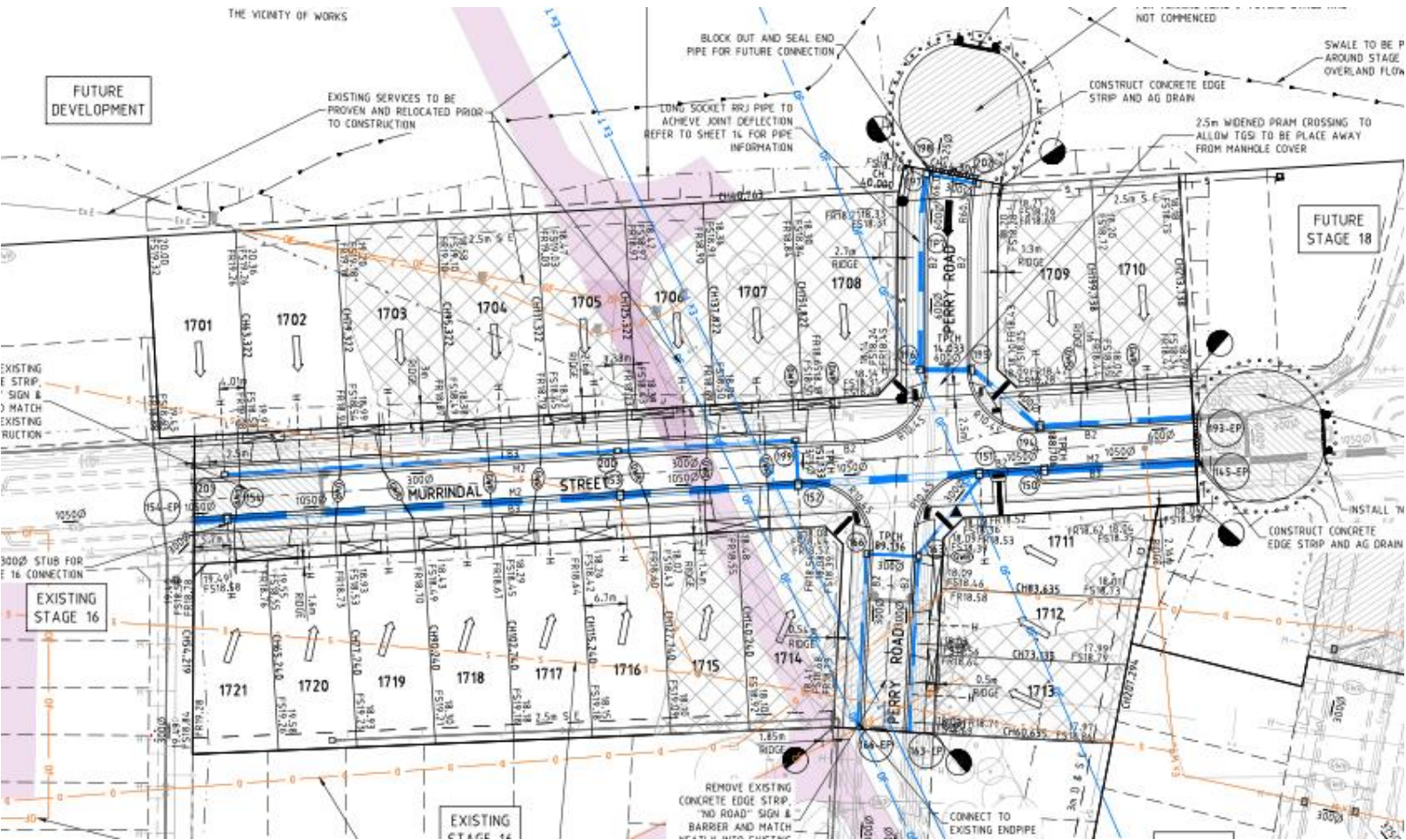




CONTINENT GEOTECH SERVICES

| Geotechnical | Environmental | Residential | Pavements |

Level 1 Supervision Report Riverwalk Stage 17 Werribee



Universal Corporation

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Document Details

Project Number	6181.17 – R1	Rev 1
Project Name	Riverwalk Stage 17 Structural Fill	
Project Location	Werribee VIC	
Client	Universal Corporation 57 Yale Drive Epping VIC 3076	

