Douglas PARTNERS

GROUNDED EXPERTISE

Report on Lot Classification and Salinity Assessment

Proposed Residential Subdivision

"Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

Prepared for Mirvac Homes NSW Pty Ltd

Project 92323.27

13 May 2026

Douglas PARTNERS | GROUNDED EXPERTISE

Document History

Details

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Signature		Date
Author		13 May 2026
Reviewer		13 May 2026

Table of Contents

Report on Lot Classification and Salinity Assessment
Proposed Residential Subdivision
"Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

1. Introduction

This report presents the results of a lot classification and salinity assessment undertaken for a proposed residential subdivision at "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW. The investigation was undertaken in accordance with Douglas Partners Pty Ltd (Douglas) proposal 92323.27.P.002.Rev0 dated 10 April 2025.

The creation of 72 residential lots (Lots 2201 – 2261 and 2301 – 2311) is proposed, and investigation was carried out to provide information on the subsurface conditions to determine the classification of each lot in accordance with the requirements of AS 2870:2011 *Residential Slabs and Footings* and to provide a post bulk earthworks Salinity Management Plan (SMP).

The investigation comprised test pit excavation and dynamic cone penetrometer (DCP) testing followed by laboratory testing of selected samples, engineering analysis and reporting. Details of the field work and laboratory test results are given in this report, together with comments relating to design and construction practice.

This report should be read in conjunction with the notes *About this Report* and the explanatory notes included in Appendix A and Appendix B respectively.

2. Background

Previous investigation incorporating the site was undertaken by Douglas with details given in a report titled "*Report on Preliminary Salinity Assessment, Proposed Residential Subdivision, Lot 2005, D.P. 1162239, Cobbitty, NSW*" (Project 92323.01) dated February 2020 (Douglas, 2020). In summary, results from the investigation indicate that the site soils were non-saline to moderately saline.

Detailed salinity assessment was also undertaken by Geotest Services Pty Ltd (Geotest) with results given in a report titled *"Detailed Salinity Assessment Report, 321 The Northern Road, Cobbitty NSW 2570"* (Project Ref. P33603.1_R01) dated 2 February 2022 (Geotest, 2022). In summary, results from the Geotest 2022 assessment indicate that the soils underlying the site are non-saline to moderately saline, moderately aggressive to concrete and non-aggressive to steel.

3. Site description

The site is irregular in shape with an approximate area of 3.8 hectares and maximum north-south and east-west plan dimensions of some 260 m and 280 m respectively. The site is bounded in all directions by various stages of the ongoing residential development at Cobbitty.

The surface levels across the site slightly fall in a westerly direction at an approximate grade of 1 in 42. The overall difference in level from the lowest part of the site (Pit 33, RL 72.7 mAHD) to the highest part (Pit 7, RL 77.6 mAHD) is approximately 4.9 m.

At the time of the investigation, bulk earthworks were complete, and topsoil had been partially spread across the lots.

4. Regional geology

Reference to the NSW Seamless Geological Series (GSNSW, 2019) indicates that the site is underlain by Bringelly Shale of the Wianamatta Group of Triassic age. This formation typically comprises shale, carbonaceous claystone, laminite, fine to medium-grained lithic sandstone with occasional coal and tuff. Bringelly Shale typically weathers to form clays of medium to high plasticity. The results of the investigation were consistent with the broad-scale geological mapping with residual clays encountered in 24 test pits and shale and/or sandstone encountered in 20 test pits.

5. Field work

5.1 Methods

The field work comprised excavation of 37 test pits (Pits 1 – 37) using a 6-tonne excavator fitted with a 450 mm wide toothed bucket, to depths of 0.2 – 2.5 m. The pits were logged on site by a geotechnical engineer who the collected disturbed and 'undisturbed' samples (in 50 mm diameter thin-walled steel tubes) to assist in strata identification and for laboratory testing.

Dynamic cone penetrometer (DCP) tests (AS 1289.6.3.2) were carried out to depths of up to 1.2 m adjacent to each test location to assess the penetration resistance of the near-surface soils. The results are shown on the attached logs (Appendix B).

The test locations were nominated and located on site by Douglas and are shown on Drawing 1 (Appendix B). The surface levels relative to the Australian Height Datum (AHD) and coordinates to MGA20 given on the logs were recorded using a differential GPS unit for which accuracy of ±0.1 m is typical. It is important to note that Douglas is not a registered surveyor, hence the coordinates and elevations given are considered approximate.

5.2 Results

The results of the test pits are shown on the logs presented in Appendix B and should be read in conjunction with the accompanying notes defining classification methods and descriptive terms.

the succession of strata encountered can be broadly summarised as:

Topsoil fill:	Silty clay topsoil fill to depths of 0.1 – 0.3 m in Pits 7 – 9, 11 – 22, and 26 – 37.
Controlled fill:	Silty clay fill encountered to depths in the range 0.1 – 2.5 m in Pits 1 – 5, 10, 11, 13 – 19, 23, 24, and 27 – 35. Sandy clay fill encountered in Pit 25 to a depth of 0.1 m.
Residual clay:	Generally, very stiff to hard, medium to high plasticity silty clay and/or sandy clay encountered to depths of 0.5 – 2.5 m Pits 1 – 5, 7, 11 – 14, 18 – 21, 26 – 30, and 33 – 37.
Rock:	Generally, very low to low strength shale and/or sandstone encountered in Pits 4 – 12, 20 – 27, and 35 – 37 from depths of 0.0 – 2.3 m and continuing to the termination/refusal depths of 0.2 – 2.5 m.

No free groundwater was observed at any of the test pits during the field work. It is noted that following excavation and sampling, the test pits were immediately backfilled which precluded longer term monitoring of groundwater levels.

6. Laboratory testing

6.1 Shrink-swell index, plasticity and field moisture content

Selected samples from the test locations were tested in the laboratory for measurement of field moisture content, plasticity and shrink-swell index. The detailed laboratory test report sheets are presented in Appendix C, with the results summarised in Table 1.

Table 1: Summary of test results – Shrink-swell index and plasticity

Pit No.	Depth (m)	FMC (%)	LL (%)	PL (%)	PI (%)	LS (%)	I_{ss} (%/ΔpF)	Material
1	0.6 – 0.77	13.8	-	-	-	-	1.2	Fill
2	0.5	13.6	46	17	29	10.0	-	Fill
4	0.5	13.6	32	16	16	8.0	-	Silty Clay
7	0.3 – 0.64	24.5	-	-	-	-	2.3	Silty Clay
11	0.5	10.4	26	18	8	5.0	-	Sandy Clay
15	0.5 – 0.66	14.3	-	-	-	-	0.8	Fill
17	0.6 – 0.78	10.9	-	-	-	-	0.7	Fill
20	0.5 – 0.79	19.5	-	-	-	-	1.0	Silty Clay
21	0.4 – 0.59	13.0	37	19	18	9.5	-	Silty Clay
27	0.5	14.0	45	22	23	13.0	-	Fill
29	0.5	10.3	33	24	9	3.5	-	Fill
31	0.5	8.0	27	17	10	7.0	-	Fill
32	0.5 – 0.71	22.1	-	-	-	-	3.0	Fill
35	0.6 – 0.89	17.1	-	-	-	-	1.9	Fill

Where: FMC = Field moisture content, PL = Plastic limit, LL = Liquid limit, PI = Plasticity Index, LS = Linear shrinkage
Iss = Shrink-swell index

The field moisture content of the tested samples generally ranged between approximately 8.0% and 24.5%, with several samples recorded below their respective plastic limits, indicating relatively dry in-situ conditions at the time of testing. The plasticity test results indicate that the soils range from low to medium plasticity and would be susceptible to shrink-swell movements with changes in the soils moisture content. The shrink-swell index (I_{ss}) results indicate that the soils range from low to high shrink-swell potential.

6.2 Salinity, aggressivity, sodicity and dispersibility

Selected samples collected from the test pits were tested in the laboratory for determination of aggressivity to concrete and steel, sodicity (erosion potential), Emerson class number (dispersion potential), textural classification and salinity.

The detailed laboratory report sheets along with Summary Table C1 presenting the individual test results are presented in Appendix C. Table C1 also presents aggressivity and salinity classifications for each sample tested based on pH, chloride concentration, sulphate concentration, calculated resistivity and calculated ECe values.

The number of samples tested for each parameter and the range of test results obtained are summarised in Table 2.

Table 2: Results of laboratory testing – Chemical

Parameter		Units	Number of tests	Range of results
pH		pH units	54	5.0 – 11.3
Chlorides		(mg/kg)	9	45 – 900
Sulphates		(mg/kg)	9	10 – 250
Aggressivity (AS 2159: 2009)	to Concrete	-	54	Non-aggressive to mildly aggressive
	to Steel	-	54	Non-aggressive to mildly aggressive
Exchangeable Sodium (Na)		(meq/100g)	4	1.0 – 2.9
CEC (cation exchange capacity)		(meq/100g)	4	12 – 19
Sodicity [Na/CEC]		(ESP%)	4	Sodic to highly sodic
Emerson Class Number		-	2	2
EC1:5 [Lab.]		(mS/cm)	54	5.2 – 726.9
Resistivity		Ω.cm	54	1376 – 192308
ECe [M x EC1:5]		(dS/m)	54	0.1 – 4.4
Salinity Class (Richards, 1954)		-	54	Non-saline to moderately saline

Where M = soil textural factor

6.2.1 Salinity

Sample salinity classifications (refer Table C1, Appendix C) are based on calculated ECe values using the method of Richards *"Diagnosis of Saline and Alkaline Soils."* (Richards, 1954).

The results indicate that 36 samples were non-saline, 17 samples were slightly saline, and one sample was moderately saline.

6.2.2 Aggressivity

Sample aggressivity classifications (refer Table C1, Appendix C) are based on pH, sulphate concentration, chloride concentration and calculated resistivity values and are assessed in accordance with AS 2159 *"Piling Design and Installation"* (AS 2159, 2009). The inferred very low

permeability of the sampled clay-rich soils indicates that soils at all test pits are in Condition "B" (AS 2159, 2009).

The results indicate that:

- 47 samples were non-aggressive and seven were mildly aggressive to concrete; and
- 51 samples were non-aggressive and three were mildly aggressive to steel.

Compared to the previous Geotest 2022 assessment, which reported soils as moderately aggressive to concrete and non-aggressive to steel, the current results indicate generally lower aggressivity to concrete and similar to slightly higher aggressivity to steel.

6.2.3 Sodicity and dispersibility

The sodicity test results (refer Table C1, Appendix C) indicate soils are sodic to highly sodic and would have potential for soil erosion if left exposed.

Emerson class number testing undertaken on two samples (Pits 4 and 31) at a depth of 0.5 m below ground level indicate shallow soils are Class 2, indicating potential for dispersion.

7. Comments

7.1 Subsurface conditions

The results of the test pits indicate that the subsurface conditions comprise:

- Topsoil fill (in parts), silty clay, overlying;
- Controlled fill (in parts) associated with subdivision construction; and/or
- Residual clays (in parts) – typically very stiff to hard; overlying
- Rock comprising shale and/or sandstone, typically very low to low strength, belonging to the Bringelly Shale formation.

Groundwater likely to be within the underlying rock profile, although seepage would be expected at the clay/rock interface and through rock joints, subject to preceding climatic conditions. It is noted that groundwater levels can fluctuate with seasonal climatic changes and variability in the permeability of the subsurface strata.

7.2 Fill placed on allotments

To achieve the required design levels, fill of up to and greater than approximately 3 m in depth has been placed in the southernmost portion of the site, decreasing progressively towards the north and becoming negligible in the northern lots of the site, as shown on the WAEX fill plan dated 13 May 2026 prepared by Orion Consulting Engineers Pty Ltd (Appendix D). The fill plan is understood to represent the difference between the stripped surface levels and the finished surface levels of the controlled fill. Based on the fill plan and the results of the field investigation, the estimated fill depths across the individual lots are summarised in Table 3. It is noted that some localised variation in fill depth may occur between the WAEX contours and actual site conditions, particularly where tree stumps or similar obstructions have been removed and the resulting voids backfilled with controlled fill.

Table 3: Controlled fill summary

Lot no.	Depth of controlled fill (m)	Lot no.	Depth of controlled fill (m)	Lot no.	Depth of controlled fill (m)	Lot no.	Depth of controlled fill (m)
2201	1.75 – 2.25	2219	2.25 – 3.0	2237	0 – 0.5	2255	2.0 – 3.0
2202	1.5 – 2.25	2220	2.25 – 2.75	2238	0 – 1.0	2256	2.25 – 3.0
2203	1.0 – 1.75	2221	1.75 – 2.5	2239	0 – 1.5	2257	2.25 – >3.0
2204	0.75 – 1.5	2222	1.25 – 2.5	2240	0.5 – 2.0	2258	2.0 – 2.5
2205	0.5 – 1.25	2223	1.0 – 2.0	2241	0.75 – 2.25	2259	1.75 – 2.5
2206	0.25 – 1.0	2224	0.5 – 1.5	2242	1.25 – 2.5	2260	1.5 – 2.25
2207	0 – 0.5	2225	0 – 1.0	2243	1.75 – 2.75	2261	1.0 – 2.0
2208	0 – 0.25	2226	0 – 0.25	2244	0	2301	0.25 – 1.5
2209	0	2227	0	2245	0	2302	0 – 1.0
2210	0	2228	0	2246	0	2303	0
2211	0	2229	0	2247	0 – 0.75	2304	0
2212	0	2230	0	2248	0 – 1.25	2305	0
2213	0	2231	0	2249	0.75 – 1.75	2306	0
2214	0	2232	0	2250	1.0 – 2.0	2307	0
2215	2.0 – 3.0	2233	0	2251	1.5 – 2.25	2308	0
2216	2.25 – 3.0	2234	0	2252	1.75 – 2.75	2309	0
2217	2.25 – 2.75	2235	0	2253	2.25 – >3.0	2310	0
2218	2.25 – 2.75	2236	0	2254	2.25 – 3.0	2311	0

The results of Level 1 inspection and testing for (controlled) fill carried out by Douglas indicate that the project specification minimum density ratio of 98% relative to Standard maximum dry density (SMDD) has been achieved. This satisfies Camden Council's specified minimum dry density ratio of 95% SMDD. Moisture content of the fill was maintained within 2% of OMC (where OMC is the optimum moisture content for Standard compaction). A report titled 'Level 1 Inspections and Testing of Filling' has been prepared (Project 220469.14) for earthworks testing operations and inspections completed during the period 25 August 2025 to 18 February 2026 for "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty, Cobbitty NSW. The report is included in Appendix C and includes the test result summary sheets and a test location plan.

7.3 Lot classification

Lot classification has been carried out by estimation of characteristic surface movements (y_s) using the methods outlined in AS 20870:2011, taking account of the subsurface profiles determined from the current test locations and WAEX fill plan, together with actual and inferred shrink-swell index values from laboratory soil test results.

Characteristic surface movements (y_s) of up to approximately 60 mm are predicted for the lots. Accordingly, the lot classifications have been determined and are summarised in Table 3.

Table 3: Lot classification summary

Lot no.	Lot classification
2201 – 2202	M*
2203 – 2206	H1*
2207 – 2208	M*
2209 – 2214	M
2215 – 2226	M*
2227 – 2236	M
2237 – 2243	M*
2244 – 2246	M
2247 – 2251	M*
2252 – 2255	H1*
2256 – 2261	M*
2301 – 2302	M*
2303 – 2311	M

Where: M = Class M (moderately reactive), H1 = Class H1 (highly reactive), * = filled lot

It should be noted that the classifications given in Table 3 are appropriate for the undeveloped lots at the time of this report and revision of the classifications may be required once development details and proposed site works for individual lots are known. AS 2870:2011 recommends that the classification of a site should be reconsidered if the depth of subsequent cutting exceeds 0.5 m or depth of subsequent fill exceeds 0.4 m.

7.4 Site preparation

Subject to site-specific design requirements, site preparation for the construction of residential structures will most likely include the removal of all vegetation, organic topsoils and other deleterious materials from the building area.

Where a level building platform is to be constructed by cut and fill methods, reference should be made to AS 2870 which gives guidelines on fill placement methods and specification for compaction. The placement and compaction of fill should also be carried out in accordance with the requirements of Camden Council.

The requirements of Camden Council for controlled fill specify compaction of cohesive (clay) fill to a minimum dry density ratio of 95% relative to Standard compaction. Moisture content of the fill should be maintained near OMC measured in the Standard compaction test. Density testing would be required to confirm the placement of fill in the above controlled manner.

7.5 Footings

It is recommended that footing systems be designed and constructed in accordance with AS 2870:2011 for the nominated classification (refer Section 7.3) and the additional requirements given in this report.

Footing systems founded uniformly in natural stiff or stronger clay or the controlled fill could be designed using an allowable bearing pressure of 150 kPa. Footings founded in very low strength (or stronger) rock could be designed using an allowable bearing pressure of 700 kPa.

Where footing systems are proposed adjacent to services or retaining walls or located through areas of uncontrolled fill (for example, following construction of a level building platform placed without engineering control), local deepening of the footings or alternatively the inclusion of piers will most likely be required. Founding levels should also be constructed below the zone of influence of the service trenches and retaining walls, which is generally taken to be within a 45° (i.e.: 1 horizontal:1 vertical) line extending from the base of the trench or retaining wall to the ground surface and through fill to the residual (undisturbed) soils or weathered rock.

Where partial rock foundations result following construction of cut to fill platforms or where exposed conditions include controlled fill, residual soils/rock and/or large variations in controlled fill depth, reference must be made to AS 2870:2011 regarding the provision of articulation within the structure and/or the construction of a foundation system that provides uniform bearing.

All footing systems should be designed and constructed in accordance with sound engineering principles, with care exercised to ensure that footing trenches/piers are inspected for design compliance prior to the placement of steel and pouring of concrete.

Where raft slabs are proposed, the raft stiffness should be designed in accordance with the designated lot classification and the requirements of AS 2870:2011. If a suspended raft is proposed, then it must take account of the likely range of swell movements of the construction platform for the relevant classification.

Masonry walls should be articulated in accordance with Cement Concrete & Aggregates Australia *"Technical Note 61, Articulated Walling"* (CCAA, 2008).

7.6 Site management and drainage

The site classifications in Section 7.3 are conditional on the developed lots being maintained in accordance with the CSIRO publication *Foundation Maintenance and Footing Performance: A Homeowners Guide,* a copy of which is included in Appendix E.

Whilst it must be accepted that some minor cracking in most structures is inevitable on reactive sites, the guide describes suggested site maintenance practices aimed at limiting foundation movements and at keeping cracking within acceptable limits.

Surface drainage should be installed and maintained at the site. If drainage measures (surface and subsurface) are not installed and maintained adverse moisture conditions could arise, and footing performance could be compromised. All collected stormwater, groundwater and roof runoff should be discharged into the stormwater disposal system.

8. Salinity management plan

Based on the laboratory test results, and encountered subsurface conditions, the adopted aggressivity to concrete and steel and salinity classifications for each lot are summarised in Table 4.

Table 4: Aggressivity and salinity classification summary

Lot no.	Exposure classification for concrete (AS 3600)	Exposure classification for concrete piles (AS 2159)	Exposure classification for steel piles (AS 2159)	Salinity classification (Richards 1954)
2201 – 2203	A1	Non-aggressive	Non-aggressive	Slightly saline
2204 – 2207	A1	Mildly aggressive	Non-aggressive	Slightly saline
2208 – 2214	A1	Non-aggressive	Non-aggressive	Slightly saline
2215 – 2217	A2	Mildly aggressive	Mildly aggressive	Moderately saline
2218 – 2223	A2	Mildly aggressive	Non-aggressive	Moderately saline
2224 – 2227	A1	Mildly aggressive	Non-aggressive	Non-saline
2228 – 2235	A1	Non-aggressive	Non-aggressive	Non-saline
2236 – 2239	A1	Mildly aggressive	Non-aggressive	Non-saline
2240	A2	Mildly aggressive	Non-aggressive	Moderately saline
2241 – 2243	A2	Mildly aggressive	Mildly aggressive	Moderately saline
2244 – 2247	A1	Non-aggressive	Non-aggressive	Slightly saline
2248 – 2251	A1	Mildly aggressive	Mildly aggressive	Slightly saline
2252 – 2261	A1	Non-aggressive	Non-aggressive	Slightly saline
2301 – 2311	A1	Non-aggressive	Non-aggressive	Slightly saline

The classifications given in Table 4 must be taken into account by the designer when determining durability and corrosion requirements as per AS 3600:2018 *"Concrete Structures"* (AS 3600, 2018), AS 2159:2009 *"Piling Design and Installation"* (AS 2159, 2009) and *"Precast concrete pipes"* (AS 4058, 2007) for:

- Concrete foundations and concrete structure (AS 3600).
- Concrete piles (AS 2159).
- Corrosion allowances for steel (as per AS 2159).
- Precast concrete pipes (as per AS 4058).

