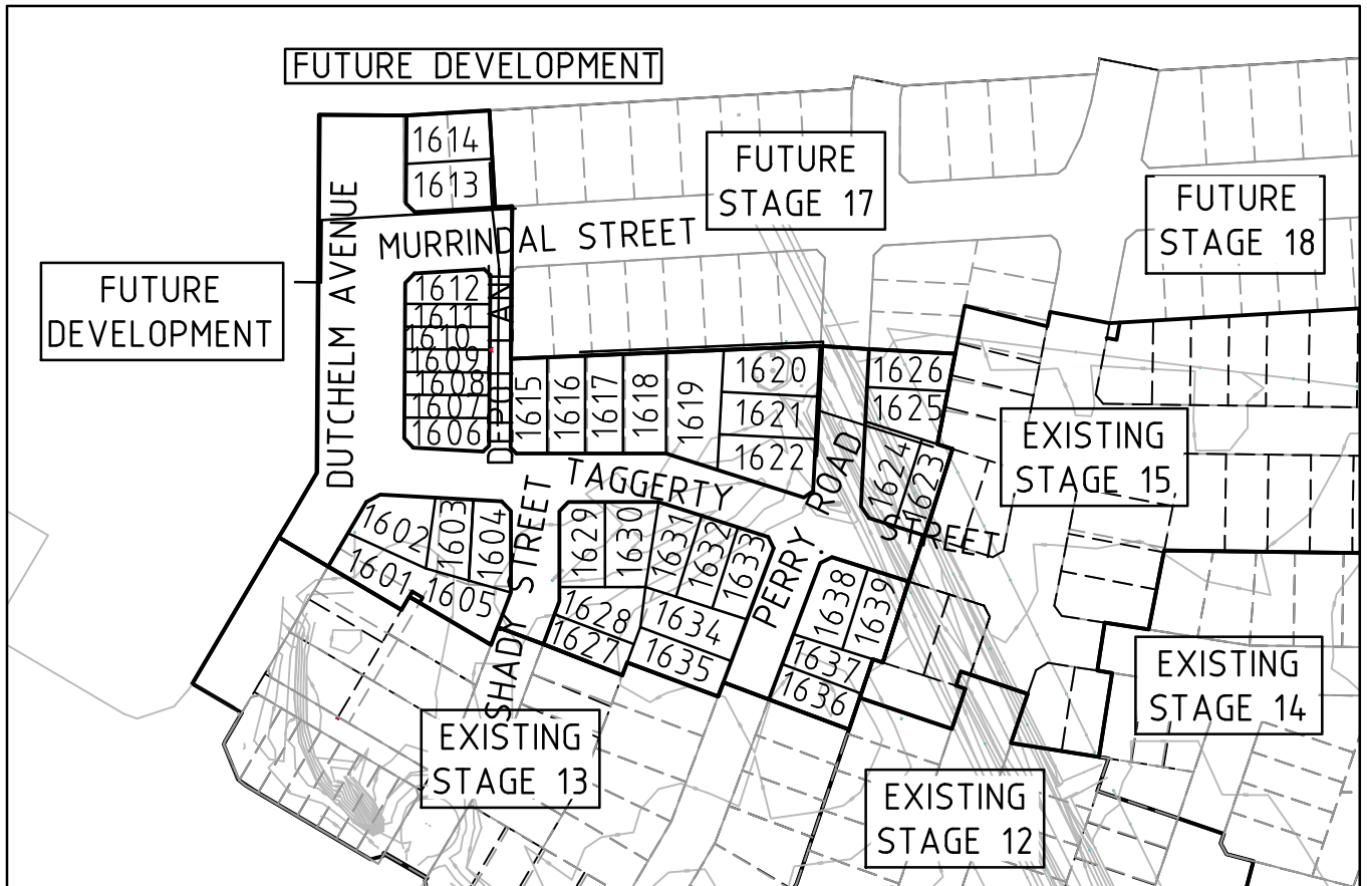




CONTINENT GEOTECH SERVICES

| Geotechnical | Environmental | Residential | Pavements |

Level 1 Supervision Report Riverwalk Stage 16 Werribee



Universal Corporation

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Document Details

Project Number	6181.16 – R0	Rev 0
Project Name	Riverwalk Stage 16 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 16 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 16 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 No. 19332E-16-05 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 16 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 58 (Fifty-Eight) 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