Revision History	
R0	Issued 15-02-2019
R1	Issued 22-02-2019 <ul style="list-style-type: none"> • Rectify Cover Plan

1. INTRODUCTION

Continent Geotech Services (CGS) has been engaged by Universal Corporation (Client) to provide Level Geotechnical Supervision of fill activity at Riverwalk Stage 17 Project. The purpose of this report is to summarise the inspection activities, compaction control and laboratory testing services performed by CGS.

Level 1 Inspection and Testing, as defined in AS3798 – 2007 ‘*Guideline on Earthworks for Commercial and Residential Development*,’ provides for full time inspection of the construction of controlled fill and field laboratory testing accordance with AS1289, “Methods of Testing Soils for Engineering Purposes The compaction control testing was undertaken by our experienced geotechnician/engineer from CGS.

2. PROJECT SUMMARY

CGS provided the Level 1 Inspection and Testing of the controlled fill placed within Stage 17 residential allotments.

The earthworks were carried out by Universal corporation with their own equipment. CGS undertook the compaction control testing of the fill material as part of Level 1 Inspection and Testing process. General Fill material used for construction was locally sourced from site and imported from nearby construction sites consists gravelly clay, silty clay, which makes material used to be able to test with AS1289 Methods for compaction compliance as per AS3798 – 2007.

The areas of controlled fill were placed is shown on site plan attached the Appendix A which is based on drawing prepared by SMEC Australia Pty Ltd and provided by client, Drawing No1932-17-02. The Level 1 Inspection and testing commenced on February 2017 and finished level completed on March 2017.

3. INSPECTION AND SUPERVISION

3.1 Fill Placement and Testing Specifications

The fill placement and testing were carried out in accordance with AS3798 – 2007 ‘*Guideline on Earthworks for Commercial and Residential Development*, the following specifications based generally on the requirements of AS3798;

- The fill area shall be stripped of topsoil, subsoil, soft material and vegetation to firm based approved by superintendent;
- Suitable fill material shall be placed in loose horizontal layers not exceeding 400mm in thickness;
- The fill shall be compacted to Dry Density Ratio of at least 95% Standard (AS1289 5.1.1, 5.4.1 or 5.7.1),
- The fill material shall not contain greater than 20% by volume, of particles size greater than 37.5mm and no particle size over 200mm in any dimension,
- The frequency of field density testing shall be accordance with AS3798 for large scale developments (Type 1), which nominates a frequency of not less than
 - 1 test per layer of 200mm per 2500mm²
 - 1 test per 500m³ distributed reasonably evenly throughout the full depth and area; or
 - 3 tests per site visit; which requires the most tests.

The technical specification of the structural fill was not provided so above guidelines were assumed for earthworks.

3.2 Strip Surface Inspection

The subgrade for the fill area was prepared by removing the topsoil and vegetation layer using a grader. The stripped surface inspection was carried and compacted with pad foot roller to compact subgrade. Generally, 100mm-150mm topsoil was removed to expose natural silty clay material layer.

The soils exposed at the subgrade comprised natural clays silts and silty clays. No soft spots were observing during the subgrade assessment.

4. EARTHWORKS AND TESTING

4.1 Fill Construction

The filling operation was undertaken with materials consists gravelly clay and silty clay, which was then conditioned close to optimum moisture for placement of fill. The fill material was visually assessed to confirm the material is clean from debris and vegetative matter and oversize rocks. The fill material used was nominated by site supervisor. It should be noted that no chemical analysis was performed by CGS on fill material. If oversize particle encountered while placing fill were removed where required.

The fill material was then placed in approximately 400mm loose layers, rolling effort with onsite roller. Compacted layers were of maximum 300mm thick that achieved 95% Standard Compaction which met Australian Standards specifications.

