



Job No: 7747/73
Our Ref: 7747/73-AA-R2
15 May 2023

Redbank Communities
P O Box 1918
PENRITH NSW 2750
Email: callumgracie@redbankcommunities.com.au

Attention: Mr C Gracie

Dear Sir

re: **Redbank Development – Ridgetops 1 and 2
Gross Vale Road, North Richmond
Site Classification Report**

This report provides site classifications for the proposed lots at the above site. The following lots are covered in this report:

| Lots | Total Lots |
|--------------|------------|
| 1801 to 1852 | 52 |
| 1901 to 1951 | 51 |
| TOTAL | 103 |

This report contains information on sub-surface conditions encountered at the site, together with site classification of the proposed lots 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

A handwritten signature in black ink, appearing to be "JC" or similar initials, written in a cursive style.

JOE CHEN
Geotechnical Engineer

TABLE OF CONTENTS

| | page |
|--|-------------|
| 1.0 INTRODUCTION ----- | 1 |
| 2.0 FIELD WORK----- | 1 |
| 3.0 FIELD WORK----- | 1 |
| 3.1 Surface Conditions ----- | 1 |
| 3.2 Sub-Surface Conditions----- | 2 |
| 4.0 LABORATORY TESTING ----- | 3 |
| 5.0 DISCUSSION & RECOMMENDATIONS ----- | 4 |
| 5.1 Assessment of Fill ----- | 4 |
| 5.2 Site Classification ----- | 4 |

APPENDICES

| | |
|-------------------|---|
| <i>APPENDIX A</i> | <i>Table A - Summary of Test Pits Drawing No 7747/73-AA1R1 (Test Pit Location Plan)</i> |
| <i>APPENDIX B</i> | <i>Summary of Site Classifications</i> |
| <i>APPENDIX C</i> | <i>Laboratory Test Results</i> |

7747/73-AA-R2
Gross Vale Road, North Richmond

1.0 INTRODUCTION

This report provides results of a site classification investigation for the proposed dwellings to be located at Gross Vale Road, North Richmond. The following lots are covered in this report:

| Lots | Total Lots |
|--------------|------------|
| 1801 to 1852 | 52 |
| 1901 to 1951 | 51 |
| TOTAL | 103 |

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 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.

2.0 FIELD WORK

Field work for the investigation was carried out under the full time supervision of a Geotechnical Engineer on 24 November, 13 December 2022 and 11 May 2023 and consisted of excavation of forty one (41) test pits (TP1 to TP41) to depths of the order of 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 7747/73-AA1R1 in Appendix A. A summary of the field data obtained is presented in Appendix A.

3.0 FIELD WORK

3.1 Surface Conditions

The site (Ridgetops 1 and 2) is of irregular shape and located off Grose Vale Road, North Richmond. The site is bound by Grose Vale Road followed by open grass land with trees and St John of God Richmond Hospital to the south; Grose Vale Road followed by low to medium density residential to the southwest; Dam 7 followed by future earth works to the northwest; medium density residential vacant lots to the north; and dam 8 followed by medium density residential vacant lots to the east. The topography of the site is generally gently to moderately sloped (~5°) in the northern direction. At the time of investigation, bulk earthworks for the lots and construction of internal roads had been completed. Retaining walls 26 and 27 had been excavated with sandstone blocks across several lots. Site activities included ongoing machinery and laborious activities. Site vegetation was limited to grass; low to medium density grass coverage across the site with majority of lots 1917-1926 completely void.

7747/73-AA-R2
Gross Vale Road, North Richmond

3.2 Sub-Surface Conditions

Sub-surface conditions encountered in the test pits are detailed in the attached Table A and summarised below in Table 1.