The above should be complementary to standard building practices.

This salinity management plan (SMP) is a post earthworks assessment only and as such, the classifications given within do not apply to services previously installed during the bulk earthworks and civil works phases of the development.

9. References

AS 2159. (2009). *Piling Design and Installation.* Standards Australia.

AS 2870. (2011). *Residential Slabs and Footings.* Standards Australia.

AS 3600. (2018). *Concrete Structures.* including Amendment 1:2018 and Amendment 2:2021: Standard Australia.

AS 4058. (2007). *Precast Concrete Pipe (Pressure and Non-Pressure).* Australian Standard.

CCAA. (2008). *TN61, Articulated Walling.* Technical Note 61, 3rd Edition: Cement Concrete & Aggregates Australia.

Douglas. (2020). *Report on Preliminary Salinity Assessment, Proposed Residential Subdivision, Lot 2005, D.P. 1162239, Cobbitty, NSW.* Macarthur: Douglas Partners Pty Ltd, Project 92323.01.

Geotest. (2022). *Detailed Salinity Assessment Report, 321 The Northern Road, Cobbitty NSW 2570.* Sydney: Geotest Services Pty Ltd, Project Ref. P33603.1_R01.

GSNSW. (2019). *NSW Seamless Geology.* Geological Survey NSW Web Map Service.

Richards, L. A. (1954). *Diagnosis of Saline and Alkaline Soils.* Washington D.C: US Department of Agriculture.

10. Limitations

Douglas has prepared this report for this project at "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW in line with Douglas' proposal dated 10 April 2025. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Mirvac Homes NSW Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations.

The assessment of atypical safety hazards arising from this advice is restricted to the (geotechnical) components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be

provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Appendix A

About this Report

About this Report

October 2024

Introduction

These notes have been provided to amplify Douglas' report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

Douglas' reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, Douglas will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, Douglas cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, Douglas will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, Douglas requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. Douglas would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Appendix B

Explanatory notes

Drawing 1 – Test location plan

Test pit logs (1 – 37)

Terminology, Symbols and Abbreviations

November 2023

Introduction to Terminology, Symbols and Abbreviations

Douglas Partners' reports, investigation logs, and other correspondence may use terminology which has quantitative or qualitative connotations. To remove ambiguity or uncertainty surrounding the use of such terms, the following sets of notes pages may be attached Douglas Partners' reports, depending on the work performed and conditions encountered:

- Soil Descriptions;
- Rock Descriptions; and
- Sampling, insitu testing, and drilling methodologies

In addition to these pages, the following notes generally apply to most documents.

Abbreviation Codes

Site conditions may also be presented in a number of different formats, such as investigation logs, field mapping, or as a written summary. In some of these formats textual or symbolic terminology may be presented using textual abbreviation codes or graphic symbols, and, where commonly used, these are listed alongside the terminology definition. For ease of identification in these note pages, textual codes are presented in these notes in the following style XW. Code usage conforms with the following guidelines:

- Textual codes are case insensitive, although herein they are generally presented in upper case; and
- Textual codes are contextual (i.e. the same or similar combinations of characters may be used in different contexts with different meanings (for example `PL` is used for plastic limit in the context of soil moisture condition, as well as in `PL(A)` for point load test result in the testing results column)).

Data Integrity Codes

Subsurface investigation data recorded by Douglas Partners is generally managed in a highly structured database environment, where records "span" between a top and bottom depth interval. Depth interval "gaps" between records are considered to introduce ambiguity, and, where appropriate, our practice guidelines may require contiguous data sets. Recording meaningful data is not always appropriate (for example assigning a "strength" to a concrete pavement) and the following codes may be used to maintain contiguity in such circumstances.

Term	Description	Abbreviation Code
Core loss	No core recovery	KL
Unknown	Information was not available to allow classification of the property. For example, when auguring in loose, saturated sand auger cuttings may not be returned.	UK
No data	Information required to allow classification of the property was not available. For example if drilling is commenced from the base of a hole predrilled by others	ND
Not Applicable	Derivation of the properties not appropriate or beyond the scope of the investigation. For example providing a description of the strength of a concrete pavement	NA

Graphic Symbols

Douglas Partners' logs contain a "graphic" column which provides a pictorial representation of the basic composition of the material. The symbols used are directly representing the material name stated in the adjacent "Description of Strata" column, and as such no specific graphic symbology legend has been provided in these notes.

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Soil Descriptions

Terminology
Symbols
Abbreviations

March 2024

Introduction

All materials which are not considered to be "in-situ rock" are described in general accordance with the soil description model of AS 1726-2017 Part 6.1.3, and can be broken down into the following description structure:

The "classification" comprises a two character "group symbol" providing a general summary of dominant soil characteristics. The "name" summarises the particle sizes within the soil which most influence its behaviour. The detailed description presents more information about composition, condition, structure, and origin of the soil.

Classification, naming and description of soils require the relative proportion of particles of different sizes within the whole soil mixture to be considered.

Particle size designation and Behaviour Model

Solid particles within a soil are differentiated on the basis of size.

The engineering behaviour properties of a soil can subsequently be modelled to be either "fine grained" (also known as "cohesive" behaviour) or "coarse grained" ("non cohesive" behaviour), depending on the relative proportion of fine or coarse fractions in the soil mixture.

Particle Size Designation	Particle Size (mm)	Behaviour Model	
		Behaviour	Approximate Dry Mass
Boulder	>200	Excluded from particle behaviour model as "oversize"	
Cobble	63 - 200		
Gravel[1]	2.36 - 63	Coarse	>65%
Sand[1]	0.075 - 2.36		
Silt	0.002 - 0.075	Fine	>35%
Clay	<0.002		

[1] – refer grain size subdivision descriptions below

The behaviour model boundaries defined above are not precise, and the material behaviour should be assumed from the name given to the material (which considers the particle fraction which dominates the behaviour, refer "component proportions" below), rather than strict observance of the proportions of particle sizes. For example, if a material is named a "Sandy CLAY", this is indicative that the material exhibits fine grained behaviour, even if the dry mass of coarse grained material may exceed 65%.

Component proportions

The relative proportion of the dry mass of each particle size fraction is assessed to be a "primary", "secondary", or "minor" component of the soil mixture, depending on its influence over the soil behaviour.

Component Proportion Designation	Definition[1]	Relative Proportion	
		In Fine Grained Soil	In Coarse Grained Soil
Primary	The component (particle size designation, refer above) which dominates the engineering behaviour of the soil	The clay/silt component with the greater proportion	The sand/gravel component with the greater proportion
Secondary	Any component which is not the primary, but is significant to the engineering properties of the soil	Any component with greater than 30% proportion	Any granular component with greater than 30%; or Any fine component with greater than 12%
Minor[2]	Present in the soil, but not significant to its engineering properties	All other components	All other components

[1] As defined in AS1726-2017 6.1.4.4

[2] In the detailed material description, minor components are split into two further sub-categories. Refer "identification of minor components" below.

Composite Materials

In certain situations, a lithology description may describe more than one material, for example, collectively describing a layer of interbedded sand and clay. In such a scenario, the two materials would be described independently, with the names preceded or followed by a statement describing the arrangement by which the materials co-exist. For example, "INTERBEDDED Silty CLAY AND SAND".

Soil Descriptions

Classification

The soil classification comprises a two character group symbol. The first character identifies the primary component. The second character identifies either the grading or presence of fines in a coarse grained soil, or the plasticity in a fine grained soil. Refer AS1726-2017 6.1.6 for further clarification.

Soil Name

For most soils, the name is derived with the primary component included as the noun (in upper case), preceded by any secondary components stated in an adjective form. In this way, the soil name also describes the general composition and indicates the dominant behaviour of the material.

Component [1]	Prominence in Soil Name
Primary	Noun (eg "CLAY")
Secondary	Adjective modifier (eg "Sandy")
Minor	No influence

[1] – for determination of component proportions, refer component proportions on previous page

For materials which cannot be disaggregated, or which are not comprised of rock or mineral fragments, the names "ORGANIC MATTER" or "ARTIFICIAL MATERIAL" may be used, in accordance with AS1726-2017 Table 14.

Commercial or colloquial names are not used for the soil name where a component derived name is possible (for example "Gravelly SAND" rather than "CRACKER DUST").

Materials of "fill" or "topsoil" origin are generally assigned a name derived from the primary/secondary component (where appropriate). In log descriptions this is preceded by uppercase "FILL" or "TOPSOIL". Origin uncertainty is indicated in the description by the characters (?), with the degree of uncertainty described (using the terms "probably" or "possibly" in the origin column, or at the end of the description).

Identification of minor components

Minor components are identified in the soil description immediately following the soil name. The minor component fraction is usually preceded with a term indicating the relative proportion of the component.

Minor Component Proportion Term	Relative Proportion	
	In Fine Grained Soil	In Coarse Grained Soil
With	All fractions: 15-30%	Clay/silt: 5-12% sand/gravel: 15-30%
Trace	All fractions: 0-15%	Clay/silt: 0-5% sand/gravel: 0-15%

The terms "with" and "trace" generally apply only to gravel or fine particle fractions. Where cobbles/boulders are encountered in minor proportions (generally less than about 12%) the term "occasional" may be used. This term describes the sporadic distribution of the material within the confines of the investigation excavation only, and there may be considerable variation in proportion over a wider area which is difficult to factually characterise due to the relative size of the particles and the investigation methods.

Soil Composition

Plasticity

Descriptive Term	Laboratory liquid limit range	
	Silt	Clay
Non-plastic materials	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

Note, Plasticity descriptions generally describe the plasticity behaviour of the whole of the fine grained soil, not individual fine grained fractions.

Grain Size

Type		Particle size (mm)
Gravel	Coarse	19 - 63
	Medium	6.7 - 19
	Fine	2.36 – 6.7
Sand	Coarse	0.6 - 2.36
	Medium	0.21 - 0.6
	Fine	0.075 - 0.21

Grading

Grading Term	Particle size (mm)
Well	A good representation of all particle sizes
Poorly	An excess or deficiency of particular sizes within the specified range
Uniformly	Essentially of one size
Gap	A deficiency of a particular size or size range within the total range

Note, AS1726-2017 provides terminology for additional attributes not listed here.

Soil Condition

Moisture

The moisture condition of soils is assessed relative to the plastic limit for fine grained soils, while for coarse grained soils it is assessed based on the appearance and feel of the material. The moisture condition of a material is considered to be independent of stratigraphy (although commonly these are related), and this data is presented in its own column on logs.

Applicability	Term	Tactile Assessment	Abbreviation code
Fine	Dry of plastic limit	Hard and friable or powdery	w<PL
	Near plastic limit	Can be moulded	w=PL
	Wet of plastic limit	Water residue remains on hands when handling	w>PL
	Near liquid limit	"oozes" when agitated	w=LL
	Wet of liquid limit	"oozes"	w>LL
Coarse	Dry	Non-cohesive and free running	D
	Moist	Feels cool, darkened in colour, particles may stick together	M
	Wet	Feels cool, darkened in colour, particles may stick together, free water forms when handling	W

The abbreviation code NDF, meaning "not-assessable due to drilling fluid use" may also be used.

Note, observations relating to free ground water or drilling fluids are provided independent of soil moisture condition.

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

These concepts give an indication of how the material may respond to applied forces (when considered in conjunction with other attributes of the soil). This behaviour can vary independent of the composition of the material, and on logs these are described in an independent column and are generally mutually exclusive (i.e it is inappropriate to describe both consistency and compaction at the same time). The method by which the behaviour is described depends on the behaviour model and other characteristics of the soil as follows:

- In fine grained soils, the "consistency" describes the ease with which the soil can be remoulded, and is generally correlated against the materials undrained shear strength;
- In granular materials, the relative density describes how tightly packed the particles are, and is generally correlated against the density index;
- In anthropogenically modified materials, the compaction of the material is described qualitatively;
- In cemented soils (both natural and anthropogenic), the cemented "strength" is described qualitatively, relative to the difficulty with which the material is disaggregated; and
- In soils of extremely weathered material origin, the engineering behaviour may be governed by relic rock features, and expected behaviour needs to be assessed based the overall material description.

Quantitative engineering performance of these materials may be determined by laboratory testing or estimated by correlated field tests (for example penetration or shear vane testing). In some cases, performance may be assessed by tactile or other subjective methods, in which case investigation logs will show the estimated value enclosed in round brackets, for example (VS).

Consistency (fine grained soils)

Consistency Term	Tactile Assessment	Undrained Shear Strength (kPa)	Abbreviation Code
Very soft	Extrudes between fingers when squeezed	<12	VS
Soft	Mouldable with light finger pressure	>12 - ≤25	S
Firm	Mouldable with strong finger pressure	>25 - ≤50	F
Stiff	Cannot be moulded by fingers	>50 - ≤100	St
Very stiff	Indented by thumbnail	>100 - ≤200	VSt
Hard	Indented by thumbnail with difficulty	>200	H
Friable	Easily crumbled or broken into small pieces by hand	-	Fr

Relative Density (coarse grained soils)

Relative Density Term	Density Index	Abbreviation Code
Very loose	<15	VL
Loose	>15 - ≤35	L
Medium dense	>35 - ≤65	MD
Dense	>65 - ≤85	D
Very dense	>85	VD

Note, tactile assessment of relative density is difficult, and generally requires penetration testing, hence a tactile assessment guide is not provided.

Compaction (anthropogenically modified soil)

Compaction Term	Abbreviation Code
Well compacted	WC
Poorly compacted	PC
Moderately compacted	MC
Variably compacted	VC

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

AS1726-2017 considers weathered material to be soil if the unconfined compressive strength is less than 0.6 MPa (i.e. less than very low strength rock). These materials may be identified as "extremely weathered material" in reports and by the abbreviation code XWM on log sheets. This identification is not correlated to any specific qualitative or quantitative behaviour, and the engineering properties of this material must therefore be assessed according to engineering principles with reference to any relic rock structure, fabric, or texture described in the description.

Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RS
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than 'very low' as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Fluvial	Deposited by channel fill and overbank (natural levee, crevasse splay or flood basin)	FLV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LAC
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Slopewash	Thin layers of soil and rock debris gradually and slowly deposited by gravity and possibly water	SW
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or seashore	LIT
Unidentifiable	Not able to be identified	UID

Cobbles and Boulders

The presence of particles considered to be "oversize" may be described using one of the following strategies:

- Oversize encountered in a minor proportion (when considered relative to the wider area) are noted in the soil description; or
- Where a significant proportion of oversize is encountered, the cobbles/boulders are described independent of the soil description, in a similar manner to composite soils (described above) but qualified with "MIXTURE OF".

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Rock Strength

Rock strength is defined by the unconfined compressive strength, and it refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects.

The Point Load Strength Index $I_{s(50)}$ is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

Strength Term	Unconfined Compressive Strength (MPa)	Point Load Index[1] $I_{s(50)}$ MPa	Abbreviation Code
Very low	0.6 - 2	0.03 - 0.1	VL
Low	2 - 6	0.1 - 0.3	L
Medium	6 - 20	0.3 - 1.0	M
High	20 - 60	1 - 3	H
Very high	60 - 200	3 - 10	VH
Extremely high	>200	>10	EH

[1] Rock strength classification is based on UCS. The UCS to $I_{s(50)}$ ratio varies significantly for different rock types and specific ratios may be required for each site. The point load Index ranges shown above are as suggested in AS1726 and should not be relied upon without supporting evidence.

The following abbreviation codes are used for soil layers or seams of material "within rock" but for which the equivalent UCS strength is less than 0.6 MPa.

Scenario	Abbreviation Code
The material encountered has an equivalent UCS strength of less than 0.6 MPa, and therefore is considered to be soil (as per Note 1 of Table 20 of AS 1726-2017). The properties of the material encountered over this interval are described in the "Description of Strata" and soil properties columns.	SOIL
The material encountered has an equivalent UCS strength of less than 0.6 MPa, and therefore is considered to be soil (as per Note 1 of Table 20 of AS 1726-2017). The prominence of the material is such that it can be considered to be a seam (as defined in Table 22 of AS1726-2017) and the properties of the material are described in the defect column.	SEAM

Degree of Weathering

The degree of weathering of rock is classified as follows:

Weathering Term	Description	Abbreviation Code
Residual Soil[1]	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.	RS
Extremely weathered[1]	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible	XW
Highly weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching or may be decreased due to deposition of weathering products in pores.	HW
Moderately weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable but shows little or no change of strength from fresh rock.	MW
Slightly weathered	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.	SW
Fresh	No signs of decomposition or staining.	FR
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.	DW

[1] The parent rock type, of which the residual/extremely weathered material is a derivative, will be stated in the description (where discernible).

Degree of Alteration

The degree of alteration of the rock material (physical or chemical changes caused by hot gasses or liquids at depth) is classified as follows:

Term	Description	Abbreviation Code
Extremely altered	Material is altered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.	XA
Highly altered	The whole of the rock material is discoloured, usually by staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is changed by alteration. Some primary minerals are altered to clay minerals. Porosity may be increased by leaching or may be decreased due to precipitation of secondary materials in pores.	HA
Moderately altered	The whole of the rock material is discoloured, usually by staining or bleaching to the extent that the colour of the original rock is not recognisable but shows little or no change of strength from fresh rock.	MA
Slightly altered	Rock is slightly discoloured but shows little or no change of strength from fresh rock	SA
Note: If HA and MA cannot be differentiated use DA (see below)		
Distinctly altered	Rock strength usually changed by alteration. The rock may be highly discoloured, usually by staining or bleaching. Porosity may be increased by leaching or may be decreased due to precipitation of secondary minerals in pores.	DA

Degree of Fracturing

The following descriptive classification apply to the spacing of natural occurring fractures in the rock mass. It includes bedding plane partings, joints and other defects, but excludes drilling breaks. These terms are generally not required on investigation logs where fracture spacing is presented as a histogram, and where used are presented in an unabbreviated format.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with occasional fragments
Fractured	Core lengths of 30-100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths of 300 mm or longer with occasional sections of 100-300 mm
Unbroken	Core contains very few fractures

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections > 100 mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or stronger. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e., drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

These terms may be used to describe the spacing of bedding partings in sedimentary rocks. Where used, these terms are generally presented in an unabbreviated format

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Defect Descriptions

Defect Type

Term	Abbreviation Code
Bedding plane	B
Cleavage	CL
Crushed seam	CS
Crushed zone	CZ
Drilling break	DB
Decomposed seam	DS
Drill lift	DL
Extremely Weathered seam	EW
Fault	F
Fracture	FC
Fragmented	FG
Handling break	HB
Infilled seam	IS
Joint	JT
Lamination	LAM
Shear seam	SS
Shear zone	SZ
Vein	VN
Mechanical break	MB
Parting	P
Sheared Surface	S

Rock Defect Orientation

Term	Abbreviation Code
Horizontal	H
Vertical	V
Sub-horizontal	SH
Sub-vertical	SV

Rock Defect Coating

Term	Abbreviation Code
Clean	CN
Coating	CT
Healed	HE
Infilled	INF
Stained	SN
Tight	TI
Veneer	VNR

Rock Defect Infill

Term	Abbreviation Code
Calcite	CA
Carbonaceous	CBS
Clay	CLAY
Iron oxide	FE
Manganese	MN
Pyrite	Py
Secondary material	MS
Silt	M
Quartz	Qz
Unidentified material	MU

Rock Defect Shape/Planarity

Term	Abbreviation Code
Curved	CU
Discontinuous	DIS
Irregular	IR
Planar	PR
Stepped	ST
Undulating	UN

Rock Defect Roughness

Term	Abbreviation Code
Polished	PO
Rough	RF
Smooth	SM
Slickensided	SL
Very rough	VR

Defect Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

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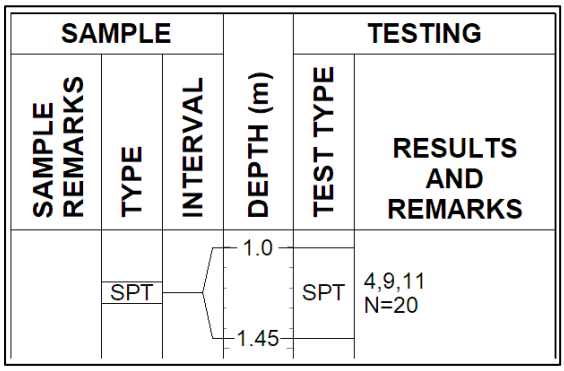
Sampling and Testing

A record of samples retained, and field testing performed is usually shown on a Douglas Partners' log with samples appearing to the left of a depth scale, and selected field and laboratory testing (including results, where relevant) appearing to the right of the scale, as illustrated below:



Sampling

The type or intended purpose for which a sample was taken is indicated by the following abbreviation codes.

