

Opalia Stage 2K

GITA Inspection Verification Report

Prepared For: Lojac Civil Pty Ltd

Report Number D19221A V1

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Title Laboratory Manager – Deer Park

Signature



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1 Introduction

Terra Firma Laboratories was engaged by *Lojac Civil Pty Ltd* as the Geotechnical Inspection and Testing Authority (GITA) to provide Level 1 supervision and testing works on the earthworks component for Opalia Estate Stage 2K. This work was conducted over the period of 2 December 2019 to 4 May 2020.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 *Guidelines for Earthworks for Commercial and Residential Development* and in compliance with the compaction control specifications established by the contractor.

2 Scope of Work

2.1 Area of Work

The areas of work included from lots 250 to 259 on Stonefly Circuit, Melton. The site will be a residential housing development.

The area on which fill was placed is shown on site plan (Appendix 1: *Test Location Plan*) based on drawings prepared by *Breese, Pitt, Dixon Pty Ltd* (6751 E/2K) and provided by *Lojac Civil Pty Ltd*.

The supervision work by the GITA involved inspection of sub grade and full time inspection and testing of fill placement.

2.2 Specification

The technical specification for compaction control requirements was provided on the design drawings and established that:

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

Section 5.2 of AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95%, noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289 5.1.1 and AS1289 5.2.1.

In accordance with Table 8.1 (AS3798), for large scale operations, (greater than 1500m²), the minimum testing frequency is 1 test per layer per material type per 2500m² or 1 test per 500m³

distributed reasonable evenly throughout full depth and area or 3 tests per lot. AS3798 defines a lot as “an area of work that is essentially homogenous in relation to material type and moisture condition, rolling response and compaction technique, and which has been used for the assessment of the relative compaction of an area of work”. All three of these test frequencies must be achieved and this is typically confirmed to have been achieved when 3 tests per visit (day) have been completed.

2.3 Limitations

Terra Firma Laboratories cannot verify any works completed by others outside of the time period specified in the introduction. Uncontrolled works may include, but are not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes unless specified in section 2.1 of this report.

Terra Firma Laboratories cannot verify that the material used as a filling medium is free from chemical or other contamination. The scope and the period of Terra Firma Laboratories as described in the introduction are subject to restrictions and limitations. Terra Firma Laboratories did not perform a complete assessment of all possible conditions and circumstances that may exist at the site. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Terra Firma Laboratories.

Verification of finished surface level to design levels is outside of the scope of the GITA report.

Any drawings or marked locations presented in this report should be considered only as pictorial evidence of our work. Therefore, unless otherwise stated, any dimensions should not be used for accurate calculations or dimensioning.

Where data has been supplied by the client or a third party, it is assumed that the information is correct unless otherwise stated. No responsibility is accepted by Terra Firma Laboratories for incomplete or inaccurate data supplied by others.

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3 Construction Method

3.1 Subgrade Preparation

At the time of subgrade inspection the following was observed:

- Subgrade preparation involved stripping the site of topsoil, vegetation and organic matter.
- The site was cleared of all trees and stumps to the extent necessary for the fill placement to proceed
- The roots of all trees and any debris was removed from site prior to any fill placement

The sub-grade area was observed to be soft or otherwise unsuitable were rectified. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill Placement

The contractor was observed to have suitable construction equipment and plant available on-site during the construction period for use in the fill placement.

All fill was placed in layers of thicknesses not exceeding 300mm. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made. It should be noted that the compaction tests are representative samples of the fill placed and support the visual assessment of the works completed. Each house lot does not necessarily require a compaction test to to have been conducted within the house allotment but may have been verified by testing conducted within up to a 2500m² area of the house lot.

Final fill placement levels were verified against design level by others. For the purposes of this report, it was observed that finished levels were in accordance with levels marked on site by survey markers.

The final 300mm of fill placed across the site was placed as a topsoil layer or growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications and placement of the final 300mm of fill was not observed by the GITA.

4 Construction Verification

Compaction Verification testing is summarized in a detailed test register with test certificates attached provided in Appendix 2: *Compaction Test Register and Test Certificates*. A test location plan (D19221D1, Appendix 1) providing a schematic of test locations across the extent of scope of works for every placed layer of fill is also documented.

A total of 10 density tests (Hilf method in accordance with 1289 5.7.1) were undertaken with no failed results. The results summarised in the compaction test register (Appendix 2) confirm that for every layer of fill placed in a specific work area, satisfactory testing was completed.

5 Statement of Compliance

The intention of this report is to provide a description of the earthworks construction for Stage 2K at Opalia Estate. For completed fill areas of greater than 300mm, and for works completed between 2 December 2019 and 4 May 2020, earthworks construction activities were conducted under the full time supervision of the Geotechnical Inspection and Testing Authority. Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification. The earthworks construction for Stage 2K of Opalia Estate was observed to be constructed in compliance with the requirements of the Technical Specification.

