Bridgefield Estate Stage 10

GITA Inspection Verification Report

Prepared For:	Lojac Civil Pty Ltd
Report Number	D20319A V1
Version Release Date	3 Feb 2021
Report Released By	C Caulfield
Title	Project Manager
Signature	

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Appendices

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 10. This work was conducted over the period of 21/04/2020 to 23/04/2020.

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 Lots 1020 through to 1031 and Lot 1040, bounded by streets Oakdale Lane, Saffron Way and Viola Drive. 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/10) 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^2), the minimum testing frequency is 1 test per layer per material type per 2500m^2 or 1 test per 500m^3 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.

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 to have been conducted within the house allotment but may have been verified by testing conducted within up to a 2500m^2 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 (D20319D1, 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 13 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.

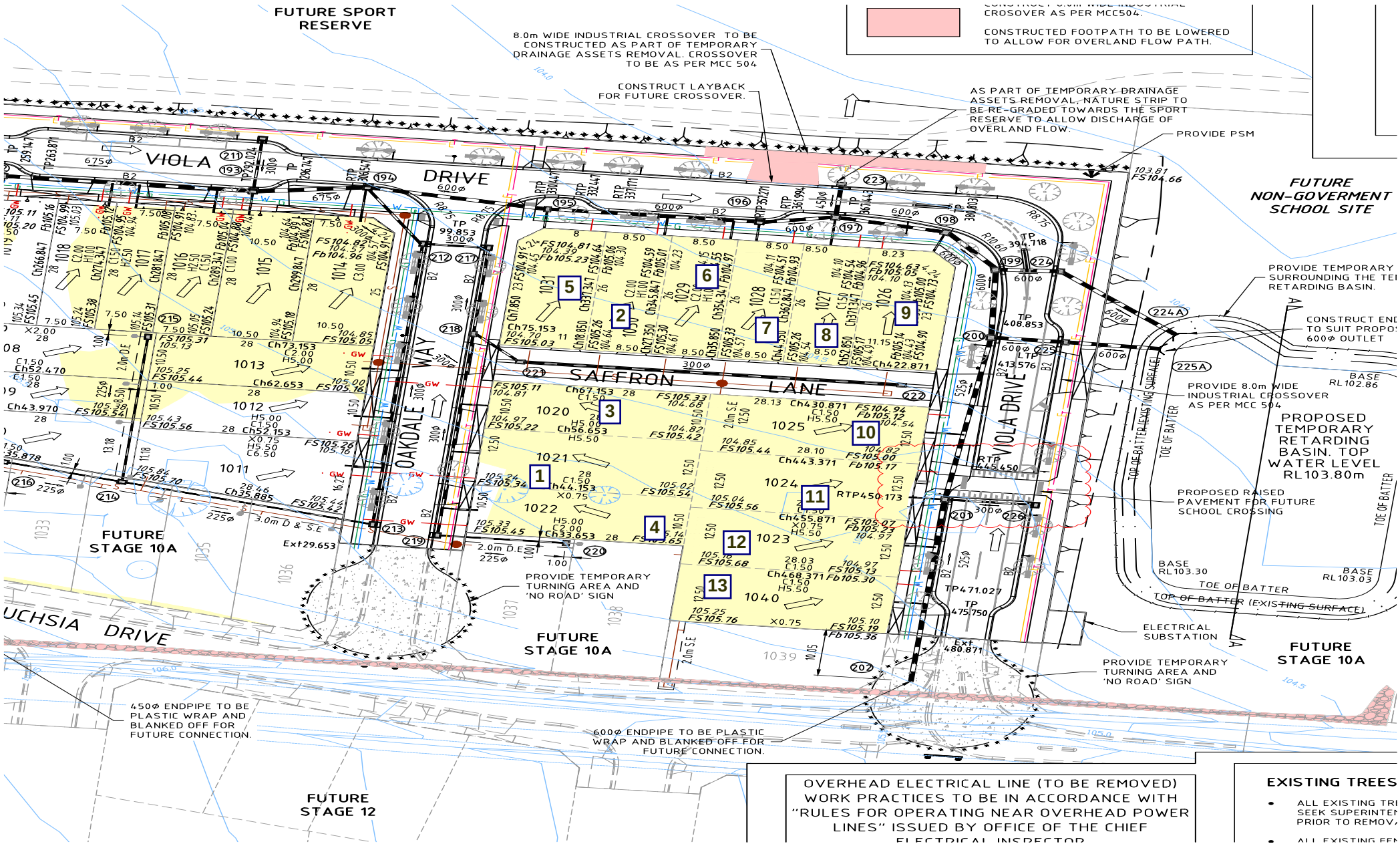
5 Statement of Compliance

The intention of this report is to provide a description of the earthworks construction for Stage 10 at Bridgefield Estate. For completed fill areas of greater than 300mm, and for works completed between 21/04/2020 and 23/04/2020, 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 10 of Bridgefield 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



terra firma laboratories

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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 10
Reference:	D20319 D1

Appendix 2: Compaction Test Register and Test Certificates

Compaction Test Register

Client: Lojac Civil Pty Ltd
Project No: D20319
Project: Bridgefield Estate Stage 10
Specification: 95%

Date:	Test No:	Layer:	Retest of:	Density:	Pass/Fail:	Lot No:	Report No:
22/04/2020	1	Layer 1		98.5%	Pass	Lot 1021	D20319-1
22/04/2020	2	Layer 1		98.5%	Pass	Lot 1030	D20319-1
22/04/2020	3	Layer 1		99.5%	Pass	Lot 1020	D20319-1
23/04/2020	4	Layer 1		100.5%	Pass	Lot 1022	D20319-2
23/04/2020	5	Layer 1		96.5%	Pass	Lot 1031	D20319-2
23/04/2020	6	Layer 1		99.5%	Pass	Lot 1029	D20319-2
23/04/2020	7	Layer 1		101.0%	Pass	Lot 1028	D20319-2
23/04/2020	8	Layer 1		103.0%	Pass	Lot 1027	D20319-2
23/04/2020	9	Layer 1		101.0%	Pass	Lot 1026	D20319-2
23/04/2020	10	Layer 1		100.5%	Pass	Lot 1025	D20319-2
23/04/2020	11	Layer 1		103.0%	Pass	Lot 1024	D20319-2
23/04/2020	12	Layer 1		100.5%	Pass	Lot 1023	D20319-2
23/04/2020	13	Layer 1		101.5%	Pass	Lot 1040	D20319-2

Material Test Report

Report Number: D20319-1
Issue Number: 1
Date Issued: 26/04/2020
Client: Lojac Civil Pty Ltd
35/148 Chesterville Road, Moorabbin Vic 3189
Project Number: D20319
Project Name: Bridgefield Estate Stage 10 - Level One
Project Location: Rockbank
Work Request: 1606
Date Sampled: 22/04/2020
Dates Tested: 22/04/2020 - 23/04/2020
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: onsite

Terra Firma Laboratories Pty Ltd
Deer Park Laboratory
Factory 1 80-82 Rebecca Drive Ravenhall VIC 3023
Phone: 0435 751 756
Email: jsomaratne@terrafirmalabs.com.au

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	D20-1606A	D20-1606B	D20-1606C
Test Number	1	2	3
Date Tested	22/04/2020	22/04/2020	22/04/2020
Time Tested	**	**	**
Test Request #/Location	Lot 1021	Lot 1030	Lot 1020
Chainage (m)	**	**	**
Location Offset (m)	**	**	**
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 (%)	6.7	5.1	5.9
Field Wet Density (FWD) t/m^3	1.95	1.96	1.97
Field Moisture Content %	21.9	22.5	22.1
Field Dry Density (FDD) t/m^3	1.60	1.60	1.61
Peak Converted Wet Density t/m^3	**	**	**
Adjusted Peak Converted Wet Density t/m^3	1.98	1.99	1.98
Moisture Ratio % (AS 1289.5.4.1)	**	**	**
Adjusted Moisture Ratio % (AS 1289.5.4.1)	108.5	104.5	105.0
Moisture Variation (Wv) %	**	**	**
Adjusted Moisture Variation %	-0.5	0.0	0.0
Hilf Density Ratio (%)	**98.5**	**98.5**	**99.5**
Compaction Method	**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: D20319-2
Issue Number: 2 - *This version supersedes all previous issues*
Reissue Reason: *Lot # Added*
Date Issued: 03/03/2021
Client: Lojac Civil Pty Ltd
35/148 Chesterville Road, Moorabbin Vic 3189
Project Number: D20319
Project Name: Bridgefield Estate Stage 10 - Level One
Project Location: Rockbank
Work Request: 1614
Date Sampled: 23/04/2020
Dates Tested: 23/04/2020 - 24/04/2020
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

terra firma laboratories

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Factory 1 80-82 Rebecca Drive Ravenhall VIC 3023
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NATA WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Chris Caulfield
Project Manager
NATA Accredited Laboratory Number: 15357

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1					
Sample Number	D20-1614A	D20-1614B	D20-1614C	D20-1614D	D20-1614E
Test Number	4	5	6	7	8
Date Tested	23/04/2020	23/04/2020	23/04/2020	23/04/2020	23/04/2020
Time Tested	**	**	**	**	**
Test Request #/Location	Lot 1022	Lot 1031	Lot 1029	Lot 1028	Lot 1027
Layer / Reduced Level	Layer 1	Layer 1	Layer 1	Layer 1	Layer 1
Thickness of Layer (mm)	300	300	300	300	300
Soil Description	Clay	Clay	Clay	Clay	Clay
Test Depth (mm)	275	275	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	5.8	0.0	0.0	4.6	0.0
Field Wet Density (FWD) t/m^3	1.96	1.97	1.94	1.98	1.94
Field Moisture Content %	22.0	23.2	22.3	22.2	20.5
Field Dry Density (FDD) t/m^3	1.60	1.60	1.59	1.62	1.61
Peak Converted Wet Density t/m^3	**	2.04	1.95	**	1.89
Adjusted Peak Converted Wet Density t/m^3	1.95	**	**	1.96	**
Moisture Ratio % (AS 1289.5.4.1)	**	91.5	83.0	**	81.5
Adjusted Moisture Ratio % (AS 1289.5.4.1)	95.5	**	**	95.0	**
Moisture Variation (Wv) %	**	2.0	4.0	**	4.5
Adjusted Moisture Variation %	2.5	**	**	2.0	**
Hilf Density Ratio (%)	**100.5**	**96.5**	**99.5**	**101.0**	**103.0**
Compaction Method	**Standard**	**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: D20319-2
Issue Number: 2 - *This version supersedes all previous issues*
Reissue Reason: *Lot # Added*
Date Issued: 03/03/2021
Client: Lojac Civil Pty Ltd
35/148 Chesterville Road, Moorabbin Vic 3189
Project Number: D20319
Project Name: Bridgefield Estate Stage 10 - Level One
Project Location: Rockbank
Work Request: 1614
Date Sampled: 23/04/2020
Dates Tested: 23/04/2020 - 24/04/2020
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
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NATA Accredited Laboratory Number: 15357

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1					
Sample Number	D20-1614F	D20-1614G	D20-1614H	D20-1614I	D20-1614J
Test Number	9	10	11	12	13
Date Tested	23/04/2020	23/04/2020	23/04/2020	23/04/2020	23/04/2020
Time Tested	**	**	**	**	**
Test Request #/Location	Lot 1026	Lot 1025	Lot 1024	Lot 1023	Lot 1040
Layer / Reduced Level	Layer 1	Layer 1	Layer 1	Layer 1	Layer 1
Thickness of Layer (mm)	300	300	300	300	300
Soil Description	Clay	Clay	Clay	Clay	Clay
Test Depth (mm)	275	275	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0.0	0.0	0.0	0.0	6.2
Field Wet Density (FWD) t/m^3	1.95	1.93	1.97	1.94	1.97
Field Moisture Content %	22.2	21.2	20.9	22.8	22.9
Field Dry Density (FDD) t/m^3	1.60	1.60	1.63	1.58	1.60
Peak Converted Wet Density t/m^3	1.93	1.93	1.91	1.92	**
Adjusted Peak Converted Wet Density t/m^3	**	**	**	**	1.94
Moisture Ratio % (AS 1289.5.4.1)	82.0	89.5	81.5	90.5	**
Adjusted Moisture Ratio % (AS 1289.5.4.1)	**	**	**	**	97.0
Moisture Variation (Wv) %	4.5	2.5	4.5	2.5	**
Adjusted Moisture Variation %	**	**	**	**	2.0
Hilf Density Ratio (%)	**101.0**	**100.5**	**103.0**	**100.5**	**101.5**
Compaction Method	**Standard**	**Standard**	**Standard**	**Standard**	**Standard**

Moisture Variation Note:
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