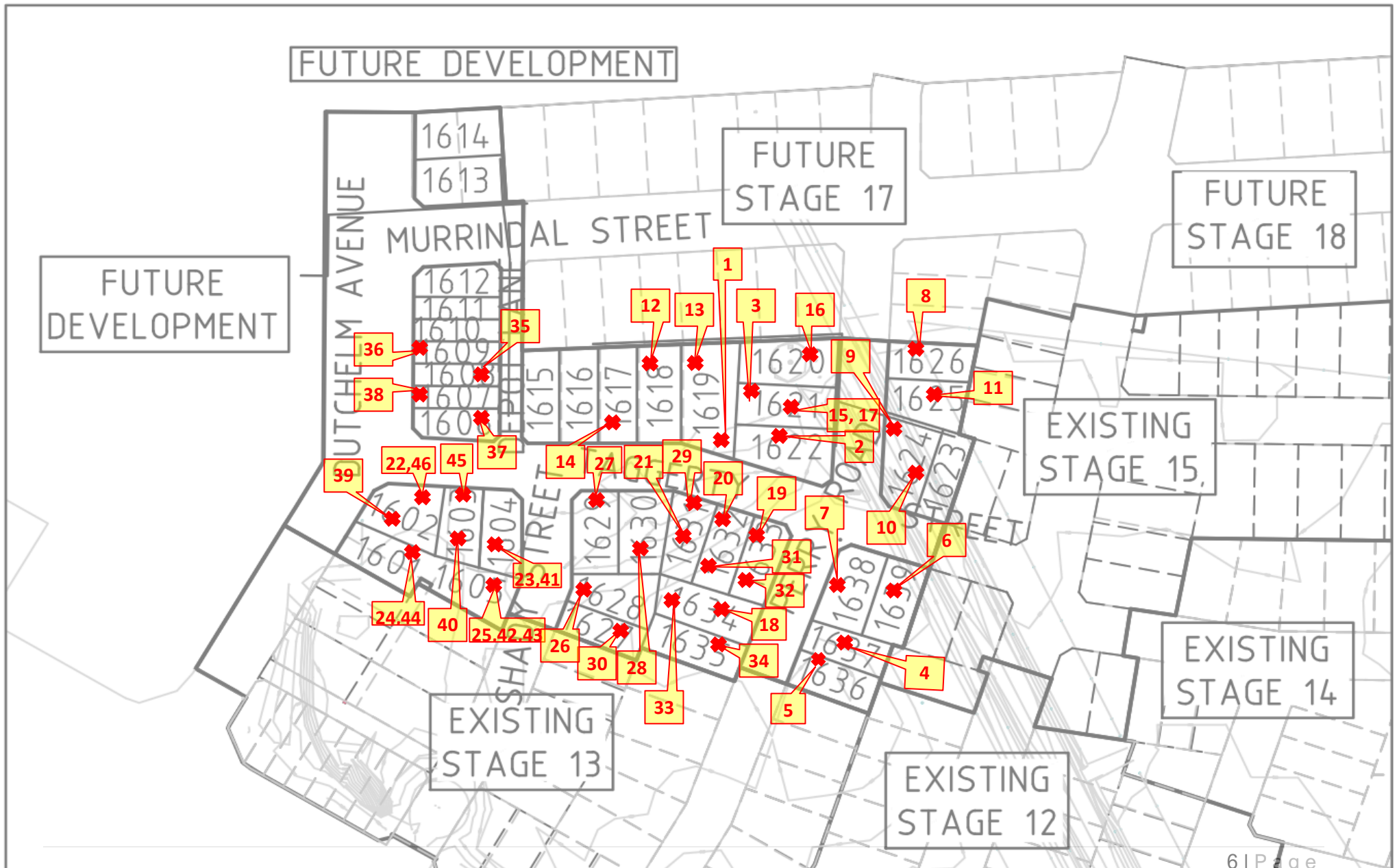
The purpose of performing level 1 inspection and testing is to ensure compliance of fill construction with the nominated specifications. The engagement of Geotechnical Inspection Testing Authority (GITA) allows the contractor to perform his role in the construction of the filling operation while the 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.