Table 1: Sub-surface conditions

| Test Pit | Termination Depth (m) | Topsoil (m) | Fill (m) | Natural (m) | Bedrock (m) |
|----------|-----------------------|-------------|----------|-------------|-------------|
| TP1 | 1.5 | 0.0-0.1 | 0.1-1.5 | NE | NE |
| TP2 | 1.5 | 0.0-0.2 | 0.2-1.2 | 1.2-1.5 | NE |
| TP3 | 1.5 | 0.0-0.1 | 0.1-1.2 | 1.2-1.5 | NE |
| TP4 | 1.5 | 0.0-0.1 | 0.1-1.3 | 1.3-1.5 | NE |
| TP5 | 1.5 | 0.0-0.1 | 0.1-1.5 | NE | NE |
| TP6 | 1.5 | 0.0-0.1 | 0.1-1.5 | NE | NE |
| TP7 | 1.5 | 0.0-0.1 | 0.1-1.5 | NE | NE |
| TP8 | 1.5 | 0.0-0.1 | 0.1-1.5 | NE | NE |
| TP9 | 0.6 | 0.0-0.3 | NE | 0.3-0.6 | 0.6 |
| TP10 | 1.5 | 0.0-0.15 | 0.15-1.5 | NE | NE |
| TP11 | 0.3 | 0.0-0.1 | 0.1-0.3 | NE | 0.3 |
| TP12 | 1.5 | 0.0-0.1 | NE | 0.1-1.5 | NE |
| TP13 | 1.5 | 0.0-0.1 | 0.1-0.6 | 0.6-1.5 | NE |
| TP14 | 0.2 | 0.0-0.2 | NE | NE | 0.2 |
| TP15 | 1.4 | 0.0-0.1 | NE | 0.1-1.4 | 1.4-1.5 |
| TP16 | 0.7 | 0.0-0.2 | NE | 0.2-0.7 | 0.7 |
| TP17 | 1.5 | 0.0-0.1 | 0.1-1.5 | NE | NE |
| TP18 | 1.5 | 0.0-0.1 | 0.1-1.3 | 1.3-1.5 | NE |
| TP19 | 1.5 | 0.0-0.1 | 0.1-1.5 | NE | NE |
| TP20 | 1.5 | 0.0-0.1 | 0.1-1.3 | 1.3-1.5 | NE |
| TP21 | 0.3 | 0.0-0.15 | 0.15-0.3 | NE | 0.3 |
| TP22 | 0.2 | 0.0-0.2 | NE | NE | 0.2 |
| TP23 | 1.0 | 0.0-0.2 | NE | 0.2-1.0 | 1.0 |
| TP24 | 1.5 | 0.0-0.1 | 0.1-1.5 | NE | NE |
| TP25 | 0.3 | 0.0-0.3 | NE | NE | 0.3 |
| TP26 | 0.5 | 0.0-0.2 | NE | 0.2-0.5 | 0.5 |
| TP27 | 0.5 | 0.0-0.2 | NE | 0.2-0.5 | 0.5 |
| TP28 | 1.5 | 0.0-0.3 | 0.3-1.5 | NE | NE |
| TP29 | 0.5 | 0.0-0.2 | NE | 0.2-0.5 | 0.5 |
| TP30 | 0.3 | 0.0-0.3 | NE | NE | 0.3 |
| TP31 | 1.2 | 0.0-0.3 | NE | 0.3-1.2 | 1.2 |
| TP32 | 0.3 | 0.0-0.3 | NE | NE | 0.3 |
| TP33 | 0.3 | 0.0-0.1 | NE | 0.1-0.3 | 0.3 |
| TP34 | 0.4 | 0.0-0.2 | NE | 0.2-0.4 | 0.4 |
| TP35 | 1.0 | 0.0-0.1 | NE | 0.1-1.0 | 1.0 |
| TP36 | 1.4 | 0.0-0.2 | 0.2-1.4 | NE | 1.4 |
| TP37 | 0.2 | NE | NE | NE | 0.2 |
| TP38 | 0.2 | NE | NE | NE | 0.2 |
| TP39 | 0.2 | NE | NE | NE | 0.2 |
| TP40 | 0.2 | NE | NE | NE | 0.2 |
| TP41 | 0.2 | NE | NE | NE | 0.2 |

NE: Not encountered to the termination depth

7747/73-AA-R2
Gross Vale Road, North Richmond

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

| | |
|----------------|---|
| Fill | Silty Clay, low plasticity, pale brown to red brown, traces of fine to coarse grain sub-angular gravel Silty Clay, medium to high plasticity, pale grey mottled brown, traces of fine to coarse grain sub-angular gravel with fragments of shale Silty Clay, low plasticity, pale grey, trace of fine to coarse grain sub-angular gravel, trace of root fibres Silty Sand, fine to coarse grain, brown-yellow, trace of fine to medium grain sub-angular gravel, well graded |
| Natural | Silty CLAY, medium plasticity, pale grey mottled red, traces of fine to medium grain sub-angular gravel Silty CLAY, low to medium plasticity, brown mottled grey-red, traces of fine grain sub-angular gravel |
| Bedrock | SHALE, grey-orange, low to medium strength, moderately weathered |

Groundwater seepage on top of the underlying bedrock was observed in TP27, TP29 and TP30 covering lots 1818-1821, and lots 1928-1929. Groundwater was not observed in any other 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.

4.0 LABORATORY TESTING

A total of three (3) undisturbed 50mm diameter hollow tube (U₅₀) samples and five (5) disturbed samples were recovered from the site. These samples were tested to determine shrink/swell index and Atterberg limit values. The tests were conducted in accordance with relevant Australian Standards and the results are summarised below and detailed in the attached test certificates, in Appendix C.