Appendix 1: Test Location Plan



Our Head Office
47 National Ave
Pakenham, VIC 3810

Our Laboratories
Pakenham 03 9769 5799
Deer Park 03 8348 5596
Bibra Lake 08 9395 7220

Test Location Plan

not to scale

Client: Lojac Civil Pty Ltd

Project: Opalia Estate, Stage 2K

Reference: D19221 D1

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Test Location Plan 2018

Appendix 2: Compaction Test Register and Test Certificates



Compaction Test Register

Client: Lojac Civil Pty Ltd
Project: Opalia Estate Stage 2K

Project No: D19221
Specification: 95%

Date:	Test No:	Layer:	Retest of:	Density:	Pass/Fail:	Lot No:	Report No:
2/12/2019	1	Layer 1		98.0%	Pass	Lot 251	D19221-1
2/12/2019	2	Layer 1		98.0%	Pass	Lot 253	D19221-1
2/12/2019	3	Layer 1		99.5%	Pass	Lot 255	D19221-1
2/12/2019	4	Layer 1		97.0%	Pass	Lot 257	D19221-1
4/05/2020	5	Layer 2		95.0%	Pass	Lot 250	D19221-2
4/05/2020	6	Layer 2		98.5%	Pass	Lot 252	D19221-2
4/05/2020	7	Layer 2		98.0%	Pass	Lot 254	D19221-2
4/05/2020	8	Layer 2		98.0%	Pass	Lot 256	D19221-2
4/05/2020	9	Layer 2		99.5%	Pass	Lot 258	D19221-2
4/05/2020	10	Layer 2		99.5%	Pass	Lot 259	D19221-2

Material Test Report

Report Number: D19221-1
Issue Number: 1
Date Issued: 05/12/2019
Client: Lojac Civil Pty Ltd
 35/148 Chesterville Road, Moorabbin Vic 3189
Project Number: D19221
Project Name: Opalia Estate Stage 2K (Level one)
Project Location: Level one
Work Request: 1166
Date Sampled: 02/12/2019
Dates Tested: 02/12/2019 - 04/12/2019
Sampling Method: AS1289 1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% STD
Material: Clay
Material Source: on site



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Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Janaka Somaratne

Lab Manager

NATA Accredited Laboratory Number: 15357

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1				
Sample Number	D19-1166A	D19-1166B	D19-1166C	D19-1166D
Test Number	1	2	3	4
Date Tested	02/12/2019	02/12/2019	02/12/2019	02/12/2019
Time Tested	15:00	15:00	15:00	15:00
Test Request #/Location	LOT 251	LOT 253	LOT 255	LOT 257
Chainage (m)	**	**	**	**
Location Offset (m)	**	**	**	**
Layer / Reduced Level	Layer 1	Layer 1	Layer 1	Layer 1
Thickness of Layer (mm)	300	300	300	300
Soil Description	Clay	Clay	Clay	Clay
Test Depth (mm)	275	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0.0	0.0	0.0	0.0
Field Wet Density (FWD) t/m ³	1.92	1.92	1.94	1.91
Field Moisture Content %	17.3	17.8	17.5	17.9
Field Dry Density (FDD) t/m ³	1.63	1.63	1.65	1.62
Peak Converted Wet Density t/m ³	1.96	1.96	1.95	1.97
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**
Moisture Ratio % (AS 1289.5.4.1)	88.5	87.5	89.0	89.0
Adjusted Moisture Ratio % (AS 1289.5.4.1)	**	**	**	**
Moisture Variation (Wv) %	2.5	2.5	2.0	2.0
Adjusted Moisture Variation %	**	**	**	**
Hilf Density Ratio (%)	98.0	98.0	99.5	97.0
Compaction Method	Standard	Standard	Standard	Standard

Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

Material Test Report



Report Number: D19221-2
Issue Number: 1
Date Issued: 12/05/2020
Client: Lojac Civil Pty Ltd
 35/148 Chesterville Road, Moorabbin Vic 3189
Project Number: D19221
Project Name: Opalia Estate Stage 2K (Level one)
Project Location: Level one
Work Request: 1656
Date Sampled: 04/05/2020
Dates Tested: 04/05/2020 - 11/05/2020
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% STD
Material: Clay
Material Source: On Site

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Approved Signatory: Eranda Hippola
 Snr lab Tech
 NATA Accredited Laboratory Number: 15357

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1						
Sample Number	D20-1656A	D20-1656B	D20-1656C	D20-1656D	D20-1656E	D20-1656F
Test Number	5	6	7	8	9	10
Date Tested	04/05/2020	04/05/2020	04/05/2020	04/05/2020	04/05/2020	04/05/2020
Time Tested	**	**	**	**	**	**
Test Request #/Location	LOT 250	LOT 252	LOT 254	LOT 256	LOT 258	LOT 259
Chainage (m)	**	**	**	**	**	**
Location Offset (m)	**	**	**	**	**	**
Layer / Reduced Level	Layer 2	Layer 2	Layer 2	Layer 2	Layer 2	Layer 2
Thickness of Layer (mm)	300	300	300	300	300	300
Soil Description	Clay	Clay	Clay	Clay	Clay	Clay
Test Depth (mm)	275	275	275	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	6.2	7.0	0.0	0.0	0.0	0.0
Field Wet Density (FWD) t/m ³	1.88	1.92	1.88	1.89	1.90	1.90
Field Moisture Content %	8.2	17.3	17.9	17.9	17.6	17.2
Field Dry Density (FDD) t/m ³	1.74	1.64	1.59	1.61	1.62	1.62
Peak Converted Wet Density t/m ³	**	**	1.91	1.93	1.91	1.91
Adjusted Peak Converted Wet Density t/m ³	1.98	1.96	**	**	**	**
Moisture Ratio % (AS 1289.5.4.1)	**	**	98.5	99.0	99.0	102.5
Adjusted Moisture Ratio % (AS 1289.5.4.1)	93.0	105.5	**	**	**	**
Moisture Variation (Wv) %	**	**	0.5	0.0	0.0	-0.5
Adjusted Moisture Variation %	1.0	0.5	**	**	**	**
Hilf Density Ratio (%)	95.0	98.5	98.0	98.0	99.5	99.5
Compaction Method	Standard	Standard	Standard	Standard	Standard	Standard

Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC