

SOIL CLASSIFICATION REPORT

Client: BELLRIVER HOMES PTY LTD **Job No:** 45856
Site Address: Lot 1213 No. 59 Mona Vale Road, Mona Vale. NSW **Client Job No:** 402515
Date of Report: 17-January-2019

Site Photo



Site Classification

Soil Classification

Wind Classification:

P

M

W28N/N1

Allowable Bearing Capacity

| BH1 Load Depth | |
|----------------|-------|
| 50kpa | 0mm |
| 100kpa | 600mm |
| 150kpa | 800mm |
| 250kpa | 900mm |

| BH2 Load Depth | |
|----------------|--------|
| 50kpa | 0mm |
| 100kpa | 0mm |
| 150kpa | 900mm |
| 250kpa | 1200mm |

1. P-CLASS INDICATORS

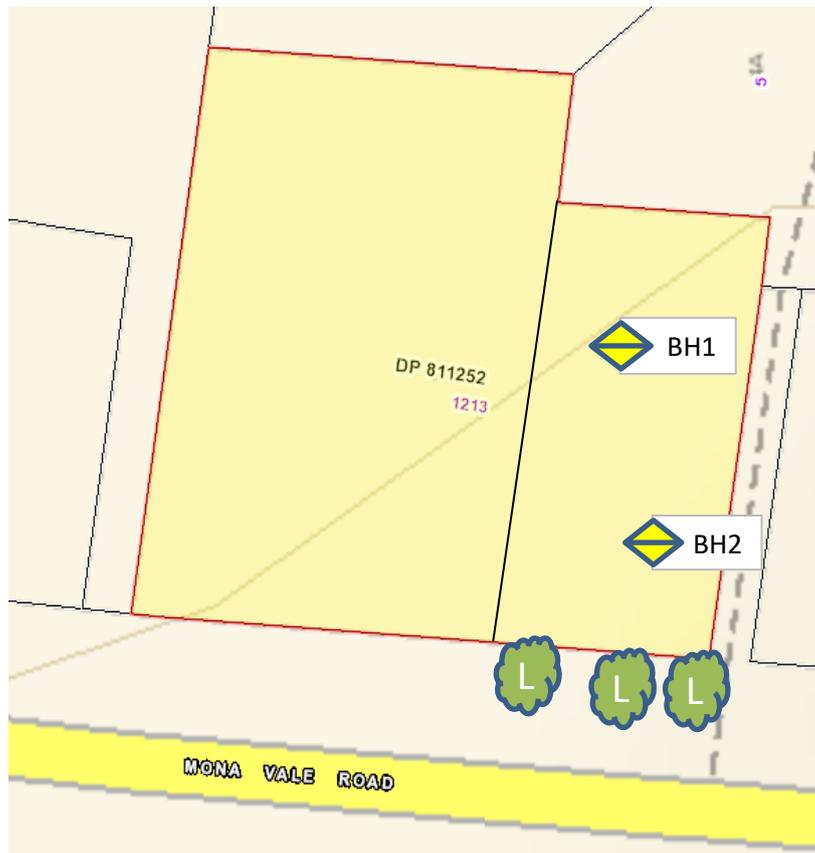
| | |
|--|-----|
| 1.1 Soft & Collapsing Soil: | No |
| 1.2 Trees Onsite: | Yes |
| 1.3 Boulders In Fill Present: | No |
| 1.4 Fill Containing Wood, Metal, Plastic or other Harmful Materials: | No |
| 1.5 Deep Fill (Over 400mm): | Yes |
| 1.6 Knockdown / Rebuild | No |

Notes: **Trees onsite and on the adjoining sites**

2. OTHER CONDITIONS PRESENT

| | |
|--|------------|
| 2.1 Rock Within 1 metre of the Surface: | No |
| 2.2 Marine Environment: | Within 2km |
| 2.3 Water Table/Purged Water Table Encountered | No |

