

# Kerani Heights Stage 5

## GITA Inspection Verification Report

---

<b>Prepared For:</b>	Ginsan Construction Pty Ltd
----------------------	-----------------------------

---

<b>Report Number</b>	D21706A V2
----------------------	------------

---

<b>Version Release Date</b>	11 Aug 2022
-----------------------------	-------------

---

<b>Report Released By</b>	C Caulfield
---------------------------	-------------

---

<b>Title</b>	Project Manager
--------------	-----------------

---

**Signature**



## **Table of Contents**

1	Introduction .....	3
2	Scope of Work .....	3
2.1	Area of Work .....	3
2.2	Specification .....	3
2.3	Limitations.....	4
3	Construction Method .....	5
3.1	Subgrade Preparation .....	5
3.2	Fill Placement .....	5
4	Construction Verification.....	5
5	Statement of Compliance .....	6

## **Appendices**

Appendix 1	Test Location Plan
Appendix 2	Compaction Test Register and Test Certificates

## 1 Introduction

*Terra Firma Laboratories* was engaged by Ginsan Construction Pty Ltd as the Geotechnical Inspection and Testing Authority (GITA) to provide Level 1 supervision and testing works on the earthworks component for Kerani Heights Stage 5. This work was conducted over the period of 23/11/2021 to 19/07/2022.

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 501 to 502, 509 to 510, 516 to 519, 540 and 542 to 553, bounded by streets Sherry Circuit and Story Street. 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 Potter George (Drawing Reference: 305874CR200) and provided by Ginsan Construction 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 Ginsan Construction 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.

This document is COPYRIGHT, all rights reserved to Terra Firma Laboratories and therefore no part of this document may be reproduced or copied in any form or by means without the written permission of Terra Firma Laboratories. This submission is for the use only of the party to whom it is addressed and for no other purpose. No responsibility is accepted to any third party who may use or rely on the whole or any part of the content of this submission. No responsibility will be taken for this report if it is altered in any way, or not reproduced in full.

### 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 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 (D21706D1, 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 15 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 5 at Kerani Heights. For completed fill areas of greater than 300mm, and for works completed between 23/11/2021 and 19/07/2022, 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 5 of Kerani Heights was observed to be constructed in compliance with the requirements of the Technical Specification.

---

## **Appendix 1: Test Location Plan**







## **Appendix 2: Compaction Test Register and Test Certificates**



## Compaction Test Register

**Client:** Ginsan Construction Pty Ltd  
**Project:** Kerani Heights Stage 5

**Project No:** D21706  
**Specification:** 95%

Date:	Test No:	Layer:	Retest of:	Density:	Pass/Fail:	Lot No:	Report No:
23/11/2021	1	Layer 1		107.0%	Pass	Lot 542	D21706-1
23/11/2021	2	Layer 1		106.5%	Pass	Lot 544	D21706-1
23/11/2021	3	Layer 1		108.0%	Pass	Lot 546	D21706-1
15/02/2022	4	Layer 01		104.5%	Pass	Lot 519	D21706-2
15/02/2022	5	Layer 01		107.0%	Pass	Lot 518	D21706-2
15/02/2022	6	Layer 01		108.5%	Pass	Lot 517	D21706-2
16/02/2022	7	Layer 02		105.0%	Pass	Lot 519	D21706-3
16/02/2022	8	Layer 02		102.5%	Pass	Lot 516	D21706-3
16/02/2022	9	Layer 02		100.5%	Pass	Lot 517	D21706-3
11/03/2022	10	Layer 1		101.0%	Pass	Lot 501	D21706-5
11/03/2022	11	Layer 2		98.5%	Pass	Lot 502	D21706-5
11/03/2022	12	Layer 3		100.0%	Pass	Lot 501	D21706-5
19/07/2022	13	Layer 1		101.5%	Pass	Lot 510	D21706-6
19/07/2022	14	Layer 1		101.5%	Pass	Lot 548	D21706-6
19/07/2022	15	Layer 1		99.5%	Pass	Lot 552	D21706-6

# Material Test Report

**Report Number:** D21706-1  
**Issue Number:** 1  
**Date Issued:** 25/11/2021  
**Client:** Ginsan Constructions  
 1/79 Merola Way , Melbourne Vic 3000  
**Contact:** Mario  
**Project Number:** D21706  
**Project Name:** Kerani Heights Estate Stage 5 - Level One  
**Project Location:** Plumpton  
**Work Request:** 3979  
**Date Sampled:** 23/11/2021  
**Dates Tested:** 23/11/2021 - 24/11/2021  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% STD  
**Site Selection:** Selected by Client  
**Location:** Kerani Heights Estate Stage 5 - Level One  
**Material:** Gravely Clay  
**Material Source:** Onsite



Deer Park Laboratory  
 17 Walhalla Way Ravenhall VIC 3023  
 Phone: 0435 751 756  
 Email: ehippola@terrafirmalabs.com.au