Sample Type	Code
Auger sample	A
Acid Sulfate sample	ASS
Bulk sample	B
Core sample	C
Disturbed sample	D
Environmental sample	ES
Driven Tube sample	DT
Gas sample	G
Piston sample	P
Sample from SPT test	SPT
Undisturbed tube sample	U[1]
Water sample	W
Material Sample	MT
Core sample for unconfined compressive strength testing	UCS

[1] – numeric suffixes indicate tube diameter/width in mm

The above codes only indicate that a sample was retained, and not that testing was scheduled or performed.

Field and Laboratory Testing

A record that field and laboratory testing was performed is indicated by the following abbreviation codes.

Test Type	Code
Pocket penetrometer (kPa)	PP
Photo ionisation detector (ppm)	PID
Standard Penetration Test x/y =*x* blows for *y* mm penetration HB = hammer bouncing HW = fell under weight of hammer	SPT
Shear vane (kPa)	V
Unconfined compressive strength, (MPa)	UCS
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(_)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP9/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150
Dynamic probe super heavy, followed by blow count penetration increment in mm	DPSH/100

Groundwater Observations

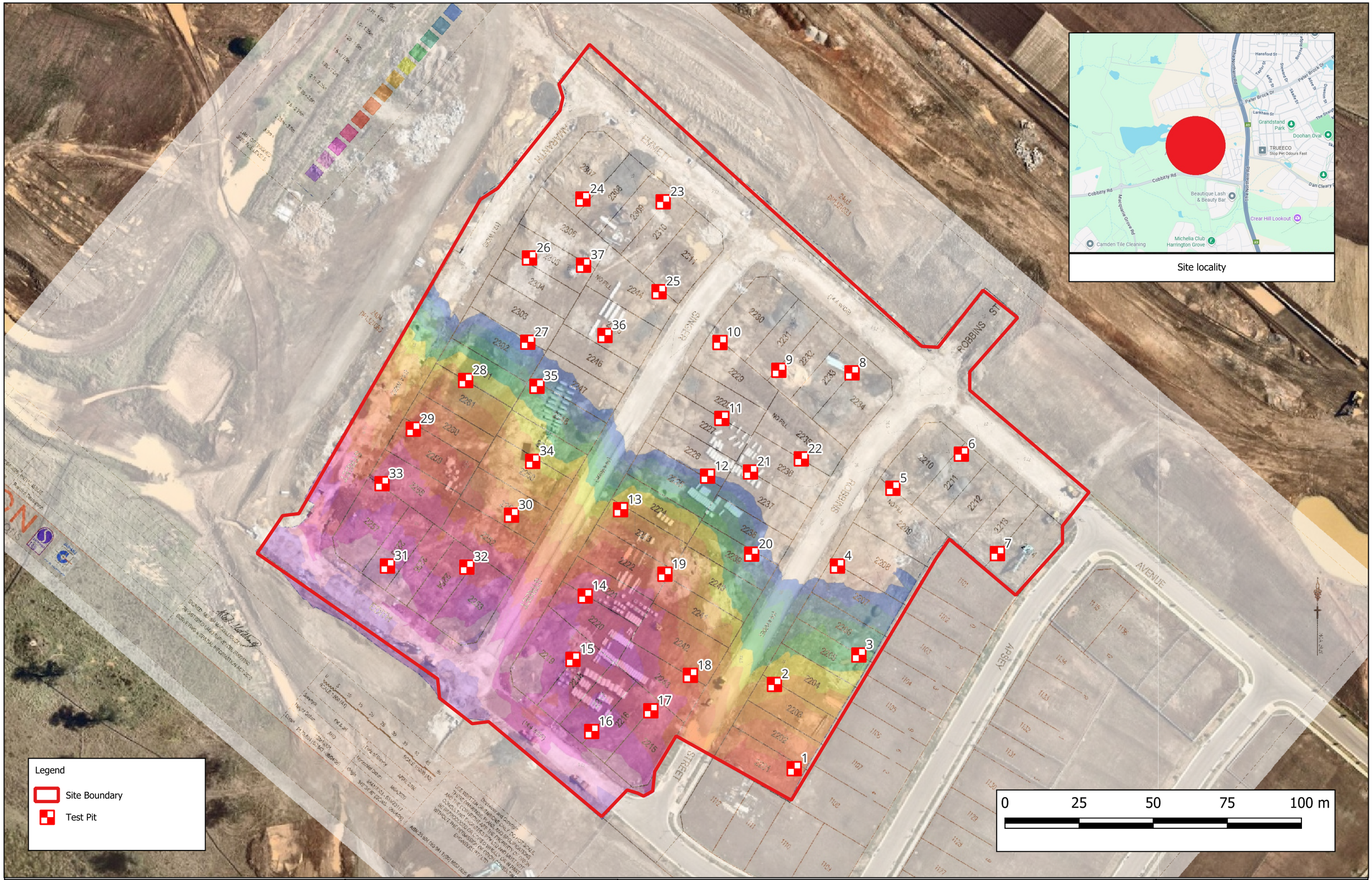
	water seepage/inflow
	water seepage/outflow
	standing or observed water level
NFGWO	no free groundwater observed
OBS	observations obscured by drilling fluids

Drilling or Excavation Methods/Tools

The drilling/excavation methods used to perform the investigation may be shown either in a dedicated column down the left-hand edge of the log, or stated in the log footer. In some circumstances abbreviation codes may be used.

Method	Abbreviation Code
Direct Push	DP
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD[1]
Air Track	AT
Diatube	DT[1]
Hand auger	HA[1]
Hand tools (unspecified)	HAND
Existing exposure	X
Hollow flight auger	HSA[1]
HQ coring	HQ3
HMLC series coring	HMLC
NMLC series coring	NMLC
NQ coring	NQ3
PQ coring	PQ3
Predrilled	PD
Push tube	PT[1]
Ripping tyne/ripper	R
Rock roller	RR[1]
Rock breaker/hydraulic hammer	EH
Sonic drilling	SON[1]
Mud/blade bucket	MB[1]
Toothed bucket	TB[1]
Vibrocore	VC[1]
Vacuum excavation	VE
Wash bore (unspecified bit type)	WB[1]

[1] – numeric suffixes indicate tool diameter/width in mm



Douglas PARTNERS GROUNDED EXPERTISE

CLIENT: Mirvac Homes NSW Pty Ltd		
OFFICE: Macarthur	DRAWN BY: AS	
SCALE: As shown	DATE: 30 April 2026	

TITLE: **Test Pit Location Plan**
Proposed Residential Subdivision
"Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

MGA

PROJ. #:	92323.27
DRAWING No:	1
REVISION:	0

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 74.8 AHD
COORDINATE: E:288285.4, N:6234531.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 1
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	74	0	FILL / Silty CLAY (CL-CI): pale grey and pale orange; low to medium plasticity; trace fine to coarse gravel and rootlets.		FILL	NA	w<PL		A/D		0.50	DCP9/150	5 10 15 21
									U50		0.60		
											0.77		
	73	1							D		1.00		
									A/D		1.50		
		2							D		2.00		
		2.30	Silty CLAY (CI-CH): pale red; medium to high plasticity; trace fine to medium gravel and rootlets.		RS	VSt			A/D		2.50	PP	310-330kPa
	72	3	Test Pit discontinued at 2.50m depth. Limit of investigation.										
	71	4											
	70	5											
	69	6											
	68	7											
	67	8											
	66	9											
	65												

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 74.8 AHD
COORDINATE: E:288278.7, N:6234559.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 2
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	74 / 0	FILL / Silty CLAY (CI): pale brown and pale red ; medium plasticity; trace fine to coarse gravel.		FILL	NA	w<PL		A/D		0.50	DCP9/150	5 10 15
	1							D		1.00		
	1.60 / 73	Silty CLAY (CI-CH): pale brown and pale red; medium to high plasticity; trace fine to medium gravel, sub-rounded to sub-angular ironstone gravel and rootlets. From 2.20m: grading to pale grey and pale orange		RS	VSt			D		1.50		
	2							D		2.00	PP	270-300kPa
								D		2.50	PP	340-370kPa
	72 / 3	Test Pit discontinued at 2.50m depth. Limit of investigation.										
	71 / 4											
	70 / 5											
	69 / 6											
	68 / 7											
	67 / 8											
	66 / 9											
	65											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 75.5 AHD
COORDINATE: E:288307.2, N:6234569.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 3
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	75	0.60	FILL / Silty CLAY (CL-CI): brown; low to medium plasticity; trace fine to medium gravel.		FILL	NA			A/D		0.50	DCP9/150	5 10 15
	74	1	Silty CLAY (CI-CH): pale brown; medium to high plasticity; trace fine to medium gravel.		RS	VSt	w<PL		D		1.00		
			From 1.30m: grading to pale red						A/D		1.50	PP	280-300kPa
	73	2	From 1.70m: grading to pale brown and grey, with extremely weathered to highly weathered shale bands			H			D		2.00	PP	600-kPa
									A/D		2.50	PP	600-kPa
			Test Pit discontinued at 2.50m depth. Limit of investigation.										
	72	3											
	71	4											
	70	5											
	69	6											
	68	7											
	67	8											
	66	9											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 75.5 AHD
COORDINATE: E:288300.0, N:6234599.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 4
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE			TESTING		
					SOIL			ROCK										
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(†) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH			SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	75	0.10	FILL / Silty CLAY (CL-CI): brown; low to medium plasticity; trace fine to medium gravel.		FILL	NA										0.50	DCP9/150	5 10 15 21
		0.80	Silty CLAY (CL-CI): pale brown; low to medium plasticity; trace fine to medium gravel and rootlets			VSt - H	w<PL							A/D				
	74	1	From 0.40m: with extremely weathered to highly weathered shale bands.					HW	0.80	VL - L						1.00		
			SHALE: pale orange. Bringelly Shale.											D				
		2	Test Pit discontinued at 1.00m depth. Refusal on low strength rock.															
	73	3																
	72	4																
	71	5																
	70	6																
	69	7																
	68	8																
	67	9																
	66																	

NOTES: (#)Soil origin is "probable" unless otherwise stated. (†)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 1m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil with Simple Rock Log

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 76.3 AHD
COORDINATE: E:288318.7, N:6234625.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 5
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE				TESTING	
				SOIL				ROCK										
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH			SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	76	0.20	FILL / Silty CLAY (CL-CI): brown; low to medium plasticity; trace fine to medium gravel.		FILL	NA										0.50	DCP9/150	5 10 15 Ref 18/100mm
		0.80	Silty CLAY (CI-CH): pale grey and pale brown; medium to high plasticity; trace fine to medium gravel and rootlets, with extremely weathered to highly weathered shale bands.		RS	VSt - H	w<PL	HW - MW	0.80	VL - L				A/D				
	75	1	SHALE: grey and dark grey. Bringelly Shale.											D		1.00		
			Test Pit discontinued at 1.00m depth. Refusal on low strength rock.															
	74	2																
	73	3																
	72	4																
	71	5																
	70	6																
	69	7																
	68	8																
	67	9																

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 1m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil with Simple Rock Log

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 76.9 AHD
COORDINATE: E:288341.8, N:6234636.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 6
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE				TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL				ROCK				SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN(#)	CONSIS.(*) DENSITY.(*)		MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH							
		0	SHALE: dark grey. Bringelly Shale.						HW - MW	0.00	VL L M H VH EH	VL - L		A/D		0.20	DCP9/150	Ref 18/10mm
22/01/26 No free groundwater observed			Test Pit discontinued at 0.20m depth. Refusal on low strength rock.															
	76	1																
	75	2																
	74	3																
	73	4																
	72	5																
	71	6																
	70	7																
	69	8																
	68	9																
	67																	

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 0.2m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 77.7 AHD
COORDINATE: E:288354.0, N:6234603.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 7
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE				TESTING	
				SOIL			ROCK											
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH			SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	77	0.30	FILL / TOPSOIL: Silty CLAY (CL-CI): dark brown; low to medium plasticity; with roots and fine to medium gravel.		FILL	NA											DCP9/150	5 10 15 Ref 18/100mm
			Silty CLAY (CI-CH): pale red; medium to high plasticity; trace fine to medium gravel and rootlets.		RS	VSt - H	w<PL											
		0.80	SHALE: dark grey. Bringelly Shale.					HW - MW	0.80	VL - L								
	76	1	Test Pit discontinued at 1.00m depth. Refusal on low strength rock.															
	75	2																
	74	3																
	73	4																
	72	5																
	71	6																
	70	7																
	69	8																
	68	9																

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 1m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 76.7 AHD
COORDINATE: E:288304.9, N:6234664.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 8
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE				TESTING	
				SOIL				ROCK										
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(†) DENSITY.(†)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
		0.10	FILL / TOPSOIL: Silty CLAY (CL-CI): dark brown; low to medium plasticity; with roots and fine to medium gravel.		FILL	NA	w<PL		0.10			A/D		0.20	DCP9/150	Ref 16/60mm/5
			SANDSTONE: dark grey. Bringelly Shale.													
			Test Pit discontinued at 0.20m depth. Refusal on low strength rock.													
22/01/26 No free groundwater observed	76	1														
	75	2														
	74	3														
	73	4														
	72	5														
	71	6														
	70	7														
	69	8														
	68	9														
	67															

NOTES: (#)Soil origin is "probable" unless otherwise stated. (†)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 1m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil with Simple Rock Log

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 76.3 AHD
COORDINATE: E:288280.2, N:6234664.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 9
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE				TESTING	
				SOIL				ROCK										
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH			SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
		0.10	FILL / TOPSOIL: Silty CLAY (CL-CI): dark brown; low to medium plasticity; with roots and fine to medium gravel.		FILL	NA	w<PL		0.10	VL L M H VH EH							DCP9/150	Ref 16/60mm
			SANDSTONE: dark grey. Bringelly Shale.															
			Test Pit discontinued at 0.20m depth. Refusal on low strength rock.															
22/01/26 No free groundwater observed	76	0																
	75	1																
	74	2																
	73	3																
	72	4																
	71	5																
	70	6																
	69	7																
	68	8																
	67	9																

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 1m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 75.5 AHD
COORDINATE: E:288260.3, N:6234674.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 10
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE				TESTING	
				SOIL				ROCK										
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(†) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH			SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	75.5	0.10	FILL / Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL	NA	w<PL										DCP9/150	Ref 16/60mm/5
			SANDSTONE: pale brown. Bringelly Shale.					HW	0.10	VL	L			A/D		0.20		
			Test Pit discontinued at 0.20m depth. Refusal on low strength rock.															
	74	1																
	73	2																
	72	3																
	71	4																

NOTES: (#)Soil origin is "probable" unless otherwise stated. (†)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 1m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 75.9 AHD
COORDINATE: E:288260.9, N:6234648.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 11
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK ESTIMATED STRENGTH	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	SAMPLE DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
22/01/26 No free groundwater observed	75	0.20 0.30	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to medium gravel.		FILL FILL	NA									DCP9/150	5 10 15 24/140mm
		1	FILL / Silty CLAY (CL-CI): orange-brown; low to medium plasticity; with fine to coarse gravel.		RS	H	w<PL					A/D		0.50		
	74	1.10	Sandy CLAY (CL): pale orange and brown; low plasticity; with extremely weathered sandstone bands.						1.10			A/D		1.00		
			SANDSTONE: pale brown. Bringelly Shale.					HW - MW		VL - L		A/D		1.50		
		2	Test Pit discontinued at 1.90m depth. Refusal on low strength rock.									A/D		1.90		
	73	3														
	72	4														
	71	5														
	70	6														
	69	7														
	68	8														
	67	9														
	66															

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 1.9m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 75.8 AHD
COORDINATE: E:288256.1, N:6234629.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 12
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK ESTIMATED STRENGTH	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	SAMPLE DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
22/01/26 No free groundwater observed	75	0.30	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL	NA								0.50		DCP9/150 (5, 10, 15)
	74	1	Silty CLAY (CI-CH): pale red; medium to high plasticity; trace fine to medium gravel and rootlets. From 0.70m: grading to pale brown and red		RS	VSt - H	w<PL					A/D		1.00		
			From 1.20m: with extremely weathered to highly weathered shale bands			H						D		1.50	PP	600kPa
	73	1.70	SHALE: dark grey. Bringelly Shale.					HW - MW	1.70	VL - L		D		2.00		
	72	3	Test Pit discontinued at 2.10m depth. Refusal on low strength rock.													
	71	5														
	70	6														
	69	7														
	68	8														
	67	9														
	66															

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.1m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil with Simple Rock Log

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 74.8 AHD
COORDINATE: E:288226.8, N:6234617.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 13
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	74	0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL				A/D		0.50	DCP9/150	5 10 15
		1	FILL / Silty CLAY (CL-CI): pale brown and red-brown; low to medium plasticity; trace rootlets and fine to coarse gravel.		FILL	NA	w<PL		D		1.00		
	73	1.40	Silty CLAY (CI-CH): pale brown and pale grey; medium to high plasticity; trace fine to coarse gravel, sub-rounded to sub-angular ironstone gravel.		RS	VSt - H			D		1.50	PP	380-500kPa
		2	From 1.60m: with extremely weathered to highly weathered shale bands						D		2.00	PP	280-310kPa
			From 2.30m: becomes pale grey			H			D		2.50	PP	600kPa
	72	3	Test Pit discontinued at 2.50m depth. Limit of investigation.										
	71	4											
	70	5											
	69	6											
	68	7											
	67	8											
	66	9											
	65												

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 74.3 AHD
COORDINATE: E:288214.9, N:6234588.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 14
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
22/01/26 No free groundwater observed	74	0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL							DCP9/150	5 10 15
			FILL / Silty CLAY (CL-CI): pale brown and pale red; low to medium plasticity; trace rootlets and fine to medium gravel.						A/D		0.50		
	73	1	From 1.20m: grading to dark grey		FILL	NA	w<PL		D		1.00		
			From 1.20m: grading to pale brrown and grey						A/D		1.50	PP	380-500kPa
		2							D		2.00	PP	280-310kPa
	72	2.10	Silty CLAY (CI-CH): pale brown and pale red; medium to high plasticity; trace rootlets and fine to coarse gravel.		RS	VSt - H			A/D		2.50	PP	600kPa
			Test Pit discontinued at 2.50m depth. Limit of investigation.										
	71	3											
	70	4											
	69	5											
	68	6											
	67	7											
	66	8											
	65	9											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 73.8 AHD
COORDINATE: E:288210.7, N:6234567.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 15
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED									SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	73	0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL				A/D		0.50	DCP9/150	5 10 15
			FILL / Silty CLAY (CL-CI): brown and orange-brown; low to medium plasticity; with fine to coarse gravel.		FILL	NA	w<PL		U50		0.66		
	72	1							D		1.00		
									D		1.50	PP	380-500kPa
		2							D		2.00	PP	280-310kPa
	71		Test Pit discontinued at 2.50m depth. Limit of investigation.						D		2.50	PP	600kPa
		3											
	70	4											
	69	5											
	68	6											
	67	7											
	66	8											
	65	9											
	64												

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 73.6 AHD
COORDINATE: E:288217.0, N:6234543.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 16
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	73	0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL				A/D		0.50	DCP9/150	5 10 15 Ref 28/100mm
	72	1	FILL / Silty CLAY (CL-CI): brown and grey-brown; low to medium plasticity; trace cobbles, with fine to coarse gravel.		FILL	NA	w<PL		D		1.00		
									A/D		1.50		
	71	2							D		2.00		
									A/D		2.50		
		3	Test Pit discontinued at 2.50m depth. Limit of investigation.										
	70	4											
	69	5											
	68	6											
	67	7											
	66	8											
	65	9											
	64												

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 74.2 AHD
COORDINATE: E:288237.0, N:6234550.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 17
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED									SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	74	0.15	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL				A/D		0.50	DCP9/150	5 10 15
			FILL / Silty CLAY (CL-CI): brown and orange-brown; low to medium plasticity; with fine to coarse gravel.		FILL	NA	w<PL		U50		0.60 0.78		
	73	1							D		1.00		
									A/D		1.50		
	72	2							D		2.00		
									A/D		2.50		
			Test Pit discontinued at 2.50m depth. Limit of investigation.										
	71	3											
	70	4											
	69	5											
	68	6											
	67	7											
	66	8											
	65	9											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: AS