TESTING LOCATION



BORE LOGS/BEARING

| BH1 | | | | |
|-----------|----|-----|-----|--|
| Depth (m) | PP | KPA | DCP | Soil Profile |
| 0.1 | | | 7 | Fill. Silty Clayey Gravelly Sand (SM) |
| | | | 13 | Brown mottled orange grey, dark brown, |
| | | | 10 | Moist-dry,Medium dense-dense |
| | | | 13 | |
| 0.5 | | | 5 | |
| | | | 2 | Becomes loose |
| | | | 3 | Natural. Residual Soil (RS) |
| 1.0 | | | 4 | Silty Sandy Gravelly Clay (CI) |
| | | | 5 | Orange mottled grey,Moist,Stiff |
| | | | 15 | Becomes hard |
| | | | 13 | |
| | | | 40+ | Rock (XW) |
| 1.5 | | | | Drilled due to high strength. |
| | | | | End Bore 1.8m |
| 2.0 | | | | |
| 2.5 | | | | |
| 3.0 | | | | |
| 3.5 | | | | |
| 4.0 | | | | |
| 4.5 | | | | |
| 5.0 | | | | |
| 5.5 | | | | |
| 6.0 | | | | |

| BH2 | | | | |
|-----------|----|-----|-----|-----------------------------------|
| Depth (m) | PP | KPA | DCP | Soil Profile |
| 0.1 | | | 3 | Natural. Sandy Gravelly Silt (ML) |
| | | | 4 | Brown,Dry,Stiff-very stiff |
| | | | 4 | |
| | | | 6 | |
| 0.5 | | | 4 | Grades grey mottled brown |
| | | | 5 | Becomes moist-dry |
| | | | 3 | |
| 1.0 | | | 3 | Natural. Residual Soil (RS) |
| | | | 4 | Silty Sandy Gravelly Clay (CI) |
| | | | 5 | Orange mottled grey,Moist,Stiff |
| | | | 5 | |
| | | | 9 | Becomes hard |
| 1.5 | | | 11 | |
| | | | 21 | |
| | | | 40+ | Rock (XW) |
| | | | | Drilled due to high strength. |
| 2.0 | | | | End Bore 1.8m |
| 2.5 | | | | |
| 3.0 | | | | |
| 3.5 | | | | |
| 4.0 | | | | |
| 4.5 | | | | |
| 5.0 | | | | |
| 5.5 | | | | |
| 6.0 | | | | |

| SAND | | | SILTS & CLAY | | |
|--------------|-------------------|------------------------|------------------|--------------------------------|------------------------|
| Density Term | Density Index (%) | Approx. DCP Blow Count | Consistency Term | Undrained Shear Strength (kPa) | Approx. DCP Blow Count |
| Very Loose | <15 | < 1 | Very Soft | 0 - 12 | < 1 |
| Loose | 15 - 35 | 1 - 3 | Soft | 12 - 25 | 1 - 2 |
| Medium Dense | 35 - 65 | 3 - 9 | Firm | 25 - 50 | 2 - 3 |
| Dense | 65 - 85 | 9 - 15 | Stiff | 50 - 100 | 3 - 5 |
| Very Dense | > 85 | > 15 | Very Stiff | 100 - 200 | 5 - 8 |
| | | | Hard | > 200 | > 8 |

Note: DCP = Dynamic Cone Penetrometer blow counts (blows/100mm);UTP = Unable to penetrate.

PURPOSE

This report is based on our field and laboratory test results and site construction information (if any) supplied to us by the client. Should any proposed construction vary from those advised, this office should be notified as we may need to undertake additional soil testing. It should also be noted that the test results may not be relevant if the location of a proposed structure varies from that originally advised.

This report relates to the ground conditions on the property at the time of the site investigation. If so advised by the client, this report has considered the proposed site preparation. If unadvised cutting or filling is proposed or carried out, additional testing may be required to reclassify the site as indicated in Clause 2.3.2 (B) and Clause 2.5.3 of AS2870-2011.

This site has been classified in accordance with Section 2 of AS2870-2011. The characteristic surface movement, y_s , has been determined either by shrink and swell tests as specified in AS1289.7.1.1-1992 in accordance with Clause 2.3.2 (i) of AS2870-2011, or by visual-tactile identification of the soil with assistance of Atterberg Limits in accordance with Clause 2.3.2 (iii) of AS2870-2011. Results of our site investigation are indicated in the attached Soil Test Results Page.

SITE CLASSIFICATIONS

(in accordance with Clause 2.1.1, Clause 2.1.3, Table 2.1 and Table 2.3 of AS2870-2011)

- A** Most sand and rock sites with little or no ground movement from moisture changes.
- S** Slightly reactive clay sites, which may experience only slight ground movement from moisture changes. Estimated characteristic surface movement, $0 < y_s < 20\text{mm}$.
- M** Moderately reactive clay or silt sites, which may experience moderate ground movement from moisture changes, $20 < y_s < 40\text{mm}$.
- H1** Highly reactive clay sites, which may experience high ground movement from moisture changes, $40 < y_s < 60\text{ mm}$.
- H2** Highly reactive clay sites, which may experience very high ground movement from moisture changes, $60 < y_s < 75\text{ mm}$.
- E** Extremely reactive sites, which may experience extreme ground movement from moisture changes, $y_s > 75\text{ mm}$.
- P** Particular sites, due to either: low bearing strength, potential excessive foundation settlement, fill, mine subsidence, landslip, collapse activity, coastal erosion, abnormal moisture changes or sites which cannot be classified otherwise.