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	D21-3979A	D21-3979B	D21-3979C
Test Number	1	2	3
Date Tested	23/11/2021	23/11/2021	23/11/2021
Time Tested	14:50	14:50	14:50
Test Request #/Location	Lot 542	Lot 544	Lot 546
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 (%)	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0
Field Wet Density (FWD) t/m <sup>3</sup>	2.00	1.96	1.97
Field Moisture Content %	25.5	23.2	24.0
Field Dry Density (FDD) t/m <sup>3</sup>	1.60	1.59	1.58
Peak Converted Wet Density t/m <sup>3</sup>	1.88	1.84	1.82
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	26.1	25.4	26.7
Adj. Field Moisture Content % (AS1289.5.4.1)	25.5	23.2	24.0
Moisture Ratio % (AS1289.5.4.1)	98.0	91.5	90.0
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**
Moisture Variation (Wv) %	0.5	2.0	2.5
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	107.0	106.5	108.0
Compaction Method	Standard	Standard	Standard
Report Remarks	**	**	**

## Moisture Variation Note:

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

# Material Test Report

**Report Number:** D21706-2  
**Issue Number:** 1  
**Date Issued:** 18/02/2022  
**Client:** Ginsan Constructions  
 1/79 Merola Way , Melbourne Vic 3000  
**Contact:** Mario  
**Project Number:** D21706  
**Project Name:** Kerani Heights Estate Stage 5 - Level One  
**Project Location:** Plumpton  
**Work Request:** 4259  
**Date Sampled:** 15/02/2022 15:40  
**Dates Tested:** 15/02/2022 - 17/02/2022  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% STD  
**Location:** Kerani Heights Stage 5 - Level one  
**Material:** Silty Clay  
**Material Source:** On Site



Deer Park Laboratory  
 17 Walhalla Way Ravenhall VIC 3023  
 Phone: 0435 751 756  
 Email: ehippola@terrafirmalabs.com.au



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	D22-4259A	D22-4259B	D22-4259C
Test Number	4	5	6
Date Tested	15/02/2022	15/02/2022	15/02/2022
Time Tested	15:20	15:30	15:40
Test Request #/Location	Lot 519	Lot 518	Lot 517
Layer / Reduced Level	Layer 01	Layer 01	Layer 01
Thickness of Layer (mm)	200	200	200
Soil Description	Clay	Clay	Clay
Test Depth (mm)	175	175	175
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	9	10	12
Percentage of Dry Oversize (%) (AS1289.5.4.1)	**	**	**
Field Wet Density (FWD) t/m <sup>3</sup>	1.95	2.02	2.07
Field Moisture Content %	26.3	18.4	21.4
Field Dry Density (FDD) t/m <sup>3</sup>	1.58	1.73	1.75
Peak Converted Wet Density t/m <sup>3</sup>	**	**	**
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	1.87	1.89	1.91
Adj. Optimum Moisture Content % (AS1289.5.4.1)	28.7	20.3	23.5
Adj. Field Moisture Content % (AS1289.5.4.1)	23.9	16.5	18.8
Moisture Ratio % (AS1289.5.4.1)	**	**	**
Adjusted Moisture Ratio % (AS1289.5.4.1)	83.5	81.0	80.0
Moisture Variation (Wv) %	**	**	**
Adjusted Moisture Variation %	4.5	4.0	4.5
Hilf Density Ratio (%)	104.5	107.0	108.5
Compaction Method	Standard	Standard	Standard
Report Remarks	**	**	**

## Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

# Material Test Report

**Report Number:** D21706-3  
**Issue Number:** 1  
**Date Issued:** 21/02/2022  
**Client:** Ginsan Constructions  
 1/79 Merola Way , Melbourne Vic 3000  
**Contact:** Mario  
**Project Number:** D21706  
**Project Name:** Kerani Heights Estate Stage 5 - Level One  
**Project Location:** Plumpton  
**Work Request:** 4267  
**Date Sampled:** 16/02/2022 14:30  
**Dates Tested:** 16/02/2022 - 18/02/2022  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% MOD  
**Location:** Kerani Heights Stage 5 - Level one  
**Material:** Silty Clay  
**Material Source:** On Site



Deer Park Laboratory  
 17 Walhalla Way Ravenhall VIC 3023  
 Phone: 0435 751 756  
 Email: ehippola@terrafirmalabs.com.au