Table 2: Summary of Test Results

| Test Pit | Depth (m) | Material Description | Liquid Limit (%) | Plasticity Index (%) | Linear Shrinkage (%) | Shrink/Swell Index (%/pF) |
|----------|-----------|--|------------------|----------------------|----------------------|---------------------------|
| TP1 | 0.6 – 0.8 | FILL: Silty Clay, low plasticity, pale grey, some fine to medium gravel | 23 | 9 | 6.5 | - |
| TP3 | 0.7-0.9 | FILL: Silty Clay, Low plasticity, dark brown, trace of fine to coarse grain sub-angular gravel, trace of root fibres | - | - | - | 0.7 |
| TP9 | 0.4-0.6 | (CL-CI) Silty CLAY, low to medium plasticity, pale grey, trace of fine to medium grain gravel | 29 | 11 | 11.5 | - |
| TP10 | 0.5-0.7 | FILL: Silty CLAY, low plasticity, pale grey mottled red, trace of fine to medium grain gravel | 25 | 10 | 7 | - |
| TP13 | 0.7-0.9 | (CL-CI) Silty CLAY, low to medium plasticity, red-brown, trace of fine to medium grain gravel | - | - | - | 1.6 |
| TP19 | 0.6-0.8 | FILL: Silty Clay, low plasticity, pale grey-brown, trace of fine to medium grain gravel | - | - | - | 0.6 |
| TP26 | 0.3-0.5 | (CI) Silty gravelly CLAY, medium plasticity, mottled orange-brown and grey | 42 | 19 | 11 | - |
| TP28 | 0.9-1.1 | FILL: Silty Clay, low plasticity, red-brown with grey mottling, trace of fine to medium grain gravel | 27 | 13 | 8 | - |

7747/73-AA-R2
Gross Vale Road, North Richmond

5.0 DISCUSSION & RECOMMENDATIONS

5.1 Assessment of Fill

Fill was encountered in several test pits excavated across the site. It should be noted that several field density tests were conducted by Geotech Testing Pty Ltd during the fill placement and the results are provided in our summary report (Our Ref: 7747/54-AE dated 21 September 2022). Based on our inspection of the fill during the investigation and the above field density tests results, it is our assessment that the fill 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.

The above recommendations are applicable to the Lots at the date of conducting the investigation, being 24 November, 13 December 2022 and 11 May 2023 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".

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APPENDIX A

**TABLE A
SUMMARY OF TEST PITS**

**DRAWING NO 7747/73-AA1R1
(*Test Pit Location Plan*)**

TABLE A

Job No: 7747/73
Our Ref: 7747/73-AA

Page 1 of 7

| TEST PIT | DEPTH (m) | SAMPLE DEPTH (m) | MATERIAL DESCRIPTION |
|----------|-----------|----------------------------|--|
| TP1 | 0.0-0.1 | 0.6-0.8 (U ₅₀) | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-0.6 | | FILL: Silty Clay, low to medium plasticity, brown, trace of fine to medium grain sub-angular gravel, M _≤ PL, well compacted |
| | 0.6-1.5 | | FILL: Silty Clay, low plasticity, pale grey, trace of fine to coarse grain sub-angular gravel, with shale fragments, M _≤ PL, well compacted |
| TP2 | 0.0-0.2 | 0.7-0.9 (U ₅₀) | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.2-1.2 | | FILL: Silty Clay, low plasticity, pale grey, trace of fine to coarse grain sub-angular gravel, M _≤ PL, well compacted |
| | 1.2-1.5 | | (CL-CI) Silty CLAY, low to medium plasticity, pale grey mottled red, trace of fine to medium grain sub-angular gravel, M _≤ PL, stiff |
| TP3 | 0.0-0.1 | 0.7-0.9 (U ₅₀) | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-1.2 | | FILL: Silty Clay, low plasticity, pale grey, trace of fine to coarse grain sub-angular gravel, trace of root fibres, M _≤ PL, well compacted, @0.6m, dark brown, trace of organic material |
| | 1.2-1.5 | | (CL-CI) Silty CLAY, low to medium plasticity, pale grey mottled red, trace of fine to medium grain sub-angular gravel, M _≤ PL, stiff |
| TP4 | 0.0-0.1 | 0.7-0.9 (U ₅₀) | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-1.3 | | FILL: Silty Clay, low plasticity, pale grey, trace of fine to coarse grain sub-angular gravel, M _≤ PL, well compacted, @1.0m, M<PL |
| | 1.3-1.5 | | (CL-CI) Silty CLAY, low to medium plasticity, pale grey mottled red, trace of fine to medium grain sub-angular gravel, M _≤ PL, stiff |
| TP5 | 0.0-0.1 | 0.7-0.9 (U ₅₀) | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-1.5 | | FILL: Silty Clay, low plasticity, pale grey mottled brown, trace of fine to coarse grain sub-angular gravel, trace of ironstone fragments, M<PL, well compacted |

TABLE A

Job No: 7747/73
Our Ref: 7747/73-AA

Page 2 of 7

| TEST PIT | DEPTH (m) | SAMPLE DEPTH (m) | MATERIAL DESCRIPTION |
|----------|---------------|----------------------------|--|
| TP6 | 0.0-0.1 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-1.5 | | FILL: Silty Clay, low plasticity, pale grey, trace of fine to coarse grain sub-angular gravel, M<PL, well compacted |
| TP7 | 0.0-0.1 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-1.5 | | FILL: Silty Clay, low plasticity, pale brown, trace of fine to coarse grain sub-angular gravel, M≤PL, well compacted |
| TP8 | 0.0-0.1 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-1.3 | | FILL: Silty Clay, low plasticity, pale brown mottled red, trace of fine to coarse grain sub-angular gravel, M≤PL, well compacted |
| | 1.3-1.5 | | FILL: Silty Clay, low to medium plasticity, red-brown, trace of fine to coarse grain sub-angular gravel, M≤PL, well compacted |
| TP9 | 0.0-0.3 | 0.4-0.6 (DS) | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.3-0.6 | | (CL-CI) Silty CLAY, low to medium plasticity, pale grey, trace of fine to coarse grain sub-angular gravel, M≤PL |
| | 0.6 (refusal) | | SHALE, grey-orange, low to medium strength, moderately weathered |
| TP10 | 0.0-0.15 | 0.5-0.7 (U ₅₀) | TOPSOIL: Silty Clay, high plasticity, brown, trace of root fibres |
| | 0.15-1.5 | | FILL: Silty Clay, low plasticity, pale brown mottled red, trace of fine to coarse sub-angular gravel, M<PL, well compacted |
| TP11 | 0.0-0.1 | | TOPSOIL: Silty Clay, high plasticity, brown, trace of root fibres |
| | 0.1-0.3 | | FILL: Silty Clay, low to medium plasticity, red-brown, trace of fine to medium grain sub-angular gravel, M≤PL, well compacted |
| | 0.3 (refusal) | | SHALE, grey-orange, low to medium strength, moderately weathered |

TABLE A

Job No: 7747/73
Our Ref: 7747/73-AA

Page 3 of 7

| TEST PIT | DEPTH (m) | SAMPLE DEPTH (m) | MATERIAL DESCRIPTION |
|----------|---------------|---|---|
| TP12 | 0.0-0.1 | 0.7-0.9 (U ₅₀) | TOPSOIL: Silty Clay, high plasticity, brown, trace of root fibres |
| | 0.1-1.5 | | (CL-CI) Silty CLAY, low to medium plasticity, pale brown, fragments of fine to coarse sub-angular gravel, M ₅ PL, stiff |
| TP13 | 0.0-0.1 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-0.6 | | FILL: Silty Clay, low plasticity, pale brown mottled red, trace of fine to coarse grain sub-angular gravel, M ₅ PL, well compacted |
| | 0.6-1.5 | | (CL-CI) Silty CLAY, low to medium plasticity, red-brown, trace of fine to medium grain sub-angular gravel, M ₅ PL, stiff |
| TP14 | 0.0-0.2 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.2 (refusal) | | SHALE, grey-orange, low to medium strength, moderately weathered |
| TP15 | 0.0-0.1 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-1.4 | | (CL-CI) Silty CLAY, low to medium plasticity, pale brown mottled red, trace of fine to medium grain sub-angular gravel, M ₅ PL, very stiff |
| | 1.4 (refusal) | | SHALE, grey-orange, low to medium strength, moderately weathered |
| TP16 | 0.0-0.2 | TOPSOIL: Silty Clay, high plasticity, brown | |
| | 0.2-0.7 | (CL-CI) Silty CLAY, low to medium plasticity, pale brown mottled red, trace of fine to medium grain sub-angular gravel, M ₅ PL, very stiff | |
| | 0.7 (refusal) | SHALE, grey-orange, low to medium strength, moderately weathered | |
| TP17 | 0.0-0.1 | TOPSOIL: Silty Clay, high plasticity, brown | |
| | 0.1-1.5 | FILL: Silty Clay, low plasticity, pale brown, trace of fine to medium grain sub-angular gravel, M ₅ PL, well compacted | |