For sites with deep-seated moisture changes characteristic of dry climates and corresponding to a designed depth of suction change, H_s , equal to or greater than 3.0m, classifications M, H1, H2 and E shall include the suffix 'D', as appropriate (eg H1-D).

CONTROLLED AND CERTIFIED FILL – AS2870-2011

If our site investigation indicates that fill is present on site, and we have been provided with documentation from the Company, Reference and Date certifying that this fill has been “controlled” to requirements of the specification and AS2870-2011 with Level 1 supervision in accordance with AS3797-2007. Based upon this we would be able to reclassified the site from Class P in accordance with Clause 2.5.3 (c) of AS2870-11.

UNCONTROLLED FILL

If the investigation indicates that “uncontrolled” fill is present on this site. Any construction on such fill shall be founded in suitable material beneath.

The site shall be given a **P** classification in accordance with Clause 2.5.3 (b) of AS2870-2011.

BEARING CAPACITY

Please refer to Bore Logs/Bearing

SUB-SOIL SEEPAGE OR WATER TABLE

When Sub-soil seepage is encountered in the boreholes at the time of testing. Problems with footing constructions including softening of footing bases and potential collapse of piers is possible. Provisions should be made for fluctuations in the water table and sub-soil seepage entering foundations during constructions.

INFLUENCE OF TREES

Trees onsite or on adjoining sites will be given a **P** classification in accordance with Clause 1.3.3, Clause 2.1.3(e), Appendix H and Appendix CH of AS2870-2011. Trees remove moisture from the soil and result in abnormal moisture conditions occurring on site. On removal of these trees, or if they remain in place, damage to a proposed building may occur without additional treatment.

The design engineer is to be informed of the proposed work in order to provide an appropriate design to address the influence of the trees. This may include one of the following:

- 1) Provisions of piers and stiffening the footing system.
- 2) Provision of a root barrier system acceptable to the design engineer.
- 3) Stiffening the entire slab and footing system to take into consideration the total $y_t = (y_s + y_t / 0.7)$.
- 4) Provision of piers with a suspended slab solution.

INFLUENCE OF PREVIOUS TREES

When recent tree removal is present on this site as indicated by a research of the estate or aerial photographs. The effect of the tree removal can have an affect on the performance the foundation material due to abnormal moisture conditions will be given a P classification in accordance with Clause 1.3.3 of AS2870-2011. It is recommended the design engineer confirms the time frame and location of the tree removal to determine the effect on the footing and slab design.

HOUSE REMOVAL

The removal of the slab and footings or any structure may result in an affect on the moisture condition of the foundation material. The designer is to take into consideration the effect of possible abnormal moisture conditions in accordance with Clause 1.3.3 of AS2870-2011.

DISCLAIMER

This report has been prepared on the behalf of and for the exclusive use of the client stated on page 1.

Structerre Consulting Engineers accepts no liability or responsibility what so ever for the use of this report by any third party.

The purpose of this document is specifically to provide a site classification suitable to be used for residential structures only.

Any preliminary recommendations are based upon the site investigation and site classification only. This is to enable the design engineers to determine their own professional opinion for the final design of the product.

LIMITS OF OUR INVESTIGATION

The recommendations made in this report are based on the assumption that the test results are representative of the overall subsurface conditions. Should excavations reveal variations from the soil conditions indicated in this report, our office should be notified before proceeding as the site classification may need revising and modifications to the design may be required. Also, should we be provided with additional information that affects the site classification, after the report has been issued, an additional fee may be charged to revise and reissue our report.

For and on behalf of

STRUCTERRE CONSULTING ENGINEERS



Paul Schuster
SOILS COORDINATOR

WA | QLD | NSW | VIC

Sydney Office: Unit 1, Second Floor, 42 Birnie Ave, Lidcombe, New South Wales 2141

Phone (+612) 9646 5811 | Fax (+612) 9646 2311 | Email sydney@structerre.com.au | Web www.structerre.com.au

ABN 87 131 748 260 Structerre Consulting Engineers (NSW) Pty Ltd ACN 131 748 260 trading as Structerre Consulting Engineers