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	D22-4267A	D22-4267B	D22-4267C
Test Number	7	8	9
Date Tested	16/02/2022	16/02/2022	16/02/2022
Time Tested	14:30	14:40	14:50
Test Request #/Location	Lot 519	Lot 516	Lot 517
Layer / Reduced Level	Layer 02	Layer 02	Layer 02
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 (%)	14	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	**	0	0
Field Wet Density (FWD) t/m <sup>3</sup>	2.12	1.94	2.00
Field Moisture Content %	25.5	24.6	24.5
Field Dry Density (FDD) t/m <sup>3</sup>	1.74	1.55	1.60
Peak Converted Wet Density t/m <sup>3</sup>	**	1.88	1.99
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	2.02	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	23.8	24.3	26.6
Adj. Field Moisture Content % (AS1289.5.4.1)	22.0	24.6	24.5
Moisture Ratio % (AS1289.5.4.1)	**	101.5	92.0
Adjusted Moisture Ratio % (AS1289.5.4.1)	92.5	**	**
Moisture Variation (Wv) %	**	-0.5	2.0
Adjusted Moisture Variation %	1.5	**	**
Hilf Density Ratio (%)	105.0	102.5	100.5
Compaction Method	Standard	Standard	Standard
Report Remarks	**	**	**

## Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC



# Material Test Report

**Report Number:** D21706-5  
**Issue Number:** 1  
**Date Issued:** 16/03/2022  
**Client:** Ginsan Constructions  
 1/79 Merola Way , Melbourne Vic 3000  
**Contact:** Mario  
**Project Number:** D21706  
**Project Name:** Kerani Heights Estate Stage 5 - Level One  
**Project Location:** Plumpton  
**Work Request:** 4380  
**Date Sampled:** 11/03/2022  
**Dates Tested:** 11/03/2022 - 16/03/2022  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% STD  
**Location:** Kerani Heights stage 5 - Level One  
**Material:** Clay  
**Material Source:** On site



Deer Park Laboratory  
 17 Walhalla Way Ravenhall VIC 3023  
 Phone: 0435 751 756  
 Email: ehippola@terrafirmalabs.com.au



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	D22-4380A	D22-4380B	D22-4380C
Test Number	10	11	12
Date Tested	11/03/2022	11/03/2022	11/03/2022
Time Tested	**	**	**
Test Request #/Location	Lot 501	Lot 502	Lot 501
Layer / Reduced Level	Layer 1	Layer 2	Layer 3
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 (%)	4	3	3
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0
Field Wet Density (FWD) t/m <sup>3</sup>	1.98	1.96	1.98
Field Moisture Content %	22.2	21.5	21.9
Field Dry Density (FDD) t/m <sup>3</sup>	1.63	1.62	1.63
Peak Converted Wet Density t/m <sup>3</sup>	**	**	**
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	1.97	1.99	1.98
Adj. Optimum Moisture Content % (AS1289.5.4.1)	24.8	25.0	24.6
Adj. Field Moisture Content % (AS1289.5.4.1)	21.4	20.8	21.1
Moisture Ratio % (AS1289.5.4.1)	**	**	**
Adjusted Moisture Ratio % (AS1289.5.4.1)	86.0	83.5	86.0
Moisture Variation (Wv) %	**	**	**
Adjusted Moisture Variation %	2.5	3.0	2.5
Hilf Density Ratio (%)	101.0	98.5	100.0
Compaction Method	Standard	Standard	Standard
Report Remarks	**	**	**

## Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

# Material Test Report

**Report Number:** D21706-6  
**Issue Number:** 1  
**Date Issued:** 22/07/2022  
**Client:** Ginsan Constructions  
 1/79 Merola Way , Melbourne Vic 3000  
**Contact:** Mario  
**Project Number:** D21706  
**Project Name:** Kerani Heights Estate Stage 5 - Level One  
**Project Location:** Plumpton  
**Work Request:** 4875  
**Date Sampled:** 19/07/2022 12:00  
**Dates Tested:** 19/07/2022 - 21/07/2022  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% STD  
**Location:** Kerani Heights estate stage 5 -Level one  
**Material:** Clay  
**Material Source:** On site



Deer Park Laboratory  
 17 Walhalla Way Ravenhall VIC 3023  
 Phone: 0435 751 756  
 Email: nbandara@terrafirmalabs.com.au



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			
Sample Number	D22-4875A	D22-4875B	D22-4875C
Test Number	13	14	15
Date Tested	19/07/2022	19/07/2022	19/07/2022
Time Tested	12:00	12:10	12:25
Test Request #/Location	Lot 510	Lot 548	Lot 552
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 (%)	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0
Field Wet Density (FWD) t/m <sup>3</sup>	1.98	1.93	1.96
Field Moisture Content %	27.6	28.3	25.1
Field Dry Density (FDD) t/m <sup>3</sup>	1.55	1.50	1.56
Peak Converted Wet Density t/m <sup>3</sup>	1.95	1.90	1.96
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	30.0	31.9	28.4
Adj. Field Moisture Content % (AS1289.5.4.1)	27.6	28.3	25.1
Moisture Ratio % (AS1289.5.4.1)	91.5	88.5	88.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**
Moisture Variation (Wv) %	2.5	3.5	3.0
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	101.5	101.5	99.5
Compaction Method	Standard	Standard	Standard
Report Remarks	**	**	**

## Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC