GEOTECHNICAL INVESTIGATION REPORT

PROPOSED METAL RECYCLING FACILITY
88 MURRAYS FLAT ROAD, TOWRANG NSW

Prepared for **Sincorp Properties Pty Ltd**

25 March 2026

Ref: DRM P24.1039.V01-R01

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Report Title	GEOTECHNICAL INVESTIGATION REPORT
Site	Proposed Metal Recycling Facility 88 Murrays Flat Road, Towrang NSW
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GEOTECHNICAL INVESTIGATION REPORT
Proposed Metal Recycling Facility
88 Murrays Flat Road, Towrang NSW

Development Risk Management Pty Ltd (DRM) is pleased to present this Geotechnical Investigation report for proposed metal recycling facility located at a portion of 88 Murrays Flat Road, Towrang NSW (the site). This report has been prepared by our sub-consultant Core Geotech Pty Ltd.

I trust this report meets your current requirements. Please do not hesitate to contact me on 0450 715 562 or nalin_desilva@drm.ltd if you have any queries.

For and on behalf of Development Risk Management Pty Ltd,

NALIN DE SILVA

Principal Environmental Engineer

This report must be read in conjunction with the ***Limitation and General Notes*** page at the front of this report.

LIMITATIONS AND GENERAL NOTES

LIMITATIONS

The report has been prepared in accordance with the scope of services set out in the Development Risk Management Pty Ltd (DRM) Proposal under the agreed Terms of Engagement. The scope of services were agreed to with due consideration of a range of factors including time, budget, access and site constraints. The report is provided for the specific purpose as described in the report. The report may not contain sufficient information for purposes other than that described in the report.

The information in this report is considered accurate at the date of issue.

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Subsurface conditions can change with time and can vary between test locations. Therefore, actual conditions in areas not sampled may differ from those predicted since no subsurface investigation, no matter how comprehensive, can reveal all subsurface details and anomalies. Anthropogenic impact and natural causes can also affect subsurface conditions and thus the continuing adequacy of these reports. Seasonal variations can also affect subsurface conditions. DRM should be kept informed of any such events and should be retained to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Data obtained from nominated discrete locations, subsequent laboratory testing and empirical or external sources are interpreted by trained professionals in order to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions in accordance with any relevant industry standards, guidelines or procedures.

Document Status

Date	Document Number	Revision	Description
25.03.2026	CG26-0371-A	0	Geotechnical Investigation Report

	Name	Signature	Position
Prepared by	Vipul De Silva		Senior Principal Geotechnical Engineer FIEAust, CPEng, NER
Reviewed by	Raj Singh		Principal Geotechnical Engineer MIEAust CPEng, NER

Document Delivery

CG provides this document in either printed format, electronic format or both. The electronic format is provided for the client's convenience and CG requests that the client ensures the integrity of this electronic information is maintained.

Where an electronic only version is provided to the client, a signed hard copy of this document is held on file by CG, and a copy will be provided if requested.

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Appendices

1 INTRODUCTION

Core Geotech Pty Ltd (CG) was engaged by Development Risk Management Pty Ltd (DRM) to undertake a geotechnical investigation to support a development by Sincorp Properties Pty Ltd for a proposed metal recycling facility. The works were carried out at 88 Murrays Flat Road, Towrang NSW (property).

The proposed development comprises establishment of a metal recycling facility at the western portion of the property (Lot 3 DP 251779). The site is located within Zone E4 General Industry, and the proposed buildings are nominated as NCC Class 5 (office building) and Class 8 (factory building) structures. The lot has an area of approximately 322,656m², with the nominated development footprint area of approximately 77,243m². (Refer Figure 1 in Appendix B)

The facility layout includes site access from Murrays Flat Road via the existing driveway, entry and exit arrangement incorporating a weighbridge and gatehouse. The internal layout comprises dedicated processing and stockpiling areas supported by extensive hardstand surfaces (noted as compacted road base), internal circulation routes for mobile plant and trucks, and staff and visitor parking (18 spaces). Refer Figure 2 in Appendix B)

The objective of the investigation is to provide geotechnical information to inform preliminary design and to support other consultants in addressing the anticipated Planning Secretary's Environmental Assessment Requirements (SEARs), including consideration of geotechnical constraints relevant to earthworks and erosion and sediment control planning.

Details of the work undertaken, and the results obtained are presented in this report, together with comments relating to engineering design and construction practise. Comments are also provided on the need for further geotechnical investigations that are required when the project progresses to the construction stage.

2 PROVIDED INFORMATION

The following documents have been used in preparation of this report:

- Architectural Drawings prepared by JEP Environment and Planning dated 6 October 2025; and
- Planning Secretary's Environmental Assessment Requirements (SEAR) (ref: EF25/16786, SEAR 2038) dated 13 November 2025.

3 SCOPE OF WORKS

As defined in our proposal, the proposed scope of work to be conducted by DRM was defined as follows:

- Desktop study of available information relevant to the proposed metal recycling facility;
- Arrange and execute a geotechnical Site Investigation (SI);
- Review of all the data relevant to existing subsurface information and the proposed project;
- Details and descriptions of the existing subsoil strata with laboratory test results;
- Development of the geotechnical ground model and provide appropriate geotechnical design parameters and recommendations for site preparation, earthworks, reuse of on-site materials, foundations and slabs, pavements and hardstands, excavations, temporary works, retaining walls, batter slopes and slope stability where relevant;
- Preliminary settlement considerations;

- Seismic site subsoil classification parameters for structural design;
- Recommendation of soil and rock aggressivity; and
- Geotechnical inputs relevant to erosion and sediment control.

4 PROPOSED DEVELOPMENT

Based on the supplied architectural drawings, it is understood that proposed development comprises construct and operate a metal recycling facility processing up to maximum of 30,000 tonnes per annum of scrap metal. Also, development includes ancillary construction of an enclosed workshop building, staff amenities, hardstand, parking area, weighbridges, supporting road upgrades, stormwater management system as well as conversion of an existing residential dwelling to an administrative building.

5 SITE DESCRIPTION

The site located at 88 Murrays Flat Road, Towrang NSW, within the Local Government Area of the Goulburn, as shown on the site Investigation Plan (Refer Figure in Appendix C). The investigation area occupies approximately western 77,243m² of Lot 3 DP 251779. The site is currently occupied by a small cottage at the northwest portion, and the site appears to be used for rural agricultural land use. The surrounding area of the cottage comprised with shed/vehicle service area, shipping containers, one aboveground rainwater tanks and two underground septic tanks.

Beyond the currently developed area, the site is covered with grass.

5.1 Site Topography

The ground surface generally comprises with grass cover followed by silty clay at the south portion and road base fill from the cottage area towards the site accesses at west. The site has a northwest facing slope of approximately 2.7 degree, with the elevation of 654m at the southeast corner and 630m at the northwest corner. The property comprises 15dams. No dams were identified within the development footprint. A well-defined creek flowing to Wollondilly River is located over the western part of the site. Based on the topography and existing surface water bodies, the site is draining towards Wollondilly River approximately 790m to the north.

The site photographs taken during the Geotechnical Investigation are shown on Figure 1 to 3.

Figure 1: Photo taken near north boundary looking south

Figure 2: Photo taken near south boundary looking north

Figure 3: Photo taken at the middle of the site looking south

5.2 Surface and Groundwater

The site is sloping towards the Wollondilly River approximately 790m to the north. The property contains at least 15 dams across the property, predominantly in the eastern portion. Only two large dams are located within the natural drainage channel located outside of eastern boundary of the proposed development footprint. Based on the site levels it is likely the surface water would flow north and would connect to the Wollondilly River.

Water NSW Groundwater data base indicated that there is one registered groundwater bore (GW100150) feature located within a 500m radius of the site. The summary report states that:

- Authorized purpose of the borehole was domestic;
- Standing water level was at 15m bgl; and
- It is located in 34°43'46.4"S, 149°47'47.3"E coordinates (i.e. within the property).

6 FIELDWORK

Following a Before You Dig Australia (BYDA) search and physical scanning of the area, fieldwork was carried out on 24, 25 and 26 February 2026 and included drilling thirteen (13) boreholes (BH01 to BH13) to a termination/refusal depth ranging from 5.9m to 8m using a Ute mounted drilling rig fitted with 110mm diameter solid flight auger attachment. Standard Penetration Tests (SPT) were performed at 1.5m depth intervals to assess the relative density/consistency of in situ soils. Fieldwork was carried out under the direction of CG in general accordance with AS 1726 specifications and logged in accordance with AS1726 (2017) guidance. The scope of fieldwork completed was as follows:

- Completed a walkover survey of the site to assess the general landform, site conditions and adjacent structures / infrastructure;
- An on-site services search was carried out by a specialist contractor to identify the presence of any underground obstructions or hazards, prior to the field investigation program commencing;
- Drilled 13 boreholes across the proposed development area with a geotechnical site investigation drilling rig to a depth ranging from 5.9m to 8m using a UTE mounted drilling rig fitted with 110mm diameter solid flight auger attachment. Boreholes were backfilled by hand with the excavated spoil;

- Conducted drilling works for 3 days and analysis conducted with details in Table 1 below:

Table 1: Summary of Conducted Laboratory Tests				
Borehole	**Depth, m**	**Date**	**Approximate Surface RL**	**Laboratory testing conducted**
BH01	7.5	26/02/2026	629.64	Moisture Content, CBR, Emerson, EC&pH
BH02	8	26/02/2026	631.43	--
BH03	8	26/02/2026	632.18	Moisture Content
BH04	5.4	25/02/2026	632.69	CBR, Emerson, EC&pH
BH05	8	25/02/2026	633.91	CBR
BH06	7.3	25/02/2026	634.95	Moisture Content, CBR, Atterberg Limit, Linear Shrinkage
BH07	8	25/02/2026	635.77	--
BH08	7.5	25/02/2026	636.77	CBR, Emerson, EC&pH
BH09	5.9	25/02/2026	638.48	Moisture Content, Atterberg Limit, Linear Shrinkage
BH10	8	24/02/2026	635.89	Moisture Content, Atterberg Limit, Linear Shrinkage
BH11	8	24/02/2026	637.14	Moisture Content, Atterberg Limit, Linear Shrinkage
BH12	7.5	24/02/2026	638.27	Moisture Content, Emerson
BH13	6.8	24/02/2026	641.87	EC&pH

- Standard Penetration (SPT) test at maximum 1.5m intervals, starting at 0.5m depth, was carried out in each borehole to assess the relative density/consistency of in situ soils;
- Recorded groundwater observations during borehole drilling, and at a short time after the completion of borehole drilling;
- Disturbed soil and rock samples were collected, labelled and sent to NATA Accredited laboratories with Chain of Custody (COC) documentation.

The field investigation was carried out in the presence of a Geotechnical Engineers from DRM who selected borehole locations, carried out sampling and prepared borehole logs. The approximate locations of the respective investigation sites referred to above are shown on the Site Investigation Plan in Drawing DRM P24.1039.V01-R01.F1 attached in Appendix C. Test locations were measured from the supplied plan to an accuracy of +/- 3m.

7 LABORATORY TESTING

Laboratory testing was carried out generally in accordance with the Australian Standards. All testing was scheduled by CG and carried out by Australian Laboratory Services Pty Ltd (ALS) and Macquarie Geotech Pty Ltd, all of which are NATA registered Testing Laboratories.

A summary of laboratory testing schedule is presented in Table 1 below.

Table 2: Laboratory Testing Schedule		
Type of Test	**Test Method**	**Quantity**
Moisture Content	AS 1289 2.1.1	11
Atterberg Limit	AS 1289 3.1.1 & 3.2.1 & 3.3.1	5
CBR	AS 1289 6.1.1 & 2.1.1	5
Emerson Crumb	AS 1289 3.8.1	4
Linear Shrinkage	AS 1289 3.4.1	5
Resistivity	APHA	3
CEC&ESP	Rayment and Lyons, 2011, APHA	7
EC	APHA 2510 B	20
pH	APHA 4500	20

8 GROUND MODEL

8.1 Soil Landscape

The NSW Environment & Heritage eSPADE web application designates the soil landscape at the site as Bullamalita landscape. The soil landscape is characterised by:

- Landscape – Footslopes within rises on Ordovician Metasediments (alluvium, colluvium and unconsolidated) in the Moss Vale Tablelands, Baw Baw Hills, Bullamalito Hills and Bungonia Hills. Local relief 5-30 m; altitude 508-728 m; slopes 2-7%; rock outcrop nil. Extensively cleared open woodland.
- Soils – Yellow/Brown Kurosols (Yellow Podzolic Soils), Sodosols (Soloths, Solodic Soils and Solodised Solonetz) and Stratic Rudosols (Alluvial Soils).
- Limitations – widespread soil erosion hazard, widespread seasonal waterlogging and widespread low soil fertility.

8.2 Published Geology

Based on the review of Thomas O.D., Johnston A.J., Scott M.M., Pogson D.J., Sherwin L. and MacRae G.P., 2013, Goulburn 1:100 000 Geological Sheet 8828, 1st edition. Geological Survey of New South Wales, Sydney, indicated that the large portion of site is likely to be underlain by unconsolidated alluvial quartzose sand and polymictic gravel, silcrete and quartz and iron cemented sandstone and conglomerate. The central southeast portion of site is likely to be comprised of lake and swamp deposits of silt and mud.

8.3 Stratigraphic Units

The ground conditions encountered and inferred from the investigation was considered to be generally consistent with the published geology for the area and can be summarised according to the following subsurface sequence:

Table 3: Summary of Subsurface Profile Encountered in BH01 to BH13

Layer	Description	Depth to the base of layer (m)
Fill	Gravelly SAND, brown, fine to medium gravel, moisture condition<plastic limit.	0.1
Topsoil	Silty Gravelly CLAY/Silty CLAY, low plasticity, grey, fine to medium gravel, moisture condition<plastic limit with grass layer on top.	0 – 0.8
Probable Alluvium	Gravelly CLAY/CLAY, high plasticity, brown mottled grey, fine to medium gravel, moisture condition <plastic limit, moisture condition=plastic limit, firm to very stiff.	>0.2 – 2.8
Probable Residual	Gravelly CLAY, high plasticity, yellow brown, brown grey red mottled with ironstone, quartz gravel, conglomerate, fine to medium gravel, moisture condition< plastic limit, very stiff to hard.	>1.2 – 3.8
Bedrock	Gravelly CLAY, medium plasticity, brown, orange -brown, yellow brown, fine to medium gravel with visible rock structure, decomposed granite, moisture condition<plastic limit, very stiff to hard.	>3.5 – >8.0

It should be noted that the depths and layer thickness provided in Table 3 are based on the subsurface conditions as observed at the investigation locations and may not be a representative of the entire site.

8.4 Groundwater

Groundwater was not encountered at the time of investigation. However, it is pointed out that standing groundwater and seepages may fluctuate with variations in rainfall, temperature and other factors. No longer term groundwater monitoring has been carried out.

9 LABORATORY TEST RESULTS

9.1 Moisture content, Plasticity Index and Linear Shrinkage

Filed Moisture Content (FMC) of samples tested ranged from about 7.9% to 23.5% indicating low to high plasticity soils and similar reactivity. A summary of laboratory test results which include field moisture content, Atterberg limits and Linear Shrinkage tests are presented in Table 4.