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 74.6 AHD
COORDINATE: E:288250.3, N:6234562.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 18
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	74	0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL				A/D		0.50	DCP9/150	5 10 15
	73	1	FILL / Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL	NA	w<PL		D		1.00		
									A/D		1.50		
	72	1.90	Silty CLAY (CI-CH): orange-brown with pale grey; medium to high plasticity; trace rootlets and fine gravel.		RS	H			D		2.00	PP	440-460kPa
			Test Pit discontinued at 2.50m depth. Limit of investigation.						A/D		2.50	PP	440-460kPa
	71	3											
	70	4											
	69	5											
	68	6											
	67	7											
	66	8											
	65	9											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: AS

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 75.4 AHD
COORDINATE: E:288241.8, N:6234596.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 19
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	75 / 0.30	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL				A/D		0.50	DCP9/150	5 10 15
	74 / 1	FILL / Silty CLAY (CL-CI): pale brown; low to medium plasticity; trace fine to medium gravel.		FILL	NA	w<PL		D		1.00		
	1.60							A/D		1.50	PP	250-270kPa
	73 / 2	Silty CLAY (CI-CH): orange-brown with pale grey; medium to high plasticity; trace rootlets and fine gravel.		RS	VSt - H			D		2.00	PP	430-460kPa
								A/D		2.50	PP	390-410kPa
		Test Pit discontinued at 2.50m depth. Limit of investigation.										
	72 / 3											
	71 / 4											
	70 / 5											
	69 / 6											
	68 / 7											
	67 / 8											
	66 / 9											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 75.5 AHD
COORDINATE: E:288271.0, N:6234602.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 20
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK ESTIMATED STRENGTH	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	SAMPLE DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
22/01/26 No free groundwater observed	75	0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL	NA										
			Silty CLAY (CL-CI): pale red; low to medium plasticity; trace fine to medium gravel and rooltets.		RS	VSt - H	w<PL					A/D		0.50		DCP9/150 5 10 15
												U50		0.79		
	74	1										D		1.00		
						H						D		1.50	PP	600-kPa
		1.80	SHALE: dark grey. Bringelly Shale.					XW - HW	1.80	VL - L						
	73	2	Test Pit discontinued at 2.00m depth. Refusal on low strength rock.									D		2.00	PP	600-kPa
	72	3														
	71	4														
	70	5														
	69	6														
	68	7														
	67	8														
	66	9														

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
OPERATOR: Quake Excavations
LOGGED: SHC
METHOD: 450mm TB to 2m
REMARKS:

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 76.0 AHD
COORDINATE: E:288270.6, N:6234630.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 21
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE			TESTING		
					SOIL			ROCK										
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH			SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
		0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL	NA											DCP9/150	5 10 15
			Silty CLAY (CI): pale red; medium plasticity; trace fine to medium gravel and rooltets		RS	VSt - H	w<PL							U50		0.40		
														A/D		0.50		
		0.90														0.59		
	75	1.00	From 0.60: extremely weathered to highly weathered shale bands.					HW - MW	0.90	VL - L				A/D		1.00		Ref 21/20mm
			SHALE: pale grey. Bringelly Shale.															
			Test Pit discontinued at 1.10m depth. Refusal on low strength rock.															
22/01/26 No free groundwater observed	74	2																
	73	3																
	72	4																
	71	5																
	70	6																
	69	7																
	68	8																
	67	9																

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 1.1m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil with Simple Rock Log

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 76.1 AHD
COORDINATE: E:288287.8, N:6234635.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 22
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED												SAMPLE				TESTING	
				SOIL				ROCK									
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(†) DENSITY.(†)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH		SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	76	0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL	NA	w<PL	HW - MW	0.20	VL - L			A/D		0.50	DCP9/150	5 10 Ref 29
	75	1	SANDSTONE: dark grey and pale grey. Bringelly Shale. Test Pit discontinued at 0.50m depth. Refusal on low strength rock.														
	74	2															
	73	3															
	72	4															
	71	5															
	70	6															
	69	7															
	68	8															
	67	9															

NOTES: (#)Soil origin is "probable" unless otherwise stated. (†)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 0.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil with Simple Rock Log

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 75.2 AHD
COORDINATE: E:288241.2, N:6234721.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 23
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE				TESTING	
				SOIL				ROCK										
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(†) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	75	0.20	FILL / Silty CLAY (CI-CH): brown; medium to high plasticity; trace sand, with fine to coarse gravel.		FILL	NA	w<PL									DCP9/150	5 10 15 Ref 25/120mm
			SANDSTONE: dark grey. Bringelly Shale.					HW - MW	0.20	VL - L		A/D		0.50		
		1	Test Pit discontinued at 0.70m depth. Refusal on low strength rock.													
	74	2														
	73	3														
	72	4														
	71	5														
	70	6														
	69	7														
	68	8														
	67	9														
	66															

NOTES: (#)Soil origin is "probable" unless otherwise stated. (†)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 0.7m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: AS

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil with Simple Rock Log

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 74.5 AHD
COORDINATE: E:288214.1, N:6234722.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 24
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE				TESTING	
				SOIL				ROCK										
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH			SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	74	0.30	FILL / Silty CLAY (CL-CI): brown and dark brown; low to medium plasticity; with fine to coarse gravel.		FILL	NA	w<PL										DCP9/150	5 10 15 Ref 28
			SANDSTONE: pale brown. Bringelly Shale.					HW	0.30	VL - L				A/D		0.50		
			Test Pit discontinued at 0.50m depth. Refusal on low strength rock.															
	73	1																
	72	2																
	71	3																
	70	4																
	69	5																
	68	6																
	67	7																
	66	8																
	65	9																

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 0.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: AS

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 75.1 AHD
COORDINATE: E:288239.8, N:6234691.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 25
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED												SAMPLE				TESTING	
				SOIL				ROCK									
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(†) DENSITY.(†)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH		SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	75	0.10	FILL / Sandy CLAY (CI-CH): pale brown; medium to high plasticity; with fine to coarse gravel.		FILL	NA	w<PL		0.10				A/D		0.20	DCP9/150	Ref 18/100mm
22/01/26 No free groundwater observed			SANDSTONE: pale grey. Bringelly Shale.														
	74	1	Test Pit discontinued at 0.20m depth. Refusal on low strength rock.														
	73	2															
	72	3															
	71	4															
	70	5															
	69	6															
	68	7															
	67	8															
	66	9															

NOTES: (#)Soil origin is "probable" unless otherwise stated. (†)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 0.2m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 74.2 AHD
COORDINATE: E:288196.0, N:6234702.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 26
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED												SAMPLE				TESTING	
				SOIL			ROCK										
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH		SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	74	0.20	FILL / TOPSOIL: Sandy CLAY (CI-CH): dark brown; medium to high plasticity; trace fine to coarse gravel and rootlets.		FILL	NA	w<PL						A/D		0.50	DCP9/150	5 10 15 Ref 16/130mm
		0.55	Sandy CLAY (CI-CH): pale brown; medium to high plasticity; with highly weathered to extremely weathered sandstone bands.		RS	H			0.55								
	73	1	SANDSTONE: pale grey. Bringelly Shale.														
			Test Pit discontinued at 0.70m depth. Refusal on low strength rock.														
	72	2															
	71	3															
	70	4															
	69	5															
	68	6															
	67	7															
	66	8															
	65	9															

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 0.7m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 74.1 AHD
COORDINATE: E:288195.5, N:6234674.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 27
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK ESTIMATED STRENGTH	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	SAMPLE DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
22/01/26 No free groundwater observed	74	0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): dark brown; low to medium plasticity; with fine to medium gravel and roots.		FILL	NA										
		0.50	FILL / Silty CLAY (CI): brown; medium plasticity; with fine to coarse gravel.		FILL	VSt - H	w<PL					A/D		0.50	DCP9/150	5 10 15
	73	1	Silty CLAY (CI-CH): orange-brown; medium to high plasticity; trace rootlets and fine gravel.		RS							D		1.00		
			From 1.30m: with extremely weathered to highly weathered shale bands			H						A/D		1.50	PP	410-600kPa
		1.90	SHALE: dark grey and brown. Bringelly Shale.					HW	1.90	VL - L		D		2.00		
			Test Pit discontinued at 2.10m depth. Refusal on low strength rock.													
	72	2														
	71	3														
	70	4														
	69	5														
	68	6														
	67	7														
	66	8														
	65	9														

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.1m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: AS

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 73.6 AHD
COORDINATE: E:288174.5, N:6234661.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 28
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	73 / 0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; trace fine to coarse gravel and rootlets.		FILL				A/D		0.50	DCP9/150	5 10 15
	1	FILL / Silty CLAY (CI-CH): brown; medium to high plasticity; trace fine to coarse gravel.		FILL	NA			D		1.00		
	72 / 1.20	Silty CLAY (CI-CH): orange-brown; medium to high plasticity; trace rootlets and fine to medium gravel.		RS	VSt - H	w<PL		D		1.50	PP	380-500kPa
	2	From 2.30m: becomes pale grey, with extremely weathered shale bands						D		2.00	PP	380-500kPa
					H			D		2.50	PP	420-600kPa
	71 / 3	Test Pit discontinued at 2.50m depth. Limit of investigation.										
	70 / 4											
	69 / 5											
	68 / 6											
	67 / 7											
	66 / 8											
	65 / 9											
	64											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 73.2 AHD
COORDINATE: E:288156.9, N:6234645.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 29
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	73 / 0.25	FILL / TOPSOIL: Silty CLAY (CL-CI): dark brown; low to medium plasticity; with roots and fine to medium gravel.		FILL				A/D		0.50	DCP9/150	5 10 15 21
	72 / 1	FILL / Silty CLAY (CL): brown; low plasticity; trace cobbles, with fine to coarse gravel.		FILL	NA	w<PL		D		1.00		
	1.80							D		1.50		
	71 / 2	Silty CLAY (CI-CH): orange-brown mottled pale grey; medium to high plasticity; trace rootlets and fine gravel.		RS	VSt - H			D		2.00	PP	600-kPa
		Test Pit discontinued at 2.50m depth. Limit of investigation.						D		2.50	PP	370-kPa
	70 / 3											
	69 / 4											
	68 / 5											
	67 / 6											
	66 / 7											
	65 / 8											
	64 / 9											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: AS

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 73.7 AHD
COORDINATE: E:288190.0, N:6234616.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 30
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	73.7	0.15	FILL / TOPSOIL: Silty CLAY (CL-CI): dark brown; low to medium plasticity; with fine to medium gravel and roots.		FILL				A/D		0.50	DCP9/150	5 10 15 21
	73	1	FILL / Silty CLAY (CL-CI): brown; low to medium plasticity; with fine to coarse gravel.		FILL	NA	w<PL		D		1.00		
	72		From 1.30m: becomes orange-brown						A/D		1.50		
		2	From 1.80m: becomes brown and dark brown						D		2.00		
		2.30	Silty CLAY (CI-CH): orange-brown mottled pale grey; medium to high plasticity; trace rootlets and fine gravel.		RS	H						PP	500-570kPa
	71	3	Test Pit discontinued at 2.50m depth. Limit of investigation.										
	70	4											
	69	5											
	68	6											
	67	7											
	66	8											
	65	9											
	64												

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: AS

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 72.8 AHD
COORDINATE: E:288148.1, N:6234598.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 31
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED									SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*]	DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	72	0.20	FILL / TOPSOIL: Silty CLAY (CI-CH): brown and dark brown; medium to high plasticity; trace fine to coarse gravel, with roots.		FILL									
	71	1	FILL / Silty CLAY (CL): brown and orange; low plasticity; trace sand, with fine to medium gravel.		FILL	NA		w<PL		A/D		0.50	DCP9/150	5 10 15
										D		1.00		
										A/D		1.50		
	70	2								D		2.00		
										A/D		2.50	PP	500-570kPa
		3	Test Pit discontinued at 2.50m depth. Limit of investigation.											
	69	4												
	68	5												
	67	6												
	66	7												
	65	8												
	64	9												
	63													

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 73.4 AHD
COORDINATE: E:288174.9, N:6234598.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 32
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED									SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	73	0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): dark brown; low to medium plasticity; with fine to medium gravel and rootlets.		FILL				A/D		0.50	DCP9/150	5 10 15
			FILL / Silty CLAY (CL-CI): brown and orange-beown; low to medium plasticity; with fine to coarse gravel.		FILL	NA	w<PL		U50		0.71		
	72	1							D		1.00		
									D		1.50		
	71	2							D		2.00		
									D		2.50	PP	500-570kPa
			Test Pit discontinued at 2.50m depth. Limit of investigation.										
	70	3											
		4											
	69												
		5											
	68												
		6											
	67												
		7											
	66												
		8											
	65												
		9											
	64												

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: AS

Refer to explanatory notes for symbol and abbreviation definitions

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Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 72.7 AHD
COORDINATE: E:288146.3, N:6234626.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 33
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	72	0.10	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; trace fine to coarse gravel, with roots.		FILL				A/D		0.50	DCP9/150	5 10 15 HB 15/70mm
	71	1	FILL / Silty CLAY (CL-CI): pale brown and orange; low to medium plasticity; trace sand, with fine to coarse gravel. From 0.70m: grading to pale brown and red From 1.30m: grading to pale brown and grey		FILL	NA	w<PL		D		1.00		
									D		1.50		
	70	2							D		2.00		
		2.40	Silty CLAY (CI-CH): red mottled pale grey; medium to high plasticity; with fine to medium gravel.			H			D		2.50	PP	600-kPa
		3	Test Pit discontinued at 2.50m depth. Limit of investigation.										
	69	4											
	68	5											
	67	6											
	66	7											
	65	8											
	64	9											
	63												

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 73.9 AHD
COORDINATE: E:288197.1, N:6234634.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 34
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	73 / 0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; trace fine to coarse gravel, with roots.		FILL				A/D		0.50	DCP9/150	5 10 15
	73 / 1	FILL / Silty CLAY (CI-CH): brown; medium to high plasticity; trace fine to coarse gravel.		FILL	NA			D		1.00		
	1.30	Silty CLAY (CI-CH): orange-brown and pale grey; medium to high plasticity; trace fine to medium gravel.			St - VSt	w<PL		A/D		1.50	PP	180-200kPa
	72 / 2							D		2.00	PP	200-220kPa
					VSt			A/D		2.50	PP	300-320kPa
	71 / 3	Test Pit discontinued at 2.50m depth. Limit of investigation.										
	70 / 4											
	69 / 5											
	68 / 6											
	67 / 7											
	66 / 8											
	65 / 9											
	64											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 74.0 AHD
COORDINATE: E:288198.6, N:6234659.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 35
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED												SAMPLE			TESTING	
					SOIL			ROCK								
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(†) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	74	0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): dark brown; low to medium plasticity; with roots and fine to medium gravel.		FILL							A/D	0.50	0.50	DCP9/150	5 10 15
			FILL / Silty CLAY (CL-CI): brown and dark grey; low to medium plasticity; with fine to coarse gravel.		FILL	NA						U50	0.60	0.60		
	73	0.90	Silty CLAY (CI-CH): orange-brown and pale grey; medium to high plasticity; trace fine to medium gravel.		RS	VSt - H	w<PL					D	0.89	0.89		
			From 1.80m: with extremely weathered to highly weathered shale bands									D	1.00	1.00		
	72	2										D	1.50	1.50	PP	300-330kPa
		2.30	SHALE: brown and dark grey. Bringelly Shale.			H		HW	2.30	VL - L		D	2.00	2.00	PP	600-kPa
			Test Pit discontinued at 2.50m depth. Limit of investigation.									D	2.50	2.50	PP	600-kPa
	71	3														
	70	4														
	69	5														
	68	6														
	67	7														
	66	8														
	65	9														

NOTES: (#)Soil origin is "probable" unless otherwise stated. (†)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 2.5m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 74.6 AHD
COORDINATE: E:288221.5, N:6234676.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 36
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE			TESTING	
					SOIL			ROCK									
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(†) DENSITY.(†)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH (VL L M H VH EH)	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	74	0.10	FILL / TOPSOIL: Silty CLAY (CL-CI): brown; low to medium plasticity; trace fine to coarse gravel, with roots.		FILL	NA									DCP9/150	5 10 15 Ref 17/100mm
		0.50	Sandy CLAY (CI-CH): pale brown; medium to high plasticity; with extremely weathered to highly weathered sandstone bands.		RS	VSt - H	w<PL	HW - MW	0.50	VL - L		A/D		0.50		
	73	1	SANDSTONE: pale brown. Bringelly Shale.									D		1.00		
												A/D		1.20		
	72	2	Test Pit discontinued at 1.20m depth. Refusal on low strength rock.													
	71	3														
	70	4														
	69	5														
	68	6														
	67	7														
	66	8														
	65	9														

NOTES: (#)Soil origin is "probable" unless otherwise stated. (†)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 1.2m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: SHC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Mirvac Homes NSW Pty Ltd
PROJECT: Proposed Residential Subdivision
LOCATION: "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty NSW

SURFACE LEVEL: 74.6 AHD
COORDINATE: E:288214.3, N:6234700.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 37
PROJECT No: 92323.27
DATE: 22/01/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE				TESTING	
				SOIL			ROCK											
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	ESTIMATED STRENGTH	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/01/26 No free groundwater observed	74	0.20	FILL / TOPSOIL: Silty CLAY (CL-CI): dark brown; low to medium plasticity; trace fine to coarse gravel, with rootlets.		FILL	NA	w<PL	HW MW	0.50	VL L		A/D		0.50	DCP9/150	5 10 15 Ref 18/140mm
		0.50	Sandy CLAY (CI-CH): pale brown; medium to high plasticity; with extremely weathered to highly weathered sandstone bands.		RS	H										
	73	1	SANDSTONE: pale brown. Bringelly Shale.													
			Test Pit discontinued at 0.70m depth. Refusal on low strength rock.													
	72	2														
	71	3														
	70	4														
	69	5														
	68	6														
	67	7														
	66	8														
	65	9														

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hyundai 60CR-9 excavator
METHOD: 450mm TB to 0.7m
REMARKS:

OPERATOR: Quake Excavations
LOGGED: AS

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Appendix C

Laboratory test results

Salinity summary - Table C1

Report on Level 1 Inspection and Testing of Filling (Project 220469.14)

Material Test Report

Douglas Partners Pty Ltd
Macarthur Laboratory
18 Waler Crescent Smeaton Grange NSW 2567
Phone: (02) 4647 0075
Email: meregal.henakaa@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Nilusha Arachchi
Senior Technician
Laboratory Accreditation Number: 828

Report Number: **92323.27-2**
Issue Number: 1
Date Issued: 29/04/2026
Client: Mirvac Homes NSW Pty Ltd
PO Box 787, Parramatta NSW
Contact: Ayberk Sahin
Project Number: 92323.27
Project Name: Proposed Residential Subdivision
Project Location: 593 Cobbitty Road, Cobbitty, Cobbitty NSW
Work Request: 17966
Sample Number: MA-17966F
Client Sample #: 21
Date Sampled: 21/01/2026
Dates Tested: 28/01/2026 - 12/02/2026
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Remarks: The sample was not sufficient enough to test for shrinks swell test.
Sample Location: **21 , Depth: 0.4 - 0.59 m**
Material: Silty CLAY: CI-CH, pale brown and pale red

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	37		
Plastic Limit (%)	19		
Plasticity Index (%)	**18**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**9.5**		
Cracking Crumbling Curling	None		

Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	13.0		

Material Test Report

Douglas Partners Pty Ltd
Macarthur Laboratory
18 Waler Crescent Smeaton Grange NSW 2567
Phone: (02) 4647 0075
Email: meregal.henakaa@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Nilusha Arachchi
Senior Technician
Laboratory Accreditation Number: 828

Report Number: **92323.27-2**
Issue Number: 1
Date Issued: 29/04/2026
Client: Mirvac Homes NSW Pty Ltd
PO Box 787, Parramatta NSW
Contact: Ayberk Sahin
Project Number: 92323.27
Project Name: Proposed Residential Subdivision
Project Location: 593 Cobbitty Road, Cobbitty, Cobbitty NSW
Work Request: 17966
Sample Number: MA-17966I
Client Sample #: 2
Date Sampled: 21/01/2026
Dates Tested: 28/01/2026 - 12/02/2026
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **2 , Depth: 0.5 m**
Material: Fill/Silty CLAY: CL-CI, brown

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	46		
Plastic Limit (%)	17		
Plasticity Index (%)	**29**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**10.0**		
Cracking Crumbling Curling	Cracking & Curling		

Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	13.6		

Material Test Report

Douglas Partners Pty Ltd
Macarthur Laboratory
18 Waler Crescent Smeaton Grange NSW 2567
Phone: (02) 4647 0075
Email: meregal.henakaa@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Nilusha Arachchi
Senior Technician
Laboratory Accreditation Number: 828

Report Number: **92323.27-2**
Issue Number: 1
Date Issued: 29/04/2026
Client: Mirvac Homes NSW Pty Ltd
PO Box 787, Parramatta NSW
Contact: Ayberk Sahin
Project Number: 92323.27
Project Name: Proposed Residential Subdivision
Project Location: 593 Cobbitty Road, Cobbitty, Cobbitty NSW
Work Request: 17966
Sample Number: MA-17966J
Client Sample #: 4
Date Sampled: 21/01/2026
Dates Tested: 28/01/2026 - 13/02/2026
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **4 , Depth: 0.5 m**
Material: Silty CLAY: CI-CH, pale brown

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	32		
Plastic Limit (%)	16		
Plasticity Index (%)	**16**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**8.0**		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	13.6		

Emerson Class Number of a Soil (AS 1289.3.8.1)		Min	Max
Emerson Class	**2**		
Soil Description	As above		
Nature of Water	Distilled water		

Material Test Report

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Approved Signatory: Nilusha Arachchi
Senior Technician
Laboratory Accreditation Number: 828

Report Number: **92323.27-2**
Issue Number: 1
Date Issued: 29/04/2026
Client: Mirvac Homes NSW Pty Ltd
PO Box 787, Parramatta NSW
Contact: Ayberk Sahin
Project Number: 92323.27
Project Name: Proposed Residential Subdivision
Project Location: 593 Cobbitty Road, Cobbitty, Cobbitty NSW
Work Request: 17966
Sample Number: MA-17966K
Client Sample #: 11
Date Sampled: 21/01/2026
Dates Tested: 28/01/2026 - 06/03/2026
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **11 , Depth: 0.5 m**
Material: Sandy CLAY: CI-CH, pale orange and pale brown

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	26		
Plastic Limit (%)	18		
Plasticity Index (%)	**8**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**5.0**		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	10.4		

Material Test Report

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Approved Signatory: Nilusha Arachchi
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Laboratory Accreditation Number: 828

Report Number:	**92323.27-2**
Issue Number:	1
Date Issued:	29/04/2026
Client:	Mirvac Homes NSW Pty Ltd
	PO Box 787, Parramatta NSW
Contact:	Ayberk Sahin
Project Number:	92323.27
Project Name:	Proposed Residential Subdivision
Project Location:	593 Cobbitty Road, Cobbitty, Cobbitty NSW
Work Request:	17966
Sample Number:	MA-17966L
Client Sample #:	27
Date Sampled:	21/01/2026
Dates Tested:	28/01/2026 - 06/02/2026
Sampling Method:	Sampled by Engineering Department
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**27 , Depth: 0.5 m**
Material:	Fill/Silty CLAY:CI-CH, orange-brown

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	45		
Plastic Limit (%)	22		
Plasticity Index (%)	**23**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**13.0**		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	14.0		

Material Test Report

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Approved Signatory: Nilusha Arachchi
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Laboratory Accreditation Number: 828

Report Number: **92323.27-2**
Issue Number: 1
Date Issued: 29/04/2026
Client: Mirvac Homes NSW Pty Ltd
PO Box 787, Parramatta NSW
Contact: Ayberk Sahin
Project Number: 92323.27
Project Name: Proposed Residential Subdivision
Project Location: 593 Cobbitty Road, Cobbitty, Cobbitty NSW
Work Request: 17966
Sample Number: MA-17966M
Client Sample #: 29
Date Sampled: 21/01/2026
Dates Tested: 28/01/2026 - 06/02/2026
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **29 , Depth: 0.5 m**
Material: Fill/Silty CLAY: CL-CI, brown

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	33		
Plastic Limit (%)	24		
Plasticity Index (%)	**9**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**3.5**		
Cracking Crumbling Curling			

Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	10.3		

Material Test Report

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Approved Signatory: Nilusha Arachchi
Senior Technician
Laboratory Accreditation Number: 828

Report Number: **92323.27-2**
Issue Number: 1
Date Issued: 29/04/2026
Client: Mirvac Homes NSW Pty Ltd
PO Box 787, Parramatta NSW
Contact: Ayberk Sahin
Project Number: 92323.27
Project Name: Proposed Residential Subdivision
Project Location: 593 Cobbitty Road, Cobbitty, Cobbitty NSW
Work Request: 17966
Sample Number: MA-17966N
Client Sample #: 31
Date Sampled: 21/01/2026
Dates Tested: 28/01/2026 - 13/02/2026
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **31 , Depth: 0.5 m**
Material: Fill/Silty CLAY: CL-CI, brown and orange

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	27		
Plastic Limit (%)	17		
Plasticity Index (%)	**10**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**7.0**		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	8.0		

Emerson Class Number of a Soil (AS 1289.3.8.1)		Min	Max
Emerson Class	**2**		
Soil Description	As above		
Nature of Water	Distilled water		

Material Test Report

Report Number: **92323.27-2**
Issue Number: 1
Date Issued: 29/04/2026
Client: Mirvac Homes NSW Pty Ltd
PO Box 787, Parramatta NSW
Contact: Ayberk Sahin
Project Number: 92323.27
Project Name: Proposed Residential Subdivision
Project Location: 593 Cobbitty Road, Cobbitty, Cobbitty NSW
Work Request: 17966
Date Sampled: 21/01/2026
Dates Tested: 28/01/2026 - 05/02/2026
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Location: 593 Cobbitty Road, Cobbitty

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Approved Signatory: Nilusha Arachchi
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Moisture Content AS 1289 2.1.1

Sample Number	Client Sample Number	Sample Location	Moisture Content (%)	Min	Max	Material
MA-17966F	21	21 , Depth: 0.4 - 0.59 m	13.0 %	**	**	Silty CLAY: CI-CH, pale brown and pale red
MA-17966I	2	2 , Depth: 0.5 m	13.6 %	**	**	Fill/Silty CLAY: CL-CI, brown
MA-17966J	4	4 , Depth: 0.5 m	13.6 %	**	**	Silty CLAY: CI-CH, pale brown
MA-17966K	11	11 , Depth: 0.5 m	10.4 %	**	**	Sandy CLAY: CI-CH, pale orange and pale brown
MA-17966L	27	27 , Depth: 0.5 m	14.0 %	**	**	Fill/Silty CLAY:CI-CH, orange-brown
MA-17966M	29	29 , Depth: 0.5 m	10.3 %	**	**	Fill/Silty CLAY: CL-CI, brown
MA-17966N	31	31 , Depth: 0.5 m	8.0 %	**	**	Fill/Silty CLAY: CL-CI, brown and orange

Material Test Report

Report Number: **92323.27-2**
Issue Number: 1
Date Issued: 29/04/2026
Client: Mirvac Homes NSW Pty Ltd
PO Box 787, Parramatta NSW
Contact: Ayberk Sahin
Project Number: 92323.27
Project Name: Proposed Residential Subdivision
Project Location: 593 Cobbitty Road, Cobbitty, Cobbitty NSW
Work Request: 17966
Date Sampled: 21/01/2026
Dates Tested: 28/01/2026 - 11/02/2026
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Location: 593 Cobbitty Road, Cobbitty

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Laboratory Accreditation Number: 828

Determination of pH of Soil (In-House) DP MAC1

Sample Number	Location	Depth (m)	Material	pH Value
MA-17966O	1	0.5	Soil	6.2
MA-17966P	2	0.5	Soil	5.8
MA-17966Q	3	0.5	Soil	5.8
MA-17966R	3	1.5	Soil	5.2
MA-17966S	3	2.5	Soil	7.0
MA-17966T	4	0.5	Soil	7.7
MA-17966U	5	0.5	Soil	7.9
MA-17966V	6	0.2	Soil	9.2
MA-17966W	7	0.5	Soil	6.3
MA-17966X	8	0.3	Soil	9.0
MA-17966Y	9	0.5	Soil	8.2
MA-17966Z	10	0.2	Soil	9.3
MA-17966AA	11	0.5	Soil	8.6
MA-17966AB	11	1.0	Soil	8.7
MA-17966AC	11	1.5	Soil	8.8
MA-17966AD	11	1.9	Soil	8.7
MA-17966AE	12	0.5	Soil	5.4
MA-17966AF	13	0.5	Soil	7.1
MA-17966AG	14	0.5	Soil	6.7
MA-17966AH	14	1.5	Soil	8.2
MA-17966AI	14	2.5	Soil	6.5
MA-17966AJ	15	0.5	Soil	5.6
MA-17966AK	16	0.5	Soil	8.6
MA-17966AL	16	1.5	Soil	8.7
MA-17966AM	16	2.5	Soil	7.1
MA-17966AN	17	0.5	Soil	5.5
MA-17966AO	18	0.5	Soil	7.7
MA-17966AP	19	0.5	Soil	5.7
MA-17966AQ	19	1.5	Soil	5.3
MA-17966AR	19	2.5	Soil	5.6
MA-17966AS	20	0.5	Soil	5.5

Sample Number	Location	Depth (m)	Material	pH Value
MA-17966AT	21	0.5	Soil	7.1
MA-17966AU	21	1.0	Soil	8.2
MA-17966AV	22	0.5	Soil	8.1
MA-17966AW	23	0.5	Soil	8.8
MA-17966AX	24	0.5	Soil	9.1
MA-17966AY	25	0.2	Soil	9.2
MA-17966AZ	26	0.5	Soil	8.5
MA-17966BA	27	0.5	Soil	6.9
MA-17966BB	27	1.5	Soil	8.9
MA-17966BC	28	0.5	Soil	9.0
MA-17966BD	29	0.5	Soil	11.3
MA-17966BE	30	0.5	Soil	8.2
MA-17966BF	31	0.5	Soil	8.3
MA-17966BG	31	1.5	Soil	7.5
MA-17966BH	31	2.5	Soil	6.1
MA-17966BI	32	0.5	Soil	8.6
MA-17966BJ	33	0.5	Soil	8.3
MA-17966BK	34	0.5	Soil	8.4
MA-17966BL	34	1.5	Soil	5.0
MA-17966BM	34	2.5	Soil	5.1
MA-17966BN	35	0.5	Soil	8.5
MA-17966BO	36	0.5	Soil	8.9
MA-17966BP	37	0.5	Soil	8.6

Material Test Report

Report Number: **92323.27-2**
Issue Number: 1
Date Issued: 29/04/2026
Client: Mirvac Homes NSW Pty Ltd
PO Box 787, Parramatta NSW
Contact: Ayberk Sahin
Project Number: 92323.27
Project Name: Proposed Residential Subdivision
Project Location: 593 Cobbitty Road, Cobbitty, Cobbitty NSW
Work Request: 17966
Date Sampled: 21/01/2026
Dates Tested: 28/01/2026 - 11/02/2026
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Location: 593 Cobbitty Road, Cobbitty

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Approved Signatory: Nilusha Arachchi
Senior Technician
Laboratory Accreditation Number: 828

Determination of EC of Soil (In-House) DP MAC2

Sample Number	Location	Depth (m)	Material	EC Value (µS/cm)
MA-17966O	1	0.5	Soil	312.80
MA-17966P	2	0.5	Soil	255.50
MA-17966Q	3	0.5	Soil	223.50
MA-17966R	3	1.5	Soil	386.50
MA-17966S	3	2.5	Soil	481.80
MA-17966T	4	0.5	Soil	197.40
MA-17966U	5	0.5	Soil	410.20
MA-17966V	6	0.2	Soil	256.10
MA-17966W	7	0.5	Soil	426.00
MA-17966X	8	0.3	Soil	140.10
MA-17966Y	9	0.5	Soil	184.30
MA-17966Z	10	0.2	Soil	190.00
MA-17966AA	11	0.5	Soil	103.80
MA-17966AB	11	1.0	Soil	117.00
MA-17966AC	11	1.5	Soil	122.90
MA-17966AD	11	1.9	Soil	124.90
MA-17966AE	12	0.5	Soil	108.10
MA-17966AF	13	0.5	Soil	278.50
MA-17966AG	14	0.5	Soil	286.40
MA-17966AH	14	1.5	Soil	363.80
MA-17966AI	14	2.5	Soil	123.70
MA-17966AJ	15	0.5	Soil	171.20
MA-17966AK	16	0.5	Soil	216.30
MA-17966AL	16	1.5	Soil	204.10
MA-17966AM	16	2.5	Soil	491.80
MA-17966AN	17	0.5	Soil	165.50
MA-17966AO	18	0.5	Soil	726.90
MA-17966AP	19	0.5	Soil	292.70
MA-17966AQ	19	1.5	Soil	109.30
MA-17966AR	19	2.5	Soil	54.70
MA-17966AS	20	0.5	Soil	93.40

Sample Number	Location	Depth (m)	Material	EC Value (µS/cm)
MA-17966AT	21	0.5	Soil	102.20
MA-17966AU	21	1.0	Soil	139.30
MA-17966AV	22	0.5	Soil	94.90
MA-17966AW	23	0.5	Soil	147.70
MA-17966AX	24	0.5	Soil	214.30
MA-17966AY	25	0.2	Soil	315.20
MA-17966AZ	26	0.5	Soil	269.90
MA-17966BA	27	0.5	Soil	167.80
MA-17966BB	27	1.5	Soil	272.30
MA-17966BC	28	0.5	Soil	316.40
MA-17966BD	29	0.5	Soil	5.20
MA-17966BE	30	0.5	Soil	245.10
MA-17966BF	31	0.5	Soil	277.10
MA-17966BG	31	1.5	Soil	175.20
MA-17966BH	31	2.5	Soil	236.50
MA-17966BI	32	0.5	Soil	212.50
MA-17966BJ	33	0.5	Soil	263.10
MA-17966BK	34	0.5	Soil	445.20
MA-17966BL	34	1.5	Soil	539.90
MA-17966BM	34	2.5	Soil	614.70
MA-17966BN	35	0.5	Soil	378.30
MA-17966BO	36	0.5	Soil	108.40
MA-17966BP	37	0.5	Soil	80.40

Material Test Report

Report Number: **92323.27-2**
Issue Number: 1
Date Issued: 29/04/2026
Client: Mirvac Homes NSW Pty Ltd
PO Box 787, Parramatta NSW
Contact: Ayberk Sahin
Project Number: 92323.27
Project Name: Proposed Residential Subdivision
Project Location: 593 Cobbitty Road, Cobbitty, Cobbitty NSW
Work Request: 17966
Date Sampled: 21/01/2026
Dates Tested: 28/01/2026 - 09/02/2026
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Location: 593 Cobbitty Road, Cobbitty

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Shrink Swell Index AS 1289 7.1.1 & 2.1.1					
Sample Number	MA-17966A	MA-17966B	MA-17966C	MA-17966D	MA-17966E
Date Sampled	21/01/2026	21/01/2026	21/01/2026	21/01/2026	21/01/2026
Date Tested	28/01/2026	28/01/2026	28/01/2026	09/02/2026	28/01/2026
Material Source	**	**	**	**	**
Sample Location	1 (0.6 - 0.77 m)	7 (0.3 - 0.64 m)	15 (0.5 - 0.66 m)	17 (0.6 - 0.78 m)	20 (0.5 - 0.79 m)
Inert Material Estimate (%)	**	**	23	18	9
Pocket Penetrometer before (kPa)	320	480	600	380	600
Pocket Penetrometer after (kPa)	210	290	110	160	370
Shrinkage Moisture Content (%)	14.0	20.7	13.7	11.4	19.2
Shrinkage (%)	**1.2**	**3.6**	**1.2**	**1.2**	**1.4**
Swell Moisture Content Before (%)	13.8	24.5	14.3	10.9	19.5
Swell Moisture Content After (%)	21.1	27.9	24.2	22.5	24.7
Swell (%)	**1.8**	**1.2**	**0.4**	**0.0**	**0.9**
Shrink Swell Index Iss (%)	**1.2**	**2.3**	**0.8**	**0.7**	**1.0**
Visual Description	Fill/ Silty CLAY: CL-CI, pale grey and pale orange	Silty CLAY: CI-CH, pale red	Fill/ Silty CLAY: CL-CI, brown and orange brown	Fill/ Silty CLAY: CL-CI, brown and orange brown	Silty CLAY: CI-CH, pale red
Cracking	SC	SC	SC	SC	HC
Crumbling	No	**	No	No	No
Remarks	**	**	**	**	**

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.
Cracking Terminology: UC Uncracked, SC Slightly Cracked, MC Moderately Cracked, HC Highly Cracked, FR Fragmented.
Scope of accreditation does not cover the performance of pocket penetrometer readings.

Material Test Report

Report Number: **92323.27-2**
Issue Number: 1
Date Issued: 29/04/2026
Client: Mirvac Homes NSW Pty Ltd
PO Box 787, Parramatta NSW
Contact: Ayberk Sahin
Project Number: 92323.27
Project Name: Proposed Residential Subdivision
Project Location: 593 Cobbitty Road, Cobbitty, Cobbitty NSW
Work Request: 17966
Date Sampled: 21/01/2026
Dates Tested: 28/01/2026 - 09/02/2026
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Location: 593 Cobbitty Road, Cobbitty

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Macarthur Laboratory
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Approved Signatory: Nilusha Arachchi
Senior Technician
Laboratory Accreditation Number: 828

Shrink Swell Index AS 1289 7.1.1 & 2.1.1					
Sample Number	MA-17966G	MA-17966H			
Date Sampled	21/01/2026	21/01/2026			
Date Tested	28/01/2026	28/01/2026			
Material Source	**	**			
Sample Location	32 (0.5 - 0.71 m)	35 (0.6 - 0.89 m)			
Inert Material Estimate (%)	0	17			
Pocket Penetrometer before (kPa)	380	600			
Pocket Penetrometer after (kPa)	300	600			
Shrinkage Moisture Content (%)	23.9	15.7			
Shrinkage (%)	**5.0**	**3.0**			
Swell Moisture Content Before (%)	22.1	17.1			
Swell Moisture Content After (%)	24.1	21.1			
Swell (%)	**0.8**	**0.9**			
Shrink Swell Index Iss (%)	**3.0**	**1.9**			
Visual Description	Fill/Silty CLAY: CL-CI, brown and orange brown	Fill/Silty CLAY: brown and dark grey			
Cracking	UC	SC			
Crumbling	No	No			
Remarks	**	**			

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.
Cracking Terminology: UC Uncracked, SC Slightly Cracked, MC Moderately Cracked, HC Highly Cracked, FR Fragmented.
Scope of accreditation does not cover the performance of pocket penetrometer readings.