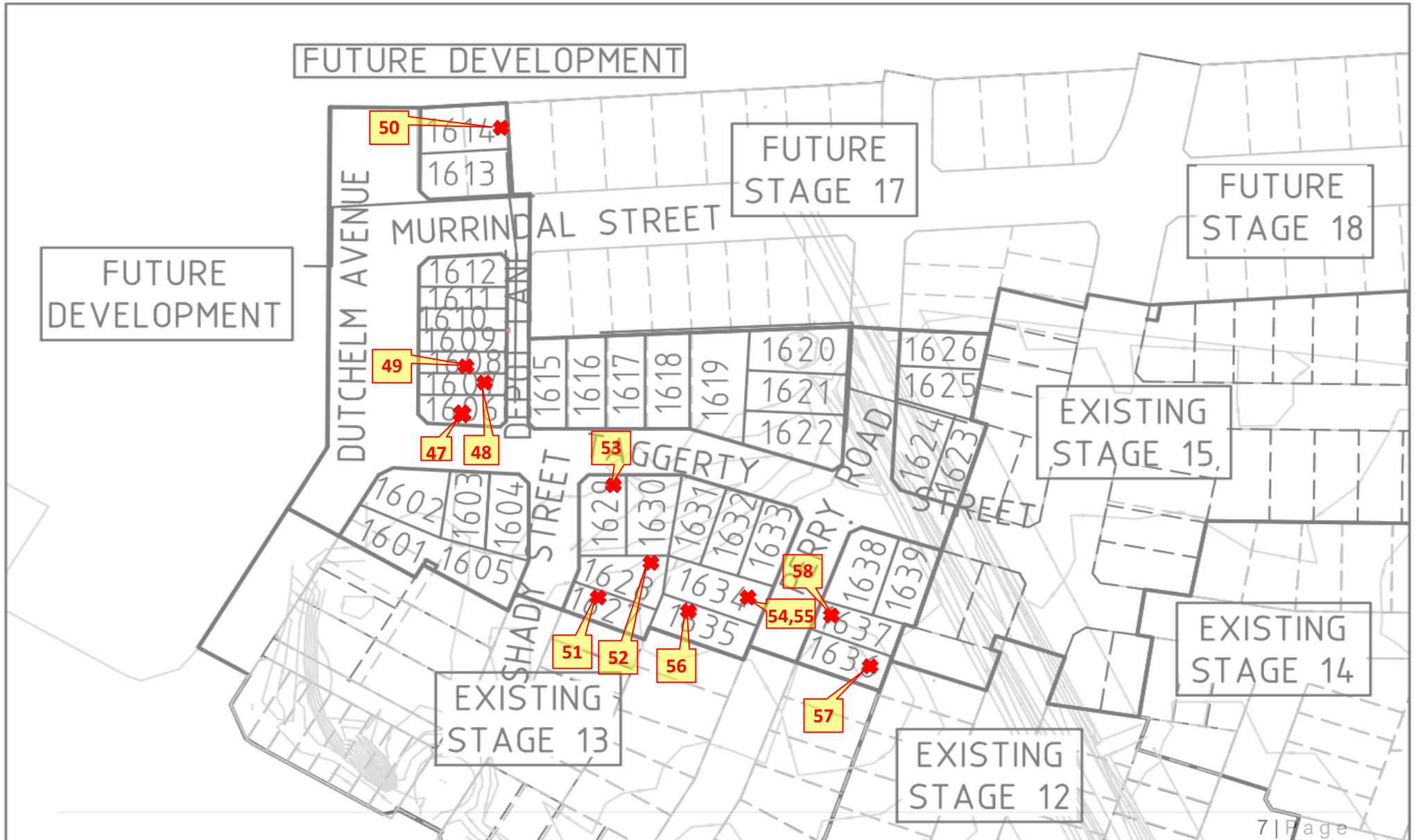
Prepared By
M Levi – Geotech Engineer

Authorised By
S Kang
Project Manager



APPENDIX 1 – SITE PLAN







APENDIX 2 – TESTING SUMMARY

Sample No. & Report No	Test No.	Location	Layer	Material Type	Date Tested	Density Ratio (%)	Moisture Variation of OMC (%)	Pass/Fail
9466	1	Lot 1619	Layer 1	Gravelly Silty Clay	20/02/2017	98.0	0.5% Dry	Pass
9467	2	Lot 1622	Layer 1	Gravelly Silty Clay	20/02/2017	99.5	0.5% Dry	Pass
9468	3	Lot 1621	Layer 1	Gravelly Silty Clay	20/02/2017	100.5	2% Dry	Pass
9492	4	Lot 1637	Layer 1	Gravelly Silty Clay	21/02/2017	98.0	0.5% Dry	Pass
9493	5	Lot 1636	Layer 1	Gravelly Silty Clay	21/02/2017	99.5	0.5% Dry	Pass
9494	6	Lot 1639	Layer 1	Gravelly Silty Clay	21/02/2017	100.5	2% Dry	Pass
9495	7	Lot 1638	Layer 1	Gravelly Silty Clay	21/02/2017	98.5	0.5% Wet	Pass
9496	8	Lot 1626	Layer 2	Gravelly Silty Clay	22/02/2017	98.5	0.5% Dry	Pass



9497	9	Lot 1624	Layer 2	Gravelly Silty Clay	22/02/2017	100.0	0.5% Dry	Pass
9498	10	Lot 1623	Layer 2	Gravelly Silty Clay	22/02/2017	101.0	2% Dry	Pass
9499	11	Lot 1625	Layer 2	Gravelly Silty Clay	22/02/2017	97.0	Omc	Pass
9513	12	Lot 1618	Layer 2	Gravelly Silty Clay	23/02/2017	98.5	0.5% Dry	Pass
9514	13	Lot 1619	Layer 2	Gravelly Silty Clay	23/02/2017	100.0	0.5% Dry	Pass