Table 4: FMC, Atterberg limits and Linear Shrinkage test results

BH No.	Depth (m)	Material Description/Origin	FMC (%)	LL (%)	PL (%)	PI (%)	LS (%)
BH01	0.4 -0.6	Brown Silty Clay with Gravel	7.9	--	--	--	--
BH03	0.5 -0.7	Brown Silty Clay with Gravel	22.7	--	--	--	--
BH06	1.0 - 1.2	Brown Clay with Gravel	19.3	71	18	53	9
BH09	1.0 - 1.2	Brown Silty Clay with Gravel	18.4	69	17	52	11.5
BH09	1.5 -1.7	Brown Clay with Gravel	20.7	--	--	--	--
BH10	0.5 - 0.7	Dark Brown Silty Clay	10.9	35	13	22	9
BH10	1.0 -1.2	Brown Silty Clay with Gravel	12.4	--	--	--	--
BH10	1.5 - 1.7	Brown Clay with Silt & Gravel	23.5	65	17	48	10.5
BH11	0.5-0.7	Brown Clay with Silt & Gravel	9.0	--	--	--	--
BH11	1.5 - 1.7	Light Brown Silty Clay with Gravel	20.1	77	16	61	9.5
BH12	3.0 -3.2	Light Brown Silty Clay with Gravel	16.1	--	--	--	--

Note: FMC – Field Moisture Content, LL – Liquid Limit, PL – Plastic Limit, PI – Plasticity Index, LS – Linear Shrinkage

9.2 California Bearing Ratio

Five (5) bulk samples were collected from the selected boreholes from the subgrade level to assess the strength of subgrade material. The FMC and CBR results are shown in Table 5 below.

Table 5: Summary of Field Moisture Content and CBR Test Results

BH No.	Depth (m)	Material Description/Origin	FMC (%)	OMC (%)	MDD (t/m³)	Swell (%)	CBR (%)
BH08	1.0 - 1.3	Brown Silty Clay with Gravel	16	16.5	1.84	1.0	2.5
BH06	0.6 - 0.9	Light Brown Silty Clay with Gravel	20	22.5	1.61	0.5	3.5
BH05	0.5 - 0.8	Light Brown Silty Clay with Gravel	19.9	23.5	1.56	1.5	5
BH04	0.7 - 1.0	Light Brown Silty Clay with Gravel	20.4	22.5	1.61	1.5	4.5
BH01	0.8 - 1.1	Brown Silty Clay with Gravel	16.7	18	1.76	0.5	6

Note: FMC – Field Moisture Content, OMC – Optimum Moisture Content, MDD – Maximum Dry Density, CBR – California Bearing Ratio

9.3 Chemical Properties

A summary of laboratory test results which include field moisture content, pH/EC, Resistivity, Sulfate and Chloride content are presented in Table 6 below.

Table 6: Summary of Laboratory Test Results

BH No.	Depth (m)	Material Description/ Origin	pH	EC (µS/cm)	Resistivity Ohm.m	Sulfate SO4 2- mg/kg	Chloride mg/kg	Moisture %w/w	ESP %	CEC meq/100g
BH01	0.5-0.7	Silty clay with gravel	6.5	130	4900	80	16	16.9	20	16
BH01	1.0-1.2	Silty clay with gravel	7.5	180	--	--	--	13.5	--	--
BH01	1.5-1.7	Silty clay with gravel	7.8	380	--	--	--	14.9	29	14
BH01	2.5-2.7	Silty clay with gravel	7.9	350	--	--	--	14.1	--	--
BH01	3.7-3.9	Silty clay with gravel	8.8	610	--	--	--	11.9	--	--
BH01	4.3-4.5	Silty clay with gravel	8.4	470	--	--	--	10.8	--	--
BH04	0.5-0.7	Silty clay with gravel	7.0	170	--	--	--	8.8	--	--
BH04	1.1-1.3	Silty clay with gravel	7.7	210	--	--	--	12.4	36	9
BH04	1.5-1.7	Silty clay with gravel	7.4	220	--	--	--	10.8	--	--
BH04	2.5-2.7	Silty clay with gravel	--	--	--	--	--	15.9	31	15
BH04	3.5-3.7	Silty clay with gravel	7.9	370	--	--	--	13.3	--	--
BH08	0.5-0.7	Silty clay with gravel	6.7	120	--	--	--	13.2	--	--
BH08	1.0-1.2	Silty clay with gravel	7.5	260	1900	100	170	16.2	26	17
BH08	1.5-1.7	Silty clay with gravel	7.5	310	--	--	--	14.4	--	--
BH08	2.5-2.7	Silty clay with gravel	--	--	--	--	--	17.5	29	18
BH08	3.0-3.2	Silty clay with gravel	7.5	350	--	--	--	12.0	--	--
BH13	0.5-0.7	Silty clay with gravel	6.4	49	--	--	--	8.9	--	--
BH13	0.8-1.0	Silty clay with gravel	6.4	68	7600	33	21	14.2	7	18
BH13	1.5-1.7	Silty clay with gravel	6.7	87	--	--	--	13.1	--	--
BH13	1.8-2.0	Silty clay with gravel	8.4	260	--	--	--	13.7	--	--
BH13	3.0-3.2	Silty clay with gravel	8.1	120	--	--	--	14.3	--	--

Note: EC – Electrical Conductivity, ESP - Exchangeable Sodium Percentage, CEC - Cation Exchange Capacity

9.4 Emersion Class Number

The Emerson Class Number (ECN) for a soil relates to the potential for the soil to slake and disperse. Higher Emerson Class Numbers correspond to soils with a lower tendency to disperse. Emerson Class Numbers of 2 indicate a tendency for the soil to slake with some dispersion, possibly more when remoulded. The ECN results are shown in Table 7 below.

Table 7: Summary of Emerson Class

Borehole	Depth, m	ECN	Soil Description	Comments
BH01	0.4-0.6	2	Brown Silty Clay with Gravel	--
BH04	0.5-0.7	4	Brown Silty Clay with Gravel	Mineral Present: Carbonate and Gypsum
BH08	0.3-0.5	3	Tan Silt with Gravel, Trace Clay	--
BH12	0.3-0.5	3	Tan Silt with Gravel, Trace Clay	--
ECN - Emerson Class Number				

9.5 Standard Penetration Test Results

The Standard Penetration Test (SPT) was carried out inside the boreholes at a regular depth interval to assess the relative density/consistency of in situ soils. A summary of SPT test results is presented in Table 8 below.

Table 8: Summary of SPT test results

BH No.	Depth, m					
	0.5 – 0.95m	1.5-1.95m	3-3.45m	4.5-4.94m	6-6.45m	7.5-7.95m
BH01	12	15	21	+5/ Double Bounce	+5/ Double Bounce	--
BH02	27	12	+9/ Double Bounce	+5/ Double Bounce	--	--
BH03	11	12	24	+5/ Double Bounce	+6/ Double Bounce	--
BH04	29	25	+6/ Double Bounce	+4/ Double Bounce	--	--
BH05	10	11	+10/ Double Bounce	+4/ Double Bounce	--	--
BH06	30	7	20	+7/ Double Bounce	+7/ Double Bounce	--
BH07	29	7	+3/ Double Bounce	+15/ Double Bounce	+10/ Double Bounce	--
BH08	14	7	23	+11/ Double Bounce	+7/ Double Bounce	--
BH09	15	12	+4/ Double Bounce	+5/ Double Bounce	--	--
BH10	22	8	30	+6/ Double Bounce	+8/ Double Bounce	--
BH11	7	8	23	+4/ Double Bounce	+8/ Double Bounce	+6/ Double Bounce
BH12	10	5	23	+6/ Double Bounce	+13/ Double Bounce	--
BH13	17	25	38	+0/ Double Bounce	+12/ Double Bounce	--

10 GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS

10.1 General

The subsurface profile encountered in the boreholes comprises silt layer overlaying “probable” alluvial clay, residual clay and extremely weathered bedrock.

Only one borehole has encountered with a surface fill from surface to 0.1m below the existing surface grade. However, to reduce the potential for possible differential movements in the future, we recommend that below any proposed building or structure, the silt layer or the existing fill layer should be stripped down to the underlying stiff to very stiff clay.

Engineered fill, as detailed in section 10.5 Earthworks below, should then be used to raise surface levels as required.

10.2 Slope Instability

No evidence of slope instability (i.e. landslip, etc.) was observed within the site, which is consistent with the gently sloping landforms from the southern boundary towards northeastern portion of the site. Therefore, it is considered that hillside instability does not impose significant constraints on the proposed site development. A stability hazard map has not been prepared, as no significant stability hazards were identified within the site.

10.3 Preliminary AS2870 Classification

The site classification for residential detached buildings is governed by the recommendations in AS2870-2011. However, due to the size of the proposed commercial warehouses, the provisions in AS 2870 would not apply.

In accordance with AS2870-2011, “Residential Slabs and Footings - Construction” the site soils are likely producing a shrink swell movement between 40mm and 60mm for residential buildings falling within the scope of AS2870, provided the site moisture content is within the normal range and no cut fill earthworks. Assuming the site moisture content is unlikely to disturbed by removal of large trees, a site classification of Class H1 would apply.

Assuming most of the site will be subjected to cut/fill earthworks, the possible differential movement should be assessed after the completion of earthworks and immediately prior to construction of building pads.

In order not to increase the reactivity of the site, we recommend using low reactive soil such as Sand, Gravel, Silty Sand, or Clayey Sand (unified classification, SP, SW, SM, SC and GC).

The design of slabs should be made using engineering principles, allowing for the reactivity in addition to the imposed loads.

The above recommendations are provided on the assumption that the performance expectations described in AS 2870 – 2011 are acceptable and future site maintenance accord CSIRO BTF - 18 a copy of which is attached in Appendix G.

10.4 Electrical Conductivity/pH and Exposure Classification

Nineteen (19) samples were collected from selected boreholes to assess the salinity rating and provide an indicative exposure classification for in situ soils relevant to buried concrete and steel elements. Electrical conductivity (EC) and pH testing was undertaken on the soil to indicate salinity conditions and acidity or alkalinity across the site. The measured pH values range from about 6.4 to 8.8, with most results near neutral. Salinity rating is based on electrical conductivity of saturated pores (ECe) based on EC results measured in 1:5 soil water mixture multiplied by a factor depending on the soil texture. The following salinity rating was adopted based on NSW guide on Urban salinity (Site investigations for urban salinity by Department of Land and Water Conservation, Sydney, NSW dated 2002). The classification for salinity presented in Table 9.

Table 9: Salinity Classification

Salinity Class	EC_e (dS/m)
Non saline (NS)	<2
Slightly Saline	2-4
Moderately Saline	4-8
Very Saline	8-16
Highly Saline	>16

EC measured are generally low, with most values less than470µS/cm and an isolated higher result of 610µS/cm. Site soils are assessed to medium clay as per the textural classification defined in NSW guide on Urban salinity. Due to the presence of small quantities of sand and gravel, a textural classification of light clay has been assumed for estimating ECe. When assessed using the derived ECe, the majority of samples classify as non-saline to slightly saline, however the isolated higher EC result classify as moderately saline.

Exposure classification as defined in AS2870-2011 depends on both salinity (ECe) and pH of soil and is used to assess the strength of concrete and concrete cover requirements for reinforcements for members in contact with soil such as footings, piers and slab on ground. This classification is applicable for all concrete structures and not limited to residential constructions

A summary of EC, pH, derived salinity rating and exposure classification is presented in Table 10. While one sample is classified as A2 exposure, exposure classification A1 can be assumed for the whole site as the multiplication factor could have been over estimated.

Table 10: Summary of Salinity Rating and Exposure Classification								
Sample ID	**Field Texture**	**Multiplication factor (MF)**	**EC (µS/cm)**	**EC (dS/cm)**	**EC_e**	**Salinity Rating**	**pH**	**Exposure Classification**
BH01_0.5-0.7	Gravelly Clay	8.5	130	0.13	1.1	NS	6.5	A1
BH01_1.0-1.2	Gravelly Clay	8.5	180	0.18	1.5	NS	7.5	A1
BH01_1.5-1.7	Gravelly Clay	8.5	380	0.38	3.2	SS	7.8	A1
BH01_2.5-2.7	Gravelly Clay	8.5	350	0.35	3.0	SS	7.9	A1
BH01_3.7-3.9	Gravelly Clay	8.5	610	0.61	5.2	MS	8.8	A2
BH01_4.3-4.5	Gravelly Clay	8.5	470	0.47	4.0	SS	8.4	A1
BH04_0.5-0.7	Gravelly Clay	8.5	170	0.17	1.4	NS	7.0	A1
BH04_1.1-1.3	Gravelly Clay	8.5	210	0.21	1.8	NS	7.7	A1
BH04_1.5-1.7	Gravelly Clay	8.5	220	0.22	1.9	NS	7.4	A1
BH04_3.5-3.7	Gravelly Clay	8.5	370	0.37	3.1	SS	7.9	A1
BH08_0.5-0.7	Gravelly Clay	8.5	120	0.12	1.0	NS	6.7	A1
BH08_1.0-1.2	Gravelly Clay	8.5	260	0.26	2.2	SS	7.5	A1
BH08_1.5-1.7	Gravelly Clay	8.5	310	0.31	2.6	SS	7.5	A1
BH08_3.0-3.2	Gravelly Clay	8.5	350	0.35	3.0	SS	7.5	A1
BH13_0.5-0.7	Gravelly Clay	8.5	49	0.049	0.4	NS	6.4	A1
BH13_0.8-1.0	Gravelly Clay	8.5	68	0.068	0.6	NS	6.4	A1
BH13_1.5-1.7	Gravelly Clay	8.5	87	0.087	0.7	NS	6.7	A1
BH13_1.8-2.0	Gravelly Clay	8.5	260	0.26	2.2	SS	8.4	A1
BH13_3.0-3.2	Gravelly Clay	8.5	120	0.12	1.0	NS	8.1	A1

10.5 Earthworks

10.5.1 Excavation Characteristics

The depth of excavation and filling to achieve the proposed design levels are unknown at this stage of investigation as a cut fill plan has not been supplied at this stage. Based on the preliminary architectural drawings, most of the facilities to the east of the proposed accessway is to be RL 636m and those to the west of the driveway to be about RL634m. This would require cut and fill depths not more than 2m.

Based on the subsurface profile encountered up to the termination/refusal depth of the boreholes, the excavation below the existing surface grade is expected to be through firm to very stiff residual gravelly clay and then hard residual clay, ‘potentially highly weathered low strength bedrock. Excavation of residual soils and very low strength bedrock should be readily achieved using conventional earthmoving equipment.

It is unlikely that large earthmoving equipment for rock ripping and/or blasting would be required to achieve design levels.

However, it is suggested that bulk excavation tenderers be required to make their own assessment of the equipment required to carry out the work.

10.5.2 Subgrade preparation

Following stripping and excavation to design levels, the subgrade should be proof rolled with at least eight passes of a static (non-vibratory) smooth drum roller of at least 12 tonnes deadweight. The final pass of proof rolling should be carried out under the direction of an experienced geotechnical engineer for the detection of unstable or soft areas.

The same treatment should be applied to areas where new fill to be placed to achieve the design level.

Subgrade heaving during proof-rolling may occur in areas where the clays have become ‘wet' and should be expected in areas of poorly compacted fill. Heaving areas should be locally removed to a stable base and replaced with engineered fill, as outlined below in Section 10.4.3 Engineered Fill of this report.

If soil softening occurs after rainfall periods, then the clay subgrade should be over-excavated to below the depth of moisture softening and replaced with engineered fill. If the clay subgrade exhibits shrinkage cracking, then the surface should be watered and rolled until the shrinkage cracks are no longer evident.

Where subgrade soils with low strength (say CBR less than 3%) and wet, subgrade replacement with selected fill or subgrade stabilisation with lime would be required.

Approved engineered fill must be used where site levels need to be raised.

10.5.3 Fill materials

Materials of residual origin encountered in the boreholes were assessed to be generally high plasticity Gravelly clay with Liquid Limit ranging from 65% to 77% and Plasticity Index 48% to 61%. BH10 0.5-0.7m depth recorded medium plasticity with Liquid Limit of 35% and Plasticity Index 22%. These materials were generally located within the eastern area close to the creek. Alluvial clays are likely to be present in BH4, BH6 and BH10 within the upper 1m depth.

CBR samples tested selected from the upper 1m depth based on the relevance for pavement thickness design recorded CBR values ranging from 2.5% to 6% with swell 0.5% to 1.5%. These soils are suitable for use in engineered fill in lower depths of the fill platform and in areas.

It is likely that materials at deeper levels, including gravelly clay and clay associated with inferred weathered granite to be of better quality.

In general, site excavated soil could be used for site filling subject to careful management of placement of high plasticity (highly reactive) soils at areas of less significance such as formation of earthen bunds and, landscape areas and also at depth under some structures which may not be sensitive to settlement.

If site sourced fill is to be used for fill, it would be prudent to identify low to medium reactivity fill from the available materials by excavating test pits and testing samples at close depth intervals.

If it is desired that the reactive movement of ground slabs to be controlled within strict limits (say less than 20mm), low plasticity fill materials with low fines content should be sourced from outside.

Alternatively, areas with settlement restrictions may be stabilised with lime to reduce the reactive movement.

The materials should be certified by an environmental consultant for its suitability for the intended land use (commercial).

10.5.4 Fill Compaction

Engineered fill should be compacted in maximum 300mm thick loose layers using a minimum 12 tonne deadweight padfoot roller to the following density and moisture ratios:

- Below the proposed buildings and pavements: strictly between 98% and 102% of Standard Maximum Dry Density (SMDD) and at a moisture content within 2% of Standard Optimum Moisture Content (SOM; and
- Below landscaped areas: to a density ratio of at least 95% of SMDD and at a moisture content within 2% of SOMC.

In order to achieve adequate edge compaction where fill platforms are proposed, we recommend that the outer edge of each fill layer extend a horizontal distance of at least 1m beyond the design geometry. The roller must extend over the edge of each placed layer in order to seal the batter surface. On completion of filling, the excess under-compacted edge fill should be trimmed back to the design geometry.

10.6 Footings

10.6.1 Shallow footings

For high level footings founded in engineered fill placed under Level 1 control to the specification in *Section 10.5 Earthworks* above, or natural clayey soils of at least very stiff strength, an allowable bearing pressure of 150kPa may be adopted for footings embedded at least 0.5m below the surrounding ground level, provided the movements associated with shrink swell reactivity of the underlying soils can be accommodated.

The proposed buildings must be designed to accommodate shrink swell movements as discussed above. We note that the effects of differential movements associated with the reactive soils would be reduced where pavements extend around the entire perimeter of the buildings. Planters, gardens or grassed areas immediately adjacent to the building should be avoided for buildings founded on high level footings as they allow for the ingress of moisture and exacerbate reactive movements.

10.6.2 Deep Footings

Deep pier footings in clay with toe levels below 6 times the diameter and below 3m depth may be designed for an allowable end bearing pressure (serviceability end bearing pressure) of 450kPa. Ultimate skin friction below 2m depth may be taken as 45kPa. These values are based on very stiff clay with Standard Penetration N value more than 20 (undrained shear strength of 150kPa).

If higher bearing capacity is required, additional investigation with rock coring should be carried out.

We recommend that all high-level footings be excavated, cleaned, inspected and poured with minimum delay to avoid either wetting or drying of the foundation. If delays in pouring concrete are anticipated, we recommend that the base of the footings be protected with a blinding layer of concrete of at least 75mm thickness. Water should be prevented from ponding in the base of footing excavations as this will tend to soften the foundation material, resulting in further excavation and cleaning being required.

10.6.3 Settlement

Settlement of lightly loaded structures such as warehouse slabs has two components;

- Movement due to moisture changes under the centre of the slabs and edges over time resulting in a differential movement in the range of 40-60mm similar to Class H1 site in AS2870-2011. and
- Compressive settlement under the applied load. Where the applied load under the slab is not more than 25kPa and under edge beams and other shallow footings are less than 150kPa, the compressive settlement is likely to be less than 20mm.

Settlement of heavily loaded footings with bearing pressure of 500kPa would be mainly from elastic compression which is estimated to be less than 1% of the footing width.

10.7 Pavements

10.7.1 Subgrade

Total twenty (5) California Bearing Ratio (CBR) samples were collected for the assessment of strength of the subgrade of proposed internal roads. CBR value of residual clay/Gravely clay samples collected from the boreholes (BH01, BH04, BH05, BH06 and BH08) ranged from 2.5% to 6.0%. The CBR test result reports are attached in Appendix E. Subgrade material at the tested locations comprises medium to high plasticity residual clay/silty clay and the moisture content was assessed to be about 0.5% to 3.5% dry of Standard Optimum Moisture Content (SOMC) at the time of testing. The natural subgrade material of all samples recorded a swell ranging from 0.5% to 1.5%.

In the event, subgrade exhibit movement or deflection, the area should be excavated and replaced with better quality materials or stabilised with lime or similar additive. CG recommends the subgrade should be inspected by a geotechnical consultant after preliminary boxing to identify stabilisation requirements.

For the proposed road, provided the subgrade has been prepared in accordance with recommendations described above, a CBR value of 4% can be adopted for design, or a short-term Young's Modulus of 40MPa. Where wet, high plasticity clay with soaked CBR less than 4% is suspected after boxing out, such areas should be excavated to a minimum 400mm depth and back filled with low to medium plasticity Gravelly Clay or similar with CBR not less than 5%.

Alternatively, subgrade clay may be stabilised to a minimum 300mm depth and pavement may be designed for a subgrade CBR of 5%. Liming rate for stabilisation should be assessed by further testing.

It is also possible that the upper 300mm depth of subgrade be constructed with low plasticity gravelly materials with CBR more than 10%.

10.7.2 Preliminary Pavement Design

We recommend that all base course materials for flexible pavements and sub-base materials for rigid pavements comprise DGB20 in accordance with Transport for NSW (TfNSW) QA Specification 3051 unbound base. The DGB20 material should be compacted in maximum 200mm thick loose layers using a large smooth drum roller to at least 98% of Modified Maximum Dry Density (MMDD). Adequate moisture conditioning to within 2% of Standard Optimum Moisture Content (SOMC) should be provided during placement. For rigid pavements a recycled DGB20 product would be considered appropriate.

For preliminary purposes, a subgrade CBR of 4% has been adopted for natural residual silty gravelly clay/silty clay/clay subgrades. Traffic loadings will need to be confirmed by the Client, prior to finalisation on design drawings. Preliminary pavement thickness design for different traffic loading is presented in Table 11 below:

Table 11: Preliminary Pavement Thickness Design

Design Traffic (ESA)	Design CBR (%)	Recommended Pavement Thickness (mm)				
		Sub-Base Layer 1	Sub-Base Layer 2	Base course	Wearing Course	TOTAL
5 x 10^6	4	200	120	200	50mm (AC)	570
1 x 10^7	4	200	150	200	50mm (AC)	600

Notes:

- The recommended designs have been prepared in accordance with Council requirements and Austroads Guide to Pavement Technology Part 2: Pavement Structural Design 2017;
- Design subgrade CBR values and adopted traffic loadings are noted above. Please contact this office immediately, if the design traffic load differs from the assumed value in the above table;
- Wearing course for roads should be placed in layers of 25mm thick AC10 on a single coat hot bitumen flush seal as required by council;
- Pavement/subgrade compaction should meet Council's minimum specification which is as follows:
  - Subgrade: 100% Standard;
  - Sub-base Layer 1 and 2: 95% Modified;
  - Base Course: 98% Modified;
- Subgrade conditions will be assessed after boxing at the time of construction. If adverse conditions are found during subgrade preparation, drying out the wet material from subgrade may be required depending upon the field conditions at the time of boxing the subgrade. Alternatively, subgrade replacement with select fill may be required. However, the extent of subgrade treatment should be verified after preliminary boxing;
- It is imperative to ensure adequate drainage is constructed / made available to avoid any water ponding at the surface in the event of rainfall events; and
- Subsoil drains should be directed by Council Engineers.

10.8 Aggressivity

Based on the aggressivity test results, a 'non-aggressive' exposure classification for concrete piles in accordance with Table 6.4.2 (C) in AS2159-2009 and a 'non-aggressive' exposure classification for steel piles in accordance with Table 6.5.2 (C) in AS2159- 2009 'Piling – Design and Construction' is applicable. This classification is for low permeability soils (type B). Therefore, we recommend use of construction materials, such as concrete and steel that are appropriate to assessed aggressivity.

10.9 Erosion and sediment control

Two of the three samples tested recorded Emerson Class number of 3 indicating the clay is vulnerable for erosion. Chemical test carried out recorded Exchangeable Sodium Percentage (ESP) in the range 20% to 35% (with one sample recording 7%). ESP more than 20% is considered to be highly erodible soils if not retarded by the presence of higher percentage of potassium and, calcium and magnesium.

Environmental regulations prevent soil from escaping from site and into drains and water courses. Sedimentation fences should be installed around the site to prevent surface water runoff from carrying and depositing silt away from the site. Sedimentation fences and filter socks are likely to be suitable for use at this site to prevent escape of sediment from site, into drains or breaking up overland flows.

All disturbed areas should be protected from localised erosion control measures.

Adequate onsite detention basins including bio retention basins should be provided based on the area identified for development. Sediment loads may be assessed based on soil properties indicated in this report or using presumptive values for the region.

Erosion control measures implemented in accordance with the recommendations in the NSW “Blue Book”.

10.10 Batter slopes

Given most batter slopes in cut or fill would be in clay soils, all new batters (cut or fill) should be shaped to 3 horizontals to 1 vertical. Batter slopes should be protected from erosion by turfing and if required, stabilisation.

10.11 Retaining walls

The following parameters may be used in the design of retaining walls less than 3m in clear height:

Angle of internal friction	28º
Earth pressure coefficient - Active	0.3
Earth pressure coefficient - Passive	2.8
Unit weight of soil	17kN/m³
Allowable bearing pressure	150kPa

10.12 Subsoil Class for Seismic Design

Based on the investigation carried out, the subsoil class of Ce (shallow soils) may be used for earthquake design as most boreholes recorded stiff to very stiff or even hard clay. Based on the geology and observations during drilling it is unlikely the soil profile extends deeper than 40m.

It may be possible that the site may be even Class Be (shallow rock). While rock with unconfined compressive strength of more than 1MPa was not encountered in the boreholes, it may be possible that shear wave velocity to be more than 360m/s within the upper 30m depth. This may be assessed by a simple seismic survey by a geophysical consultant.

11 SITE SUITABILITY

Based on our site observations, the subsurface profile encountered in the boreholes, geotechnical model, and experience on similar projects, the proposed commercial development is considered feasible from a geotechnical perspective. Provided appropriate further inspections as specified in Section 12 Further Inspections of this report, design assessments, and construction monitoring normally associated with this type of development are carried out, the risks associated with design and construction should be able to be managed.

12 FURTHER GEOTECHNICAL INPUT

It is recommended that the following review/inspections be undertaken during the construction stage and to minimise any risk of slope instability:

- CG to review the architectural, civil and structural drawings of the project to assess if the recommendation provided in the report are incorporated in the design.
- Deeper drilling investigations including rock coring may be carried out if heavy foundation loads are anticipated.
- A geophysical survey may be carried out to confirm the seismic subsoil factor if upgrade to Class B is desired.
- Detailed investigations to be carried out within the cut area to assess the quality of fill materials available and direct them to different zones of the fill area.
- All the footings should be cleared of debris, softened materials and designed by a qualified professional Structural Engineer and should be inspected and approved by a Structural or Geotechnical Consultant prior to pouring of concrete.
- All earthworks including proof rolling inspections, density testing of all engineered fill should be carried out under the geotechnical supervision under level 1 requirements of AS3798 Guidelines For earthworks.
- In the event soil conditions encountered differ significantly from those described within this report.
- Any excavations exceeding 1.5m depth should be inspected by an experienced person to assess its stability.
- If project design is altered significantly from drawings reviewed and outlined or project described within this report, then the updated project drawings must be reviewed by the geotechnical engineer to assess if the recommendations provided in this report are still relevant to the project or not.
- Further advise to be sought in the event soil conditions encountered differ significantly from those described within this report.
- Proof rolling inspections.

13 REFERENCES

1. AS1726 - 2017, “Geotechnical Site Investigation”.
2. AS2870 - 2011, “Residential slabs and footings”.
3. AS2159 - 2009, “Piling – Design and installation”.
4. AS3798 - 2007, “Guidelines on earthworks for commercial and residential developments”.
5. AS1170.4 – 2024, “Structural design actions, Part 4: Earthquake actions in Australia”
6. NSW Environment & Heritage eSPADE web application.
7. Sydney 1:100,000 Geological map Geological Series Sheet 9130 (Edition 1) 1983.

14 CLOSURE

This report has been prepared for Development Risk Management Pty Ltd.

The report is provided for the exclusive use of Development Risk Management Pty Ltd and Sincorp Properties Pty Ltd for the specific development and purpose as described in the report. The report may not contain sufficient information for developments or purposes other than that described in the report.

The information in this report is considered accurate at the date of issue with regard to the current conditions of the site. The conclusions drawn in the report are based on interpolation between boreholes. Conditions can vary between test locations that cannot be explicitly defined or inferred by investigation.

The report, or sections of the report, should not be used as part of a specification for a project, without review and agreement by CG, as the report has been written as advice and opinion rather than instructions for construction.

The report must be read in conjunction with the attached Information Sheets and any other explanatory notes and should be kept in its entirety without separation of individual pages or sections. CG cannot be held responsible for interpretations or conclusions from review by others of this report or test data, which are not otherwise supported by an expressed statement, interpretation, outcome or conclusion stated in this report. In preparing the report CG has necessarily relied upon information provided by the client and/or their agents.

This report must be read in conjunction with the attached Information Sheets and any other explanatory notes.

We trust these comments are sufficient to meet your present requirements. Please do not hesitate to contact CG should you have any queries.

Appendix A
Information About this Report

Information About This Report

Limitations

Scope of Services: The report has been prepared in accordance with the scope of services set out in CG's Proposal under CG's Terms of Engagement, or as otherwise agreed with the client. The scope of services may have been limited and/or amended by a range of factors including time, budget, access and site constraints.

Specific Purpose: The report is provided for the specific development and purpose as described in the report. The report may not contain sufficient information for developments or purposes other than that described in the report.

Currency of Information: The information in this report is considered accurate at the date of issue with regard to the current conditions of the site.