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CERTIFICATE OF ANALYSIS 400558

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Eric Riggle
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	**92323.27, Cobbitty**
Number of Samples	10 Soil
Date samples received	27/01/2026
Date completed instructions received	27/01/2026

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client unless as indicated below in the method summaries. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	03/02/2026
Date of Issue	03/02/2026

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Giovanni Agosti, Group Technical Manager
Nancy Zhang, Laboratory Manager, Sydney

Authorised By
Nancy Zhang, Laboratory Manager

Misc Inorg - Soil						
Our Reference		400558-1	400558-2	400558-3	400558-4	400558-5
Your Reference	UNITS	3	3	3	19	19
Depth		0.5	1.5	2.5	0.5	1.5
Date Sampled		21/01/2026	21/01/2026	21/01/2026	21/01/2026	21/01/2026
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/01/2026	27/01/2026	27/01/2026	27/01/2026	27/01/2026
Date analysed	-	30/01/2026	30/01/2026	30/01/2026	30/01/2026	30/01/2026
Chloride, Cl 1:5 soil:water	mg/kg	140	530	740	510	82
Sulphate, SO4 1:5 soil:water	mg/kg	86	250	10	250	150

Misc Inorg - Soil					
Our Reference		400558-6	400558-7	400558-8	400558-9
Your Reference	UNITS	19	34	34	34
Depth		2.5	0.5	1.5	2.5
Date Sampled		21/01/2026	21/01/2026	21/01/2026	21/01/2026
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	27/01/2026	27/01/2026	27/01/2026	27/01/2026
Date analysed	-	30/01/2026	30/01/2026	30/01/2026	30/01/2026
Chloride, Cl 1:5 soil:water	mg/kg	45	690	820	900
Sulphate, SO4 1:5 soil:water	mg/kg	65	44	140	28

ESP/CEC					
Our Reference		400558-1	400558-4	400558-7	400558-10
Your Reference	UNITS	3	19	34	14
Depth		0.5	0.5	0.5	0.5
Date Sampled		21/01/2026	21/01/2026	21/01/2026	21/01/2026
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	02/02/2026	02/02/2026	02/02/2026	02/02/2026
Date analysed	-	02/02/2026	02/02/2026	02/02/2026	02/02/2026
Exchangeable Ca	meq/100g	4.5	2.2	4.8	3.6
Exchangeable K	meq/100g	0.1	0.2	0.3	0.2
Exchangeable Mg	meq/100g	6.3	9.3	11	8.0
Exchangeable Na	meq/100g	1	2.4	2.9	2.0
Cation Exchange Capacity	meq/100g	12	14	19	14
ESP	%	8	17	15	14

Method ID	Methodology Summary
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			27/01/2026	1	27/01/2026	27/01/2026		27/01/2026	[NT]
Date analysed	-			30/01/2026	1	30/01/2026	30/01/2026		30/01/2026	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	1	140	170	19	94	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	1	86	100	15	109	[NT]

QUALITY CONTROL: ESP/CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	400558-10
Date prepared	-			02/02/2026	[NT]	[NT]	[NT]	[NT]	02/02/2026	02/02/2026
Date analysed	-			02/02/2026	[NT]	[NT]	[NT]	[NT]	02/02/2026	02/02/2026
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	111	130
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	108	101
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	101	112
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	108	92

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volumes) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates can be downloaded from the Envirolab Resources website or obtained directly by contacting the laboratory.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

For Dust Deposit Gauge (DDG) analysis the sampling, sampling period and funnel exposure area do not fall under Envirolab's NATA accreditation (unless the Newcastle laboratory where responsible for the sampling), hence the annotation on the DDG units of reporting.

Urine Analysis - The BEI values listed are taken from the 2022 edition of "TLVs and BEIs Threshold Limits" by ACGIH.

Table C1: Summary Table - Laboratory Tests and Assessments

Test	Sample Depth	pH	Chloride Concentration	Sulphate Concentration	Resistivity	Soil Condition	Sample Aggressivity Class					Exchangeable Sodium (Na) Concentration	Cation Exchange Capacity	Sodicity	Sodicity Class	Emerson Crumb Class Number	Dispersion?	Soil Texture Group	Textural Factor (M)	$EC_{1:5}$	EC_e	Sample Salinity Class
					By inversion of EC1:5		Aggr. to Concrete - from sample pH	Aggr. to Concrete - from Sulphate conc.	Aggr. to Steel - from sample pH	Aggr. to Steel - from Chloride conc.	Aggr. to Steel - from sample Resistivity			[Na/CEC]			(from Emerson Class)	(for detailed soil logs see Report Appendix)		[Lab.]	[M x $EC_{1:5}$]	(Based on sample ECe)
	(m bgl)	(pH units)	(mg/kg)	(mg/kg)	Ω.cm	[AS2159-2009]	[AS2159-2009]					(meq/100g)	(meq/100g)	(%)	[after DLWC]		[AS1289.3.8.1]	[after DLWC]	[after DLWC]	(microS/cm)	(deciS/m)	[Richards 1954]
1	0.5	6.2			3197	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Heavy clay	6	312.8	1.9	Non-Saline
2	0.5	5.8			3914	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	255.5	1.8	Non-Saline
3	0.5	5.8	140	86	4474	B	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	1	12	8	Sodic			Medium clay	7	223.5	1.6	Non-Saline
3	1.5	5.2	530	250	2587	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive							Medium clay	7	386.5	2.7	Slightly Saline
3	2.5	7	740	10	2076	B	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive							Medium clay	7	481.8	3.4	Slightly Saline
4	0.5	7.7			5066	B	Non-Aggressive		Non-Aggressive		Non-Aggressive					2	Some	Medium clay	7	197.4	1.4	Non-Saline
5	0.5	7.9			2438	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Heavy clay	6	410.2	2.5	Slightly Saline
6	0.2	9.2			3905	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	256.1	1.8	Non-Saline
7	0.5	6.3			2347	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Heavy clay	6	426	2.6	Slightly Saline
8	0.3	9			7138	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	140.1	1.0	Non-Saline
9	0.5	8.2			5426	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	184.3	1.3	Non-Saline
10	0.2	9.3			5263	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	190	1.3	Non-Saline
11	0.5	8.6			9634	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Clay loam	9	103.8	0.9	Non-Saline
11	1	8.7			8547	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	117	0.8	Non-Saline
11	1.5	8.8			8137	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	122.9	0.9	Non-Saline
11	1.9	8.7			8006	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Loam	10	124.9	1.2	Non-Saline
12	0.5	5.4			9251	B	Mild		Non-Aggressive		Non-Aggressive							Heavy clay	6	108.1	0.6	Non-Saline
13	0.5	7.1			3591	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	278.5	1.9	Non-Saline
14	0.5	6.7			3492	B	Non-Aggressive		Non-Aggressive		Non-Aggressive	2	14	14	Sodic			Medium clay	7	286.4	2.0	Slightly Saline
14	1.5	8.2			2749	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	363.8	2.5	Slightly Saline
14	2.5	6.5			8084	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Light medium clay	8	123.7	1.0	Non-Saline
15	0.5	5.6			5841	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Light clay	8.5	171.2	1.5	Non-Saline
16	0.5	8.6			4623	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Heavy clay	6	216.3	1.3	Non-Saline
16	1.5	8.7			4900	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	204.1	1.4	Non-Saline
16	2.5	7.1			2033	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	491.8	3.4	Slightly Saline
17	0.5	5.5			6042	B	Mild		Non-Aggressive		Non-Aggressive							Medium clay	7	165.5	1.2	Non-Saline
18	0.5	7.7			1376	B	Non-Aggressive		Non-Aggressive		Mild							Heavy clay	6	726.9	4.4	Moderately Saline
19	0.5	5.7	510	250	3416	B	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	2.4	14	17	Highly Sodic			Heavy clay	6	292.7	1.8	Non-Saline
19	1.5	5.3	82	150	9149	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive							Medium clay	7	109.3	0.8	Non-Saline
19	2.5	5.6	45	65	18282	B	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive							Heavy clay	6	54.7	0.3	Non-Saline
20	0.5	5.5			10707	B	Mild		Non-Aggressive		Non-Aggressive							Heavy clay	6	93.4	0.6	Non-Saline
21	0.5	7.1			9785	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	102.2	0.7	Non-Saline
21	1	8.2			7179	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Heavy clay	6	139.3	0.8	Non-Saline
22	0.5	8.1			10537	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	94.9	0.7	Non-Saline
23	0.5	8.8			6770	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	147.7	1.0	Non-Saline
24	0.5	9.1			4666	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	214.3	1.5	Non-Saline
25	0.2	9.2			3173	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	315.2	2.2	Slightly Saline
26	0.5	8.5			3705	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	269.9	1.9	Non-Saline
27	0.5	6.9			5959	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Heavy clay	6	167.8	1.0	Non-Saline
27	1.5	8.9			3672	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Loam	10	272.3	2.7	Slightly Saline
28	0.5	9			3161	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	316.4	2.2	Slightly Saline
29	0.5	11.3			192308	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Loam	10	5.2	0.1	Non-Saline
30	0.5	8.2			4080	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Clay loam	9	245.1	2.2	Slightly Saline
31	0.5	8.3			3609	B	Non-Aggressive		Non-Aggressive		Non-Aggressive					2	Some	Clay loam	9	277.1	2.5	Slightly Saline
31	1.5	7.5			5708	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Heavy clay	6	175.2	1.1	Non-Saline
31	2.5	6.1			4228	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Heavy clay	6	236.5	1.4	Non-Saline
32	0.5	8.6			4706	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Light medium clay	8	212.5	1.7	Non-Saline
33	0.5	8.3			3801	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Light clay	8.5	263.1	2.2	Slightly Saline
34	0.5	8.4	690	44	2246	B	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive	2.9	19	15	Highly Sodic			Light medium clay	8	445.2	3.6	Slightly Saline
34	1.5	5	820	140	1852	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Mild							Medium clay	7	539.9	3.8	Slightly Saline
34	2.5	5.1	900	28	1627	B	Mild	Non-Aggressive	Non-Aggressive	Non-Aggressive	Mild							Heavy clay	6	614.7	3.7	Slightly Saline
35	0.5	8.5			2643	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Clay loam	9	378.3	3.4	Slightly Saline
36	0.5	8.9			9225	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	108.4	0.8	Non-Saline
37	0.5	8.6			12438	B	Non-Aggressive		Non-Aggressive		Non-Aggressive							Medium clay	7	80.4	0.6	Non-Saline

Douglas PARTNERS | GROUNDED EXPERTISE

Mirvac Homes NSW Pty Ltd
c-/ Orion Consulting Engineers Pty Ltd
PO Box 787
Parramatta, NSW 2124

Attention: Ayberk Sahin
Email: ayberk.sahin@mirvac.com

Project 220469.14
30 April 2026
R.001.Rev1
AS

Report on Level 1 Inspection and Testing of Filling Proposed Residential Subdivision "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty, Cobbitty NSW

1. Introduction

This report presents a summary of Level 1 inspections and testing for the period 25 August 2025 to 18 February 2026 for the bulk fill placed within "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty, Cobbitty NSW. The approximate locations of density testing for the site are shown on Drawing 1 attached.

This report must be read in conjunction with the notes *"About this Inspection Report"* which are attached.

2. Fill Standard and Specification

The scope of works requires Level 1 inspection and testing as defined in AS 3798 *"Guidelines on Earthworks for Commercial and Residential Developments"* (AS 3798, 2007) for the bulk fill placed. The standards and the specifications for the placement of bulk fill for the project include but are not limited to:

- Stripped inspections of proposed fill areas prior to the placement of fill to ensure that stripped natural subgrade is exposed and comprises suitable material free from uncontrolled fill, weak or soft subgrade, vegetation and highly organic topsoil.
- Compaction of bulk fill to a minimum 98% Standard maximum dry density (SMDD) which is in excess of Camden Council requirements (Council requires a minimum 95% SMDD).
- Moisture content within the range ±2% of Standard optimum moisture content (OMC) within the residential lots.
- Testing frequency in accordance with AS 3798 Table 8.1.

2.1 Stripping inspections

Stripped areas were inspected then test rolled by a Douglas earthworks superintendent or geotechnical engineer, prior to the placement of fill, from 25 August 2025. The stripped subgrades

generally comprised natural silty clay or rock, free from vegetation and highly organic topsoil. The subgrade areas were stripped to what was considered an appropriate surface to support the placement of controlled fill.

2.2 Placement and testing of fill

The bulk fill was placed by TRN Group (TRN) during the period 25 August 2025 to 18 February 2026 and, based on the bulk earthworks plans provided, comprised some 36 000 m^3 of fill. It was placed continuously under compaction plant and was tested in lifts of up to 300 mm thickness. The fill materials typically comprised site-won clays and rock. When informed by TRN that controlled fill was to be placed, a soils technician was present on site full-time during the fill placement to make site observations and undertake field testing.

A total of 122 field density tests were undertaken within bulk earthworks during the reporting period. The locations of tests are shown on Drawing 1 (attached).

For assessment of testing frequency compliance, only the bulk earthworks testing has been considered. Based on an estimated fill volume of 36 000 m^3 and a testing frequency of one test per 500 m^3, a minimum of 72 density tests was required. A total of 105 conforming bulk earthworks tests were undertaken, which exceeds the minimum requirement. The testing frequency for the bulk fill is therefore considered to be in accordance with the project requirements.

17 non-conforming test results were recorded:

- Four failed tests (Test No. 53, 56, 57 and 106) were retested, with the subsequent result achieving compliance.
- The remaining 13 failed tests (Test No. 85 – 87, 89, 91, 94 – 99 and 101 – 102) were not retested. These results were generally attributed to over compaction and still satisfy the applicable Camden Council requirements. It is further noted that these tests were located outside the lot boundaries, within the batter of the site boundary, and are not considered to adversely affect the overall performance of the fill.

The test locations were selected by Douglas to achieve appropriate spatial distribution and are shown on Drawing 1. Detailed results are provided in the attached Project Summary Report and summarised in Table 1 below.

Table 1: Summary of density testing

	Density ratio	Moisture content variance
Project specification	98% – 104%	-2.0% (wet) to +2.0% (dry)
Range (passed tests)	98% – 103.5%	-0.5% (wet) to +2.0% (dry)
Mean (passed tests)	100.4%	+1.4% (dry)
Median (passed tests)	100.5%	+1.5% (dry)
Standard deviation (passed tests)	1.2%	0.8%
No. passed tests (inc. retests)	105	
No. of retests	4	

Notes: Statistics provided are rounded to the nearest 0.1%.

3. Comments

Douglas undertook inspection and earthworks testing of fill placed within "Light Green" Stages 2 and 3, 593 Cobbitty Road, Cobbitty, Cobbitty NSW, as requested by Mirvac Homes NSW Pty Ltd. It is considered that the placement and compaction of the bulk fill by TRN in the areas inspected by Douglas during the period have been carried out in accordance with the project specification as far as Douglas has been able to determine and in accordance with the requirements of AS 3798 and can be classified as controlled fill. Douglas does not undertake to guarantee the work of the contractor nor relieve their responsibility to produce a completed product conforming to the requirements of the specification.

For building on the filled areas, consideration should be given by the user/designer to the following:

- Possible disruption of the compacted fill by installation of services.
- The possibility that additional fill has been placed after the date of the last field density test, including the spreading of topsoil.
- Adequate containment of the filled area.
- The suitability of the filled land to support structures of various types without excessive deflection. In particular, the shrink/swell properties of the fill and natural soils must be considered in foundation/footing slab design and in detailing structures.
- The possible softening of the compacted fill because of rainfall and/or inundation from other sources. The moisture content (thus strength) of the placed fill could vary considerably from the time of placement to the time of construction.
- Variation in fill depth.

We trust that the above information is in accordance with your present needs. Please do not hesitate to contact the undersigned should you require additional information at this stage.

4. References

AS 3798. (2007). *Guidelines on Earthworks for Commercial and Residential Developments.* Standards Australia.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully
Douglas Partners Pty Ltd

Afham Syed
Geotechnical Engineer

Reviewed by

Konrad Schultz
Principal

Attachments: About this Inspection Report
Works-as-executed fill plan (WAEX) (provided by client)
Drawing 1 – Density test plan
Project Summary Report

About this Inspection Report

October 2024

Introduction

These notes are provided to amplify Douglas' inspection report in regard to the limitations of carrying out inspection work. Not all notes are necessarily relevant to this report.

Standards

This inspection report has been prepared by qualified personnel to current engineering standards of interpretation and analysis.

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- an investigation report for the project (if available to Douglas);
- inspection of the work, exposed ground conditions, excavation spoil and performance of excavating equipment while Douglas was on site;
- investigation and testing that was carried out during the site inspection;
- anecdotal information provided by authoritative site personnel; and
- Douglas' experience and knowledge of local geology.

Such information may be limited by the frequency of any inspection or testing that was able to be practically carried out, including possible site or cost constraints imposed by the client/ contractor(s). For these reasons, the reliability of this inspection report is limited by the scope of information on which it relies.

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NOTES:

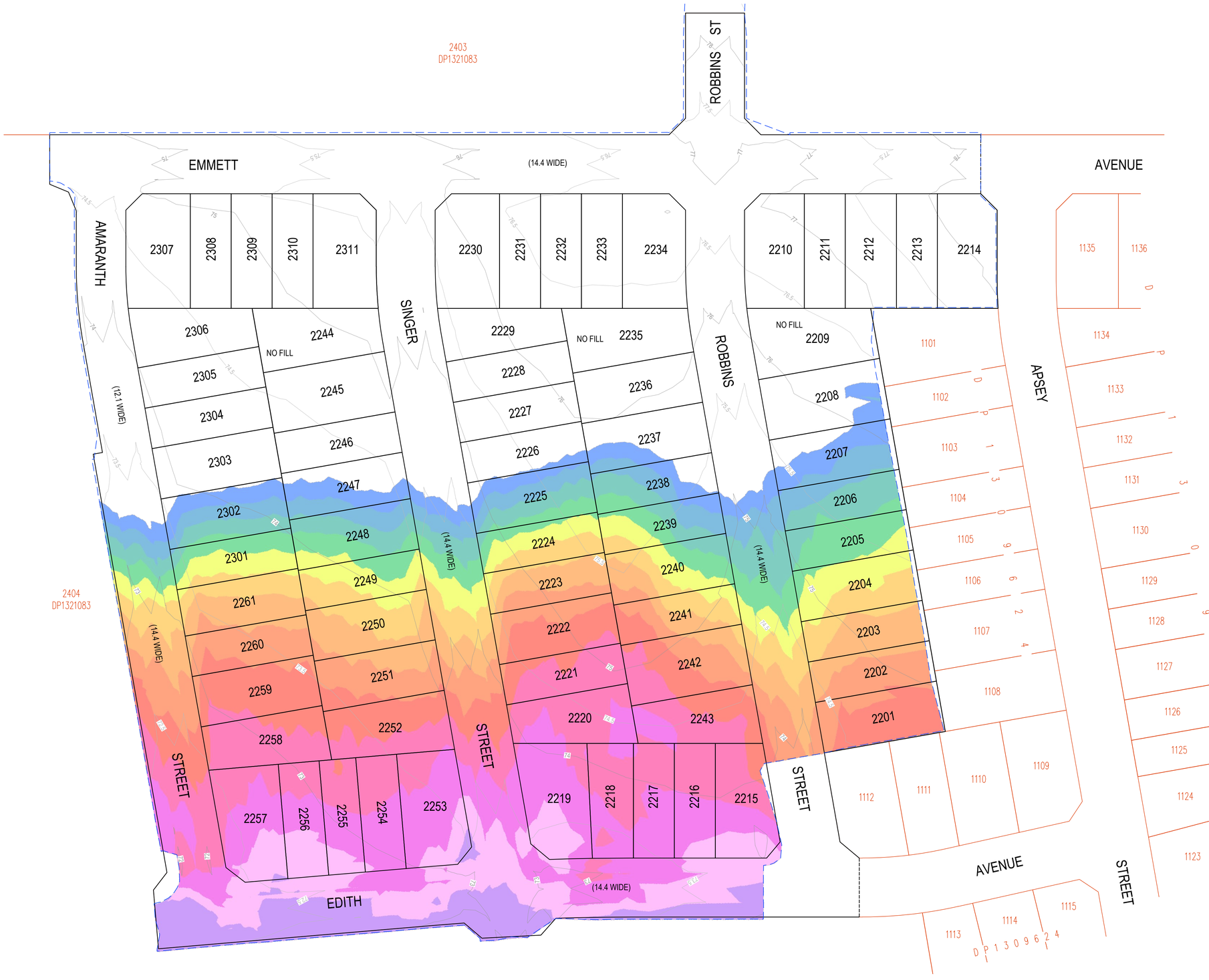
1. EXTENT OF LOT FILL & DEPTHS SHOWN ON THIS PLAN REFLECT CIVIL WORKS UNDERTAKEN BY TRN ONLY. THIS PLAN DOES NOT REFLECT ANY FILLING THAT MAY HAVE HAPPENED PRIOR TO THESE WORKS.
2. STRIPPED SURFACE SURVEY & DTM PREPARED BY TRN. ORION GROUP TAKES NO RESPONSIBILITY FOR THE ACCURACY OF THIS SURVEY.
3. FINISHED SURFACE SURVEY & DTM PREPARED BY ORION GROUP. DATE OF SURVEY: 08/05/2026

LEGEND

APPROXIMATE FILL DEPTH

- 0 - 0.25m
- 0.25 - 0.5m
- 0.5 - 0.75m
- 0.75 - 1.0m
- 1.0 - 1.25m
- 1.25 - 1.5m
- 1.5 - 1.75m
- 1.75 - 2.0m
- 2.0 - 2.25m
- 2.25 - 2.5m
- 2.5 - 2.75m
- 2.75m - 3.0m
- 3.0m +

LIMIT OF FINISHED SURFACE LEVELS



Rev	Drawn	Checked	Appd.	Date	Revision Description
01	AM	AM	AM	13/05/2026	UPDATED WAE LEVELS
00	NAI	AM	AM	22/04/2026	INITIAL ISSUE

SIGNED: AILESH MACGILLICUDDY
REGISTERED LAND SURVEYOR: SU008890
SURVEYING & SPATIAL INFORMATION ACT 2002

0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)

Surveyor	PK & JH	Date of Survey	APRIL 2026
Height Datum	AHD	Horizontal Datum	MGA2020
Origin	SSM18301 RL73.899 (SCIMS - 08/04/26)	Origin	SSM18303 - SSM23117 349°34'36" (SCIMS - 08/04/26)

ABN:25 604 069 981 **T:**(02) 8660 0035 **E:**info@theoriongroup.au

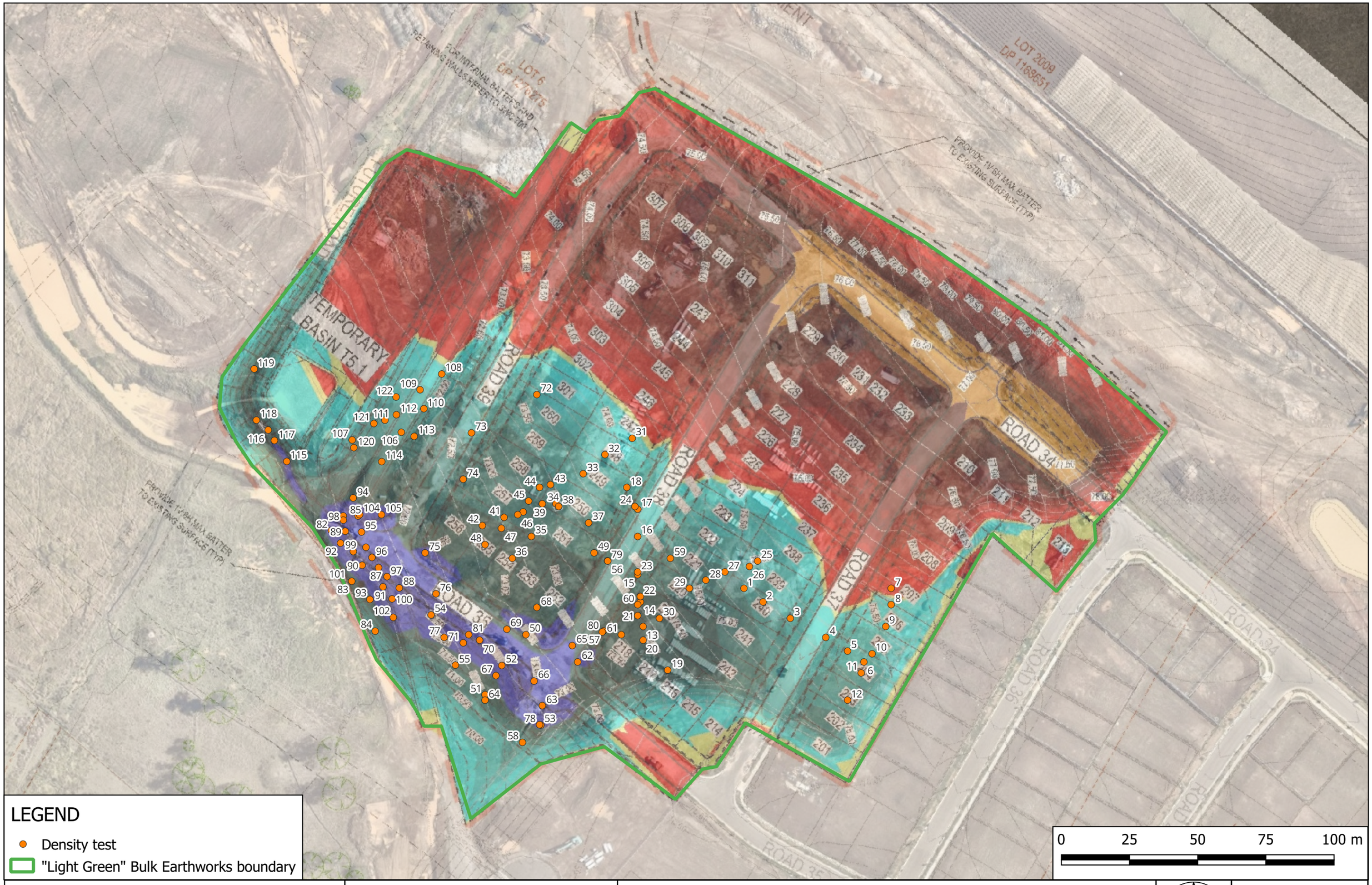
For: mirvac

Project: COBBITTY BY MIRVAC

Title: LOT FILL PLAN
LIGHT GREEN STAGES 2 & 3

ORION EXPANDING HORIZONS

Orion Ref. 24-0549-SV-03-002 | Sheet 01 of 01 | Revision 01



Douglas PARTNERS	CLIENT: Mirvac Homes NSW Pty Ltd c-/ Orion Group	TITLE: **Density Test Plan** **Proposed Residential Subdivision** **"Light Green" Cobbitty Road, Cobbitty NSW**	PROJECT: 220469.14
	OFFICE: Macarthur DRAWN BY: AS		DRAWING No: 1
	Scale: As shown DATE: 24.April.2026		REVISION: 0

Project Summary Report

Douglas Partners Pty Ltd
Macarthur Laboratory
18 Waler Crescent Smeaton Grange NSW 2567
Phone: (02) 4647 0075

Report date: 24/04/2026
Client: Mirvac Homes NSW Pty Ltd
c-/ Orion Consulting Engineers Pty Ltd
Contact: Ayberk Sahin
Project number: 220469.14
Project name: Proposed Residential Subdivision
Project location: Stage "Light Green", Cobbitty, NSW
Specification: 98 - 104% SMDD and -2.0% (wet) to 2.0% (dry) of SOMC
Test methods: AS 1289 5.7.1 STD & 5.8.1

Test #	Date	Easting	Northing	Elevation (m)	Relative compaction (%)	Moisture variation (%)	Pass/fail	Comment
1	25/08/2025	288246	6234590	72.943	99	1.5	Pass	
2	25/08/2025	288253	6234585	73.281	99	1.5	Pass	
3	25/08/2025	288263	6234579	73.379	100	1.5	Pass	
4	25/08/2025	288276	6234572	73.552	99	1.5	Pass	
5	25/08/2025	288284	6234567	73.691	99.5	1.5	Pass	
6	25/08/2025	288290	6234563	73.583	100	1.5	Pass	
7	26/08/2025	288300	6234590	75.087	98.5	1.5	Pass	
8	26/08/2025	288300	6234584	75.026	99	1.5	Pass	
9	26/08/2025	288298	6234576	74.979	99	1.5	Pass	
10	26/08/2025	288293	6234566	74.479	99.5	1.5	Pass	
11	26/08/2025	288289	6234559	74.226	99	2	Pass	
12	26/08/2025	288284	6234549	73.732	99.5	1.5	Pass	
13	27/08/2025	288209	6234576	71.162	99.5	1.5	Pass	
14	27/08/2025	288208	6234585	71.073	101	2	Pass	
15	27/08/2025	288207	6234595	71.588	99.5	1.5	Pass	
16	27/08/2025	288207	6234609	71.965	98.5	2	Pass	
17	27/08/2025	288207	6234619	72.244	99	1.5	Pass	
18	27/08/2025	288203	6234627	72.258	99.5	2	Pass	
19	28/08/2025	288218	6234560	72.049	99.5	1.5	Pass	
20	28/08/2025	288209	6234571	71.432	100.5	1.5	Pass	
21	28/08/2025	288207	6234580	71.482	100	2	Pass	
22	28/08/2025	288208	6234587	71.8	99	1.5	Pass	
23	28/08/2025	288207	6234596	72.01	100	1.5	Pass	
24	28/08/2025	288206	6234620	72.856	99.5	2	Pass	
25	29/08/2025	288251	6234600	74.846	100.5	2	Pass	
26	29/08/2025	288248	6234598	74.648	100.5	2	Pass	
27	29/08/2025	288239	6234596	74.455	100.5	1.5	Pass	
28	29/08/2025	288232	6234593	74.02	100	2	Pass	
29	29/08/2025	288226	6234590	73.687	100	1.5	Pass	
30	29/08/2025	288215	6234579	72.615	98.5	2	Pass	
31	1/09/2025	288205	6234645	72.425	100.5	2	Pass	
32	1/09/2025	288195	6234639	72.81	101	2	Pass	
33	1/09/2025	288187	6234632	72.264	99.5	1.5	Pass	
34	1/09/2025	288177	6234621	71.635	99.5	2	Pass	
35	1/09/2025	288168	6234609	71.02	100.5	1.5	Pass	
36	1/09/2025	288161	6234601	70.535	100	1.5	Pass	
37	2/09/2025	288189	6234614	72.932	101.5	2	Pass	
38	2/09/2025	288178	6234620	72.43	100.5	1.5	Pass	
39	2/09/2025	288172	6234621	72.166	101.5	2	Pass	
40	2/09/2025	288165	6234618	71.689	100	2	Pass	
41	2/09/2025	288158	6234616	71.39	100.5	2	Pass	
42	2/09/2025	288150	6234613	70.905	101	2	Pass	
43	3/09/2025	288175	6234628	72.238	101	2	Pass	
44	3/09/2025	288171	6234627	72.156	101.5	2	Pass	

Test #	Date	Easting	Northing	Elevation (m)	Relative compaction (%)	Moisture variation (%)	Pass/fail	Comment
45	3/09/2025	288167	6234622	71.986	100.5	2	Pass	
46	3/09/2025	288163	6234617	71.955	101.5	2	Pass	
47	3/09/2025	288157	6234612	71.801	100.5	2	Pass	
48	3/09/2025	288151	6234606	71.655	99.5	2	Pass	
49	4/09/2025	288191	6234603	73.019	98	2	Pass	
50	4/09/2025	288166	6234573	70.742	101	2	Pass	
51	4/09/2025	288151	6234551	68.611	98.5	2	Pass	
52	5/09/2025	288157.13	6234561.7	69.849	99.5	-0.5	Pass	
53	5/09/2025	288171.49	6234539.9	70.468	99.5	2.5	Fail	
54	5/09/2025	288131.21	6234580.2	69.491	100	0.5	Pass	
55	5/09/2025	288140.14	6234561.8	69.382	99	0	Pass	
56	6/09/2025	288195.94	6234600.1	73.089	107	1	Fail	
57	6/09/2025	288194.39	6234574.4	72.631	107	0.5	Fail	
58	6/09/2025	288164.73	6234533.5	70.65	102.5	0	Pass	
59	8/09/2025	288219	6234601	73.379	99.5	2	Pass	
60	8/09/2025	288207	6234584	73.503	99.5	2	Pass	
61	8/09/2025	288201	6234573	72.99	99.5	2	Pass	
62	8/09/2025	288185	6234563	72.277	98.5	2	Pass	
63	8/09/2025	288172	6234547	71.31	101.5	2	Pass	
64	8/09/2025	288151	6234549	69.892	100	2	Pass	
65	9/09/2025	288183	6234569	72.708	100.5	1.5	Pass	
66	9/09/2025	288169	6234556	71.828	100.5	2	Pass	
67	9/09/2025	288155	6234558	70.372	99.5	2	Pass	
68	12/09/2025	288170	6234583	72.501	100	2	Pass	
69	12/09/2025	288159	6234575	71.958	100.5	2	Pass	
70	12/09/2025	288149	6234571	71.055	100.5	2	Pass	
71	12/09/2025	288143	6234570	70.537	99.5	2	Pass	
72	13/09/2025	288170	6234661	73.231	101.5	1	Pass	
73	13/09/2025	288146	6234647	72.106	101	1	Pass	
74	13/09/2025	288143	6234630	71.742	102	-0.5	Pass	
75	15/09/2025	288129	6234603	71.524	101.5	2	Pass	
76	15/09/2025	288133	6234588	71.448	100	2	Pass	
77	15/09/2025	288136	6234572	70.745	100.5	2	Pass	
78	15/09/2025	288171	6234540	70.47	99.5	1.5	Pass	Re-test for #53
79	15/09/2025	288196	6234600	73.09	99	2	Pass	Re-test for #56
80	15/09/2025	288194	6234574	72.63	100.5	2	Pass	Re-test for #57
81	16/09/2025	288145	6234573	72.154	99.5	1.5	Pass	
82	18/10/2025	288094.6	6234611.2	69.185	100	0.5	Pass	
83	18/10/2025	288102.1	6234592.6	68.995	99.5	0.5	Pass	
84	18/10/2025	288110.7	6234574.3	68.672	102	0.5	Pass	
85	28/10/2025	288104.45	6234616.5	70.123	102.5	3.5	Fail	
86	28/10/2025	288107.33	6234605.1	71.36	105	1	Fail	
87	28/10/2025	288111.94	6234597.6	71.531	107	3	Fail	
88	28/10/2025	288119.53	6234590.1	71.765	102	1	Pass	
89	28/10/2025	288099.69	6234610.9	70.651	107	-1	Fail	
90	28/10/2025	288105.91	6234598.4	71.255	100	0	Pass	
91	28/10/2025	288113.56	6234590.5	71.595	102.5	4	Fail	
92	28/10/2025	288097.98	6234606.6	70.921	100.5	0.5	Pass	
93	28/10/2025	288108.77	6234585.9	70.279	101	0	Pass	
94	28/10/2025	288102.61	6234623.1	69.715	111	1.5	Fail	
95	28/10/2025	288105.68	6234610.6	71.068	108	2	Fail	
96	28/10/2025	288109.51	6234601.3	71.758	106.5	4.5	Fail	
97	28/10/2025	288115.05	6234594.3	71.838	105	1.5	Fail	
98	28/10/2025	288098.99	6234616.5	70.646	111.5	4.5	Fail	
99	28/10/2025	288102.66	6234603.5	71.298	110	2.5	Fail	
100	28/10/2025	288116.9	6234586.1	71.863	103	1.5	Pass	
101	28/10/2025	288101.23	6234598.4	70.857	108	5	Fail	

Test #	Date	Easting	Northing	Elevation (m)	Relative compaction (%)	Moisture variation (%)	Pass/fail	Comment
102	28/10/2025	288117.34	6234579.3	70.621	108.5	0.5	Fail	
103	4/11/2025	288099	6234615	71.296	101	2	Pass	
104	4/11/2025	288105	6234617	71.5	100.5	1.5	Pass	
105	4/11/2025	288113	6234617	71.706	101	1.5	Pass	
106	11/02/2026	288120.28	6234647.2	70.384	106.5	0.5	Fail	
107	11/02/2026	288102.25	6234644.4	70.006	102.5	0.5	Pass	
108	12/02/2026	288135.11	6234668.6	71.14	101.5	-0.5	Pass	Re-test for #106
109	12/02/2026	288127.17	6234662.8	70.88	103.5	1.5	Pass	
110	12/02/2026	288128.56	6234655.8	71.285	103	0	Pass	
111	12/02/2026	288114.28	6234651.6	71.203	102.5	-0.5	Pass	
112	13/02/2026	288118.47	6234653.6	71.184	100.5	0	Pass	
113	13/02/2026	288125	6234645.7	71.692	102.5	0	Pass	
114	13/02/2026	288113.09	6234636.4	71.417	101.5	0	Pass	
115	16/02/2026	288078.26	6234636.5	70.05	103	0	Pass	
116	16/02/2026	288071.44	6234648	69.953	103.5	1	Pass	
117	17/02/2026	288073.72	6234644.2	70.768	102.5	0	Pass	
118	17/02/2026	288067.12	6234651.7	70.605	101	0.5	Pass	
119	17/02/2026	288066.3	6234670.4	70.651	100	1	Pass	
120	18/02/2026	288102.87	6234641.6	71.136	101.5	-0.5	Pass	
121	18/02/2026	288110.21	6234650.4	71.224	101.5	-0.5	Pass	
122	18/02/2026	288118.36	6234660.1	71.428	101	0	Pass	

Appendix D

Works-as-executed fill plan (WAEX) (provided by client)

NOTES:

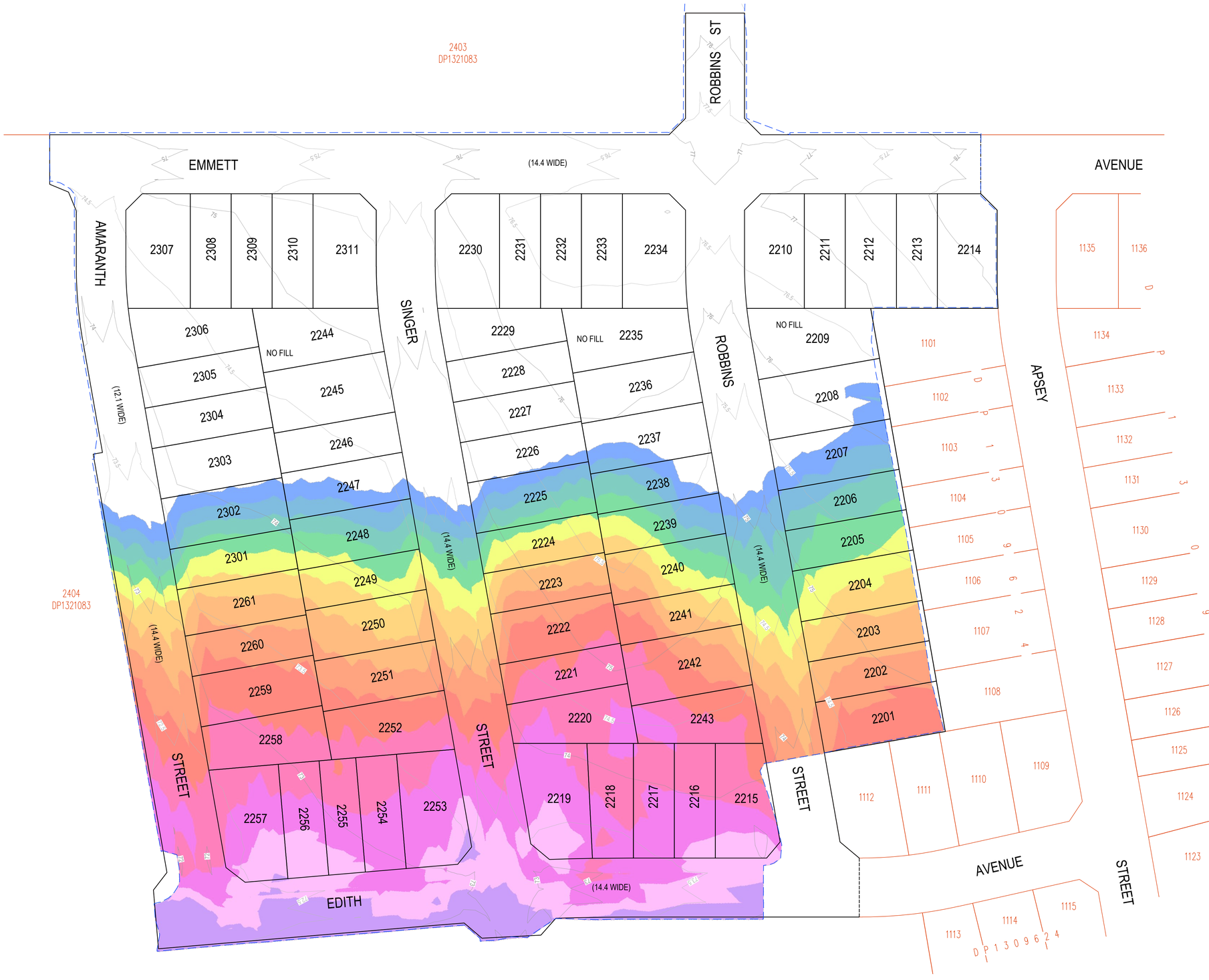
1. EXTENT OF LOT FILL & DEPTHS SHOWN ON THIS PLAN REFLECT CIVIL WORKS UNDERTAKEN BY TRN ONLY. THIS PLAN DOES NOT REFLECT ANY FILLING THAT MAY HAVE HAPPENED PRIOR TO THESE WORKS.
2. STRIPPED SURFACE SURVEY & DTM PREPARED BY TRN. ORION GROUP TAKES NO RESPONSIBILITY FOR THE ACCURACY OF THIS SURVEY.
3. FINISHED SURFACE SURVEY & DTM PREPARED BY ORION GROUP. DATE OF SURVEY: 08/05/2026

LEGEND

APPROXIMATE FILL DEPTH

- 0 - 0.25m
- 0.25 - 0.5m
- 0.5 - 0.75m
- 0.75 - 1.0m
- 1.0 - 1.25m
- 1.25 - 1.5m
- 1.5 - 1.75m
- 1.75 - 2.0m
- 2.0 - 2.25m
- 2.25 - 2.5m
- 2.5 - 2.75m
- 2.75m - 3.0m
- 3.0m +

LIMIT OF FINISHED SURFACE LEVELS



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01	AM	AM	AM	13/05/2026	UPDATED WAE LEVELS
00	NAI	AM	AM	22/04/2026	INITIAL ISSUE

SIGNED: AILESH MACGILLICUDDY
REGISTERED LAND SURVEYOR: SU008890
SURVEYING & SPATIAL INFORMATION ACT 2002

0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)

Surveyor	PK & JH	Date of Survey	APRIL 2026
Height Datum	AHD	Horizontal Datum	MGA2020
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ABN:25 604 069 981 **T:**(02) 8660 0035 **E:**info@theoriongroup.au

For: mirvac

Project: COBBITTY BY MIRVAC

Title: LOT FILL PLAN
LIGHT GREEN STAGES 2 & 3

ORION EXPANDING HORIZONS

Orion Ref. 24-0549-SV-03-002 | Sheet 01 of 01 | Revision 01

Appendix E

CSIRO Publication

FOUNDATION MAINTENANCE AND FOOTING PERFORMANCE

Understanding and preventing soil-related building movement

This Building Technology Resource is designed to identify causes of soil-related building movement, and to suggest methods of prevention of resultant cracking.

Buildings can and often do move. This movement can be up, down, lateral or rotational. The fundamental cause of movement in buildings can usually be related to one or more problems in the foundation soil. It is important for the home owner to identify the soil type in order to ascertain the measures that should be put in place in order to ensure that problems in the foundation soil can be prevented, thus protecting against building movement.

SOIL TYPES

The types of soils usually present under the topsoil in land zoned for residential buildings can be split into two approximate groups – granular and clay. Quite often, foundation soil is a mixture of both types. The general problems associated with soils having granular content are usually caused by erosion. Clay soils are subject to saturation and swell/shrink problems.

Classifications for a given area can generally be obtained by application to the local authority, but these are sometimes unreliable and if there is doubt, a geotechnical report should be commissioned. As most buildings suffering movement problems are founded on clay soils, there is an emphasis on classification of soils according to the amount of swell and shrinkage they experience with variations of water content. Table 1 below is a reproduction of Table 2.1 from Australian Standard AS 2870-2011, Residential slabs and footings.

CAUSES OF MOVEMENT

SETTLEMENT DUE TO CONSTRUCTION

There are two types of settlement that occur as a result of construction:

- Immediate settlement occurs when a building is first placed on its foundation soil, as a result of compaction of the soil under the weight of the structure. The cohesive quality of clay soil mitigates against this, but granular (particularly sandy) soil is susceptible.
- Consolidation settlement is a feature of clay soil and may take place because of the expulsion of moisture from the soil or because of the soil's lack of resistance to local compressive or shear stresses. This will usually take place during the first few months after construction but has been known to take many years in exceptional cases.

These problems may be the province of the builder and should be taken into consideration as part of the preparation of the site for construction.

EROSION

All soils are prone to erosion, but sandy soil is particularly susceptible to being washed away. Even clay with a sand component of say 10% or more can suffer from erosion.

SATURATION

This is particularly a problem in clay soils. Saturation creates a bog-like suspension of the soil that causes it to lose virtually all of its bearing capacity. To a lesser degree, sand is affected by saturation because saturated sand may undergo a reduction in volume, particularly imported sand fill for bedding and blinding layers. However, this usually occurs as immediate settlement and should normally be the province of the builder.

SEASONAL SWELLING AND SHRINKAGE OF SOIL

All clays react to the presence of water by slowly absorbing it, making the soil increase in volume (see table below, from AS 2870). The degree of increase varies considerably between different clays, as does the degree of decrease during the subsequent drying out caused by fair weather periods. Because of the low absorption and expulsion rate, this phenomenon will not usually be noticeable unless there are prolonged rainy or dry periods, usually of weeks or months, depending on the land and soil characteristics.

The swelling of soil creates an upward force on the footings of the building, and shrinkage creates subsidence that takes away the support needed by the footing to retain equilibrium.

SHEAR FAILURE

This phenomenon occurs when the foundation soil does not have sufficient strength to support the weight of the footing. There are two major post-construction causes:

- Significant load increase.
- Reduction of lateral support of the soil under the footing due to erosion or excavation.

In clay soil, shear failure can be caused by saturation of the soil adjacent to or under the footing.

TREE ROOT GROWTH

Trees and shrubs that are allowed to grow in the vicinity of footings can cause foundation soil movement in two ways:

- Roots that grow under footings may increase in cross-sectional size, exerting upward pressure on footings.

TABLE 1. GENERAL DEFINITIONS OF SITE CLASSES.

Class	Foundation
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
M	Moderately reactive clay or silt sites, which may experience moderate ground movement from moisture changes
H1	Highly reactive clay sites, which may experience high ground movement from moisture changes
H2	Highly reactive clay sites, which may experience very high ground movement from moisture changes
F	Extremely reactive sites, which may experience extreme ground movement from moisture changes

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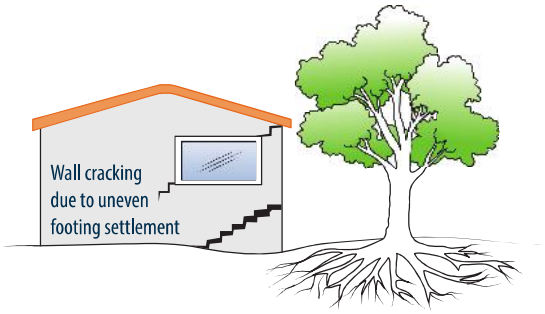

FIGURE 1 Trees can cause shrinkage and damage.

- Roots in the vicinity of footings will absorb much of the moisture in the foundation soil, causing shrinkage or subsidence.

UNEVENNESS OF MOVEMENT

The types of ground movement described above usually occur unevenly throughout the building's foundation soil. Settlement due to construction tends to be uneven because of:

- Differing compaction of foundation soil prior to construction.
- Differing moisture content of foundation soil prior to construction.

Movement due to non-construction causes is usually more uneven still. Erosion can undermine a footing that traverses the flow or can create the conditions for shear failure by eroding soil adjacent to a footing that runs in the same direction as the flow.

Saturation of clay foundation soil may occur where subfloor walls create a dam that makes water pond. It can also occur wherever there is a source of water near footings in clay soil. This leads to a severe reduction in the strength of the soil which may create local shear failure.

Seasonal swelling and shrinkage of clay soil affects the perimeter of the building first, then gradually spreads to the interior through absorption. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Shrinkage usually begins on the side of the building where the sun's heat is greatest.

EFFECTS OF UNEVEN SOIL MOVEMENT ON STRUCTURES

EROSION AND SATURATION

Erosion removes the support from under footings, tending to create subsidence of the part of the structure under which it occurs. Brickwork walls will resist the stress created by this removal of support by bridging the gap or cantilevering until the bricks or the mortar bedding fail. Older masonry has little resistance. Evidence of failure varies according to circumstances and symptoms may include:

- Step cracking in the mortar beds in the body of the wall or above/below openings such as doors or windows.
- Vertical cracking in the bricks (usually but not necessarily in line with the vertical beds or perpends).

Isolated piers affected by erosion or saturation of foundations will eventually lose contact with the bearers they support and may tilt or fall over. The floors that have lost this support will become bouncy, sometimes rattling ornaments etc.

SEASONAL SWELLING/SHRINKAGE IN CLAY

Swelling foundation soil due to rainy periods first lifts the most exposed extremities of the footing system, then the remainder of the perimeter footings while gradually permeating inside the building footprint to lift internal footings. This swelling first tends to create a dish effect, because the external footings are pushed higher than the internal ones.

The first noticeable symptom may be that the floor appears slightly dished. This is often accompanied by some doors binding on the floor or the door head, together with some cracking of cornice mitres. In buildings with timber flooring supported by bearers and joists, the floor can be bouncy. Externally there may be visible dishing of the hip or ridge lines.

As the moisture absorption process completes its journey to the innermost areas of the building, the internal footings will rise. If the spread of moisture is roughly even, it may be that the symptoms will temporarily disappear, but it is more likely that swelling will be uneven, creating a difference rather than a disappearance in symptoms. In buildings with timber flooring supported by bearers and joists, the isolated piers will rise more easily than the strip footings or piers under walls, creating noticeable doming of flooring.

As the weather pattern changes and the soil begins to dry out, the external footings will be first affected, beginning with the locations where the sun's effect is strongest. This has the effect of lowering the external footings. The doming is accentuated, and cracking reduces or disappears where it occurred because of dishing, but other cracks open up. The roof lines may become convex.

Doming and dishing are also affected by weather in other ways. In areas where warm, wet summers and cooler dry winters prevail, water migration tends to be toward the interior and doming will be accentuated, whereas where summers are dry, and winters are cold and wet, migration tends to be toward the exterior and the underlying propensity is toward dishing.

MOVEMENT CAUSED BY TREE ROOTS

In general, growing roots will exert an upward pressure on footings, whereas soil subject to drying because of tree or shrub roots will tend to remove support from under footings by inducing shrinkage.

COMPLICATIONS CAUSED BY THE STRUCTURE ITSELF

Most forces that the soil causes to be exerted on structures are vertical – i.e. either up or down. However, because these forces are seldom spread evenly around the footings, and because the building resists uneven movement because of its rigidity, forces are exerted from one part of the building to another. The net result of all these forces is usually rotational. This resultant force often complicates the diagnosis because the visible symptoms do not simply reflect the original cause. A common symptom is binding of doors on the vertical member of the frame.

EFFECTS ON FULL MASONRY STRUCTURES

Brickwork will resist cracking where it can. It will attempt to span areas that lose support because of subsided foundations or raised points. It is therefore usual to see cracking at weak points, such as openings for windows or doors.

In the event of construction settlement, cracking will usually remain unchanged after the process of settlement has ceased.

With local shear or erosion, cracking will usually continue to develop until the original cause has been remedied, or until the subsidence has completely neutralised the affected portion of footing and the structure has stabilised on other footings that remain effective.

In the case of swell/shrink effects, the brickwork will in some cases return to its original position after completion of a cycle, however it is more likely that the rotational effect will not be exactly reversed, and it is also usual that brickwork will settle in its new position and will resist the forces trying to return it to its original position. This means that in a case where swelling takes place after construction and cracking occurs, the cracking is likely to at least partly remain after the shrink segment of the cycle is complete. Thus, each time the cycle is repeated, the likelihood is that the cracking will become wider until the sections of brickwork become virtually independent.

With repeated cycles, once the cracking is established, if there is no other complication, it is normal for the incidence of cracking to stabilise, as the building has the articulation it needs to cope with the problem. This is by no means always the case, however, and monitoring of cracks in walls and floors should always be treated seriously.

Upheaval caused by growth of tree roots under footings is not a simple vertical shear stress. There is a tendency for the root to also

exert lateral forces that attempt to separate sections of brickwork after initial cracking has occurred.

The normal structural arrangement is that the inner leaf of brickwork in the external walls and at least some of the internal walls (depending on the roof type) comprise the load-bearing structure on which any upper floors, ceilings and the roof are supported. In these cases, it is internally visible cracking that should be the main focus of attention, however there are a few examples of dwellings whose external leaf of masonry plays some supporting role, so this should be checked if there is any doubt. In any case, externally visible cracking is important as a guide to stresses on the structure generally, and it should also be remembered that the external walls must be capable of supporting themselves.

EFFECTS ON FRAMED STRUCTURES

Timber or steel framed buildings are less likely to exhibit cracking due to swell/shrink than masonry buildings because of their flexibility. Also, the doming/dishing effects tend to be lower because of the lighter weight of walls. The main risks to framed buildings are encountered because of the isolated pier footings used under walls. Where erosion or saturation causes a footing to fall away, this can double the span which a wall must bridge. This additional stress can create cracking in wall linings, particularly where there is a weak point in the structure caused by a door or window opening. It is, however, unlikely that framed structures will be so stressed as to suffer serious damage without first exhibiting some or all of the above symptoms for a considerable period. The same warning period should apply in the case of upheaval. It should be noted, however, that where framed buildings are supported by strip footings there is only one leaf of brickwork and therefore the externally visible walls are the supporting structure for the building. In this case, the subfloor masonry walls can be expected to behave as full brickwork walls.

EFFECTS ON BRICK VENEER STRUCTURES

Because the load-bearing structure of a brick veneer building is the frame that makes up the interior leaf of the external walls plus perhaps the internal walls, depending on the type of roof, the building can be expected to behave as a framed structure, except that the external masonry will behave in a similar way to the external leaf of a full masonry structure.

WATER SERVICE AND DRAINAGE

Where a water service pipe, a sewer or stormwater drainage pipe is in the vicinity of a building, a water leak can cause erosion, swelling or saturation of susceptible soil. Even a minuscule leak can be enough to saturate a clay foundation. A leaking tap near a building can have the same effect. In addition, trenches containing pipes can become watercourses even though backfilled, particularly where broken rubble is used as fill. Water that runs along these trenches can be responsible for serious erosion, interstrata seepage into subfloor areas and saturation.

Pipe leakage and trench water flows also encourage tree and shrub roots to the source of water, complicating and exacerbating the problem. Poor roof plumbing can result in large volumes of rainwater being concentrated in a small area of soil:

- Incorrect falls in roof guttering may result in overflows, as may gutters blocked with leaves etc.
- Corroded guttering or downpipes can spill water to ground.
- Downpipes not positively connected to a proper stormwater collection system will direct a concentration of water to soil that is directly adjacent to footings, sometimes causing large-scale problems such as erosion, saturation and migration of water under the building.

SERIOUSNESS OF CRACKING

In general, most cracking found in masonry walls is a cosmetic nuisance only and can be kept in repair or even ignored. Table 2 below is a reproduction of Table C1 of AS 2870-2011.

AS 2870-2011 also publishes figures relating to cracking in concrete floors, however because wall cracking will usually reach the critical point significantly earlier than cracking in slabs, this table is not reproduced here.

PREVENTION AND CURE

PLUMBING

Where building movement is caused by water service, roof plumbing, sewer or stormwater failure, the remedy is to repair the problem. It is prudent, however, to consider also rerouting pipes away from the building where possible and relocating taps to positions where any leakage will not direct water to the building vicinity. Even where gully traps are present, there is sometimes sufficient spill to create erosion or saturation, particularly in modern installations using smaller diameter PVC fixtures. Indeed, some gully traps are not situated directly under the taps that are installed to charge them, with the result that water from the tap may enter the backfilled trench that houses the sewer piping. If the trench has been poorly backfilled, the water will either pond or flow along the bottom of the trench. As these trenches usually run alongside the footings and can be at a similar depth, it is not hard to see how any water that is thus directed into a trench can easily affect the foundation's ability to support footings or even gain entry to the subfloor area.

GROUND DRAINAGE

In all soils there is the capacity for water to travel on the surface and below it. Surface water flows can be established by inspection during and after heavy or prolonged rain. If necessary, a grated drain system connected to the stormwater collection system is usually an easy solution.

It is, however, sometimes necessary when attempting to prevent water migration that testing be carried out to establish watertable height and subsoil water flows. This subject may be regarded as an area for an expert consultant.

PROTECTION OF THE BUILDING PERIMETER

It is essential to remember that the soil that affects footings extends well beyond the actual building line. Watering of garden plants, shrubs and trees causes some of the most serious water problems.

For this reason, particularly where problems exist or are likely to occur, it is recommended that an apron of paving be installed around as much of the building perimeter as necessary. This paving should extend outwards a minimum of 900 mm (more in highly reactive soil) and should have a minimum fall away from the building of 1:60. The finished paving should be no less than 100 mm below brick vent bases.

It is prudent to relocate drainage pipes away from this paving, if possible, to avoid complications from future leakage. If this is not practical, earthenware pipes should be replaced by PVC and backfilling should be of the same soil type as the surrounding soil and compacted to the same density.

Except in areas where freezing of water is an issue, it is wise to remove taps in the building area and relocate them well away from the building – preferably not uphill.

It may be desirable to install a grated drain at the outside edge of the paving on the uphill side of the building. If subsoil drainage is needed this can be installed under the surface drain.

CONDENSATION

In buildings with a subfloor void, such as where bearers and joists support flooring, insufficient ventilation creates ideal conditions for condensation, particularly where there is little clearance between the floor and the ground. Condensation adds to the moisture already present in the subfloor and significantly slows the process of drying out. Installation of an adequate subfloor ventilation system, either natural or mechanical, is desirable.

TABLE 2. CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS.

Description of typical damage and required repair	Approximate crack width limit	Damage category
Hairline cracks	<0.1 mm	0 – Negligible
Fine cracks which do not need repair	<1 mm	1 – Very Slight
Cracks noticeable but easily filled. Doors and windows stick slightly.	<5 mm	2 – Slight
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weathertightness often impaired.	5–15 mm (or a number of cracks 3 mm or more in one group)	3 – Moderate
Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted.	15–25 mm but also depends on number of cracks	4 – Severe

Warning: Although this Building Technology Resource deals with cracking in buildings, it should be said that subfloor moisture can result in the development of other problems, notably:

- Water that is transmitted into masonry, metal or timber building elements causes damage and/or decay to those elements.
- High subfloor humidity and moisture content create an ideal environment for various pests, including termites and spiders, and mould.
- Where high moisture levels are transmitted to the flooring and walls, an increase in the dust mite count can ensue within the living areas. Dust mites, as well as dampness in general, can be a health hazard to inhabitants, particularly those who are abnormally susceptible to respiratory ailments.

THE GARDEN

The ideal vegetation layout is to have lawn or plants that require only light watering immediately adjacent to the drainage or paving edge, then more demanding plants, shrubs and trees spread out in that order.

Overwatering due to misuse of automatic watering systems is a common cause of saturation and water migration under footings. If it is necessary to use these systems, it is important to remove garden beds to a completely safe distance from buildings.

EXISTING TREES

Where a tree is causing a problem of soil drying or there is the existence or threat of upheaval of footings, if the offending roots are subsidiary and their removal will not significantly damage the tree, they should be severed and a concrete or metal barrier placed vertically in the soil to prevent future root growth in the direction of the building. If it is not possible to remove the relevant roots without damage to the tree, an application to remove the tree should be made to the local authority. A prudent plan is to transplant likely offenders before they become a problem.

INFORMATION ON TREES, PLANTS AND SHRUBS

State departments overseeing agriculture can give information regarding root patterns, volume of water needed and safe distance from buildings of most species. Botanic gardens are also sources of information.

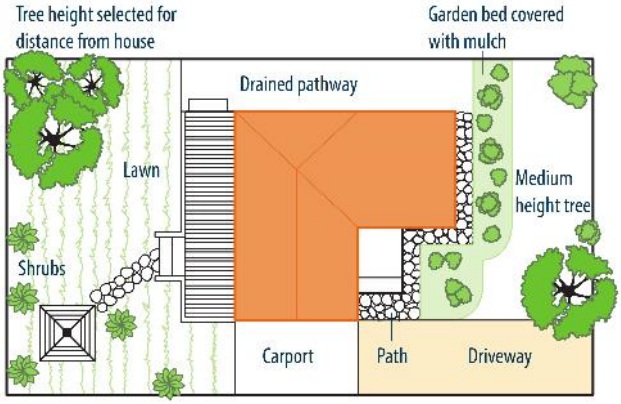

FIGURE 2 Gardens for a reactive site.

EXCAVATION

Excavation around footings must be properly engineered. Soil supporting footings can only be safely excavated at an angle that allows the soil under the footing to remain stable. This angle is called the angle of repose (or friction) and varies significantly between soil types and conditions. Removal of soil within the angle of repose will cause subsidence.

REMEDIATION

Where erosion has occurred that has washed away soil adjacent to footings, soil of the same classification should be introduced and compacted to the same density. Where footings have been undermined, augmentation or other specialist work may be required. Remediation of footings and foundations is generally the realm of a specialist consultant.

Where isolated footings rise and fall because of swell/shrink effect, the home owner may be tempted to alleviate floor bounce by filling the gap that has appeared between the bearer and the pier with blocking. The danger here is that when the next swell segment of the cycle occurs, the extra blocking will push the floor up into an accentuated dome and may also cause local shear failure in the soil. If it is necessary to use blocking, it should be by a pair of fine wedges and monitoring should be carried out fortnightly.

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