



Job No: 8574/10
Our Ref: 8574/10-AA
13 December 2017

J K Williams Contracting Pty Ltd
P O Box 308
PENRITH NSW 2750
Email: SHartog@jkw.com.au

Attention: Mr S Hartog

Dear Sir

re: **Proposed Caddens Hill Residential Subdivision (Stage 3)**
O'Connell Lane, Caddens
Site Classification Report

Please find herewith our site classification report for the proposed dwellings at the above development. A total of 91 lots (Lot 301 to Lot 391) are covered in this report.

This report contains information on surface and sub-surface conditions encountered at the site, together with site classification of the proposed lots in accordance with AS2870-2011 "Residential slabs & footings".

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

Yours faithfully
GEOTECH TESTING PTY LTD

A handwritten signature in black ink, appearing to be "Ziauddin Ahmed", written over a horizontal line.

ZIAUDDIN AHMED
Associate Geotechnical Engineer

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8574/10-AA
Stage 3 - O'Connell Lane, Caddens

1.0 INTRODUCTION

This report provides results of a site classification investigation for proposed dwellings to be located at Caddens Hill Residential Development – Stage 3. A total of ninety-one (91) lots (Lot 301 to 391) are covered in this report.

Site classification in accordance with AS2870-2011 is only applicable for 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 including buildings classified as Class 1 and Class 10a in the Building Code of Australia (BCA). AS2870 is not suitable for dwellings situated vertically above or below another dwelling. 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 that 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

The field work for the investigation was carried out 20 and 21 November 2017, under the full time supervision of a Geotechnical Engineer from this company. The field work was consisted of excavation of thirty-four (34) test pits (TP1 to TP34) to depths ranging from 0.4m to 1.5m, using a rubber-tyred backhoe. Test pits at shallow depths were terminated due to refusal on bedrock. The locations of the test pits are shown on the attached Drawing No 8574/10-AA1 in Appendix A. A summary of the field data obtained is presented in Appendix A.

3.0 SITE CONDITIONS

3.1 Surface Conditions

Stage 3 is bound by future Stage 5 to the north, Stage 4 to the west, Stage 2 to the south and the property of State Archives and Records Authority of NSW to the east. At the time of the investigation, the internal roads were constructed and services installed. Site surface levels gently fall towards the east/south-east. The site was not covered with any vegetation and there were no trees planted.

3.2 Sub-Surface Conditions

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

Fill	Silty Clay, low to medium plasticity, brown, with gravel
Natural	Silty CLAY, low to high plasticity, orange-brown
Bedrock	SHALE

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.

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4.0 LABORATORY TESING

Five (5) soil samples were recovered during the field work of the investigation and tested for shrink/swell index tests (AS1289 7.1.1). The purpose of the test was to assess soil reactivity to variation in moisture content. The tests results are detailed in the attached certificate and summarised below:

TP	Sample Depth (m)	Summary Description	Shrink/Swell Index % _{pF}
1	0.5 – 0.9	(CL) Silty CLAY, low plasticity, orange-brown	1.1
6	0.2 – 0.6	FILL : Silty Clay, medium plasticity, brown, trace of fine to medium gravel	2.0
9	0.4 – 0.8	FILL : Silty Clay, medium plasticity, brown, trace of fine to medium gravel	2.0
16	0.4 – 0.8	FILL : Silty Clay, medium plasticity, brown, trace of fine to medium gravel	2.6
24	0.4 – 0.8	FILL : Silty Clay, medium plasticity, brown, trace of fine to medium gravel	2.3

5.0 DISCUSSION & RECOMMENDATIONS

5.1 Assessment of Fill

Fill was encountered in a number of test pits excavated across the site. It should be noted that a number of field density tests were conducted by Geotech Testing Pty Ltd during the fill placement and the results are provided in certificates 8574/5 dated 8 September and 24 October 2017. Based on our inspection of the fill encountered in the test pits and the above compaction tests results, it is our assessment that the fill at Stage 3 is "Controlled Fill".

5.2 Site Classification

Based on the field and laboratory results, the site classification to AS2870-2011 "Residential slabs & footings", for the proposed lots are summarised in Appendix B of this report.

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. Footings supported on compacted clay fill may be designed for a safe bearing pressure of 100kPa, subject to insitu testing of the exposed footings utilising the Dynamic Cone Penetrometer (DCP) test.

The above recommendations are applicable to the Lots at the date of conducting the investigation, being 20 and 21 November 2017 and are made on the following assumptions:

1. The construction requirements of AS2870-2011 must be followed.
2. The recommendations for site maintenance set out in Appendix B of AS2870 are followed.
3. The performance expectations set out in Appendix C of AS2870 are acceptable.

It is recommended that house owners are made aware of the recommendations given by the CSIRO publication, "Guide to Home Owners on Foundation Maintenance and Footing Performance".

GEOTECH TESTING PTY LTD



APPENDIX A

TABLE A SUMMARY OF TEST PITS

DRAWING NO 8574/10-AA1
(Test Pit Location Plan)

TABLE A

Job No: 8574/10
Our Ref: 8574/10-AA (Stage 3)

Page 1 of 5

TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
TP1	0-0.5	0.5-0.9	FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.5-1.1		(CL) Silty CLAY, low plasticity, orange-brown, M _s PL, VSt
	1.1		Refusal on bedrock (shale)
TP2	0-1.1	0.5-0.9	FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	1.1-1.5		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s PL, VSt
TP3	0-0.5	0.5-0.9	FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.5-1.5		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s PL, VSt
TP4	0-0.4	0.5-0.9	FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.4-1.2		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s PL, VSt
	1.2		Refusal on bedrock (shale)
TP5	0-0.4	0.5-0.9	FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.4-1.1		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s PL, VSt
	1.1		Refusal on bedrock (shale)
TP6	0-0.2	0.5-0.9	FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.2-0.7		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s PL, VSt
	0.7		Refusal on bedrock (shale)

TABLE A

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Our Ref: 8574/10-AA (Stage 3)

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TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
TP7	0-0.2	0.4-0.8	FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.2-0.9		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s PL, VSt
	0.9		Refusal on bedrock (shale)
TP8	0-0.6		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.6-1.5		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s PL, VSt
TP9	0-1.2		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	1.2-1.5		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s PL, VSt
TP10	0-1.2		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	1.2		Refusal on boulder
TP11	0-0.3		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.3-1.5		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s PL, VSt
TP12	0-0.2		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.2-1.5		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s PL, VSt
TP13	0-0.2		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.2-1.5		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s PL, VSt
TP14	0-1.5		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted

TABLE A

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TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
TP15	0-1.5	0.4-0.8	FILL: Silty Clay, low plasticity, brown, with gravel, well compacted(very gravelly)
TP16	0-1.5		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
TP17	0-1.5		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
TP18	0-1.5		FILL: Silty Clay, low plasticity, brown, with gravel, well compacted(very gravelly)
TP19	0-1.5		FILL: Silty Clay, low plasticity, brown, with gravel, well compacted(very gravelly)
TP20	0-1.5		FILL: Silty Clay, low plasticity, brown, with gravel, well compacted(very gravelly)
TP21	0-0.7		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.7		Refusal on bedrock
TP22	0-0.3		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.3-1.5		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s ≤PL, VSt
TP23	0-0.2		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.2-1.5		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s ≤PL, VSt
TP24	0-0.4		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.4-1.5	0.4-0.8	(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M _s ≤PL, VSt

TABLE A

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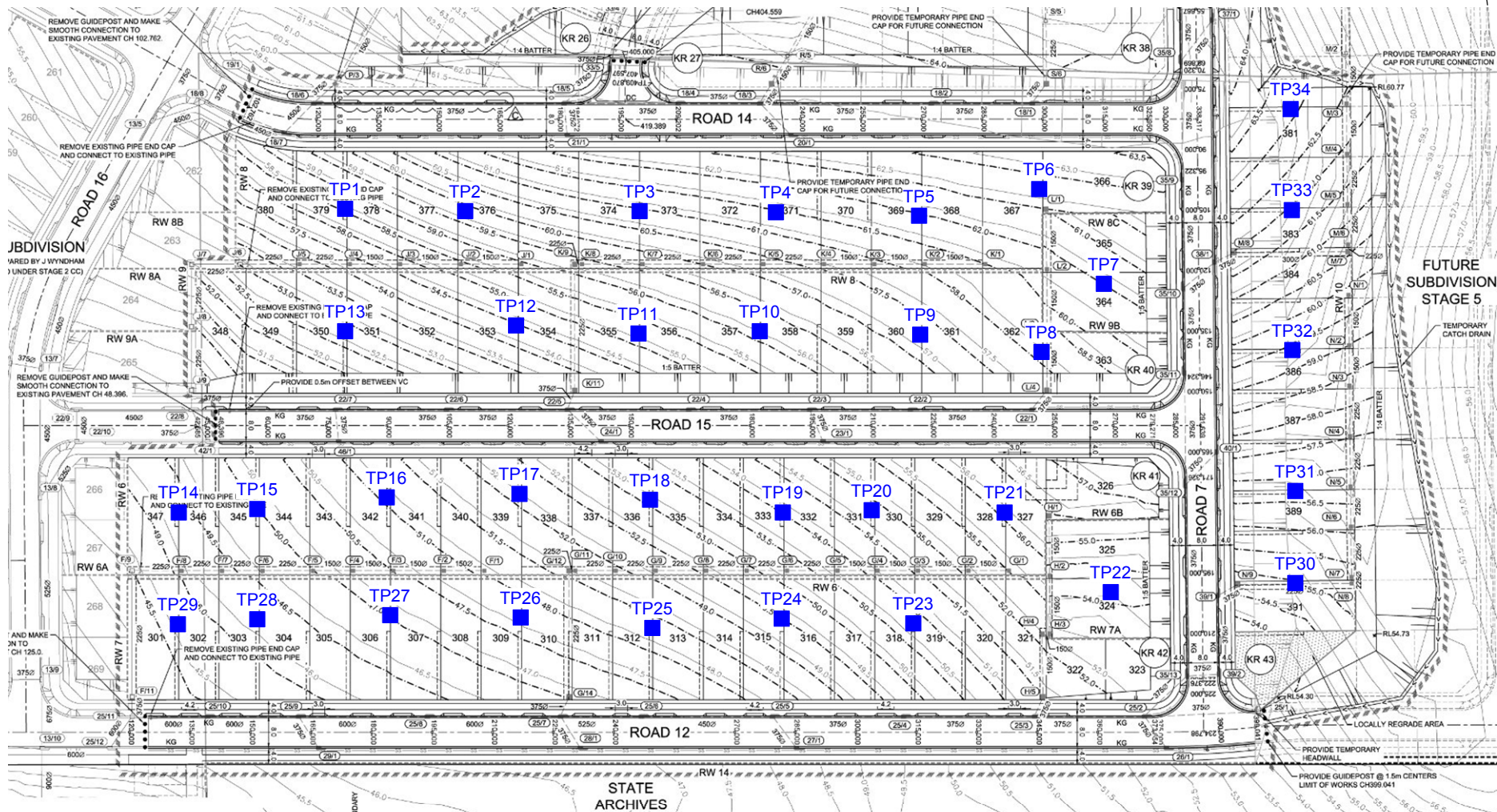
TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
TP25	0-0.2	0.4-0.6	FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	0.2-1.5		(CI-CH) Silty CLAY, medium to high plasticity, orange-brown, M ₅ PL, VSt
TP26	0-1.5		(CI-CH) Shaley CLAY, medium to high plasticity, grey mottled with brown, M ₅ PL, VSt
TP27	0-0.4		FILL: Silty Clay, low plasticity, brown, with gravel, well compacted
	0.4-0.7		(CI-CH) Shaley CLAY, medium to high plasticity, grey mottled with brown, M ₅ PL, VSt
	0.7		Refusal on shale
TP28	0-0.6	0.4-0.6	FILL: Silty Clay, low plasticity, brown, with gravel, well compacted, inclusion of boulders
	0.6		Refusal on shale
TP29	0-0.7		FILL: Silty Clay, low plasticity, brown, with gravel, well compacted, inclusion of boulders
	0.7		Refusal on shale
TP30	0-0.4		FILL: Silty Clay, low plasticity, brown, with gravel, well compacted(very gravelly)
	0.4-1.1		FILL: Silty Clay, medium plasticity, brown, with gravel, well compacted
	1.1		Refusal on bedrock(shale)
TP31	0-0.5		FILL: Silty Clay, low plasticity, brown, with gravel, well compacted(very gravelly)
	0.5		Refusal on bedrock(shale)
TP32	0-0.5		FILL: Silty Clay, low plasticity, brown, with gravel, well compacted(very gravelly)
	0.5		Refusal on bedrock(shale)

TABLE A

Job No: 8574/10
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TEST PIT NUMBER	DEPTH (m)	SAMPLE DEPTH (m)	MATERIAL DESCRIPTION
TP33	0-0.4		FILL: Silty Clay, low plasticity, brown, with gravel, well compacted(very gravelly)
	0.4		Refusal on bedrock(shale)
TP34	0-0.4		FILL: Silty Clay, low plasticity, brown, with gravel, well compacted(very gravelly)
	0.4		Refusal on bedrock(shale)



LEGEND

■ Test Pit

0 15 30 45 60 75m
Scale 1:1500

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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 K Williams Contracting Pty Ltd
Proposed Caddens Hill Residential Subdivision
Stage 3
O'Connell Lane, Caddens

Test Pit Locations

Drawing No: 8574/10-AA1
Job No: 8574/10
Drawn By: MH
Date: 23 November 2017
Checked By: ZA

File No: 8574-10
Layers: 0, AA1

APPENDIX B

SUMMARY OF SITE CLASSIFICATIONS

Job No: 8574/10
Our Ref: 8574/10-AA

TABLE B

SUMMARY OF SITE CLASSIFICATIONS

**CADDENS HILL RESIDENTIAL DEVELOPMENT
STAGE 3
O'Connell Lane, Caddens**

Lot	Site Classification	Lot	Site Classification	Lot	Site Classification
301	Class “M”	332	Class “H1”	363	Class “M”
302	Class “M”	333	Class “H1”	364	Class “M”
303	Class “M”	334	Class “H1”	365	Class “M”
304	Class “M”	335	Class “H1”	366	Class “M”
305	Class “M”	336	Class “H1”	367	Class “M”
306	Class “M”	337	Class “H1”	368	Class “M”
307	Class “M”	338	Class “H1”	369	Class “M”
308	Class “M”	339	Class “H1”	370	Class “M”
309	Class “H1”	340	Class “H1”	371	Class “M”
310	Class “H1”	341	Class “H1”	372	Class “M”
311	Class “M”	342	Class “H1”	373	Class “M”
312	Class “M”	343	Class “H1”	374	Class “M”
313	Class “M”	344	Class “H1”	375	Class “M”
314	Class “M”	345	Class “H1”	376	Class “M”
315	Class “M”	346	Class “H1”	377	Class “M”
316	Class “M”	347	Class “H1”	378	Class “M”
317	Class “M”	348	Class “M”	379	Class “M”
318	Class “M”	349	Class “M”	380	Class “M”
319	Class “M”	350	Class “M”	381	Class “S”
320	Class “M”	351	Class “M”	382	Class “S”
321	Class “M”	352	Class “M”	383	Class “S”
322	Class “M”	353	Class “M”	384	Class “S”
323	Class “M”	354	Class “M”	385	Class “S”
324	Class “M”	355	Class “M”	386	Class “S”
325	Class “M”	356	Class “M”	387	Class “S”
326	Class “H1”	357	Class “M”	388	Class “S”
327	Class “H1”	358	Class “M”	389	Class “S”
328	Class “H1”	359	Class “M”	390	Class “M”
329	Class “H1”	360	Class “M”	391	Class “M”
330	Class “H1”	361	Class “M”		
331	Class “H1”	362	Class “M”		
S: Slightly Reactive, Free Surface Movement: 0-20mm M: Moderately Reactive, Free Surface Movement: 20-40mm H1: Highly Reactive, Free Surface Movement: 40-60mm					

APPENDIX C

LABORATORY TEST RESULTS

J K WILLIAMS CONTRACTING PTY LTD
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PENRITH NSW 2750

Job No: 8574/10
Tested By: JM
Checked By: AK
Date Tested: 28/11/2017
Laboratory: Penrith

SITE CLASSIFICATION-STAGE 3
PROPOSED CADDENS HILL RESIDENTIAL SUBDIVISION - O'CONNELL LANE, STAGE 3, CADDENS

TEST RESULTS - SHRINK / SWELL INDEX

Page 1 of 2

Test Procedure: AS 1289 7.1.1				
Sample Identification	Test Pit 1	Test Pit 6	Test Pit 9	Test Pit 16
Depth (m)	0.5 - 0.9	0.2 - 0.6	0.4 - 0.8	0.4 - 0.8
Laboratory Number	8574/10-1	8574/10-2	8574/10-3	8574/10-4
Test Description				
Moisture Content				
Initial %	13.8	22.0	16.7	16.1
Final %	19.4	22.8	20.0	19.2
Swell %	0.8	1.4	1.9	4.9
Shrinkage %	1.6	2.9	2.7	2.3
Shrink/Swell Index % _{pF}	1.1	2.0	2.0	2.6
Material Description	(CL) Silty CLAY, low plasticity, orange-brown	FILL: Silty Clay, medium plasticity, brown, trace of fine to medium gravel	FILL: Silty Clay, medium plasticity, brown, trace of fine to medium gravel	FILL: Silty Clay, medium plasticity, brown, trace of fine to medium gravel

Form No R007 Version 12 06/13



NATA Accreditation Number 2734
Corporate Site Number 2727

Accredited for compliance with
ISO/IEC 17025 - Testing.

A Kench 05/12/2017
Approved Signatory

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J K WILLIAMS CONTRACTING PTY LTD
PO BOX 308
PENRITH NSW 2750

Job No: 8574/10
Tested By: JM
Checked By: AK
Date Tested: 28/11/2017
Laboratory: Penrith

SITE CLASSIFICATION-STAGE 3
PROPOSED CADDENS HILL RESIDENTIAL SUBDIVISION - O'CONNELL LANE, STAGE 3, CADDENS

TEST RESULTS - SHRINK / SWELL INDEX

Page 2 of 2

Test Procedure: AS 1289 7.1.1				
Sample Identification	Test Pit 24			
Depth (m)	0.4 - 0.8			
Laboratory Number	8574/10-5			
Test Description				
Moisture Content				
Initial %	19.8			
Final %	25.6			
Swell %	1.2			
Shrinkage %	3.5			
Shrink/Swell Index % _{pF}	2.3			
Material Description	FILL: Silty Clay, medium plasticity, brown, trace of fine to medium gravel			

Form No R007 Version 12 06/13



NATA Accreditation Number 2734
Corporate Site Number 2727

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