9515	14	Lot 1617	Layer 1	Gravelly Silty Clay	23/02/2017	100.0	2% Dry	Pass
9536	15	Lot 1621	Layer 2	Gravelly Silty Clay	24/02/2017	101.5	Omc	Pass
9537	16	Lot 1620	Layer 2	Gravelly Silty Clay	24/02/2017	100.5	0.5% Dry	Pass
9538	17	Lot 1621	Layer 3	Gravelly Silty Clay	24/02/2017	100.0	2% Dry	Pass
9576	18	Lot 1634	Layer 1	Gravelly Silty Clay	27/02/2017	98.5	0.5% Dry	Pass
9577	19	Lot 1633	Layer 1	Gravelly Silty Clay	27/02/2017	98.0	Omc	Pass



9578	20	Lot 1632	Layer 2	Gravelly Silty Clay	27/02/2017	100.0	2% Dry	Pass
9579	21	Lot 1631	Layer 2	Gravelly Silty Clay	27/02/2017	98.0	Omc	Pass
9582	22	Lot 1602	Layer 1	Gravelly Silty Clay	28/02/2017	98.0	0.5% Dry	Pass
9583	23	Lot 1604	Layer 1	Gravelly Silty Clay	28/02/2017	100.5	0.5% Dry	Pass
9584	24	Lot 1601	Layer 1	Gravelly Silty Clay	28/02/2017	101.0	2% Dry	Pass
9585	25	Lot 1605	Layer 1	Gravelly Silty Clay	28/02/2017	99.0	Omc	Pass
9597	26	Lot 1628	Layer 1	Gravelly Silty Clay	01/03/2017	98.5	0.5% Dry	Pass
9598	27	Lot 1629	Layer 1	Gravelly Silty Clay	01/03/2017	100.0	0.5% Dry	Pass
9599	28	Lot 1630	Layer 2	Gravelly Silty Clay	01/03/2017	101.0	2% Dry	Pass
9600	29	Lot 1631	Layer 2	Gravelly Silty Clay	01/03/2017	98.5	Omc	Pass
9601	30	Lot 1627	Layer 2	Gravelly Silty Clay	01/03/2017	100.0	0.5% Dry	Pass



9609	31	Lot 1632	Layer 3	Gravelly Silty Clay	02/03/2017	98.0	0.5% Dry	Pass
9610	32	Lot 1633	Layer 3	Gravelly Silty Clay	02/03/2017	100.0	Omc	Pass
9611	33	Lot 1634	Layer 2	Gravelly Silty Clay	02/03/2017	101.0	2% Dry	Pass
9612	34	Lot 1635	Layer 2	Gravelly Silty Clay	02/03/2017	98.0	Omc	Pass
9628	35	Lot 1608	Layer 1	Gravelly Silty Clay	03/03/2017	98.0	0.5% Dry	Pass
9629	36	Lot 1609	Layer 1	Gravelly Silty Clay	03/03/2017	98.5	0.5% Dry	Pass
9630	37	Lot 1606	Layer 2	Gravelly Silty Clay	03/03/2017	100.5	2% Dry	Pass
9631	38	Lot 1607	Layer 2	Gravelly Silty Clay	03/03/2017	98.0	Omc	Pass
9641	39	Lot 1602	Layer 2	Gravelly Silty Clay	06/03/2017	98.0	0.5% Dry	Pass
9642	40	Lot 1603	Layer 2	Gravelly Silty Clay	06/03/2017	98.0	0.5% Dry	Pass
9643	41	Lot 1604	Layer 3	Gravelly Silty Clay	06/03/2017	100.5	2% Dry	Pass



9644	42	Lot 1605	Layer 3	Gravelly Silty Clay	06/03/2017	98.0	0.5% Dry	Pass
9647	43	Lot 1605	Layer 4	Gravelly Silty Clay	07/03/2017	98.5	0.5% Dry	Pass
9648	44	Lot 1601	Layer 4	Gravelly Silty Clay	07/03/2017	98.0	0.5% Dry	Pass
9649	45	Lot 1603	Layer 5	Gravelly Silty Clay	07/03/2017	98.0	Omc	Pass
9650	46	Lot 1602	Layer 5	Gravelly Silty Clay	07/03/2017	98.0	0.5% Dry	Pass
9652	47	Lot 1606	Layer 3	Gravelly Silty Clay	08/03/2017	99.5	0.5% Dry	Pass
9653	48	Lot 1607	Layer 4	Gravelly Silty Clay	08/03/2017	99.0	0.5% Dry	Pass
9654	49	Lot 1608	Layer 4	Gravelly Silty Clay	08/03/2017	99.5	Omc	Pass
9655	50	Lot 1614	Layer 1	Gravelly Silty Clay	08/03/2017	99.5	0.5% Dry	Pass
9662	51	Lot 1627	Layer 3	Gravelly Silty Clay	09/03/2017	100.5	2% Dry	Pass
9663	52	Lot 1628	Layer 3	Gravelly Silty Clay	09/03/2017	98.5	0.5%Dry	Pass



9664	53	Lot 1629	Layer 3	Gravelly Silty Clay	09/03/2017	98.5	Omc	Pass
9665	54	Lot 1634	Layer 4	Gravelly Silty Clay	09/03/2017	98.0	0.5% Dry	Pass
9669	55	Lot 1634	Layer 3	Gravelly Silty Clay	10/03/2017	100.0	2% Dry	Pass
9670	56	Lot 1635	Layer 3	Gravelly Silty Clay	10/03/2017	99.0	0.5% Dry	Pass
9671	57	Lot 1636	Layer 3	Gravelly Silty Clay	10/03/2017	98.5	Omc	Pass
9672	58	Lot 1637	Layer 3	Gravelly Silty Clay	10/03/2017	98.5	0.5% Dry	Pass