TABLE A

Job No: 7747/73
Our Ref: 7747/73-AA

Page 4 of 7

| TEST PIT | DEPTH (m) | SAMPLE DEPTH (m) | MATERIAL DESCRIPTION |
|----------|---------------|----------------------------|--|
| TP18 | 0.0-0.1 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-0.3 | | FILL: Silty Cobbly CLAY, medium plasticity, grey-orange, fine grain sub-angular cobble, trace of medium to coarse grain sub-angular gravel, M ₅₀ PL, well compacted |
| | 0.3-1.3 | | FILL: Silty Clay, low plasticity, pale brown, trace of fine to coarse grain sub-angular gravel, M ₅₀ PL, well compacted |
| | 1.3-1.5 | | (CL-CI) Silty CLAY, low to medium plasticity, red-brown, trace of fine to medium grain sub-angular gravel, M ₅₀ PL, stiff |
| TP19 | 0.0-0.1 | 0.6-0.8 (U ₅₀) | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-1.5 | | FILL: Silty Clay, low plasticity, pale brown, trace of fine to coarse grain sub-angular gravel, M ₅₀ PL, well compacted |
| TP20 | 0.0-0.1 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-1.3 | | FILL: Silty Clay, low plasticity, pale brown, trace of fine to coarse grain sub-angular gravel, M ₅₀ PL, well compacted |
| | 1.3-1.5 | | (CL-CI) Silty CLAY, low to medium plasticity, red-brown, trace of fine to medium grain sub-angular gravel, M ₅₀ PL, very stiff |
| TP21 | 0.0-0.15 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.15-0.3 | | FILL: Silty Sand, fine to coarse grain, brown-yellow, trace of fine to medium grain sub-angular gravel, well graded, moist, well compacted |
| | 0.3 (refusal) | | SHALE, grey-orange, low to medium strength, moderately weathered |
| TP22 | 0.0-0.2 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.2 (refusal) | | SHALE, grey-orange, low to medium strength, moderately weathered |
| TP23 | 0.0-0.2 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.2-1.0 | | (CL-CI) Silty CLAY, low to medium plasticity, red-brown, trace of fine to medium grain sub-angular gravel, M ₅₀ PL, stiff |
| | 1.0 (refusal) | | SHALE, grey-orange, low to medium strength, moderately weathered |

TABLE A

Job No: 7747/73
Our Ref: 7747/73-AA

| TEST PIT | DEPTH (m) | SAMPLE DEPTH (m) | MATERIAL DESCRIPTION |
|----------|---------------|------------------|---|
| TP24 | 0.0-0.1 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.1-1.5 | | FILL: Silty Clay, low plasticity, pale brown, trace of fine to coarse sub-angular gravel, M \leq PL, well compacted |
| TP25 | 0.0-0.3 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.3 (refusal) | | SHALE, grey-orange, low to medium strength, moderately weathered |
| TP26 | 0.0-0.2 | 0.3-0.5 (DS) | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.2-0.5 | | (CI) Silty CLAY, medium plasticity, pale grey mottled red, trace of fine to medium grain sub-angular gravel, M \leq PL, stiff |
| | 0.5 (refusal) | | SHALE, grey-orange, low to medium strength, moderately weathered |
| TP27 | 0.0-0.2 | | TOPSOIL: Silty Clay, high plasticity, brown |
| | 0.2-0.5 | | (CL-CI) Silty CLAY, low to medium plasticity, red-brown mottled grey, trace of fine to medium grain sub-angular gravel, M \leq PL, stiff |
| | 0.5 (refusal) | | SHALE, grey-orange, low to medium strength, moderately weathered, @0.5m groundwater seepage |
| TP28 | 0.0-0.3 | | TOPSOIL: Silty Clay, high plasticity, brown, trace of root fibres |
| | 0.3-0.9 | | FILL: Silty Clay, low to medium plasticity, brown, trace of fine to coarse grain sub-angular gravel, M \leq PL, well compacted |
| | 0.9-1.5 | | 0.9-1.1 (U ₅₀) FILL: Silty Clay, low plasticity, pale brown, trace of fine to coarse grain sub-angular gravel, M \geq PL, well compacted |
| TP29 | 0.0-0.2 | | TOPSOIL: Silty Clay, high plasticity, brown, trace of root fibres |
| | 0.2-0.5 | | (CL-CI) Silty CLAY, low to medium plasticity, pale brown, trace of fine to coarse grain sub-angular gravel, M \leq PL, stiff to very stiff |
| | 0.5 (refusal) | | SHALE, grey-orange, low to medium strength, moderately weathered, @0.5m groundwater seepage |

