



CONTINENT GEOTECH SERVICES

| Geotechnical | Environmental | Residential | Pavements |

Level 1 Supervision Report Riverwalk Stage 15 Werribee



Universal Corporation

TABLE OF CONTENTS

1.	INTRODUCTION	1
2.	PROJECT SUMMARY	1
3.	INSPECTION AND SUPERVISION	1
3.1	FILL PLACEMENT AND TESTING SPECIFICATIONS	1
3.2	STRIP SURFACE INSPECTION	2
4.	EARTHWORKS AND TESTING	2
4.1	FILL CONSTRUCTION	2
4.2	COMPACTION CONTROL TESTING	3
5.	CONCLUSION	3
6.	LIMITATION OF THIS REPORT	3
7.	UNDERSTANDING LEVEL 1 INSPECTION AND TESTING	4
	APPENDIX 1 – SITE PLAN	5
	APPENDIX 2 – TESTING SUMMARY	8
	APPENDIX 3 – NATA LAB RESULTS	17

Document Details

Project Number	6181.15 – R0	Rev 0
Project Name	Riverwalk Stage 15 Structural Fill	
Project Location	Werribee VIC	
Client	Universal Corporation 57 Yale Drive Epping VIC 3076	

Revision History	
R0	Issued 15-02-2019

1. INTRODUCTION

Continent Geotech Services (CGS) has been engaged by Universal Corporation (Client) to provide Level Geotechnical Supervision of fill activity at Riverwalk Stage 15 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 15 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 No1932-15-02. 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 15 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 89 (Eighty-Nine) 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 3 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







APENDIX 2 – TESTING SUMMARY

Sample No. & Report No	Test No.	Location	Layer	Material Type	Date Tested	Density Ratio (%)	Moisture Variation of OMC (%)	Pass/Fail
9679	1	Lot 1532	Layer 1	Gravelly Silty Clay	13/03/2017	99.0	0.5% Dry	Pass
9680	2	Lot 1531	Layer 1	Gravelly Silty Clay	13/03/2017	98.5	Omc	Pass
9681	3	Lot 1530	Layer 3	Gravelly Silty Clay	13/03/2017	100.0	2% Dry	Pass
9682	4	Lot 1533	Layer 3	Gravelly Silty Clay	13/03/2017	99.5	0.5% Dry	Pass
9689	5	Lot 1529	Layer 1	Gravelly Silty Clay	14/03/2017	98.0	0.5% Dry	Pass
9690	6	Lot 1528	Layer 1	Gravelly Silty Clay	14/03/2017	100.0	Omc	Pass
9691	7	Lot 1530	Layer 3	Gravelly Silty Clay	14/03/2017	101.0	2% Dry	Pass
9692	8	Lot 1529	Layer 3	Gravelly Silty Clay	14/03/2017	98.5	Omc	Pass



9721	9	Lot 1527	Layer 1	Gravelly Silty Clay	15/03/2017	98.5	0.5% Dry	Pass
9722	10	Lot 1526	Layer 2	Gravelly Silty Clay	15/03/2017	98.0	Omc	Pass
9723	11	Lot 1527	Layer 2	Gravelly Silty Clay	15/03/2017	98.0	2% Dry	Pass
9766	12	Lot 1533	Layer 3	Gravelly Silty Clay	16/03/2017	98.0	0.5% Dry	Pass
9767	13	Lot 1532	Layer 3	Gravelly Silty Clay	16/03/2017	99.0	Omc	Pass
9768	14	Lot 1530	Layer 4	Gravelly Silty Clay	16/03/2017	98.0	2% Dry	Pass
9769	15	Lot 1531	Layer 4	Gravelly Silty Clay	16/03/2017	99.0	Omc	Pass
9789	16	Lot 1521	Layer 1	Gravelly Silty Clay	20/03/2017	100.0	0.5% Dry	Pass
9790	17	Lot 1520	Layer 2	Gravelly Silty Clay	20/03/2017	98.0	0.5% Dry	Pass
9791	18	Lot 1522	Layer 2	Gravelly Silty Clay	20/03/2017	92.0	4.0% Dry	Fail
9792	19	Lot 1525	Layer 2	Gravelly Silty Clay	20/03/2017	94.5	3.5% Wet	Fail



9811	20	Lot 1522 (Retest of 9791)	Layer 2	Gravelly Silty Clay	21/03/2017	100.5	0.5% Dry	Pass
9812	21	Lot 1525 (Retest of 9792)	Layer 2	Gravelly Silty Clay	21/03/2017	99.0	Omc	Pass
9821	22	Lot 1532	Layer 4	Gravelly Silty Clay	22/03/2017	99.0	0.5% Dry	Pass
9822	23	Lot 1533	Layer 4	Gravelly Silty Clay	22/03/2017	99.5	0.5% Dry	Pass
9823	24	Lot 1531	Layer 5	Gravelly Silty Clay	22/03/2017	100.0	0.5% Dry	Pass
9824	25	Lot 1530	Layer 5	Gravelly Silty Clay	22/03/2017	98.5	0.5% Dry	Pass
9825	26	Lot 1532	Layer 5	Gravelly Silty Clay	22/03/2017	99.5	Omc	Pass
9857	27	Lot 1508	Layer 1	Gravelly Silty Clay	27/03/2017	99.5	0.5% Dry	Pass
9858	28	Lot 1509	Layer 1	Gravelly Silty Clay	27/03/2017	98.5	0.5% Dry	Pass
9859	29	Lot 1507	Layer 2	Gravelly Silty Clay	27/03/2017	99.5	2.5% Dry	Pass
9860	30	Lot 1506	Layer 2	Gravelly Silty Clay	27/03/2017	100.5	Omc	Pass



9861	31	Lot 1502	Layer 1	Gravelly Silty Clay	27/03/2017	99.5	0.5% Dry	Pass
9862	32	Lot 1503	Layer 1	Gravelly Silty Clay	27/03/2017	98.0	0.5% Dry	Pass
9863	33	Lot 1501	Layer 1	Gravelly Silty Clay	27/03/2017	100.0	2% Dry	Pass
9896	34	Lot 1504	Layer 1	Gravelly Silty Clay	29/03/2017	99.0	0.5% Dry	Pass
9897	35	Lot 1505	Layer 2	Gravelly Silty Clay	29/03/2017	95.5	2% Wet	Fail
9898	36	Lot 1504	Layer 2	Gravelly Silty Clay	29/03/2017	91.0	2.5% Wet	Fail
9906	37	Lot 1504 (Retest of 9898)	Layer 2	Gravelly Silty Clay	30/30/2017	99.0	0.5% Dry	Pass
9907	38	Lot 1505 (Retest of 9897)	Layer 2	Gravelly Silty Clay	30/30/2017	99.5	0.5% Dry	Pass
9972	39	Lot 1528	Layer 3	Gravelly Silty Clay	03/04/2017	99.5	0.5% Dry	Pass
9973	40	Lot 1529	Layer 3	Gravelly Silty Clay	03/04/2017	99.5	0.5% Dry	Pass
9974	41	Lot 1530	Layer 4	Gravelly Silty Clay	03/04/2017	98.0	2% Dry	Pass



9975	42	Lot 1527	Layer 4	Gravelly Silty Clay	03/04/2017	99.5	Omc	Pass
9989	43	Lot 1520	Layer 2	Gravelly Silty Clay	04/04/2017	99.0	0.5% Dry	Pass
9990	44	Lot 1521	Layer 2	Gravelly Silty Clay	04/04/2017	100.0	0.5% Dry	Pass
9991	45	Lot 1502	Layer 2	Gravelly Silty Clay	04/04/2017	99.5	2% Dry	Pass
9992	46	Lot 1503	Layer 2	Gravelly Silty Clay	04/04/2017	98.5	Omc	Pass
10132	47	Lot 1510	Layer 1	Gravelly Silty Clay	10/04/2017	98.5	0.5% Dry	Pass
10133	48	Lot 1512	Layer 1	Gravelly Silty Clay	10/04/2017	100.0	Omc	Pass
10134	49	Lot 1514	Layer 1	Gravelly Silty Clay	10/04/2017	99.5	2% Dry	Pass
10135	50	Lot 1511	Layer 1	Gravelly Silty Clay	10/04/2017	99.5	Omc	Pass
10206	51	Lot 1518	Layer 1	Gravelly Silty Clay	12/04/2017	98.5	0.5% Dry	Pass
10207	52	Lot 1517	Layer 1	Gravelly Silty Clay	12/04/2017	100.0	Omc	Pass



10208	53	Lot 1515	Layer 1	Gravelly Silty Clay	12/04/2017	100.0	2% Dry	Pass
10209	54	Lot 1519	Layer 1	Gravelly Silty Clay	12/04/2017	99.5	Omc	Pass
10231	55	Lot 1515	Layer 2	Gravelly Silty Clay	13/04/2017	101.0	0.5% Dry	Pass
10232	56	Lot 1514	Layer 2	Gravelly Silty Clay	13/04/2017	101.0	0.5% Dry	Pass
10233	57	Lot 1511	Layer 2	Gravelly Silty Clay	13/04/2017	100.5	2% Dry	Pass
10234	58	Lot 1510	Layer 2	Gravelly Silty Clay	13/04/2017	99.0	Omc	Pass
10282	59	Lot 1510	Layer 3	Gravelly Silty Clay	18/04/2017	100.0	0.5% Dry	Pass
10283	60	Lot 1512	Layer 3	Gravelly Silty Clay	18/04/2017	100.5	0.5% Dry	Pass
10284	61	Lot 1511	Layer 3	Gravelly Silty Clay	18/04/2017	101.5	2% Dry	Pass
10289	62	Lot 1509	Layer 3	Gravelly Silty Clay	18/04/2017	100.0	0.5% Dry	Pass
10290	63	Lot 1507	Layer 3	Gravelly Silty Clay	18/04/2017	100.5	0.5% Dry	Pass



10291	64	Lot 1506	Layer 3	Gravelly Silty Clay	18/04/2017	101.0	2% Dry	Pass
10311	65	Lot 1506	Layer 4	Gravelly Silty Clay	19/04/2017	98.0	0.5% Dry	Pass
10312	66	Lot 1504	Layer 3	Gravelly Silty Clay	19/04/2017	98.0	0.5% Dry	Pass
10313	67	Lot 1505	Layer 3	Gravelly Silty Clay	19/04/2017	99.5	2% Dry	Pass
10366	68	Lot 1503	Layer 3	Gravelly Silty Clay	20/04/2017	98.5	0.5% Dry	Pass
10367	69	Lot 1503	Layer 4	Gravelly Silty Clay	20/04/2017	99.5	0.5% Dry	Pass
10368	70	Lot 1502	Layer 4	Gravelly Silty Clay	20/04/2017	100.0	2% Dry	Pass
10369	71	Lot 1503	Layer 5	Gravelly Silty Clay	20/04/2017	98.5	Omc	Pass
10432	72	Lot 1521	Layer 3	Gravelly Silty Clay	24/04/2017	100.0	0.5% Dry	Pass
10433	73	Lot 1522	Layer 3	Gravelly Silty Clay	24/04/2017	99.5	Omc	Pass
10434	74	Lot 1521	Layer 4	Gravelly Silty Clay	24/04/2017	99.5	0.5% Dry	Pass



10435	75	Lot 1522	Layer 4	Gravelly Silty Clay	24/04/2017	100.5	0.5% Dry	Pass
10436	76	Lot 1520	Layer 4	Gravelly Silty Clay	24/04/2017	99.5	Omc	Pass
10452	77	Lot 1525	Layer 5	Gravelly Silty Clay	25/04/2017	101.0	2.5% Dry	Pass
10453	78	Lot 1525	Layer 5	Gravelly Silty Clay	25/04/2017	100.5	0.5% Dry	Pass
10454	79	Lot 1527	Layer 5	Gravelly Silty Clay	25/04/2017	98.5	1.5% Dry	Pass
10455	80	Lot 1526	Layer 5	Gravelly Silty Clay	25/04/2017	101.0	Omc	Pass
10489	81	Lot 1522	Layer 5	Gravelly Silty Clay	26/04/2017	100.5	2.5% Dry	Pass
10490	82	Lot 1523	Layer 6	Gravelly Silty Clay	26/04/2017	99.5	0.5% Dry	Pass
10491	83	Lot 1523	Layer 6	Gravelly Silty Clay	26/04/2017	99.0	0.5% Wet	Pass
10492	84	Lot 1522	Layer 6	Gravelly Silty Clay	26/04/2017	100.5	Omc	Pass
10521	85	Lot 1528	Layer 6	Gravelly Silty Clay	27/04/2017	98.0	0.5% Dry	Pass



10522	86	Lot 1529	Layer 6	Gravelly Silty Clay	27/04/2017	99.5	0.5% Dry	Pass
10523	87	Lot 1530	Layer 6	Gravelly Silty Clay	27/04/2017	98.0	0.5% Wet	Pass

APPENDIX 3 – NATA LAB RESULTS

HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 1
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9679	9680	9681	9682					
ID No.	1	2	3	4					
Date Sampled	13/03/2017	13/03/2017	13/03/2017	13/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	14/03/2017	14/03/2017	14/03/2017	14/03/2017					
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 1532 Layer 1 North Side	Lot 1531 Layer 1 East Side	Lot 1530 Layer3 East Side	Lot 1533 Layer3 West 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	2	2	5				
Field Wet Density	t/m ³	2.03	1.98	2.02	2.08				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.06	2.01	2.02	2.09				

*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)	omc	2% (dry)	0.5% (dry)				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	99.0	98.5	100.0	99.5				
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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 2
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9689	9690	9691	9692					
ID No.	1	2	3	4					
Date Sampled	14/03/2017	14/03/2017	14/03/2017	14/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	14/03/2017	14/03/2017	14/03/2017	14/03/2017					
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 1529 Layer 1 West Side	Lot 1528 Layer 1 East Side	Lot 1530 Layer 3 North Side	Lot 1529 Layer 3 West 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	2	3	0				
Field Wet Density	t/m ³	1.99	2.02	2.03	1.98				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.03	2.02	2.02	2.02				

*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)	omc	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	98.0	100.0	101.0	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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 3
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9721	9722	9723						
ID No.	1	2	3						
Date Sampled	15/03/2017	15/03/2017	15/03/2017						
Time Sampled	am/pm	am/pm	am/pm						
Date Tested	16/03/2017	16/03/2017	16/03/2017						
Material Source	Imported	Imported	Imported						
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location	Lot 1527 Layer 1 West Side	Lot 1526 Layer 2 North Side	Lot 1527 Layer 2 South Side						
Layer Depth	mm	300	300	300					
Test Depth	mm	275	275	275					

Max Size	mm	19	19	19					
Oversize Wet	%	4	2	3					
Field Wet Density	t/m ³	2.00	1.98	1.98					
Field Moisture Content	%	-	-	-					
PCWD or APCWD*	t/m ³	2.04	2.02	2.02					

*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)	omc	2% (dry)					
Compactive Effort		Standard	Standard	Standard					
Hilf Density Ratio	%	98.5	98.0	98.0					
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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 4
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9766	9767	9768	9769					
ID No.	1	2	3	4					
Date Sampled	16/03/2017	16/03/2017	16/03/2017	16/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	16/03/2017	16/03/2017	16/03/2017	16/03/2017					
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 1533 Layer 3 North Side	Lot 1532 Layer 3 East Side	Lot 1530 Layer 4 South Side	Lot 1531 Layer 4 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	0	3	0				
Field Wet Density	t/m ³	2.00	1.99	1.99	2.00				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	2.00	2.02	2.03				

*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)	omc	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	98.0	99.0	98.0	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.

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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 5
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9789	9790	9791	9792					
ID No.	1	2	3	4					
Date Sampled	20/03/2017	20/03/2017	20/03/2017	20/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	20/03/2017	20/03/2017	20/03/2017	20/03/2017					
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 1521 Layer 1 East Side	Lot 1520 Layer 2 West Side	Lot 1522 Layer 2 South Side	Lot 1525 Layer 2 East Side					
Layer Depth	mm 300	300	300	300					
Test Depth	mm 275	275	275	275					

Max Size	mm	19	19	19	19				
Oversize Wet	%	3	5	3	0				
Field Wet Density	t/m ³	2.04	1.97	1.89	1.90				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	2.01	2.06	2.01				

*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)	4% (dry)	3.5% (wet)				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	100.0	98.0	92.0	94.5				
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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 6
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9811	9812							
ID No.	1	2							
Date Sampled	21/03/2017	21/03/2017							
Time Sampled	am/pm	am/pm							
Date Tested	21/03/2017	21/03/2017							
Material Source	Imported	Imported							
Material Description	Gravelly Clay	Gravelly Clay							
To Be Used As	Fill	Fill							
Sample Location	Lot 1522 Retest Layer 2 South Side	Lot 1525 Retest Layer 2 East Side							
Layer Depth	mm 300	300							
Test Depth	mm 275	275							

Max Size	mm	19	19						
Oversize Wet	%	4	2						
Field Wet Density	t/m ³	2.05	2.00						
Field Moisture Content	%	-	-						
PCWD or APCWD*	t/m ³	2.04	2.02						

*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)	omc						
Compactive Effort		Standard	Standard						
Hilf Density Ratio	%	100.5	99.0						
Min Hilf Density Ratio	%	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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 7
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9821	9822	9823	9824	9825					
ID No.	1	2	3	4	5					
Date Sampled	22/03/2017	22/03/2017	22/03/2017	22/03/2017	22/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm	am/pm					
Date Tested	22/03/2017	22/03/2017	22/03/2017	22/03/2017	22/03/2017					
Material Source	Imported	Imported	Imported	Imported	Imported					
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay	Gravelly Clay	Gravelly Clay					
To Be Used As	Fill	Fill	Fill	Fill	Fill					
Sample Location	Lot 1532 Layer 4 North Side	Lot 1533 Layer 4 East Side	Lot 1531 Layer 5 East Side	Lot 1530 Layer 5 West Side	Lot 1532 Layer 5 North Side					
Layer Depth <i>mm</i>	300	300	300	300	300					
Test Depth <i>mm</i>	275	275	275	275	275					

Max Size <i>mm</i>	19	19	19	19	19					
Oversize Wet %	4	4	0	0	5					
Field Wet Density <i>t/m³</i>	2.01	2.04	2.05	2.01	2.01					
Field Moisture Content %	-	-	-	-	-					
PCWD or APCWD* <i>t/m³</i>	2.04	2.06	2.04	2.04	2.03					

*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) <i>t/m³</i>	0.5% (dry)	0.5% (dry)	0.5% (dry)	0.5% (dry)	omc					
Compactive Effort	Standard	Standard	Standard	Standard	Standard					
Hilf Density Ratio %	99.0	99.5	100.0	98.5	99.5					
Min Hilf Density Ratio %	98	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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 8
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9857	9858	9859	9860					
ID No.	1	2	3	4					
Date Sampled	27/03/2017	27/03/2017	27/03/2017	27/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	27/03/2017	27/03/2017	27/03/2017	27/03/2017					
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 1508 Layer 1 East Side	Lot 1509 Layer 1 West Side	Lot 1507 Layer 2 South Side	Lot 1506 Layer 2 East Side					
Layer Depth	mm	300	300	300	300				
Test Depth	mm	275	275	275	275				

Max Size	mm	19	19	19	19				
Oversize Wet	%	3	5	0	5				
Field Wet Density	t/m ³	2.02	1.97	1.99	2.04				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.03	2.01	2.00	2.03				

*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)	2.5% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	99.5	98.5	99.5	100.5				
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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 9
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9861	9862	9863						
ID No.	1	2	3						
Date Sampled	27/03/2017	27/03/2017	27/03/2017						
Time Sampled	am/pm	am/pm	am/pm						
Date Tested	28/03/2017	28/03/2017	28/03/2017						
Material Source	Imported	Imported	Imported						
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location	Lot 1502 Layer 1 West Side	Lot 1503 Layer 1 East Side	Lot 1501 Layer 1 South Side						
Layer Depth	mm	300	300	300					
Test Depth	mm	275	275	275					

Max Size	mm	19	19	19					
Oversize Wet	%	4	2	2					
Field Wet Density	t/m ³	2.03	1.96	2.01					
Field Moisture Content	%	-	-	-					
PCWD or APCWD*	t/m ³	2.04	2.00	2.01					

*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)					
Compactive Effort		Standard	Standard	Standard					
Hilf Density Ratio	%	99.5	98.0	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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 10
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9896	9897	9898						
ID No.	1	2	3						
Date Sampled	29/03/2017	29/03/2017	29/03/2017						
Time Sampled	am/pm	am/pm	am/pm						
Date Tested	29/03/2017	29/03/2017	29/03/2017						
Material Source	Imported	Imported	Imported						
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location	Lot 1504 Layer 1 West Side	Lot 1505 Layer 2 East Side	Lot 1504 Layer 2 South Side						
Layer Depth	mm	300	300	300					
Test Depth	mm	275	275	275					

Max Size	mm	19	19	19					
Oversize Wet	%	0	2	3					
Field Wet Density	t/m ³	2.02	1.85	1.90					
Field Moisture Content	%	-	-	-					
PCWD or APCWD*	t/m ³	2.04	1.94	2.09					

