.81	2.30
52.50	26.77	23.62	23.39	0.23
55.00	26.80	21.13	22.96	-1.84
57.50	26.83	18.63	22.60	-3.97
60.00	26.85	17.92	22.25	-4.32
62.50	25.14	17.92	21.90	-3.98
65.00	22.45	17.92	21.56	-3.64
67.50	19.76	17.91	21.22	-3.31
70.00	19.31	17.90	20.88	-2.98
72.50	17.82	17.89	20.54	-2.65
75.00	17.77	17.77	20.21	-2.44
77.50	17.71	17.71	19.95	-2.24
80.00	17.66	17.66	19.84	-2.18
82.50	17.61	17.61	19.58	-1.97
85.00	17.56	17.56	19.19	-1.63
87.50	17.51	17.52	18.80	-1.28
90.00	17.46	17.47	17.90	-0.43
92.50	17.43	17.43	17.64	-0.21
95.00	17.39	16.87	17.55	-0.68
97.50	17.36	16.21	17.38	-1.16
100.00	15.82	15.46	16.40	-0.95
102.50	15.61	15.44	15.83	-0.39
105.00	15.24	14.41	15.06	-0.65
107.50	15.07	14.33	14.50	-0.18
110.00	14.97	14.25	13.99	0.25
112.50	14.72	14.15	13.48	0.67
115.00	14.72	14.17	12.97	1.20
117.50	14.72	14.36	11.39	2.97
120.00	14.72	14.37	10.50	3.86
122.50	14.98	14.63	9.81	4.83
125.00	14.97	14.82	9.12	5.69
127.50	14.12	13.99	8.44	5.54
130.00	13.26	13.14	7.99	5.15
132.50	12.44	12.32	7.99	4.32
135.00	11.64	11.51	8.00	3.51
137.50	10.84	10.70	8.00	2.70
140.00	10.04	9.90	8.00	1.89
142.50	9.24	9.09	9.24	-0.15
145.00	8.53	8.68	8.92	-0.24
147.50	8.73	8.58	8.57	0.01
150.00	8.61	8.46	8.80	-0.33
152.50	8.49	8.35	9.02	-0.67
155.00	8.38	8.24	9.24	-1.00
157.50	8.27	8.12	9.13	-1.01
160.00	8.17	8.02	8.79	-0.77
162.50	8.06	7.91	8.58	-0.67
165.00	7.97	7.83	8.22	-0.39
167.50	7.89	7.74	7.75	-0.01
170.00	7.82	7.67	7.75	-0.08
172.50	7.76	7.61	7.73	-0.12
175.00	7.72	7.57	7.70	-0.13
177.50	7.68	7.53	7.67	-0.14
180.00	7.64	7.49	7.64	-0.15
182.50	7.61	7.46	7.61	-0.15
185.00	7.55		7.55	
187.50			7.37	
190.00			7.08	
192.50			7.01	
195.00			6.92	
197.50			6.73	
200.00				

C-C - LONG SECTION
SCALES: HORIZONAL 1:250 VERTICAL 1:125 (2x)



KEY PLAN
SCALE 1:1000



PLACEMENT OF FILL TO OCCUR IN SEQUENCE WITH THE CONSTRUCTION OF THE RETAINING IN FRONT.

EXCAVATION OF TEMPORARY CUT FACE SHALL BE SEQUENCED TO:
- REDUCE THE DURATION OF THE EXPOSED TEMPORARY CUT FACE
- IMPLEMENT CONTRACTOR WH&S MEASURES TO MITIGATE ACTIVITY AROUND THE EXPOSED CUT FACE
- THE EXPOSED CUT FACE SHALL BE REGULARLY MONITORED BY THE LEVEL 1 SUPERVISING GEOTECHNICAL ENGINEER IN ACCORDANCE WITH T+T LETTER 1000780.L26 [V4]

DATUM R.L. 0.00

CHAINAGE	DESIGN LEVEL	BULKING LEVEL	EXISTING LEVEL	LEVEL DIFFERENCE
0.00	30.62	29.95	31.06	-0.44
2.50	29.95	29.41	30.30	-0.34
5.00	29.41	28.77	29.87	-0.46
7.50	28.92	28.33	29.53	-0.76
10.00	28.40	27.86	29.24	-0.91
12.50	27.95	27.43	28.96	-1.09
15.00	27.66	27.36	28.66	-1.23
17.50	27.59	27.30	28.26	-0.90
20.00	27.52	27.23	27.86	-0.56
22.50	27.46	27.16	27.46	-0.23
25.00	27.39	27.08	27.08	0.08
27.50	27.36	26.71	26.71	-0.07
30.00	27.45	26.73	26.35	0.38
32.50	27.40	26.68	25.96	0.72
35.00	27.56	27.41	25.55	1.85
37.50	27.77	27.62	25.15	2.47
40.00	27.80	27.80	24.76	3.04
42.50	27.80	27.80	24.37	3.44
45.00	27.80	27.80	23.98	3.82
47.50	27.85	27.84	23.59	4.24
50.00	27.91	26.96	23.21	3.76
52.50	27.97	24.46	22.83	1.63
55.00	28.04	21.96	22.46	-0.49
57.50	28.05	19.46	22.12	-2.65
60.00	26.91	18.74	21.81	-3.07
62.50	24.16	18.73	21.51	-2.77
65.00	21.40	18.73	21.20	-2.47
67.50	20.18	18.73	20.94	-2.21
70.00	20.17	18.76	20.70	-1.97
72.50	18.64	18.76	20.46	-1.70
75.00	18.59	18.58	20.22	-1.58
77.50	18.53	18.52	19.98	-1.40
80.00	18.47	18.47	19.74	-1.21
82.50	18.41	18.40	19.50	-1.03
85.00	18.35	18.34	19.24	-0.84
87.50	18.28	18.28	19.04	-0.69
90.00	18.19	17.80	18.81	-0.52
92.50	18.08	17.08	18.52	-0.71
95.00	16.48	16.44	18.23	-1.14
97.50	16.24	16.10	17.94	-1.50
100.00	15.94	15.80	17.46	-1.56
102.50	15.85	15.62	17.42	-1.63
105.00	15.73	15.50	17.19	-1.57
107.50	15.63	15.40	16.91	-1.41
110.00	15.58	15.35	16.64	-1.24
112.50	15.58	15.35	16.37	-1.02
115.00	15.57	15.34	16.02	-0.67
117.50	15.56	15.33	15.38	-0.04
120.00	15.56	15.33	14.74	0.59
122.50	15.39	14.23	14.11	1.22
125.00	14.38	13.22	13.57	1.66
127.50	13.25	12.20	13.12	1.10
130.00	12.35	12.01	12.79	0.43
132.50	12.16	12.33	12.56	-0.36
135.00	11.92	12.08	12.33	-0.32
137.50	11.68	11.57	11.83	-0.31
140.00	11.64	11.49	11.72	-0.26
142.50			11.72	-0.23
145.00			11.67	
147.50			11.46	
150.00			11.26	
152.50			11.05	
155.00			10.85	
157.50			10.64	
160.00			10.29	
162.50			9.88	
165.00			9.27	
167.50	8.63	8.48	8.90	-0.41
170.00	8.00	7.87	8.51	-0.63
172.50	7.88	7.71	8.12	-0.41
175.00	7.71	7.53	7.72	-0.19
177.50			7.62	
180.00			7.52	
182.50			7.34	
185.00			7.17	
187.50			6.99	
190.00			6.82	
192.50			6.68	
195.00			6.50	
197.50			6.45	
200.00				

D-D - LONG SECTION
SCALES: HORIZONAL 1:250 VERTICAL 1:125 (2x)

Revision	Date	Reason	Drawn	Checked
0	30.09.21	ISSUED FOR CONSTRUCTION	JSS	AK

Disclaimer:
1. This drawing is copyright of CJ Arms. It must not be copied or reproduced without written consent from the owner.
2. Do not scale from this drawing. Only figured dimensions are to be taken from this drawing.
3. All contractors must visit site and be responsible for taking and checking all dimensions related to the works shown on the drawing prior to fabrication or setting out.

Note for Contractors
The works described on this drawing must be undertaken by competent Contractors with an appropriate level of experience who have prepared appropriate Safe Work Method Statements (SWMS) relating to these works. The contractor is responsible for the management of all risks associated with the construction activities stated on this drawing.

This drawing should not be issued in part and must be read in conjunction with all appropriate specifications, notes pages, details and authority drawings as appropriate.

Dial before you dig. BEWARE OF UNDERGROUND SERVICES. The location of underground services are approximate only and their exact position should be proven on site. No guarantee is given that existing services are shown.

BULK EARTHWORKS COMPLETED UNDER EARLY WORKS PACKAGE & APPROVAL. REFER ENDORSED EARLY WORKS PACKAGE FOR FURTHER INFORMATION.

SITE SECTIONS ARE PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY AND ARE NOT TO BE USED TO SET OUT THE WORKS.

ISSUED FOR CONSTRUCTION

YourLand Developments

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Project: RIVER VALLEY - STAGE 7C
Client: YOURLAND
Purpose of Issue: ISSUED FOR CONSTRUCTION
Drawing Title: TYPICAL SECTIONS - SITE SECTIONS

Drawn By	Checked By	Drawn Scale	Date of First Issue
JSS	AK	1:500 @ A1	17.04.20

Project Number	Origin	Zone	Level	File Type	Role	Number	Revision
15019	CJA	7C	XX	DR	C	2101	0

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