

# Bridgefield Estate Stage 13

## GITA Inspection Verification Report

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**Prepared For:** Lojac Civil Pty Ltd

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**Report Number** D22945A V1

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**Version Release Date** 31 May 2023

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**Report Released By** C Caulfield

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**Title** Project Manager

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**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 Bridgefield Estate Stage 13. This work was conducted over the period of 15/12/2022 to 16/12/2022.

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 lots 1321, 1322 and 1348 to 1353, bounded by streets Innovation Avenue, Sundar Place, Patel Place and Delhi Grove. The site will be a Residential development.

The area on which fill was placed is shown on site plan (Appendix 1: *Test Location Plan*) based on drawings prepared by Reeds Consulting (Drawing Reference: 22236E/13 13R3 K) and provided by Lojac Civil Pty Ltd.

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

### 2.2 Specification

The technical specification (Reference from Drawings) for compaction control requirements was provided by Lojac Civil Pty Ltd 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 1500m<sup>2</sup>), the minimum testing frequency is 1 test per layer per material type per 2500m<sup>2</sup> or 1 test per 500m<sup>3</sup> 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 to a depth of approximately 200mm below existing levels.
- 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 then proof-rolled to confirm it was capable of withstanding test rolling without visible deformation or springing and any areas 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 have been conducted within the house allotment but may have been verified by testing conducted within up to a 2500m<sup>2</sup> 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 material 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 material 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 (D22945D1, 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 7 density tests (Hilf method in accordance with 1289 5.7.1) were undertaken with 0 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 13 at Bridgefield Estate. For completed fill areas of greater than 300mm, and for works completed between 15/12/2022 and 16/12/2022, 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 13 of Bridgefield Estate was observed to be constructed in compliance with the requirements of the Technical Specification.

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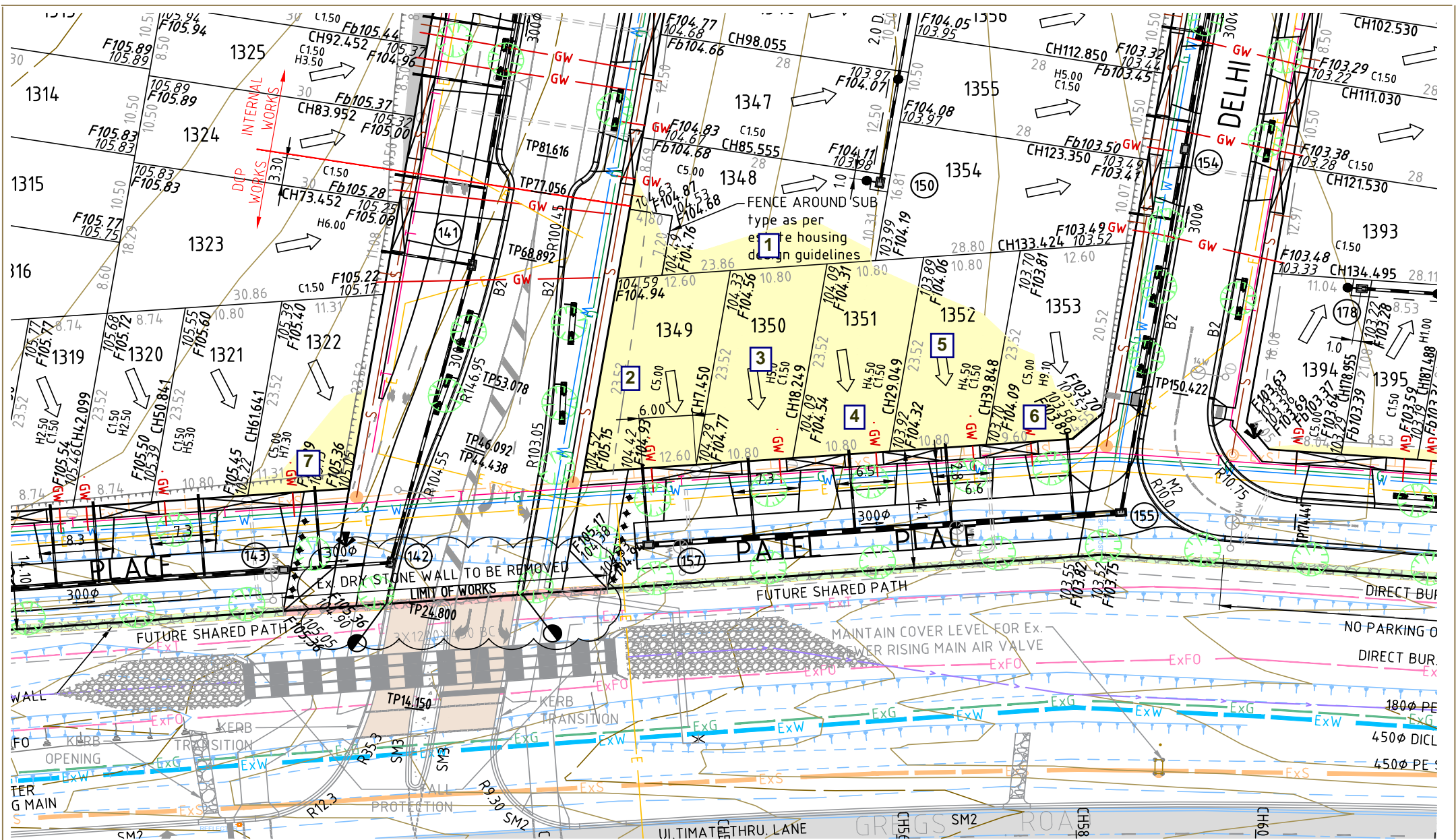
Your Worksite is Our Laboratory.

## 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

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Page 1 of 2



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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: Bridgefield Estate, Stage 13

Reference: D22945 D1





Your Worksite is Our Laboratory.

## Appendix 2: Compaction Test Register and Test Certificates



## Compaction Test Register

**Client:** Lojac Civil Pty Ltd      **Project No:** D22945  
**Project:** Bridgefield Estate Stage 13      **Specification:** 95%

Date:	Test No:	Layer:	Retest of:	Density:	Pass/Fail:	Lot No:	Report No:
15/12/2022	1	Layer 1		101.0%	Pass	Lot 1348	D22945-1
15/12/2022	2	Layer 1		97.5%	Pass	Lot 1349	D22945-1
15/12/2022	3	Layer 1		100.0%	Pass	Lot 1350	D22945-1
16/12/2022	4	Layer 1		100.0%	Pass	Lot 1351	D22945-2
16/12/2022	5	Layer 1		100.0%	Pass	Lot 1352	D22945-2
16/12/2022	6	Layer 1		99.0%	Pass	Lot 1353	D22945-2
16/12/2022	7	Layer 1		100.0%	Pass	Lot 1322	D22945-2

# Material Test Report

**Report Number:** D22945-1  
**Issue Number:** 1  
**Date Issued:** 19/12/2022  
**Client:** Lojac Civil Pty Ltd  
 35/148 Chesterville Road, Moorabbin Vic 3189  
**Project Number:** D22945  
**Project Name:** Bridgefield Estate Stage 13 - Level One  
**Project Location:** Rockbank  
**Work Request:** 5426  
**Date Sampled:** 15/12/2022 15:30  
**Dates Tested:** 15/12/2022 - 16/12/2022  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% STD  
**Location:** Bridgefield Estate Stage 13 - Level One  
**Material:** Clay  
**Material Source:** On Site



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Accredited for compliance with ISO/IEC 17025 - Testing