TABLE A

Job No: 7747/73
Our Ref: 7747/73-AA

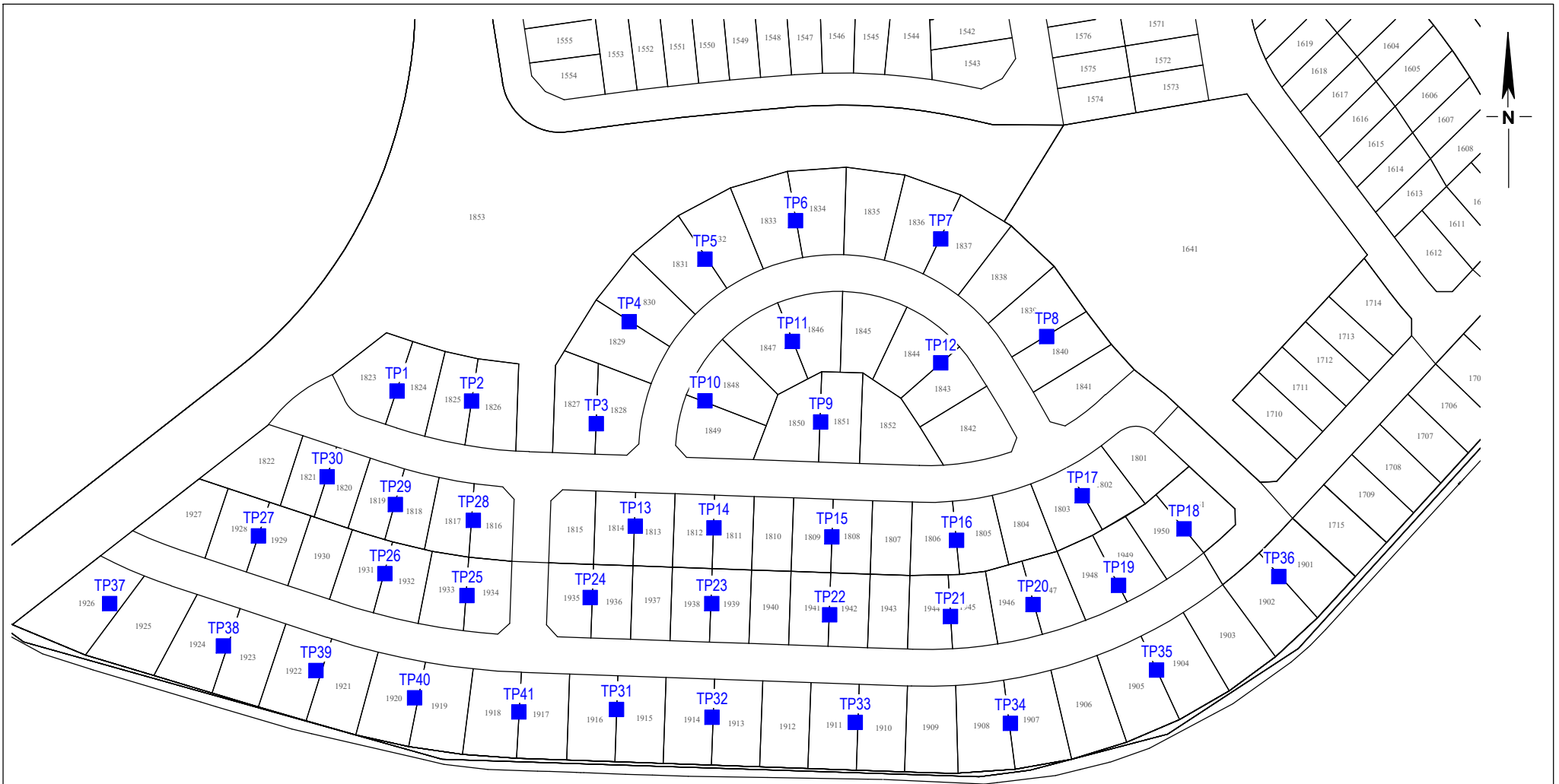
| TEST PIT | DEPTH (m) | SAMPLE DEPTH (m) | MATERIAL DESCRIPTION |
|----------|---------------|------------------|---|
| TP30 | 0.0-0.3 | | TOPSOIL: Silty Clay, high plasticity, brown, trace of root fibres |
| | 0.3 (refusal) | | SHALE, grey-orange, low to medium strength, moderately weathered, @0.3m groundwater seepage |
| TP31 | 0.0-0.3 | | TOPSOIL: Silty Clay, high plasticity, dark brown, trace of root fibres |
| | 0.3-1.2 | | (CL-CI) Silty CLAY, low to medium plasticity, brown mottled grey-red, trace of fine to medium grain gravel, M<PL, stiff to very stiff |
| | 1.2 (refusal) | | SHALE, grey-brown, low to medium strength, moderately weathered |
| TP32 | 0.0-0.3 | | TOPSOIL: Silty Clay, high plasticity, dark brown, trace of root fibres |
| | 0.3 (refusal) | | SHALE, grey-brown, low to medium strength, moderately weathered |
| TP33 | 0.0-0.1 | | TOPSOIL: Silty Clay, high plasticity, dark brown, trace of root fibres |
| | 0.1-0.3 | | (CL-CI) Silty CLAY, low to medium plasticity, brown mottled grey-red, trace of shale fragments, M<PL, very stiff |
| | 0.3 (refusal) | | SHALE, grey-brown, low to medium strength, moderately weathered |
| TP34 | 0.0-0.2 | | TOPSOIL: Silty Clay, high plasticity, dark brown, trace of root fibres |
| | 0.2-0.4 | | (CL-CI) Silty CLAY, low to medium plasticity, brown mottled grey-red, trace of fine to medium grain sub-angular gravel, M≤PL, stiff to very stiff |
| | 0.4 (refusal) | | SHALE, grey-brown, low to medium strength, moderately weathered |