*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)	2% (wet)	2.5% (wet)					
Compactive Effort		Standard	Standard	Standard					
Hilf Density Ratio	%	99.0	95.5	91.0					
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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 11
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9906	9907							
ID No.	1	2							
Date Sampled	30/03/2017	30/03/2017							
Time Sampled	am/pm	am/pm							
Date Tested	30/03/2017	30/03/2017							
Material Source	Imported	Imported							
Material Description	Gravelly Clay	Gravelly Clay							
To Be Used As	Fill	Fill							
Sample Location	Lot 1504 Retest Layer 2 South Side	Lot 1505 Retest Layer 2 East Side							
Layer Depth	<i>mm</i> 300	300							
Test Depth	<i>mm</i> 275	275							

Max Size	<i>mm</i>	19	19						
Oversize Wet	%	2	2						
Field Wet Density	<i>t/m³</i>	2.02	1.99						
Field Moisture Content	%	-	-						
PCWD or APCWD*	<i>t/m³</i>	2.04	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)	<i>t/m³</i>	0.5% (dry)	0.5% (dry)						
Compactive Effort		Standard	Standard						
Hilf Density Ratio	%	99.0	99.5						
Min Hilf Density Ratio	%	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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 12
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9972	9973	9974	9975					
ID No.	1	2	3	4					
Date Sampled	3/04/2017	3/04/2017	3/04/2017	3/04/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	3/04/2017	3/04/2017	3/04/2017	3/04/2017					
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 1528 Layer 3 East Side	Lot 1529 Layer 3 West Side	Lot 1530 Layer 4 South Side	Lot 1527 Layer 4 East Side					
Layer Depth	mm 300	300	300	300					
Test Depth	mm 275	275	275	275					

Max Size	mm	19	19	19	19				
Oversize Wet	%	0	5	4	5				
Field Wet Density	t/m ³	2.02	2.00	1.97	2.03				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.03	2.01	2.00	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	0.5% (dry)	0.5% (dry)	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	99.5	99.5	98.0	99.5				
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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 13
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	9989	9990	9991	9992					
ID No.	1	2	3	4					
Date Sampled	4/04/2017	4/04/2017	4/04/2017	4/04/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	5/04/2017	5/04/2017	5/04/2017	5/04/2017					
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 1520 Layer 2 East Side	Lot 1521 Layer 2 West Side	Lot 1502 Layer 2 South Side	Lot 1503 Layer 2 East Side					
Layer Depth	mm	300	300	300	300				
Test Depth	mm	275	275	275	275				

Max Size	mm	19	19	19	19				
Oversize Wet	%	0	5	4	0				
Field Wet Density	t/m ³	2.01	2.02	1.99	2.01				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	2.01	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	0.5% (dry)	0.5% (dry)	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	99.0	100.0	99.5	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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 14
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	10132	10133	10134	10135					
ID No.	1	2	3	4					
Date Sampled	10/04/2017	10/04/2017	10/04/2017	10/04/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	10/04/2017	10/04/2017	10/04/2017	10/04/2017					
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 1510 Layer 1 North Side	Lot 1512 Layer 1 West Side	Lot 1514 Layer 1 North Side	Lot 1511 Layer 1 East Side					
Layer Depth	mm	300	300	300	300				
Test Depth	mm	275	275	275	275				

Max Size	mm	19	19	19	19				
Oversize Wet	%	5	6	4	0				
Field Wet Density	t/m ³	2.01	2.02	2.00	2.02				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	2.02	2.01	2.03				

*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)	omc	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	98.5	100.0	99.5	99.5				
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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 15
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	10206	10207	10208	10209					
ID No.	1	2	3	4					
Date Sampled	12/04/2017	12/04/2017	12/04/2017	12/04/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	13/04/2017	13/04/2017	13/04/2017	13/04/2017					
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 1518 Layer 1 East Side	Lot 1517 Layer 1 West Side	Lot 1515 Layer 1 North Side	Lot 1519 Layer 1 West Side					
Layer Depth	mm	300	300	300	300				
Test Depth	mm	275	275	275	275				

Max Size	mm	19	19	19	19				
Oversize Wet	%	5	6	4	0				
Field Wet Density	t/m ³	2.01	2.03	2.00	2.03				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	2.03	2.00	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	0.5% (dry)	omc	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	98.5	100.0	100.0	99.5				
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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 16
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	10231	10232	10233	10234					
ID No.	1	2	3	4					
Date Sampled	13/04/2017	13/04/2017	13/04/2017	13/04/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	13/04/2017	13/04/2017	13/04/2017	13/04/2017					
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 1515 Layer 2 North Side	Lot 1514 Layer 2 West Side	Lot 1511 Layer 2 East Side	Lot 1510 Layer 2 West Side					
Layer Depth	mm	300	300	300	300				
Test Depth	mm	275	275	275	275				

Max Size	mm	19	19	19	19				
Oversize Wet	%	6	5	0	5				
Field Wet Density	t/m ³	2.06	2.04	2.04	2.01				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	2.02	2.03	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	0.5% (dry)	0.5% (dry)	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	101.0	101.0	100.5	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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 17
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	10282	10283	10284						
ID No.	1	2	3						
Date Sampled	18/04/2017	18/04/2017	18/04/2017						
Time Sampled	am/pm	am/pm	am/pm						
Date Tested	18/04/2017	18/04/2017	18/04/2017						
Material Source	Imported	Imported	Imported						
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location	Lot 1510 Layer 3 West Side	Lot 1512 Layer 3 East Side	Lot 1511 Layer 3 South Side						
Layer Depth	mm	150	150	150					
Test Depth	mm	125	125	125					

Max Size	mm	19	19	19					
Oversize Wet	%	4	5	2					
Field Wet Density	t/m ³	2.05	2.04	2.04					
Field Moisture Content	%	-	-	-					
PCWD or APCWD*	t/m ³	2.05	2.03	2.01					

*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)					
Compactive Effort		Standard	Standard	Standard					
Hilf Density Ratio	%	100.0	100.5	101.5					
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)



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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 18
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	10289	10290	10291						
ID No.	1	2	3						
Date Sampled	18/04/2017	18/04/2017	18/04/2017						
Time Sampled	am/pm	am/pm	am/pm						
Date Tested	18/04/2017	18/04/2017	18/04/2017						
Material Source	Imported	Imported	Imported						
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location	Lot 1509 Layer 3 North Side	Lot 1507 Layer 3 East Side	Lot 1506 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	4	5					
Field Wet Density	t/m ³	2.05	2.04	2.06					
Field Moisture Content	%	-	-	-					
PCWD or APCWD*	t/m ³	2.05	2.03	2.03					

*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)					
Compactive Effort		Standard	Standard	Standard					
Hilf Density Ratio	%	100.0	100.5	101.0					
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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 19
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	10311	10312	10313						
ID No.	1	2	3						
Date Sampled	19/04/2017	19/04/2017	19/04/2017						
Time Sampled	am/pm	am/pm	am/pm						
Date Tested	19/04/2017	19/04/2017	19/04/2017						
Material Source	Imported	Imported	Imported						
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location	Lot 1506 Layer 4 West Side	Lot 1504 Layer 3 East Side	Lot 1505 Layer 3 North Side						
Layer Depth	mm	300	300	300					
Test Depth	mm	275	275	275					

Max Size	mm	19	19	19					
Oversize Wet	%	6	5	6					
Field Wet Density	t/m ³	2.00	1.99	2.00					
Field Moisture Content	%	-	-	-					
PCWD or APCWD*	t/m ³	2.04	2.02	2.01					

*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)					
Compactive Effort		Standard	Standard	Standard					
Hilf Density Ratio	%	98.0	98.0	99.5					
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)



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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 20
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	10366	10367	10368	10369					
ID No.	1	2	3	4					
Date Sampled	20/04/2017	20/04/2017	20/04/2017	20/04/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	20/04/2017	20/04/2017	20/04/2017	20/04/2017					
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 1503 Layer 3 South Side	Lot 1503 Layer 4 West Side	Lot 1502 Layer 4 North Side	Lot 1503 Layer 5 West Side					
Layer Depth	mm 300	300	300	300					
Test Depth	mm 275	275	275	275					

Max Size	mm	19	19	19	19				
Oversize Wet	%	0	6	5	5				
Field Wet Density	t/m ³	2.01	2.02	2.03	2.01				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	2.03	2.03	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	0.5% (dry)	0.5% (dry)	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	98.5	99.5	100.0	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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 21
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	10432	10433	10434	10435	10436					
ID No.	1	2	3	4	5					
Date Sampled	24/04/2017	24/04/2017	24/04/2017	24/04/2017	24/04/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm	am/pm					
Date Tested	24/04/2017	24/04/2017	24/04/2017	24/04/2017	24/04/2017					
Material Source	Imported	Imported	Imported	Imported	Imported					
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay	Gravelly Clay	Gravelly Clay					
To Be Used As	Fill	Fill	Fill	Fill	Fill					
Sample Location	Lot 1521 Layer 3 North Side	Lot 1522 Layer 3 East Side	Lot 1521 Layer 4 East Side	Lot 1522 Layer 4 West Side	Lot 1520 Layer 4 North Side					
Layer Depth <i>mm</i>	300	300	300	300	300					
Test Depth <i>mm</i>	275	275	275	275	275					

Max Size <i>mm</i>	19	19	19	19	19					
Oversize Wet %	5	3	5	6	5					
Field Wet Density <i>t/m³</i>	2.01	2.03	2.03	2.06	2.03					
Field Moisture Content %	-	-	-	-	-					
PCWD or APCWD* <i>t/m³</i>	2.01	2.04	2.05	2.05	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) <i>t/m³</i>	0.5% (dry)	omc	0.5% (dry)	0.5% (dry)	omc					
Compactive Effort	Standard	Standard	Standard	Standard	Standard					
Hilf Density Ratio %	100.0	99.5	99.5	100.5	99.5					
Min Hilf Density Ratio %	98	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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 22
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	10452	10453	10454	10455					
ID No.	1	2	3	4					
Date Sampled	25/04/2017	25/04/2017	25/04/2017	25/04/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	25/04/2017	25/04/2017	25/04/2017	25/04/2017					
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 1525 Layer 5 South Side	Lot 1525 Layer 5 West Side	Lot 1527 Layer 5 East Side	Lot 1526 Layer 5 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	%	6	5	6	6				
Field Wet Density	t/m ³	2.02	2.04	1.99	2.06				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.01	2.04	2.02	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	2.5% (dry)	0.5% (dry)	1.5% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	101.0	100.5	98.5	101.0				
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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 23
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	10489	10490	10491	10492						
ID No.	1	2	3	4						
Date Sampled	26/04/2017	26/04/2017	26/04/2017	26/04/2017						
Time Sampled	am/pm	am/pm	am/pm	am/pm						
Date Tested	27/04/2017	27/04/2017	27/04/2017	27/04/2017						
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 1522 Layer 5 North Side	Lot 1523 Layer 6 West Side	Lot 1523 Layer 6 South Side	Lot 1522 Layer 6 East Side						
Layer Depth	mm	300	300	300	300					
Test Depth	mm	275	275	275	275					

Max Size	mm	19	19	19	19					
Oversize Wet	%	6	6	6	0					
Field Wet Density	t/m ³	2.01	2.04	2.04	2.05					
Field Moisture Content	%	-	-	-	-					
PCWD or APCWD*	t/m ³	2.00	2.05	2.06	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	2.5% (dry)	0.5% (dry)	0.5% (wet)	omc					
Compactive Effort		Standard	Standard	Standard	Standard					
Hilf Density Ratio	%	100.5	99.5	99.0	100.5					
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 15
Location: Werribee VIC 3030

Report Number: 6181.15 - 24
Report Date: 13/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

Page: 1 of 1

Sample No.	10521	10522	10523						
ID No.	1	2	3						
Date Sampled	27/04/2017	27/04/2017	27/04/2017						
Time Sampled	am/pm	am/pm	am/pm						
Date Tested	28/04/2017	28/04/2017	28/04/2017						
Material Source	Imported	Imported	Imported						
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location	Lot 1528 Layer 6 East Side	Lot 1529 Layer 6 West Side	Lot 1530 Layer 6 North Side						
Layer Depth	mm	300	300	300					
Test Depth	mm	275	275	275					

Max Size	mm	19	19	19					
Oversize Wet	%	6	5	0					
Field Wet Density	t/m ³	2.01	2.03	2.02					
Field Moisture Content	%	-	-	-					
PCWD or APCWD*	t/m ³	2.04	2.05	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	0.5% (dry)	0.5% (dry)	0.5% (wet)					
Compactive Effort		Standard	Standard	Standard					
Hilf Density Ratio	%	98.0	99.5	98.0					
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

-End of Document-