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J K WILLIAMS CONTRACTING PTY LTD

PROPOSED CADDENS KNOLL RESIDENTIAL SUBDIVISION
CADDENS ROAD, KINGSWOOD

SITE CLASSIFICATION

REPORT NO 8223/3-AA 28 JANUARY 2015

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Job No: 8223/3
Our Ref: 8223/3-AA
28 January 2015

J K Williams Contracting Pty Ltd
P O Box 308
PENRITH NSW 2751

Attention: Mr S Hartog

Dear Sir

re: **Proposed Caddens Knoll Residential Subdivision**
Caddens Road, Kingswood
Site Classifications - Lots 1 to 45

Please find herewith our site classification report for the proposed dwellings to be located at the above subdivision. A total of 45 lots (Lots 1 to 45) are covered in this report.

This report contains information on surface and sub-surface conditions encountered at the site, together with an assessment of the site classifications in accordance with Australian Standard AS2870-2011 "Residential Slabs & Footings".

If you have any questions, please do not hesitate to contact the undersigned.

Yours faithfully
GEOTECH TESTING PTY LTD

ZIAUDDIN AHMED
Senior Geotechnical Engineer

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APPENDICES

1.0 INTRODUCTION

This report describes geotechnical investigations for the proposed dwellings to be constructed at Caddens Knoll Residential Subdivision, Caddens Road, Kingswood. Lots 1 to 45 are covered in this report.

Site classification in accordance with AS2870-2011 is only applicable for the design of footing systems for a single dwelling, house, townhouse or similar structure that would be detached or separated by a party wall or common wall. AS2870 is not suitable for dwellings situated vertically above or below another dwelling, including buildings classified as Class 1 and Class 10a in the Building Code of Australia (BCA). Therefore, a geotechnical investigation would be required for other dwellings to be classified in accordance with the BCA.

It is understood that the proposed dwellings are to be of brick veneer construction and wall loadings are expected to be in the range of 15kN/m to 50kN/m. The maximum working load (safe bearing pressure) would be in the order of 50kPa for ground supported floor slabs and 100kPa for strip and pad footings (AS2870-2011).

2.0 FIELD WORK

Field work for the investigation was carried out on 15 December 2014, under the full time supervision of a Geotechnical Engineer from this company and consisted of excavation of twenty-two test pits (TP1 to TP22), using an excavator.

The test pit locations, which are indicated on Drawing No 8223/1-AA1 in Appendix A of this report, were pegged by the project surveyor.

A summary of the field data obtained is presented in Appendix A.

3.0 LABORATORY TESTING

During the course of the investigation, shrink/swell index (AS1289 7.1.1) were conducted on seven (7) undisturbed (U_{50}) samples of the naturally occurring clay and fill material, aimed at determining the reactivity of the material to variations in moisture changes. The detailed test results are included in Appendix C and summarised below:

TP	Depth (m)	Material Description	I_{ss} (%/$_p$F)
1	0.5 – 0.65	Fill : Sandy Silty Clay, low plasticity, trace of fine to medium gravel	1.2
6	0.3 – 0.45	(CH) Silty Clay, high plasticity	2.8
8	0.3 – 0.5	(CL) Silty Clay, low plasticity	0.4
10	0.4 – 0.6	(CH) Silty Clay, high plasticity	3.4
12	0.3 – 0.45	(CL) Silty Clay, low plasticity	1.5
16	0.25 – 0.4	(CI-CH) Silty Clay, medium to high plasticity	2.6
20	0.3 – 0.45	(CH) Silty Clay, high plasticity	3.6

I_{ss} : Shrink/swell Index;

4.0 SUB-SURFACE CONDITIONS

The test pit investigation revealed the following generalised sub-surface profile.

Topsoil	Clayey Silt, brown, trace of roots
Fill	Sandy Silty Clay, medium plasticity, orange, brown, with shale gravels
Natural (Residual)	Silty Clay, low to medium plasticity, grey, orange, brown, with shale gravel
Bedrock	Shale, grey, brown, extremely weathered grading to slightly weathered, low strength grading to high strength Siltstone/Sandstone, fine grained, brown, extremely weathered and extremely low strength

Groundwater was not observed in the test pits during the short time that they remained open. It must be noted that fluctuations in the level of groundwater might occur due to variations in rainfall, temperature and/or other factors.

5.0 DISCUSSION & RECOMMENDATIONS

5.1 Assessment of Fill

The fill placed at the site is classified as "Controlled" fill and the testing associated with fill placement was carried out to Level 1 requirements and reported in Geotech Testing Report No 8235/1-AA dated 10 October 2014.

5.2 Site Classifications

Based on the above information the classifications to AS2870-2011 are summarised in Appendix B. It should be noted that lots containing more than 400mm of clay fill (assessed as controlled fill) would originally be classified as Class P in accordance with AS2870-2011. However, based on the results of this investigation, which included laboratory testing, the lots would are re-classified as detailed in Appendix B.

It is recommended that footings for the proposed dwellings are founded on the same stratum, below any topsoil or deleterious material, to minimise the potential for differential movement. In the event that rock is encountered in any portion of the footing excavations the remainder of the foundations must be supported on rock to ensure even bearing.

These recommendations are applicable to the Lots at the date of conducting the investigation, being 15 December 2014 and are made on the following assumptions;

1. The design and construction requirements of AS2870-2011 must be followed.
2. The recommendations for foundation performance and site maintenance set out in Appendix B of AS2870-2011 are followed.
3. The proposed dwellings must be in accordance with AS2870. A detailed geotechnical investigation will be required for other dwellings that would be classified in accordance with the BCA.

It is recommended that house owners are made aware of recommendations in the CSIRO publication, "Guide to Home Owners on Foundation Maintenance and Footing Performance" and AS2870-2011 Appendix H.

GEOTECH TESTING PTY LTD

APPENDIX A

TABLE A
(Test Pit Summary)

TEST PIT LOCATION PLAN
(Drawing No 8223/3-AA1)

TABLE A

Job No: 8223/3
Our Ref: 8223/3

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
1	0.0-1.3	0.5-0.65	FILL: Sandy Silty Clay, medium plasticity, orange-brown, with shale gravel, (M<PL, well compacted)
	1.3-1.5	NS	SHALE, brown, grey, low strength, extremely weathered
2	0.0-0.3	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock. Terminated at 0.3m on shale bedrock.
3	0.0-0.5	NS	FILL: Ripped Shale, grey-brown (M, well compacted). Terminated at 0.5m on shale bedrock.
4	0.0-0.3	NS	FILL: Ripped Shale, grey-brown (M, well compacted). Terminated at 0.3m on shale bedrock.
5	0.0-0.25	NS	SANDSTONE, fine grained, brown, medium to high strength, distinctly weathered to fresh rock. Terminated at 0.25m in shale bedrock.
6	0.0-0.15	NS	(CL) Silty CLAY, low plasticity, brown (M<PL, F-St)
	0.15-0.7	0.3-0.45 (U_{50})	(CI) Silty CLAY, medium plasticity, orange (M<PL, St)
	0.7-1.0	NS	SILTSTONE/SANDSTONE, fine grained, brown, extremely low strength, extremely weathered
	1.0-1.3	NS	SANDSTONE, fine grained, brown, medium to high strength, distinctly weathered to fresh rock. Terminated at 1.3m on sandstone bedrock.
7	0.0-0.2	NS	(CL) Silty CLAY, low plasticity, brown (M<PL, St)
	0.2-0.6	NS	SILTSTONE/SANDSTONE, fine grained, brown, extremely low strength, extremely weathered
	0.6-0.9	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock. Terminated at 0.9m on shale bedrock.

TABLE A

Job No: 8223/3
Our Ref: 8223/3

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
8	0.0-0.2	NS	(CL) Silty CLAY, low plasticity, brown (M<PL, St)
	0.2-0.6	0.3-0.5 (U_{50})	(CI) Silty CLAY, medium plasticity, orange (M<PL, St-VSt)
	0.6-1.1	NS	SILTSTONE/SANDSTONE, fine grained, brown, extremely low strength, extremely weathered
	1.1-1.4	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock. Terminated at 1.4m in shale bedrock.
9	0.0-0.5	NS	(CI-CH) Silty CLAY, medium to high plasticity,, orange-brown (M<PL, VSt)
	0.5-1.2	NS	SILTSTONE/SANDSTONE, fine grained, brown, extremely low strength, extremely weathered
	1.2-1.4	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock. Terminated at 1.4m in shale bedrock.
10	0.0-0.2	NS	FILL: Sandy Silty Clay, medium plasticity, orange-brown, with shale gravel (M<PL, well compacted)
	0.2-0.9	0.4-0.6 (U_{50})	(CI-CH) Silty CLAY, medium to high plasticity,, orange-brown (M<PL, VSt)
	0.9-1.5	NS	SILTSTONE/SANDSTONE, fine grained, brown, extremely low strength, extremely weathered
11	0.0-0.3	NS	TOPSOIL: Clayey Silty, brown, trace of roots
	0.3-0.9	NS	(CI-CH) Silty CLAY, medium to high plasticity,, orange-brown (M<PL, St-VSt)
	0.9-1.2	NS	SILTSTONE/SANDSTONE, fine grained, brown, extremely low strength, extremely weathered
	1.2-1.5	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock

TABLE A

Job No: 8223/3
Our Ref: 8223/3

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
12	0.0-0.2	NS	TOPSOIL: Clayey Silty, brown, trace of roots
	0.2-0.7	0.3-0.45 (U_{50})	(CI) Silty CLAY, medium plasticity, orange (M<PL, St-VSt)
	0.7-1.2	NS	SILTSTONE/SANDSTONE, fine grained, brown, extremely low strength, extremely weathered
	1.2-1.4	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock. Terminated at 1.4m in shale bedrock.
13	0.0-0.2	NS	TOPSOIL: Clayey Silty, brown, trace of roots
	0.2-0.7	NS	(CI) Silty CLAY, medium plasticity, orange (M<PL, St-VSt)
	0.7-1.0	NS	(CL) Silty CLAY, low plasticity, grey, with shale gravel (M<PL, St-VSt)
	1.0-1.1	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock. Terminated at 1.1m in shale bedrock.
14	0.0-0.3	NS	FILL: Sandy Silty Clay, medium plasticity, orange-brown, with shale gravel (M<PL, well compacted)
	0.3-0.9	NS	SILTSTONE/SANDSTONE, fine grained, brown, extremely low strength, extremely weathered
	0.9-1.1	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock
15	0.0-0.35	NS	TOPSOIL: Clayey Silty, brown, trace of roots
	0.35-1.0	NS	FILL: Sandy Silty Clay, medium plasticity, orange-brown, with shale gravel and boulders (M<PL, well compacted)
	1.0-1.5	NS	(CI) Silty CLAY, medium plasticity, orange, yellow (M<PL, St-VSt)

TABLE A

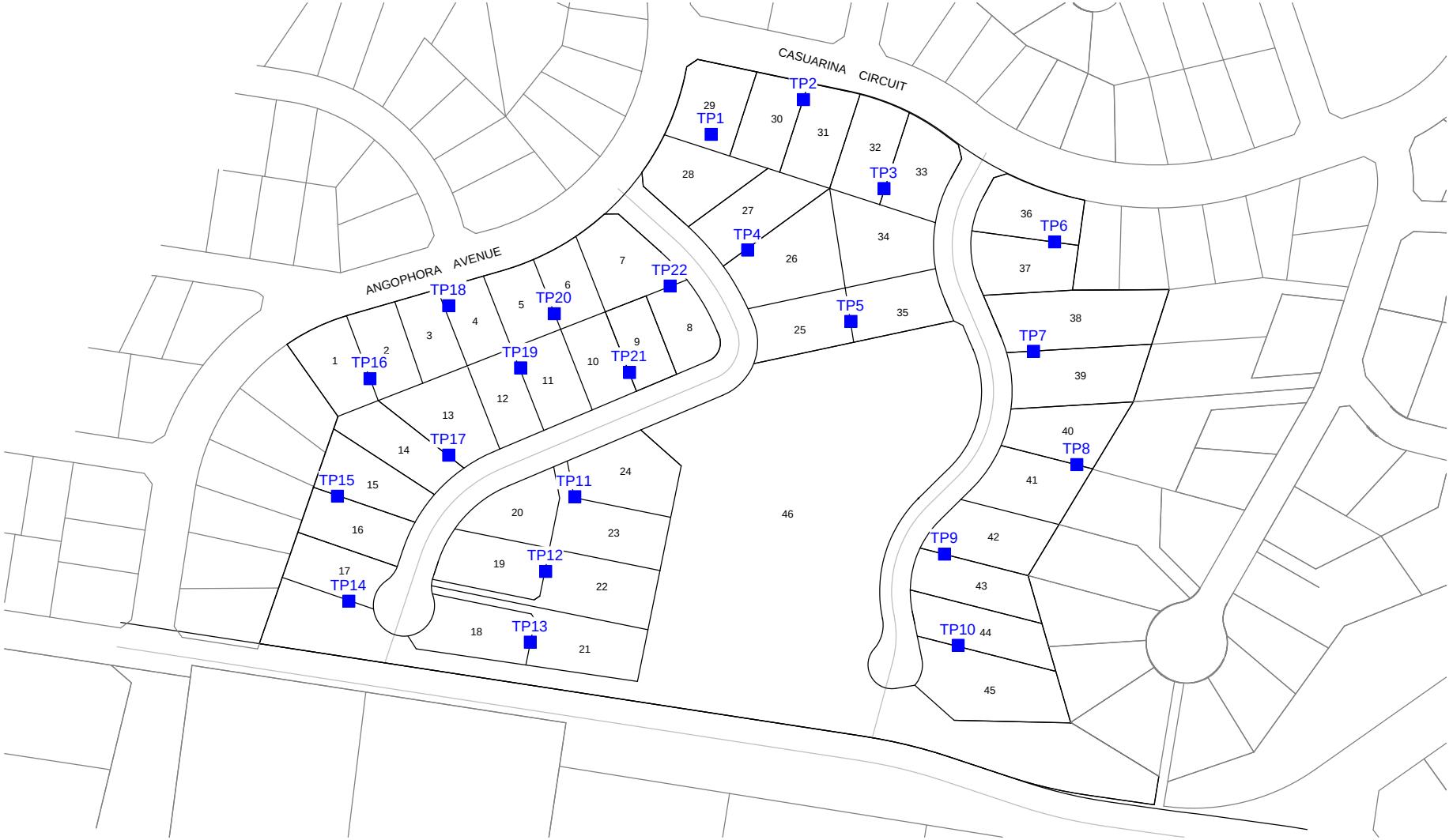
Job No: 8223/3
Our Ref: 8223/3

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
16	0.0-0.2	NS	TOPSOIL: Clayey Silty, brown, trace of roots
	0.2-0.5	0.25-0.4 (U_{50})	(CI) Silty CLAY, medium plasticity, orange (M<PL, St-VSt)
	0.5-1.1	NS	SILTSTONE/SANDSTONE, fine grained, brown, extremely low strength, extremely weathered
	1.1-1.3	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock. Terminated at 1.3m in shale bedrock.
17	0.0-0.25	NS	TOPSOIL: Clayey Silty, brown, trace of roots
	0.25-0.8	NS	(CI) Silty CLAY, medium plasticity, orange (M<PL, St-VSt)
	0.8-1.2	NS	SILTSTONE/SANDSTONE, fine grained, brown, extremely low strength, extremely weathered
18	0.0-0.4	NS	(CI) Silty CLAY, medium plasticity, orange (M<PL, St-VSt)
	0.4-0.9	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock. Terminated at 0.9m in shale bedrock.
19	0.0-0.1	NS	TOPSOIL: Clayey Silty, brown, trace of roots
	0.1-0.4	NS	(CI) Silty CLAY, medium plasticity, orange (M<PL, VSt)
	0.4-0.5	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock. Terminated at 0.5m in shale bedrock.
20	0.0-0.2	NS	TOPSOIL: Clayey Silty, brown, trace of roots
	0.2-0.8	0.3-0.45 (U_{50})	(CI-CH) Silty CLAY, medium to high plasticity, orange-brown (M<PL, VSt)
	0.8-1.0	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock. Terminated at 1.0m in shale bedrock
21	0.0-0.6	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock. Terminated at 0.6m in shale bedrock.

TABLE A

Job No: 8223/3
Our Ref: 8223/3

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
22	0.0-0.1	NS	SHALE, grey, medium to high strength, distinctly weathered to fresh rock. Terminated at 0.1m in shale bedrock.



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NOTES

1. Site features are indicative and are not to scale.
2. This drawing has been produced using a base plan provided by others to which additional information e.g test pits, borehole locations or notes have been added. Some or all of the plan may not be relevant at the time of producing this drawing

J Wyndham Prince Pty Ltd
Proposed Caddens Knoll Subdivision
Caddens Road
Kingswood

Test Pit Locations

Drawing No: 8223/3-AA1
Job No: 8223/3
Drawn By: MH
Date: 13 January 2015
Checked By: ZA

File No: 8223-3
Layers: 0, AA1

APPENDIX B

SUMMARY OF SITE CLASSIFICATIONS

Job No: 8223/3
Our Ref: 8223/3-AA

TABLE B

SUMMARY OF SITE CLASSIFICATIONS

PROPOSED CADDENS KNOLL RESIDENTIAL SUBDIVISION
CADDENS ROAD, KINGSWOOD

Lot	Site Class	Lot	Site Class
1	S	24	M
2	S	25	S
3	S	26	S
4	S	27	S
5	M	28	M
6	M	29	M
7	S	30	S
8	S	31	S
9	S	32	S
10	S	33	S
11	S	34	S
12	S	35	S
13	M	36	M
14	M	37	M
15	M	38	S
16	M	39	S
17	S	40	S
18	M	41	S
19	M	42	M
20	M	43	M
21	M	44	M
22	M	45	M
23	M		
S; Slightly Reactive (surface movement less than 20mm)			
M; Moderately Reactive (surface movement in the range of 20-40mm)			

J K Williams Contacting Pty Ltd
ZA.sf/28.01.2015

APPENDIX C

LABORATORY TEST RESULTS

GEOTECH TESTING PTY LTD®
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J K WILLIAMS CONTRACTING PTY LTD
PO BOX 308
PENRITH NSW 2751

Job No:	8223/3
Tested By:	JL & LZ
Checked By:	AK
Date Tested:	16/12/2014
Laboratory	Penrith

SITE CLASSIFICATION
PROPOSED CADDENS KNOLL RESIDENTIAL SUBDIVISION - CADDENS ROAD, KINGSWOOD

TEST RESULTS - SHRINK / SWELL INDEX

Test Procedure: AS 1289 7.1.1

Sample Identification	Test Pit 1	Test Pit 6	Test Pit 8	Test Pit 10
Depth (m)	0.5 - 0.65	0.3 - 0.45	0.3 - 0.5	0.4 - 0.6
Laboratory Number	8223/3-1	8223/3-2	8223/3-3	8223/3-4
Test Description				
Moisture Content				
Initial %	19.6	21.9	19.1	19.0
Final %	21.5	28.7	21.1	29.5
Swell %	1.8	2.8	Nil	6.8
Shrinkage %	1.3	3.6	0.7	2.7
Shrink/Swell Index %/$_p$F	1.2	2.8	0.4	3.4
Material Description	FILL: Sandy silty Clay, low plasticity, orange-brown, trace of fine to medium gravel	(CH) Silty CLAY, high plasticity, orange-brown	(CL) Silty CLAY, low plasticity, orange-brown	(CH) Silty CLAY, high plasticity, orange-brown

Form No R007 Version 12 06/13

Accredited for compliance with ISO/IEC 17025.

A Kench 19/12/2014
Approved Signatory

NATA

NATA Accreditation Number 2734
Corporate Site Number 2727

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PO BOX 308
PENRITH NSW 2751

Job No:	8223/3
Tested By:	JL & LZ
Checked By:	AK
Date Tested:	16/12/2014
Laboratory	Penrith

SITE CLASSIFICATION
PROPOSED CADDENS KNOLL RESIDENTIAL SUBDIVISION - CADDENS ROAD, KINGSWOOD

TEST RESULTS - SHRINK / SWELL INDEX

Test Procedure: AS 1289 7.1.1

Sample Identification	Test pit 12	Test Pit 16	Test Pit 20	
Depth (m)	0.3 - 0.45	0.25 - 0.4	0.3 - 0.45	
Laboratory Number	8223/3-5	8223/3-6	8223/3-7	
Test Description				
Moisture Content				
Initial %	16.6	23.0	25.5	
Final %	23.2	27.5	31.1	
Swell %	Nil	2.4	4.8	
Shrinkage %	2.7	3.5	4.1	
Shrink/Swell Index %/$_p$F	1.5	2.6	3.6	
Material Description	(CL) Silty CLAY, low plasticity, orange-brown	(CI-CH) Silty CLAY, medium to high plasticity, orange-brown	(CH) Silty CLAY, high plasticity, orange-brown	

Form No R007 Version 12 06/13

Accredited for compliance with ISO/IEC 17025.

A Kench 19/12/2014
Approved Signatory

NATA

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Corporate Site Number 2727

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