TABLE A

Job No: 7747/73
Our Ref: 7747/73-AA

Page 7 of 7

| TEST PIT | DEPTH (m) | SAMPLE DEPTH (m) | MATERIAL DESCRIPTION |
|----------|---------------|------------------|--|
| TP35 | 0.0-0.1 | | TOPSOIL: Silty Clay, high plasticity, dark brown, trace of root fibres |
| | 0.1-1.0 | | (CL-CI) Silty CLAY, low to medium plasticity, brown mottled grey-red, trace of fine grain sub-angular gravel, M _s PL, stiff to very stiff |
| | 1.0 (refusal) | | SHALE, grey-brown, low to medium strength, moderately weathered |
| TP36 | 0.0-0.2 | | TOPSOIL: Silty Clay, high plasticity, dark brown, trace of root fibres |
| | 0.2-1.4 | | FILL: Silty Clay, medium plasticity, brown-red, trace of fine to coarse grain sub-angular gravel, M _s PL, well compacted |
| | 1.4 (refusal) | | SHALE, grey-brown, low to medium strength, moderately weathered |
| TP37 | 0.0-0.2 | | SHALE, grey-orange, low to medium strength, moderately weathered |
| TP38 | 0.0-0.2 | | SHALE, grey-orange, low to medium strength, moderately weathered |
| TP39 | 0.0-0.2 | | SHALE, grey-orange, low to medium strength, moderately weathered |
| TP40 | 0.0-0.2 | | SHALE, grey-orange, low to medium strength, moderately weathered |
| TP41 | 0.0-0.2 | | SHALE, grey-orange, low to medium strength, moderately weathered |



LEGEND

■ Test Pit



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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

**Redbank Communities
Proposed Development
Ridgetops
Grose Vale Road, North Richmond**

Test Pit Locations

Drawing No: 7747/73-AA1R1
Job No: 7747/73
Drawn By: MH
Date: 11 May 2023
Checked By: JSH/JC

File No: 7747-73
Layers: 0, AA1R1

APPENDIX B

SUMMARY OF SITE CLASSIFICATIONS

Job No: 7747/73
Our Ref: 7747/73-AA-R2

TABLE B
SUMMARY OF SITE CLASSIFICATIONS

Redbank Development, Ridgetops 1 & 2

| Lot | Site Classification | Lot | Site Classification | Lot | Site Classification |
|------|---------------------|------|---------------------|------|---------------------|
| 1801 | M | 1836 | M | 1919 | S |
| 1802 | M | 1837 | M | 1920 | S |
| 1803 | M | 1838 | M | 1921 | S |
| 1804 | M | 1839 | M | 1922 | S |
| 1805 | M | 1840 | M | 1923 | S |
| 1806 | M | 1841 | M | 1924 | S |
| 1807 | M | 1842 | M | 1925 | S |
| 1808 | M | 1843 | M | 1926 | S |
| 1809 | M | 1844 | M | 1927 | S |
| 1810 | M | 1845 | M | 1928 | S |
| 1811 | S | 1846 | S | 1929 | S |
| 1812 | S | 1847 | S | 1930 | S |
| 1813 | M | 1848 | M | 1931 | S |
| 1814 | M | 1849 | M | 1932 | S |
| 1815 | M | 1850 | S | 1933 | S |
| 1816 | M | 1851 | S | 1934 | S |
| 1817 | M | 1852 | M | 1935 | M |
| 1818 | S | 1901 | M | 1936 | M |
| 1819 | S | 1902 | M | 1937 | M |
| 1820 | S | 1903 | M | 1938 | M |
| 1821 | S | 1904 | M | 1939 | M |
| 1822 | M | 1905 | M | 1940 | M |
| 1823 | M | 1906 | M | 1941 | S |
| 1824 | M | 1907 | S | 1942 | S |
| 1825 | M | 1908 | S | 1943 | S |
| 1826 | M | 1909 | S | 1944 | S |
| 1827 | M | 1910 | S | 1945 | A2 |
| 1828 | M | 1911 | S | 1946 | A2 |
| 1829 | M | 1912 | S | 1947 | A2 |
| 1830 | M | 1913 | S | 1948 | M |
| 1831 | M | 1914 | S | 1949 | M |
| 1832 | M | 1915 | M | 1950 | M |
| 1833 | M | 1916 | M | 1951 | M |
| 1834 | M | 1917 | S | | |
| 1835 | M | 1918 | S | | |

S: Slightly Reactive, Free surface Movement: 0-20mm
M: Moderately Reactive, Free Surface Movement: 20-40mm