4.2 Compaction Control Testing

The Riverwalk Stage 17 works classified as Residential Development for the purposes of AS3798-2007, thereby requires a minimum of 3 tests per day be undertaken throughout the placement of the fill (refer AS3798 Table 8.1).

The total 30 (Thirty) Field density and Laboratory Hilf Compaction tests were performed. The reports verify the achievement of the minimum density requirement of 95% Standard Compaction throughout the full depth area, with each layer tested accordingly. All the tests results were provided to Universal Corporation for inclusion within their internal quality system (refer to Appendix 2 Summary of results). The location for all the tests performed is shown in Appendix 1 site plan. It should be noted that further to fill placement 100mm topsoil is expected to complete the fill levels and is not part of controlled fill. Any fill placed as part of drainage, sewer works, pavement works is not part of this level 1 report.

5. CONCLUSION

Analysing the material used and completed earthworks the filling procedures conducted by Universal Corporation satisfied the requirements of AS3798 in regard to the placement of fill material on a project under Level 1 Supervision and in accordance with specification as provided to CGS. It is observed by CGS representative on site that finish levels had been complete up to nominated levels as per confirmation provided by clients site foreman.

This report has been prepared for benefit of our client with respect to the particular brief given to us and it may not be relied upon in other purpose without our prior review and agreement. No responsibility for this report will be taken by CGS if it is altered in any way, or not reproduced in full.

6. LIMITATION OF THIS REPORT

This level 1 report is valid for the following completion of Level 1 Supervision. CGS does not accept responsibility for any distortion or deviation of measurements as reported at the time given. It should be noted that even though the fill layer was moisture conditioned while compacting and meets the requirement but over the dry and wet weather it is subject to drying

and cracking. The top 200-300mm of fill will deteriorate with time and should be taken into account by foundation engineer prior to construction of dwelling. The levels nominated in this report are guiding to amounts of fill placed and do not necessarily reflect accurate survey of fill levels.

This report will be considered invalid if:

- Any works were carried/conducted on the site without supervision of CGS technician
- Any other unforeseeable event any event outside of the time described above.