APPENDIX 3 – NATA LAB RESULTS

HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 16
Location: Werribee VIC 3030

Report Number: 6181.16 - 1
Report Date: 22/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

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Sample No.	9466	9467	9468						
ID No.	1	2	3						
Date Sampled	20/02/2017	20/02/2017	20/02/2017						
Time Sampled	am/pm	am/pm	am/pm						
Date Tested	20/02/2017	20/02/2017	20/02/2017						
Material Source	Imported	Imported	Imported						
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location	Lot 1619 Layer 1 South Side	Lot 1622 Layer 1 North Side	Lot 1621 Layer 1 North Side						
Layer Depth	mm	300	300	300					
Test Depth	mm	275	275	275					

Max Size	mm	19	19	19					
Oversize Wet	%	4	3	0					
Field Wet Density	t/m ³	2.00	2.01	2.02					
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	99.5	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)



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 16
Location: Werribee VIC 3030

Report Number: 6181.16 - 2
Report Date: 22/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

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Sample No.	9492	9493	9494	9495					
ID No.	1	2	3	4					
Date Sampled	21/02/2017	21/02/2017	21/02/2017	21/02/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	21/02/2017	21/02/2017	21/02/2017	21/02/2017					
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 1637 Layer 1 North Side	Lot 1636 Layer 1 North Side	Lot 1639 Layer 1 East Side	Lot 1638 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	%	4	3	3	5				
Field Wet Density	t/m ³	2.00	2.01	2.02	2.02				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	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	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)



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S Kang
NATA Accreditation No. 19945

HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 16
Location: Werribee VIC 3030

Report Number: 6181.16 - 3
Report Date: 22/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

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Sample No.	9496	9497	9498	9499					
ID No.	1	2	3	4					
Date Sampled	22/02/2017	22/02/2017	22/02/2017	22/02/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	22/02/2017	22/02/2017	22/02/2017	22/02/2017					
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 1626 Layer 2 North Side	Lot 1624 Layer 2 North East Side	Lot 1623 Layer 2 West Side	Lot 1625 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	%	4	3	4	0				
Field Wet Density	t/m ³	2.01	2.03	2.01	2.00				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	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	0.5% (dry)	0.5% (dry)	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	98.5	100.0	101.0	97.0				
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 16
Location: Werribee VIC 3030

Report Number: 6181.16 - 4
Report Date: 22/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

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Sample No.	9513	9514	9515						
ID No.	1	2	3						
Date Sampled	23/02/2017	23/02/2017	23/02/2017						
Time Sampled	am/pm	am/pm	am/pm						
Date Tested	23/02/2017	23/02/2017	23/02/2017						
Material Source	Imported	Imported	Imported						
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location	Lot 1618 Layer 2 North Side	Lot 1619 Layer 2 North Side	Lot 1617 Layer 1 South Side						
Layer Depth	mm	300	300	300					
Test Depth	mm	275	275	275					

Max Size	mm	19	19	19					
Oversize Wet	%	5	3	5					
Field Wet Density	t/m ³	1.99	2.01	2.01					
Field Moisture Content	%	-	-	-					
PCWD or APCWD*	t/m ³	2.02	2.01	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)	0.5% (dry)	2% (dry)					
Compactive Effort		Standard	Standard	Standard					
Hilf Density Ratio	%	98.5	100.0	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.

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Approved Signatory

S Kang
NATA Accreditation No. 19945



HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 16
Location: Werribee VIC 3030

Report Number: 6181.16 - 5
Report Date: 22/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

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Sample No.	9536	9537	9538						
ID No.	1	2	3						
Date Sampled	24/02/2017	24/02/2017	24/02/2017						
Time Sampled	am/pm	am/pm	am/pm						
Date Tested	24/02/2017	24/02/2017	24/02/2017						
Material Source	Imported	Imported	Imported						
Material Description	Gravelly Clay	Gravelly Clay	Gravelly Clay						
To Be Used As	Fill	Fill	Fill						
Sample Location	Lot 1621 Layer 2 East Side	Lot 1620 Layer 2 East Side	Lot 1621 Layer 3 East Side						
Layer Depth	mm	300	300	300					
Test Depth	mm	275	275	275					

Max Size	mm	19	19	19					
Oversize Wet	%	4	3	5					
Field Wet Density	t/m ³	2.04	2.01	2.01					
Field Moisture Content	%	-	-	-					
PCWD or APCWD*	t/m ³	2.01	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	omc	0.5% (dry)	2% (dry)					
Compactive Effort		Standard	Standard	Standard					
Hilf Density Ratio	%	101.5	100.5	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 16
Location: Werribee VIC 3030

Report Number: 6181.16 - 6
Report Date: 22/11/2017
Request No: -

Testing performed and reported at our Main Laboratory

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Sample No.	9576	9577	9578	9579					
ID No.	1	2	3	4					
Date Sampled	27/02/2017	27/02/2017	27/02/2017	27/02/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	27/02/2017	27/02/2017	27/02/2017	27/02/2017					
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 1634 Layer 1 East Side	Lot 1633 Layer 1 North Side	Lot 1632 Layer 2 North Side	Lot 1631 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	%	5	0	3	5				
Field Wet Density	t/m ³	2.01	1.98	1.99	2.00				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	2.01	1.99	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)	omc	2% (dry)	omc				
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)



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HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 16
Location: Werribee VIC 3030

Report Number: 6181.16 - 7
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Sample No.	9582	9583	9584	9585					
ID No.	1	2	3	4					
Date Sampled	28/02/2017	28/02/2017	28/02/2017	28/02/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	28/02/2017	28/02/2017	28/02/2017	28/02/2017					
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 1602 Layer 1 North West Side	Lot 1604 Layer 1 South Side	Lot 1601 Layer 1 West Side	Lot 1605 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	4	4	4				
Field Wet Density	t/m ³	2.00	2.05	2.03	2.04				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	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	0.5% (dry)	0.5% (dry)	2% (dry)	omc				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	98.0	100.5	101.0	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)



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HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 16
Location: Werribee VIC 3030

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Sample No.	9597	9598	9599	9600	9601				
ID No.	1	2	3	4	5				
Date Sampled	1/03/2017	1/03/2017	1/03/2017	1/03/2017	1/03/2017				
Time Sampled	am/pm	am/pm	am/pm	am/pm	am/pm				
Date Tested	1/03/2017	1/03/2017	1/03/2017	1/03/2017	1/03/2017				
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 1628 Layer 1 East Side	Lot 1629 Layer 1 North Side	Lot 1630 Layer 2 South Side	Lot 1631 Layer 2 North Side	Lot 1627 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	19			
Oversize Wet	%	0	5	5	4	4			
Field Wet Density	t/m ³	2.02	2.04	2.02	2.03	2.04			
Field Moisture Content	%	-	-	-	-	-			
PCWD or APCWD*	t/m ³	2.05	2.04	2.00	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	0.5% (dry)	0.5% (dry)	2% (dry)	omc	0.5% (dry)			
Compactive Effort		Standard	Standard	Standard	Standard	Standard			
Hilf Density Ratio	%	98.5	100.0	101.0	98.5	100.0			
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)



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HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 16
Location: Werribee VIC 3030

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Sample No.	9609	9610	9611	9612					
ID No.	1	2	3	4					
Date Sampled	2/03/2017	2/03/2017	2/03/2017	2/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	2/03/2017	2/03/2017	2/03/2017	2/03/2017					
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 1632 Layer 3 South Side	Lot 1633 Layer 3 South Side	Lot 1634 Layer 2 South Side	Lot 1635 Layer 2 North 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	%	4	4	4	4				
Field Wet Density	t/m ³	2.00	2.04	2.03	2.03				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	2.04	2.01	2.07				

*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)



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HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 16
Location: Werribee VIC 3030

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Sample No.	9628	9629	9630	9631					
ID No.	1	2	3	4					
Date Sampled	3/03/2017	3/03/2017	3/03/2017	3/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	3/03/2017	3/03/2017	3/03/2017	3/03/2017					
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 1608 Layer 1 West Side	Lot 1609 Layer 1 East Side	Lot 1606 Layer 2 West Side	Lot 1607 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	%	4	0	4	4				
Field Wet Density	t/m ³	2.00	2.02	2.02	2.03				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	2.05	2.00	2.07				