Reliance on Information: In preparing the report CG has necessarily relied upon information provided by the Client and/or their Agents. Such data may include surveys, analyses, designs, maps and plans. CG has not verified the accuracy or completeness of the data except as stated in this report.

Copyright and Reproductions: The contents of this documents are and remain the intellectual property of CG. This document should only be used for the purpose for which it was commissioned and should not be used for other projects or by a third party. This report shall not be reproduced either totally or in part without the permission of CG. Where information from this report is to be included in contract documents or engineering specification for the project, the entire report should be included in order to minimise the likelihood of misinterpretation.

Construction Specifications: Unless otherwise stated, the report, or sections of the report, should not be used as part of a specification for a project, without review and agreement by CG.

Report Should Not be Separated: The report must be read in conjunction with the attached information Sheets and any other explanatory notes and should be kept in its entirely without separation of individual pages or sections.

Review by Others: CG cannot be held responsible for interpretation or conclusions from review by others of this report or test data, which are not otherwise supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

GENERAL NOTES

Geotechnical Reporting: Geotechnical reporting relies on the interpretation of factual information based on judgment and opinion and is far less exact than other engineering or design disciplines. Geotechnical reports are for a specific purpose, development and site as described in the report and may not contain sufficient information for other purposes, developments or sites (including adjacent sites) other than that described in the report.

Subsurface Conditions: Subsurface conditions can change with time and can vary between test locations. For example, the actual interface between the materials may be far more gradual or abrupt than indicated and contaminant presence may be affected by spatial and temporal patterns. Therefore, actual conditions in areas not sampled may differ from those predicted since no subsurface investigation, no matter how comprehensive, can reveal all subsurface details and anomalies. Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations can also affect subsurface conditions and thus the continuing adequacy of a geotechnical report. CG should be kept informed of any such events and should be retained to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Groundwater: Groundwater levels indicated on borehole and test pit logs are recorded at specific times. Depending on ground permeability, measured levels may or may not reflect actual levels if measured over a longer time period. Also, groundwater levels and seepage inflows may fluctuate with seasonal and environmental variations and construction activities.

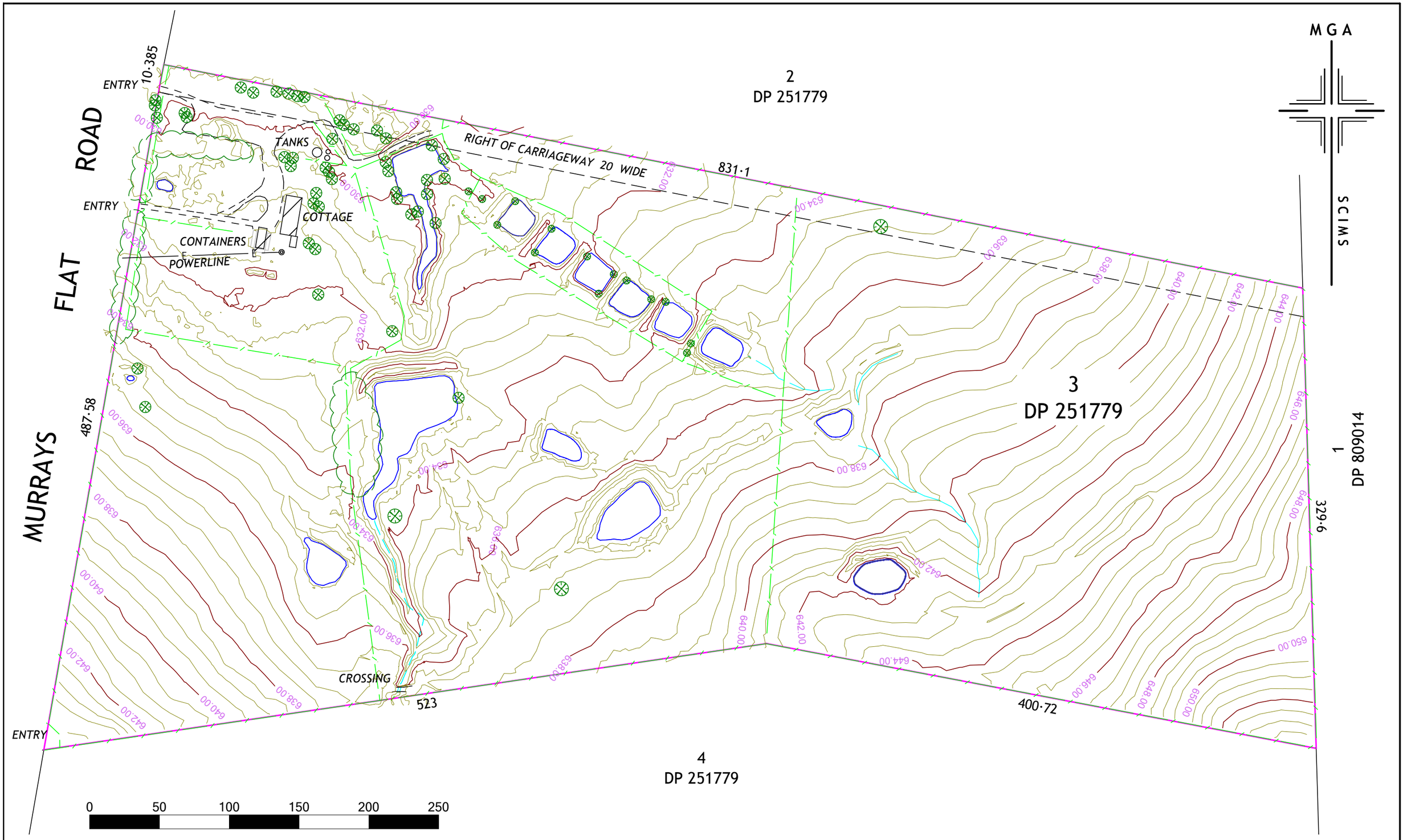
Interpretation of Data: Data obtained from nominated discrete locations, subsequent laboratory testing and empirical or external sources are interpreted by trained professionals in order to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions in accordance with any relevant industry standards, guidelines or procedures.

Soil and Rock Descriptions: Soil and rock descriptions are based on AS 1726 – 2017, using visual and tactile assessment except at discrete locations where field and / or laboratory tests have been carried out. Refer to the accompanying soil and rock terms sheet for further information.

Further Advice: CG would be pleased to further discuss how any of the above issues could affect a specific project. We would also be pleased to provide further advice or assistance including:

- Assessment of suitability of designs and construction techniques;
- Contract documentation and specification;
- Construction control testing (earthworks, pavement materials, concrete);
- Construction advice (foundation assessments, excavation support).

