





# Level One Report

Brentwood Estate Stage 12 & 13

# Document Details

## Creation Details

Document ID	Date	Author	Signature	Reviewed By	Signature
AL.WR.2089	01/06/2022	G. Turley		M. Jackman	

## Amendment Register

Revision Number	Date	Amended By	Signature	Reviewed By	Signature

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## Introduction

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Quality Control Testing Services (QCTS) was engaged by BMD on the 2<sup>nd</sup> of June 2021 to the 3<sup>rd</sup> of September 2021, to provide “Level 1” earthworks inspection and testing services for earthworks for “Brentwood Estate Stage 12 & 13” residential project, located at Bellbird Park.

Supervision and compaction control testing were carried out during the placement of material to the lot, in accordance with Section 8.0 of AS3798-2007- “Guidelines for Earthworks for Commercial and Residential Developments”.





## Preliminary Stripping

Stripping of any vegetation and organic material was carried out by excavator and was utilised to remove any deleterious materials. Once the site was cleared, the surface was then compacted using padfoot roller until No deflection was noted. A proof roll was carried out on the treated surface to ascertain if any “soft spots” or unsuitable material was present.



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## Earthworks

The filling process involved transporting cut to fill material into the fill area. Fill material consisted of a brown/orange, medium plastic sandy clay, from on-site cut areas. The fill material was conditioned and placed in layers not exceeding 300mm loose. A bulldozer and/or compactor were used to spread and padfoot roller used to compact the fill material. A water cart was available to add moisture to condition the fill material where needed. In total, approximately 6500 cubic metres of fill was placed throughout the site.

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## Compliance

Test locations were randomly selected by QCTS, and compaction control tests were carried out throughout the filling process. A total of thirteen (13) field density tests were conducted in accordance with the minimum test frequency detailed in Table 8.1 of AS3798. The specification requirements for compaction on the project were that all fill materials were to be placed, conditioned, and compacted in layers to a density ratio of not less than 95% (AS 1289 5.8.1, 5.7.1 & 2.1.1) with the moisture content suitable to achieve the desired compaction levels, as per Table 5.1 of AS3798. The results of tests performed for the project are found in Appendix B.

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## Conclusion

Based on the results obtained from compaction control tests along with observations made during earthworks operation indicate that all fill material placed would be considered to have met the requirements of AS3798-2007 and good engineering practice.

This report does not include any other geotechnical issues, road works, backfill behind any retaining structures or trench services, any topsoil placed, slope stability and site drainage.

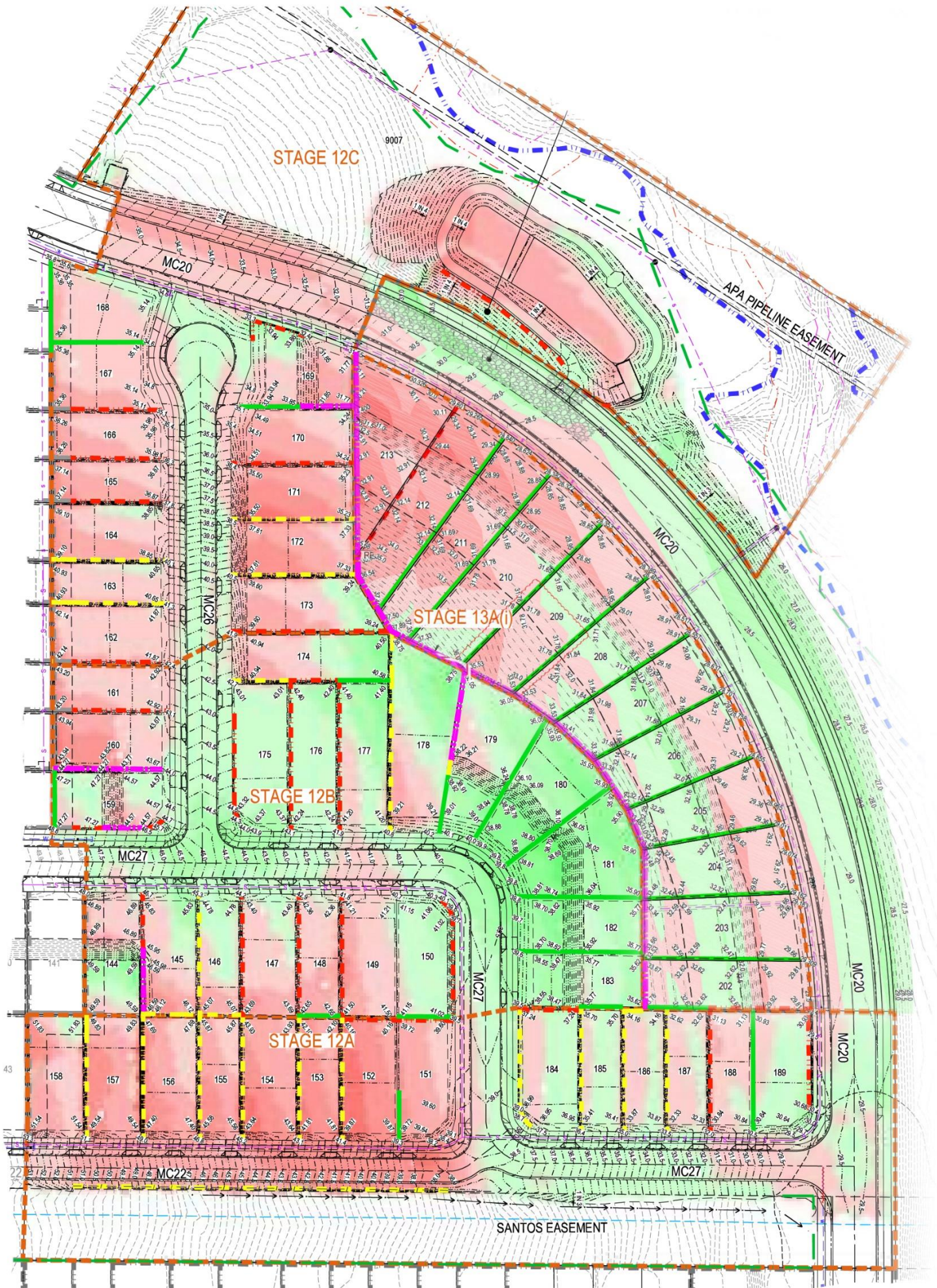




# APPENDIX A

Earthworks Plan









# APPENDIX B

Test Results

# Material Test Report

**Report Number:** B21071-7  
**Issue Number:** 1  
**Date Issued:** 08/06/2021  
**Client:** BMD Urban  
 1 Sandpiper Ave, Port of Brisbane QLD 4178  
**Contact:** Kody O'Hea  
**Project Number:** B21071  
**Project Name:** 4836 Brentwood Estate Stages 8 & 9  
**Project Location:** Brentwood Level One Earthworks  
**Work Request:** 1281  
**Date Sampled:** 02/06/2021  
**Dates Tested:** 02/06/2021 - 03/06/2021  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Preparation Method:** AS 1289.1.1 - Sampling and preparation of soils  
**Specification:** Minimum 98% Standard Compaction  
**Site Selection:** Selected By QCTS Technician  
**Material:** General Fill



Quality Control Testing Services Pty Ltd  
 Brisbane Laboratory  
 23/8 Riverland Drive Loganholme QLD 4129  
 Phone: (07) 4633 0816  
 Email: geoff@qcts.net.au



Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Geoff Turley  
 Area Manager

NATA Accredited Laboratory Number: 20024

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	B21-1281A	B21-1281B	
Date Tested	02/06/2021	02/06/2021	
Time Tested	13:00	13:44	
Test Request #/Location	Stage 12C	Stage 12B	
Easting	489249.645	489289.408	
Northing	6943063.732	6943017.939	
Elevation (m)	31.845	32.375	
Thickness of Layer (mm)	300	300	
Soil Description	Clay sand, pale yellow	Clay sand, pale yellow	
Test Depth (mm)	275	275	
Sieve used to determine oversize (mm)	19.0	19.0	
Percentage of Wet Oversize (%)	0	0	
Field Wet Density (FWD) t/m <sup>3</sup>	2.14	2.04	
Field Moisture Content %	9.4	10.1	
Field Dry Density (FDD) t/m <sup>3</sup>	1.96	1.85	
Peak Converted Wet Density t/m <sup>3</sup>	2.17	2.06	
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	**	**	
Moisture Variation (Wv) %	-0.5	-1.0	
Adjusted Moisture Variation %	**	**	
Hilf Density Ratio (%)	<b>99.0</b>	<b>99.0</b>	
Compaction Method	<b>Standard</b>	<b>Standard</b>	
Report Remarks	**	**	

**Moisture Variation Note:**

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



# Material Test Report

**Report Number:** B21071-11  
**Issue Number:** 1  
**Date Issued:** 14/06/2021  
**Client:** BMD Urban  
 1 Sandpiper Ave, Port of Brisbane QLD 4178  
**Contact:** Kody O'Hea  
**Project Number:** B21071  
**Project Name:** 4836 Brentwood Estate Stages 8 & 9  
**Project Location:** Brentwood Level One Earthworks  
**Work Request:** 1300  
**Date Sampled:** 04/06/2021  
**Dates Tested:** 04/06/2021 - 07/06/2021  
**Specification:** Minimum 95% Standard Compaction  
**Site Selection:** Selected By QCTS Technician  
**Material:** General Fill  
**Material Source:** On Site



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 Brisbane Laboratory  
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 Area Manager

NATA Accredited Laboratory Number: 20024

## Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

	B21-1300A	B21-1300B	
Sample Number	B21-1300A	B21-1300B	
Date Tested	04/06/2021	04/06/2021	
Time Tested	12:50	12:57	
Test Request #/Location	**	**	
Easting	489241.698	489252.067	
Northing	6942990.321	6942996.653	
Elevation (m)	39.078	38.032	
Thickness of Layer (mm)	300	300	
Soil Description	Clay sand, pale yellow	Clay sand, pale yellow	
Test Depth (mm)	275	275	
Sieve used to determine oversize (mm)	19.0	19.0	
Percentage of Wet Oversize (%)	0	0	
Field Wet Density (FWD) t/m <sup>3</sup>	2.06	2.12	
Field Moisture Content %	9.4	10.6	
Field Dry Density (FDD) t/m <sup>3</sup>	1.88	1.92	
Peak Converted Wet Density t/m <sup>3</sup>	2.05	2.12	
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	**	**	
Moisture Variation (Wv) %	2.0	0.0	
Adjusted Moisture Variation %	**	**	
Hilf Density Ratio (%)	<b>100.5</b>	<b>100.0</b>	
Compaction Method	<b>Standard</b>	<b>Standard</b>	
Report Remarks	**	**	

### Moisture Variation Note:

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 Negative values = test is wet of OMC

# Material Test Report


**Report Number:** B21071-12  
**Issue Number:** 1  
**Date Issued:** 14/06/2021  
**Client:** BMD Urban  
 1 Sandpiper Ave, Port of Brisbane QLD 4178  
**Contact:** Kody O'Hea  
**Project Number:** B21071  
**Project Name:** 4836 Brentwood Estate Stages 8 & 9  
**Project Location:** Brentwood Level One Earthworks  
**Work Request:** 1322  
**Date Sampled:** 08/06/2021  
**Dates Tested:** 08/06/2021 - 08/06/2021  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Preparation Method:** AS 1289.1.1 - Sampling and preparation of soils  
**Specification:** Minimum 95% Standard Compaction  
**Material:** General Fill  
**Material Source:** On Site



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 23/8 Riverland Drive Loganholme QLD 4129  
 Phone: (07) 4633 0816  
 Email: geoff@qcts.net.au



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 Approved Signatory: Geoff Turley  
 Area Manager

NATA Accredited Laboratory Number: 20024

## Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

	B21-1322A	B21-1322B	B21-1322C
Sample Number	B21-1322A	B21-1322B	B21-1322C
Date Tested	08/06/2021	08/06/2021	08/06/2021
Time Tested	11:41	11:46	12:00
Test Request #/Location	**	**	**
Easting	489241.714	489252.086	489252.810
Northing	6942990.340	6942996.658	6943025.832
Elevation (m)	39.376	38.324	37.813
Thickness of Layer (mm)	300	300	300
Soil Description	Clay sand, pale yellow	Clay sand, pale yellow	Clay sand, pale yellow
Test Depth (mm)	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Field Wet Density (FWD) t/m <sup>3</sup>	2.14	2.04	2.13
Field Moisture Content %	10.1	11.0	9.0
Field Dry Density (FDD) t/m <sup>3</sup>	1.94	1.84	1.95
Peak Converted Wet Density t/m <sup>3</sup>	2.12	2.12	2.14
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	**	**	**
Moisture Variation (Wv) %	2.0	0.0	-0.5
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	<b>101.0</b>	<b>96.5</b>	<b>99.5</b>
Compaction Method	<b>Standard</b>	<b>Standard</b>	<b>Standard</b>
Report Remarks	**	**	**

### Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC



# Material Test Report


**Report Number:** B21071-37  
**Issue Number:** 1  
**Date Issued:** 18/08/2021  
**Client:** BMD Urban  
 1 Sandpiper Ave, Port of Brisbane QLD 4178  
**Contact:** Kody O'Hea  
**Project Number:** B21071  
**Project Name:** 4836 Brentwood Estate Stages 8 & 9  
**Project Location:** Brentwood Estate Stage 12B Level 1  
**Work Request:** 1665  
**Date Sampled:** 12/08/2021  
**Dates Tested:** 12/08/2021 - 16/08/2021  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Preparation Method:** AS 1289.1.1 - Sampling and preparation of soils  
**Specification:** Minimum 95% Standard Compaction  
**Site Selection:** Selected By QCTS Technician  
**Material:** Embankment Fill  
**Material Source:** On Site



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 Brisbane Laboratory  
 23/8 Riverland Drive Loganholme QLD 4129  
 Phone: (07) 4633 0816  
 Email: geoff@qcts.net.au



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 Approved Signatory: Geoff Turley  
 Area Manager

NATA Accredited Laboratory Number: 20024

## Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

	B21-1665A	B21-1665B	B21-1665C
Sample Number	B21-1665A	B21-1665B	B21-1665C
Date Tested	12/08/2021	12/08/2021	12/08/2021
Time Tested	15:20	15:33	15:27
Test Request #/Location	Lot 150	Lot 177	Road MC27
Easting	489221.50	489175.76	489210.60
Northing	6942987.6	6943010.5	6943006.3
Elevation (m)	40.94	41.61	39.88
Thickness of Layer (mm)	300	300	300
Soil Description	Sandy Clay, Orange/Brown	Sandy Clay, Orange/Brown	Sandy Clay, Orange/Brown
Test Depth (mm)	275	275	200
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	2	0	0
Field Wet Density (FWD) t/m <sup>3</sup>	2.10	2.08	2.03
Field Moisture Content %	16.2	19.4	15.6
Field Dry Density (FDD) t/m <sup>3</sup>	1.81	1.74	1.76
Peak Converted Wet Density t/m <sup>3</sup>	**	2.08	2.06
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	2.10	**	**
Moisture Variation (Wv) %	**	0.5	0.5
Adjusted Moisture Variation %	0.0	**	**
Hilf Density Ratio (%)	<b>100.0</b>	<b>99.5</b>	<b>98.5</b>
Compaction Method	<b>Standard</b>	<b>Standard</b>	<b>Standard</b>
Report Remarks	**	**	**

### Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

# Material Test Report

**Report Number:** B21071-45  
**Issue Number:** 1  
**Date Issued:** 16/09/2021  
**Client:** BMD Urban  
 1 Sandpiper Ave, Port of Brisbane QLD 4178  
**Contact:** Kody O'Hea  
**Project Number:** B21071  
**Project Name:** 4836 Brentwood Estate Stages 8 & 9  
**Project Location:** Brentwood Estate Stage 12 Level 1  
**Work Request:** 1743  
**Dates Tested:** 03/09/2021 - 16/09/2021  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Preparation Method:** AS 1289.1.1 - Sampling and preparation of soils  
**Specification:** Minimum 95% Standard Compaction  
**Site Selection:** Selected By QCTS Technician  
**Material:** Embankment Fill  
**Material Source:** On Site



Quality Control Testing Services Pty Ltd  
 Brisbane Laboratory  
 23/8 Riverland Drive Loganholme QLD 4129  
 Phone: (07) 4633 0816  
 Email: David@QCTS.net.au



Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: David Henke

Senior Technician

NATA Accredited Laboratory Number: 20024

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	B21-1743A	B21-1743B	B21-1743C
Date Tested	03/09/2021	03/09/2021	03/09/2021
Time Tested	**	**	**
Test Request #/Location	Lot 178	Lot 176	Lot 175
Layer / Reduced Level	**	**	**
Soil Description	Gravelly Sandy Clay, Brown	Gravelly Sandy Clay, Brown	Gravelly Sandy Clay, Brown
Test Depth (mm)	275	275	275
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Field Wet Density (FWD) t/m <sup>3</sup>	2.02	2.02	2.04
Field Moisture Content %	10.0	11.9	8.8
Field Dry Density (FDD) t/m <sup>3</sup>	1.84	1.81	1.87
Peak Converted Wet Density t/m <sup>3</sup>	2.03	2.04	2.05
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	**	**	**
Moisture Variation (Wv) %	3.5	2.5	4.5
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	<b>99.5</b>	<b>99.0</b>	<b>99.5</b>
Compaction Method	<b>Standard</b>	<b>Standard</b>	<b>Standard</b>
Report Remarks	**	**	**

## Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC





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