*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	%	98.0	98.5	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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HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 16
Location: Werribee VIC 3030

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Sample No.	9641	9642	9643	9644					
ID No.	1	2	3	4					
Date Sampled	6/03/2017	6/03/2017	6/03/2017	6/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	6/03/2017	6/03/2017	6/03/2017	6/03/2017					
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 1602 Layer 2 South Side	Lot 1603 Layer 2 South Side	Lot 1604 Layer 3 South Side	Lot 1605 Layer 3 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	%	4	5	3	5				
Field Wet Density	t/m ³	2.00	2.02	2.02	2.02				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.04	2.06	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% (dry)				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	98.0	98.0	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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HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 16
Location: Werribee VIC 3030

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Sample No.	9647	9648	9649	9650					
ID No.	1	2	3	4					
Date Sampled	7/03/2017	7/03/2017	7/03/2017	7/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	7/03/2017	7/03/2017	7/03/2017	7/03/2017					
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 1605 Layer 4 East Side	Lot 1601 Layer 4 East Side	Lot 1603 Layer 5 North Side	Lot 1602 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	%	4	5	4	5				
Field Wet Density	t/m ³	2.00	2.00	2.00	2.01				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.03	2.04	2.04	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)	omc	0.5% (dry)				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	98.5	98.0	98.0	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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HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 16
Location: Werribee VIC 3030

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Sample No.	9652	9653	9654	9655					
ID No.	1	2	3	4					
Date Sampled	8/03/2017	8/03/2017	8/03/2017	8/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	8/03/2017	8/03/2017	8/03/2017	8/03/2017					
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 1606 Layer 3 South Side	Lot 1607 Layer 4 East Side	Lot 1608 Layer 4 South Side	Lot 1614 Layer 1 West Corner					
Layer Depth	mm	300	300	300	300				
Test Depth	mm	275	275	275	275				

Max Size	mm	19	19	19	19				
Oversize Wet	%	4	5	4	6				
Field Wet Density	t/m ³	2.02	2.03	2.03	2.03				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.03	2.04	2.04	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)	omc	0.5% (dry)				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	99.5	99.0	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)



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HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 16
Location: Werribee VIC 3030

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Sample No.	9662	9663	9664	9665					
ID No.	1	2	3	4					
Date Sampled	9/03/2017	9/03/2017	9/03/2017	9/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	9/03/2017	9/03/2017	9/03/2017	9/03/2017					
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 1627 Layer 3 North Side	Lot 1628 Layer 3 North West Side	Lot 1629 Layer 3 North Side	Lot 1634 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	%	4	5	0	4				
Field Wet Density	t/m ³	2.01	2.00	2.01	2.00				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.00	2.03	2.04	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)	omc	0.5% (dry)				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	100.5	98.5	98.5	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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HILF DENSITY RATIO REPORT

Customer: Universal Corporation
Project: Riverwalk Stage 16
Location: Werribee VIC 3030

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Sample No.	9669	9670	9671	9672					
ID No.	1	2	3	4					
Date Sampled	10/03/2017	10/03/2017	10/03/2017	10/03/2017					
Time Sampled	am/pm	am/pm	am/pm	am/pm					
Date Tested	13/03/2017	13/03/2017	13/03/2017	13/03/2017					
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 1634 Layer 3 East Side	Lot 1635 Layer 3 North Side	Lot 1636 Layer 3 West Side	Lot 1637 Layer 3 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	5	4	4				
Field Wet Density	t/m ³	2.00	2.01	2.02	2.02				
Field Moisture Content	%	-	-	-	-				
PCWD or APCWD*	t/m ³	2.00	2.03	2.04	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)	omc	0.5% (dry)				
Compactive Effort		Standard	Standard	Standard	Standard				
Hilf Density Ratio	%	100.0	99.0	98.5	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)



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