7. UNDERSTANDING LEVEL 1 INSPECTION AND TESTING

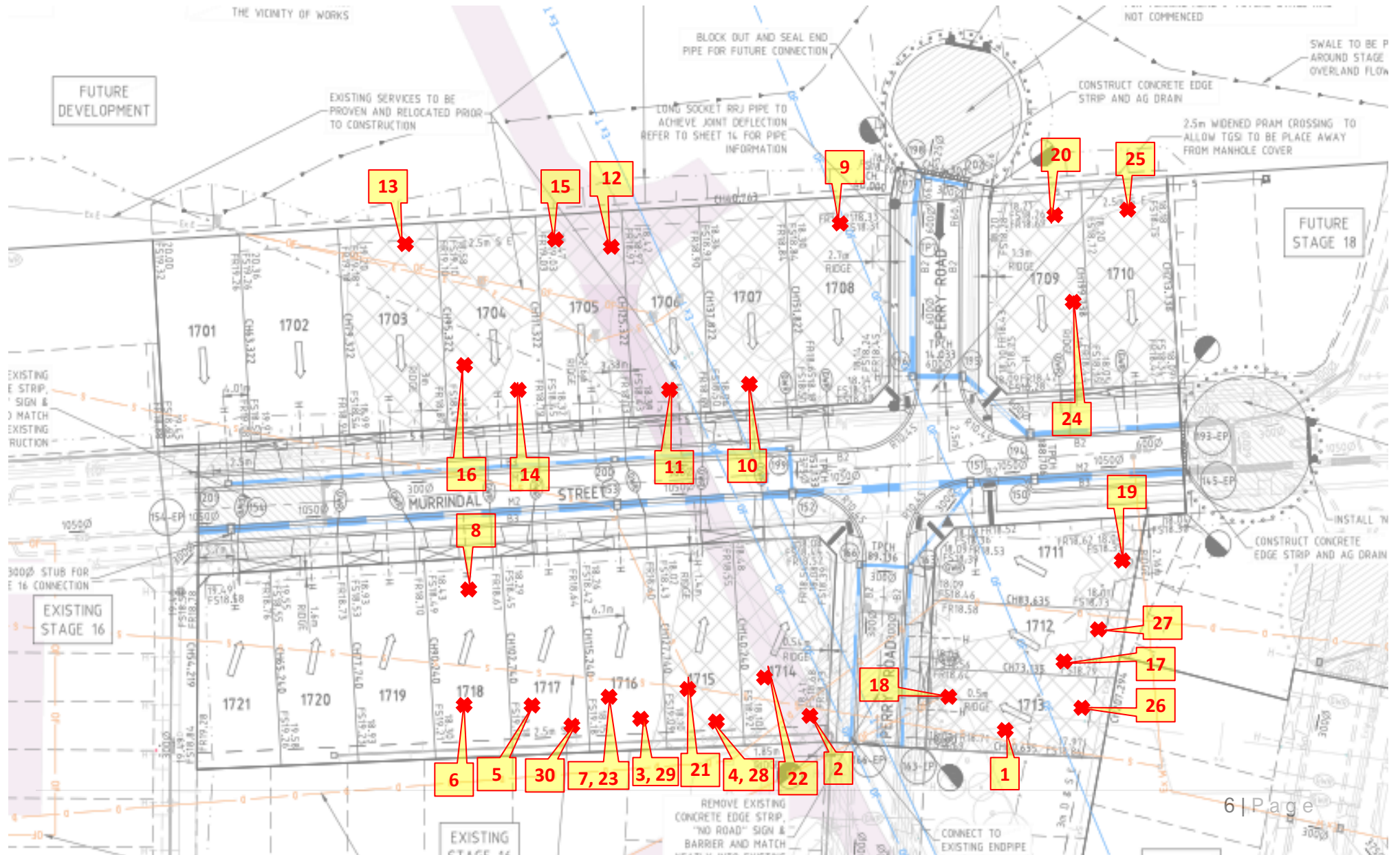
The purpose of performing level 1 inspection and testing is to ensure compliance of fill construction with the nominated specifications. The engagement of Geotechnical Inspection Testing Authority (GITA) allows the contractor to perform his role in the construction of the filling operation while the GITA monitors quality control of process of the fill placement. The visual observations of construction process and methodologies used by contractor allows the GITA to approve the subsequent placement of fill without having to wait to completion of testing and the extended time it takes to complete the laboratory results. The GITA will carry out random spots checks of the filling operations and complete the compaction control test for day's work. Level 1 inspection and testing requires full time inspection and testing of the fill placement undertaken on site. CGS are notified daily by project foreman where subsequent days of fill placement under level 1 to occur. Generally, projects rely on importation of a fill source, there can be delays in receipt of sufficient material to start placing which may result the periods where GITA representative not required on site. It is contractors responsibility to notify the GITA prior to start any fill placement. A GITA relies on the contractor to advise when the site attendance required and makes all reasonable visual attempts to assess if the works were the same as pervious day of attendance.

Prepared By
M Levi – Geotech Engineer

Authorised By
S Kang
Project Manager



APPENDIX 1 – SITE PLAN





Appendix 2 – Testing summary

Sample No. & Report No	Test No.	Location	Layer	Material Type	Date Tested	Density Ratio (%)	Moisture Variation of OMC (%)	Pass/Fail
9282	1	Lot 1713	Layer 1	Gravelly Silty Clay	08/02/2017	98.0	0.5% Dry	Pass
9283	2	Lot 1714	Layer 1	Gravelly Silty Clay	08/02/2017	99.5	0.5% Dry	Pass
9284	3	Lot 1716	Layer 1	Gravelly Silty Clay	08/02/2017	100.5	2% Dry	Pass
9285	4	Lot 1715	Layer 1	Gravelly Silty Clay	08/02/2017	98.5	0.5% Wet	Pass
9307	5	Lot 1717	Layer 1	Gravelly Silty Clay	09/02/2017	98.5	2% Dry	Pass
9308	6	Lot 1718	Layer 1	Gravelly Silty Clay	09/02/2017	98.0	0.5% Dry	Pass
9309	7	Lot 1716	Layer 2	Gravelly Silty Clay	09/02/2017	100.0	2% Dry	Pass