*Nalaka Bandara*

Approved Signatory: Nalaka Bandara  
 Lab Tech

NATA Accredited Laboratory Number: 15357

## Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

	D22-5426A	D22-5426B	D22-5426C
Sample Number	D22-5426A	D22-5426B	D22-5426C
Test Number	1	2	3
Date Tested	15/12/2022	15/12/2022	15/12/2022
Time Tested	13:00	13:00	13:00
Test Request #/Location	Lot 1348	Lot 1349	Lot 1350
Layer / Reduced Level	Layer 1	Layer 1	Layer 1
Thickness of Layer (mm)	300	300	300
Soil Description	Clay	Clay	Clay
Test Depth (mm)	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	15	13	16
Percentage of Dry Oversize (%) (AS1289.5.4.1)	**	**	**
Field Wet Density (FWD) t/m <sup>3</sup>	1.92	1.94	1.91
Field Moisture Content %	21.9	24.8	24.2
Field Dry Density (FDD) t/m <sup>3</sup>	1.62	1.59	1.59
Peak Converted Wet Density t/m <sup>3</sup>	**	**	**
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	1.90	1.99	1.91
Adj. Optimum Moisture Content % (AS1289.5.4.1)	20.6	23.9	22.3
Adj. Field Moisture Content % (AS1289.5.4.1)	18.6	21.6	20.4
Moisture Ratio % (AS1289.5.4.1)	**	**	**
Adjusted Moisture Ratio % (AS1289.5.4.1)	90.5	90.5	91.0
Moisture Variation (Wv) %	**	**	**
Adjusted Moisture Variation %	2.0	2.0	2.0
Hilf Density Ratio (%)	<b>101.0</b>	<b>97.5</b>	<b>100.0</b>
Compaction Method	<b>Standard</b>	<b>Standard</b>	<b>Standard</b>
Report Remarks	**	**	**

### Moisture Variation Note:

Positive values = test is dry of OMC  
 Negative values = test is wet of OMC

# Material Test Report


**Report Number:** D22945-2  
**Issue Number:** 1  
**Date Issued:** 20/12/2022  
**Client:** Lojac Civil Pty Ltd  
 35/148 Chesterville Road, Moorabbin Vic 3189  
**Project Number:** D22945  
**Project Name:** Bridgefield Estate Stage 13 - Level One  
**Project Location:** Rockbank  
**Work Request:** 5429  
**Date Sampled:** 16/12/2022 14:30  
**Dates Tested:** 16/12/2022 - 20/12/2022  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% STD  
**Location:** Bridgefield Stage 13 - Level One  
**Material:** Clay  
**Material Source:** On site



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Accredited for compliance with ISO/IEC 17025 - Testing

  
 Approved Signatory: Eranda Hippola  
 Laboratory Manager  
 NATA Accredited Laboratory Number: 15357

## Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	D22-5429A	D22-5429B	D22-5429C	D22-5429D
Test Number	4	5	6	7
Date Tested	16/12/2022	16/12/2022	16/12/2022	16/12/2022
Time Tested	14:30	14:30	14:30	14:30
Test Request #/Location	Lot 1351	Lot 1352	Lot 1353	Lot 1322
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 (%)	5	6	5	6
Percentage of Dry Oversize (%) (AS1289.5.4.1)	**	**	**	**
Field Wet Density (FWD) t/m <sup>3</sup>	1.91	1.92	1.92	1.93
Field Moisture Content %	19.7	21.8	22.1	21.4
Field Dry Density (FDD) t/m <sup>3</sup>	1.61	1.59	1.58	1.60
Peak Converted Wet Density t/m <sup>3</sup>	**	**	**	**
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	1.91	1.92	1.93	1.93
Adj. Optimum Moisture Content % (AS1289.5.4.1)	23.2	24.9	26.2	24.7
Adj. Field Moisture Content % (AS1289.5.4.1)	18.8	20.5	21.0	20.2
Moisture Ratio % (AS1289.5.4.1)	**	**	**	**
Adjusted Moisture Ratio % (AS1289.5.4.1)	81.0	82.0	80.0	81.5
Moisture Variation (Wv) %	**	**	**	**
Adjusted Moisture Variation %	4.5	4.0	5.0	4.5
Hilf Density Ratio (%)	<b>100.0</b>	<b>100.0</b>	<b>99.0</b>	<b>100.0</b>
Compaction Method	<b>Standard</b>	<b>Standard</b>	<b>Standard</b>	<b>Standard</b>
Report Remarks	**	**	**	**

### Moisture Variation Note:

Positive values = test is dry of OMC  
 Negative values = test is wet of OMC