APPENDIX C

LABORATORY TEST RESULTS

TEST RESULTS - ATTERBERG LIMITS
Test Procedure AS1289 3.1.1, 3.2.1, 3.3.1, 3.4.1

REDBANK COMMUNITIES
PO BOX 1918
PENRITH NSW 2750

Laboratory: Penrith
Job No: 7747/73

PROJECT: SITE CLASSIFICATION
PROPOSED DEVELOPMENT, GROSE VALE ROAD, NORTH RICHMOND, STAGE RIDGETOP 1 & 2

Page 1 of 1

| | | | |
|---------------------------------------|---|--|---|
| Date Tested: 26/11/2022 to 01/12/2022 | | Tested By: NP | |
| | | Checked By: AK | |
| Sample Identification | Test Pit 1 | Test Pit 9 | Test Pit 10 |
| Laboratory Number | 7747/73-1 | 7747/73-3 | 7747/73-4 |
| Depth (m) | 0.6 - 0.8 | 0.4 - 0.6 | 0.5 - 0.7 |
| Test Description | | | |
| Liquid Limit (W _L) | 23% | 29% | 25% |
| Plastic Limit (W _P) | 14% | 18% | 15% |
| Plastic Index (I _P) | 9% | 11% | 10% |
| Linear Shrinkage (LS) | 6.5% | 11.5% | 7.0% |
| Mould Length (mm) | 127 | 125 | 150 |
| Sample History | Oven Dried Dry Sieved | Oven Dried Dry Sieved | Oven Dried Dry Sieved |
| Material Description | FILL: Silty Clay, low plasticity, pale grey, some fine to medium gravel | (CL-CI) Silty CLAY, low to medium plasticity, pale grey some fine to medium gravel | FILL: Silty CLAY, low plasticity, pale grey-brown, trace fo fine to medium gravel |

Form No R004 Version 13 - 07/21 - Issued by ER

Report Date
A Kench 02/12/2022



Nata Accreditation Number 2734
Corporate Site Number 2727

Accredited for compliance with ISO/IEC 17025 - Testing.



Approved Signatory

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TEST RESULTS - ATTERBERG LIMITS
 Test Procedure AS1289 3.1.1, 3.2.1, 3.3.1, 3.4.1

REDBANK COMMUNITIES
 PO BOX 1918
 PENRITH NSW 2750

Laboratory: Penrith
 Job No: 7747/73

PROJECT: SITE CLASSIFICATION
 PROPOSED DEVELOPMENT, GROSE VALE ROAD, NORTH RICHMOND, STAGE RIDGETOP 1 & 2

Page 2 of 1

| | | |
|---------------------------------------|---|---|
| Date Tested: 26/11/2022 to 01/12/2022 | | Tested By: NP |
| | | Checked By: AK |
| Sample Identification | Test Pit 26 | Test Pit 28 |
| Laboratory Number | 7747/73-7 | 7747/73-8 |
| Depth (m) | 0.3 - 0.5 | 0.9 - 1.1 |
| Test Description | | |
| Liquid Limit (W _L) | 42% | 27% |
| Plastic Limit (W _P) | 23% | 14% |
| Plastic Index (I _P) | 19% | 13% |
| Linear Shrinkage (LS) | 11.0% | 8.0% |
| Mould Length (mm) | 125 | 127 |
| Sample History | Oven Dried Dry Sieved | Oven Dried Dry Sieved |
| Material Description | (CI) Silty gravelly CLAY, medium plasticity, orange- brown & grey | FILL: Silty Clay, low plasticity, red-brown with grey mottling, trace of fine to medium gravel |

Form No R004 Version 13 - 07/21 - Issued by ER

Report Date
02/12/2022

A Kench



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TEST RESULTS - SHRINK / SWELL INDEX

REDBANK COMMUNITIES
PO BOX 1918
PENRITH NSW 2750

Laboratory: Penrith
Job No: 7747/73

SITE CLASSIFICATION

PROPOSED DEVELOPMENT, GROSE VALE ROAD, NORTH RICHMOND, STAGE RIDGETOP 1 & 2

Page 1 of 1

| Test Procedure: AS 1289 7.1.1 | | | | |
|-------------------------------|------------|---|---|--|
| Sample Identification | Test Pit 3 | Test Pit 13 | Test Pit 19 | |
| Depth (m) | 0.7 - 0.9 | 0.7 - 0.9 | 0.6 - 0.8 | |
| Laboratory Number | 7747/73-2 | 7747/73-5 | 7747/73-6 | |
| Date Tested: | 26/11/2022 | 26/11/2022 | 26/11/2022 | |
| Tested By: | LC | LC | LC | |
| Checked By: | AK | AK | AK | |
| Test Description | | | | |
| Moisture Content | | | | |
| Initial % | 18.6 | 22.8 | 9.8 | |
| Final % | 23.7 | 27.8 | 17.6 | |
| Swell % | Nil | 2.0 | Nil | |
| Shrinkage % | 1.2 | 1.8 | 1.2 | |
| Shrink/Swell Index %/pF | 0.7 | 1.6 | 0.6 | |
| Material Description | Not Logged | (CL-CI) Silty CLAY, low to medium plasticity, red-brown, trace of fine to medium gravel | FILL: Silty Clay, low plasticity, pale grey-brown, trace of fine to medium gravel | |

Form No R007 Version 13 07/21



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Corporate Site Number 2727

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Report Date
02/12/2022



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