9310	8	Lot 1718	Layer 2	Gravelly Silty Clay	09/02/2017	98.0	0.5% Wet	Pass
9323	9	Lot 1708	Layer 1	Gravelly Silty Clay	10/02/2017	101.0	2% Dry	Pass
9324	10	Lot 1707	Layer 1	Gravelly Silty Clay	10/02/2017	98.0	0.5% Dry	Pass
9325	11	Lot 1706	Layer 1	Gravelly Silty Clay	10/02/2017	99.0	2% Dry	Pass
9326	12	Lot 1705	Layer 1	Gravelly Silty Clay	10/02/2017	98.0	Omc	Pass
9357	13	Lot 1703	Layer 1	Gravelly Silty Clay	13/02/2017	100.5	2% Dry	Pass
9358	14	Lot 1704	Layer 1	Gravelly Silty Clay	13/02/2017	99.0	0.5% Dry	Pass
9359	15	Lot 1705	Layer 2	Gravelly Silty Clay	13/02/2017	100.5	2% Dry	Pass
9360	16	Lot 1704	Layer 2	Gravelly Silty Clay	13/02/2017	98.0	Omc	Pass
9392	17	Lot 1712	Layer 1	Gravelly Silty Clay	14/02/2017	99.5	Omc	Pass
9393	18	Lot 1713	Layer 1	Gravelly Silty Clay	14/02/2017	100.0	0.5% Dry	Pass



9394	19	Lot 1711	Layer 1	Gravelly Silty Clay	14/02/2017	100.0	2% Dry	Pass
9395	20	Lot 1709	Layer 1	Gravelly Silty Clay	14/02/2017	99.0	Omc	Pass
9414	21	Lot 1715	Layer 3	Gravelly Silty Clay	15/02/2017	99.0	Omc	Pass
9415	22	Lot 1714	Layer 3	Gravelly Silty Clay	15/02/2017	99.5	0.5% Dry	Pass
9416	23	Lot 1716	Layer 3	Gravelly Silty Clay	15/02/2017	100.0	2% Dry	Pass
9429	24	Lot 1709	Layer 2	Gravelly Silty Clay	16/02/2017	98.0	Omc	Pass
9430	25	Lot 1710	Layer 2	Gravelly Silty Clay	16/02/2017	101.0	0.5% Dry	Pass
9431	26	Lot 1713	Layer 2	Gravelly Silty Clay	16/02/2017	99.5	2% Dry	Pass
9432	27	Lot 1712	Layer 2	Gravelly Silty Clay	16/02/2017	99.0	Omc	Pass
9467	28	Lot 1715	Layer 3	Gravelly Silty Clay	17/02/2017	98.5	Omc	Pass
9468	29	Lot 1716	Layer 3	Gravelly Silty Clay	17/02/2017	101.5	0.5% Dry	Pass



9469	30	Lot 1717	Layer 3	Gravelly Silty Clay	17/02/2017	100.5	2% Dry	Pass
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APPENDIX 3 – NATA LAB RESULTS

HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 17
Location: Werribee VIC 3030

Report Number: 6181.17 - 1
Report Date: 20/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

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Sample No.	9282	9283	9284	9285					
ID No.	1	2	3	4					
Date Sampled	8/02/2017	8/02/2017	8/02/2017	8/02/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	8/02/2017	8/02/2017	8/02/2017	8/02/2017					
Material Source	Imported	Imported	Imported	Imported					
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay	Gravelly Clay					
To Be Used As	Fill	Fill	Fill	Fill					
Sample Location	Lot 1713 Layer 1 South Side	Lot 1714 Layer 1 South Side	Lot 1716 Layer 1 South Side	Lot 1715 Layer 1 South Side					
Layer Depth	mm	300	300	300	300				
Test Depth	mm	275	275	275	275				

Max Size	mm	19	19	19	19				
Oversize Wet	%	4	3	3	0				
Field Wet Density	t/m ³	2.01	2.01	2.02	2.02				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.05	2.02	2.01	2.05				

*PCWD - Peak Converted Wet Density, APCWD - Adjusted Peak Converted Wet Density, If Oversize material present PCWD and Moisture Variation is Adjusted

Moisture Variation or Adjusted* (of OMC)	t/m ³	0.5% (dry)	0.5% (dry)	2% (dry)	0.5% (wet)				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	98.0	99.5	100.5	98.5				
Min Hilf Density Ratio	%	98	98	98	98				

Note:

Test Methods: AS1289 5.8.1, 5.7.1, 2.1.1
Sampling Test Method: AS1289 1.2.1 6.4(b)



Accredited for compliance with ISO/IEC 17025-Testing.

The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Approved Signatory



S Kang
NATA Accreditation No. 19945

HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 17
Location: Werribee VIC 3030

Report Number: 6181.17 - 2
Report Date: 20/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9307	9308	9309	9310					
ID No.	1	2	3	4					
Date Sampled	9/02/2017	9/02/2017	9/02/2017	9/02/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	9/02/2017	9/02/2017	9/02/2017	9/02/2017					
Material Source	Imported	Imported	Imported	Imported					
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay	Gravelly Clay					
To Be Used As	Fill	Fill	Fill	Fill					
Sample Location	Lot 1717 Layer 1 South Side	Lot 1718 Layer 1 South Side	Lot 1716 Layer 2 South Side	Lot 1718 Layer 2 North Side					
Layer Depth	mm	300	300	300	300				
Test Depth	mm	275	275	275	275				

Max Size	mm	19	19	19	19				
Oversize Wet	%	4	3	3	3				
Field Wet Density	t/m ³	1.99	1.98	2.00	2.01				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.02	2.02	2.00	2.06				

*PCWD - Peak Converted Wet Density, APCWD - Adjusted Peak Converted Wet Density, If Oversize material present PCWD and Moisture Variation is Adjusted

Moisture Variation or Adjusted* (of OMC)	t/m ³	2% (dry)	0.5% (dry)	2% (dry)	0.5% (wet)				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	98.5	98.0	100.0	98.0				
Min Hilf Density Ratio	%	98	98	98	98				

Note:

Test Methods: AS1289 5.8.1, 5.7.1, 2.1.1
Sampling Test Method: AS1289 1.2.1 6.4(b)



Accredited for compliance with ISO/IEC 17025-Testing.

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Approved Signatory



S Kang
NATA Accreditation No. 19945

HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 17
Location: Werribee VIC 3030

Report Number: 6181.17 - 3
Report Date: 20/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

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Sample No.	9323	9324	9325	9326					
ID No.	1	2	3	4					
Date Sampled	10/02/2017	10/02/2017	10/02/2017	10/02/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	10/02/2017	10/02/2017	10/02/2017	10/02/2017					
Material Source	Imported	Imported	Imported	Imported					
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay	Gravelly Clay					
To Be Used As	Fill	Fill	Fill	Fill					
Sample Location	Lot 1708 Layer 1 North Side	Lot 1707 Layer 1 South Side	Lot 1706 Layer 1 South Side	Lot 1705 Layer 1 North Side					
Layer Depth	mm 300	300	300	300					
Test Depth	mm 275	275	275	275					

Max Size	mm	19	19	19	19				
Oversize Wet	%	4	3	3	0				
Field Wet Density	t/m ³	1.99	1.99	1.99	2.00				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	1.98	2.03	2.01	2.04				

*PCWD - Peak Converted Wet Density, APCWD - Adjusted Peak Converted Wet Density, If Oversize material present PCWD and Moisture Variation is Adjusted

Moisture Variation or Adjusted* (of OMC)	t/m ³	2% (dry)	0.5% (dry)	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	101.0	98.0	99.0	98.0				
Min Hilf Density Ratio	%	98	98	98	98				

Note:

Test Methods: AS1289 5.8.1, 5.7.1, 2.1.1
Sampling Test Method: AS1289 1.2.1 6.4(b)



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NATA Accreditation No. 19945

HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 17
Location: Werribee VIC 3030

Report Number: 6181.17 - 4
Report Date: 20/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

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Sample No.	9357	9358	9359	9360					
ID No.	1	2	3	4					
Date Sampled	13/02/2017	13/02/2017	13/02/2017	13/02/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	13/02/2017	13/02/2017	13/02/2017	13/02/2017					
Material Source	Imported	Imported	Imported	Imported					
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay	Gravelly Clay					
To Be Used As	Fill	Fill	Fill	Fill					
Sample Location	Lot 1703 Layer 1 North Side	Lot 1704 Layer 1 South Side	Lot 1705 Layer 2 North Side	Lot 1704 Layer 2 South Side					
Layer Depth	mm 200	300	300	300					
Test Depth	mm 175	275	275	275					

Max Size	mm	19	19	19	19				
Oversize Wet	%	3	0	3	0				
Field Wet Density	t/m ³	2.01	2.02	2.02	2.00				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.00	2.04	2.00	2.05				

*PCWD - Peak Converted Wet Density , APCWD - Adjusted Peak Converted Wet Density, If Oversize material present PCWD and Moisture Variation is Adjusted

Moisture Variation or Adjusted* (of OMC)	t/m ³	2% (dry)	0.5% (dry)	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	100.5	99.0	100.5	98.0				
Min Hilf Density Ratio	%	98	98	98	98				

Note:

Test Methods: AS1289 5.8.1, 5.7.1, 2.1.1
Sampling Test Method: AS1289 1.2.1 6.4(b)



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NATA Accreditation No. 19945

HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 17
Location: Werribee VIC 3030

Report Number: 6181.17 - 5
Report Date: 20/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

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Sample No.	9392	9393	9394	9395					
ID No.	1	2	3	4					
Date Sampled	14/02/2017	14/02/2017	14/02/2017	14/02/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	15/02/2017	15/02/2017	15/02/2017	15/02/2017					
Material Source	Imported	Imported	Imported	Imported					
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay	Gravelly Clay					
To Be Used As	Fill	Fill	Fill	Fill					
Sample Location	Lot 1712 Layer 1 East Side	Lot 1713 Layer 1 West Side	Lot 1711 Layer 1 East Side	Lot 1709 Layer 1 North Side					
Layer Depth	mm	300	300	300	300				
Test Depth	mm	275	275	275	275				

Max Size	mm	19	19	19	19				
Oversize Wet	%	4	3	3	3				
Field Wet Density	t/m ³	2.01	2.02	2.00	2.02				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.02	2.02	2.00	2.05				

*PCWD - Peak Converted Wet Density, APCWD - Adjusted Peak Converted Wet Density, If Oversize material present PCWD and Moisture Variation is Adjusted

Moisture Variation or Adjusted* (of OMC)	t/m ³	omc	0.5% (dry)	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	99.5	100.0	100.0	99.0				
Min Hilf Density Ratio	%	98	98	98	98				

Note:

Test Methods: AS1289 5.8.1, 5.7.1, 2.1.1
Sampling Test Method: AS1289 1.2.1 6.4(b)



Accredited for compliance with ISO/IEC 17025-Testing.

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Approved Signatory

S Kang
NATA Accreditation No. 19945



HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 17
Location: Werribee VIC 3030

Report Number: 6181.17 - 6
Report Date: 20/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

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Sample No.	9414	9415	9416						
ID No.	1	2	3						
Date Sampled	15/02/2017	15/02/2017	15/02/2017						
Time Sampled	am/pm	am/pm	am/pm						
Date Tested	15/02/2017	15/02/2017	15/02/2017						
Material Source	Imported	Imported	Imported						
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location	Lot 1715 Layer 3 South Side	Lot 1714 Layer 3 South Side	Lot 1716 Layer 3 South Side						
Layer Depth	mm	300	300	300					
Test Depth	mm	275	275	275					

Max Size	mm	19	19	19					
Oversize Wet	%	4	3	3					
Field Wet Density	t/m ³	2.02	2.02	1.99					
Field Moisture Content	%	-	-	-					
PCWD or APCWD*	t/m ³	2.04	2.03	2.00					

*PCWD - Peak Converted Wet Density , APCWD - Adjusted Peak Converted Wet Density, If Oversize material present PCWD and Moisture Variation is Adjusted

Moisture Variation or Adjusted* (of OMC)	t/m ³	omc	0.5% (dry)	2% (dry)					
Compactive Effort		Standard	Standard	Standard					
Hilf Density Ratio	%	99.0	99.5	100.0					
Min Hilf Density Ratio	%	98	98	98					

Note:

Test Methods: AS1289 5.8.1, 5.7.1, 2.1.1
Sampling Test Method: AS1289 1.2.1 6.4(b)



Accredited for compliance with ISO/IEC 17025-Testing.

The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Approved Signatory



S Kang
NATA Accreditation No. 19945

HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 17
Location: Werribee VIC 3030

Report Number: 6181.17 - 7
Report Date: 20/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

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Sample No.	9429	9430	9431	9432					
ID No.	1	2	3	4					
Date Sampled	16/02/2017	16/02/2017	16/02/2017	16/02/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	16/02/2017	16/02/2017	16/02/2017	16/02/2017					
Material Source	Imported	Imported	Imported	Imported					
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay	Gravelly Clay					
To Be Used As	Fill	Fill	Fill	Fill					
Sample Location	Lot 1709 Layer 2 East Side	Lot 1710 Layer 2 North Side	Lot 1713 Layer 2 East Side	Lot 1712 Layer 2 West Side					
Layer Depth	mm	300	200	300	300				
Test Depth	mm	275	175	275	275				

Max Size	mm	19	19	19	19				
Oversize Wet	%	4	3	2	3				
Field Wet Density	t/m ³	2.02	2.02	1.99	2.03				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.05	2.00	1.99	2.06				

*PCWD - Peak Converted Wet Density , APCWD - Adjusted Peak Converted Wet Density, If Oversize material present PCWD and Moisture Variation is Adjusted

Moisture Variation or Adjusted* (of OMC)	t/m ³	omc	0.5% (dry)	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	98.0	101.0	99.5	99.0				
Min Hilf Density Ratio	%	98	98	98	98				

Note:

Test Methods: AS1289 5.8.1, 5.7.1, 2.1.1
Sampling Test Method: AS1289 1.2.1 6.4(b)



Accredited for compliance with ISO/IEC 17025-Testing.

The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Approved Signatory



S Kang
NATA Accreditation No. 19945

HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 17
Location: Werribee VIC 3030

Report Number: 6181.17 - 8
Report Date: 20/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9467	9468	9469						
ID No.	1	2	3						
Date Sampled	17/02/2017	17/02/2017	17/02/2017						
Time Sampled	am/pm	am/pm	am/pm						
Date Tested	17/02/2017	17/02/2017	17/02/2017						
Material Source	Imported	Imported	Imported						
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location	Lot 1715 Layer 3 South Side	Lot 1716 Layer 3 South Side	Lot 1717 Layer 3 South Side						
Layer Depth	mm 300	200	300						
Test Depth	mm 275	175	275						

Max Size	mm	19	19	19					
Oversize Wet	%	4	0	3					
Field Wet Density	t/m ³	2.03	2.03	2.00					
Field Moisture Content	%	-	-	-					
PCWD or APCWD*	t/m ³	2.06	2.01	1.99					

*PCWD - Peak Converted Wet Density, APCWD - Adjusted Peak Converted Wet Density, If Oversize material present PCWD and Moisture Variation is Adjusted

Moisture Variation or Adjusted* (of OMC)	t/m ³	omc	0.5% (dry)	2% (dry)					
Compactive Effort		Standard	Standard	Standard					
Hilf Density Ratio	%	98.5	101.5	100.5					
Min Hilf Density Ratio	%	98	98	98					

Note:

Test Methods: AS1289 5.8.1, 5.7.1, 2.1.1
Sampling Test Method: AS1289 1.2.1 6.4(b)



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