Appendix B
Development Drawings



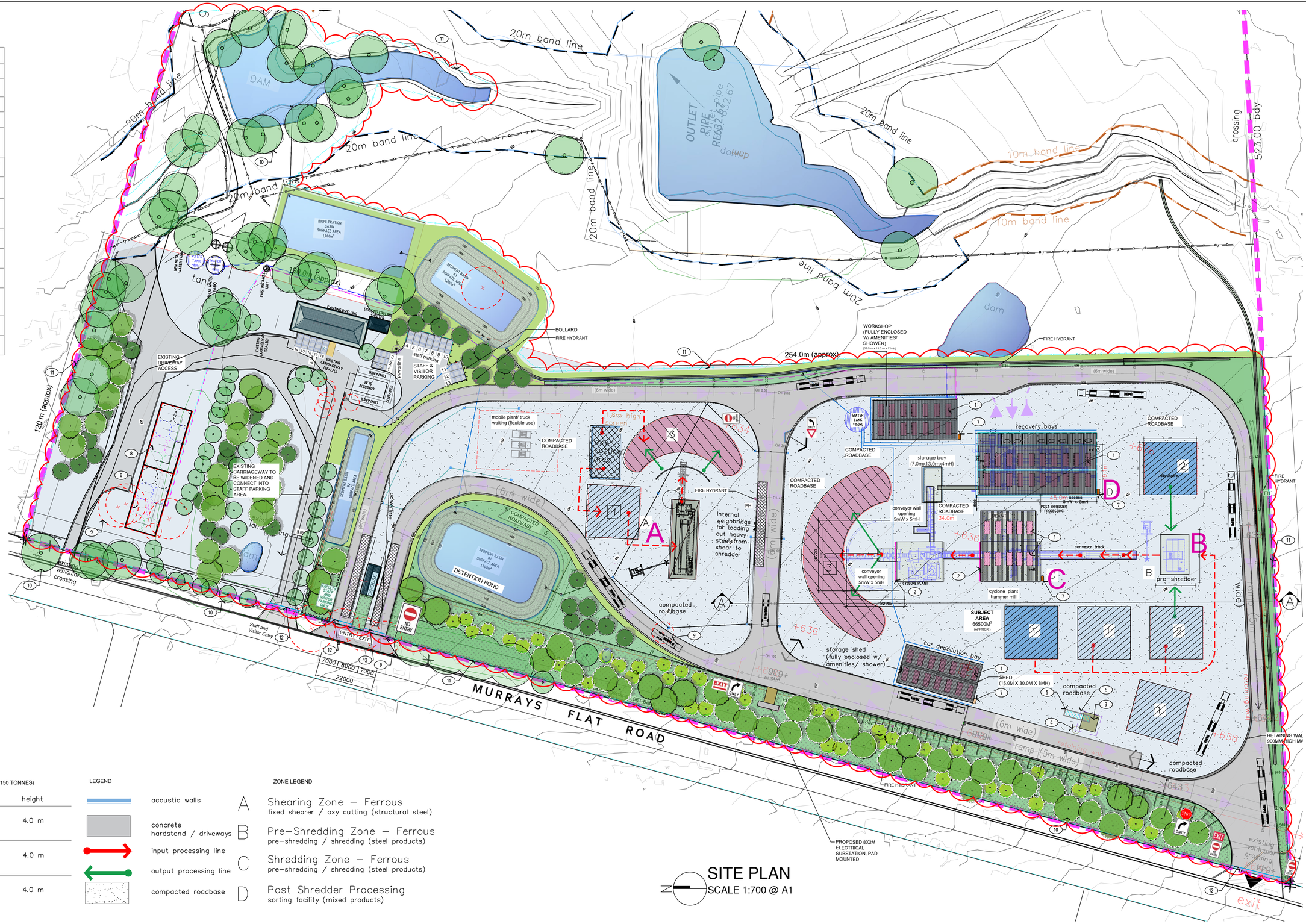
SCALE - 1:2500 AZIMUTH - MGA CONTOUR INTERVAL - 0.5m DATUM - AHD DATE - 23 SEPT 2021 REF - 24537	PLAN SHOWING DETAIL SURVEY AND CONTOURS LOT 3 DP 251779 88 MURRAYS FLAT ROAD - TOWRANG	SOUTHERN CROSS CONSULTING SURVEYORS 20 Clifford Street PO Box 142 GOULBURN NSW 2580 T: 02 4822 1366 F: 02 4822 1365 Email : admin@sccsurveyors.com.au

SITE BOUNDARY

PROPOSED AREA

SYMBOLS LEGEND

1	SOLAR PANEL	
2	4M HIGH NOISE WALL IN ACCORDANCE WITH ACOUSTIC ASSESSMENT	
3	PROP. CONCRETE PAD WITH A 25MM HIGH ROLL-OVER BUND AROUND THE ENTIRE PAD PERIMETER	6.5Mx6M
4	A 10,000L UNDERGROUND SPILL COLLECTION TANK UNDER THE CONCRETE PAD. FALL OF THE CONCRETE PAD IS TO BE DIRECTED TO THE COLLECTION PIT OPENING IN THE CENTER OF THE PAD	
5	PROP. SELF-BUNDED FUEL STORAGE TANK, 50000L 9.9M (L) X 2.4M (W) X 2.7M (H). THE FILL POINTS OF THE TANK ARE TO BE LOCATED WHOLLY WITHIN THE BUNDED CONCRETE AREA.	23.76 M^2
6	PROP. STEEL FRAMED AWNING AWNING PROVIDES 10 DEGREE-FROM VERTICAL OVERHANG OVER THE CONCRETE PAD	
7	BATTERY ENERGY STORAGE SYSTEM IN CABINET (2M x 1M x 3M HIGH	
8	EFFLUENT DISPOSAL AREA - 300m²	
9	TREES TO BE REMOVED	
10	PROPOSED LANDSCAPING	
11	PROPOSED 1.8M HIGH BLACK PALISADE METAL OPEN PICKET FENCE	
12	PROPOSED 1.8M HIGH BLACK PALISADE METAL OPEN PICKET FENCE STYLE SLIDING GATE	



SITE PLAN
SCALE 1:700 @ A1

STOCK PILE LEGEND (<150 TONNES)

	length	width	height
unprocessed small pieces 1	20m	20m	4.0 m
unprocessed large pieces 2	20m	20m	4.0 m
processed sheared/shredded 3	variable	variable	4.0 m

LEGEND

- acoustic walls
- concrete hardstand / driveways
- input processing line
- output processing line
- compacted roadbase

ZONE LEGEND

- A — Shearing Zone – Ferrous: fixed shearer / oxy cutting (structural steel)
- B — Pre-Shredding Zone – Ferrous: pre-shredding / shredding (steel products)
- C — Shredding Zone – Ferrous: pre-shredding / shredding (steel products)
- D — Post Shredder Processing: sorting facility (mixed products)

Date	Plan Number	Site Plan
06-10-2025	103	88 Murrays Flat Road Towrang, NSW 2580 (Lot 3 DP251779)

JEP Environment & Planning
Strategy | Approvals | Compliance | Licensing
A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060
E: admin@jacksonenvironment.com.au
T: 02 8056 1849
W: http://www.jacksonenvironment.com.au

JEP ENVIRONMENT & PLANNING

Client	Sydney Metal Traders Pty Ltd
Project	Proposed Metal Recycling Facility
Title	Site Plan
Scale	1:700
Source	JEP Environment & Planning

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DA

ZONE LEGEND

B Pre-Shredding Zone – Ferrous
pre-shredding / shredding (steel products)

C Shredding Zone – Ferrous
pre-shredding / shredding (steel products)

SITE - EQUIPMENT PLAN
SCALE 1:200 @ A1

Date	Plan Number	Site - Equipment Plan
06-10-2025	104	88 Murrays Flat Road Towrang, NSW 2580 (Lot 3 DP251779)

JEP Environment & Planning
Strategy | Approvals | Compliance | Licensing
A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060
E: admin@jacksonenvironment.com.au
T: 02 8056 1849
W: http://www.jacksonenvironment.com.au

JEP ENVIRONMENT & PLANNING

Client	Sydney Metal Traders Pty Ltd
Project	Proposed Metal Recycling Facility
Title	Site - Equipment Plan
Scale	1:200
Source	JEP Environment & Planning

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DA

Appendix C
Site Investigation Plan
Drawing No. DRM P24.1039.V01-R01.F1

Legend

- Approximate development area extent
- Approximate borehole Locations

Development Risk Management Pty Ltd

Scale: 100 m

Date: 19 February 2026

Drawn By: DP

Drawing Number: P24.1039.V01-R01.F1

Client: Sincorp Properties Pty Ltd

Project: Geotechnical Investigation Report

Location: 88 Murrays Flat Road, Towrang NSW

Title: Figure 1 - Site Investigation Plan

Appendix D
Borehole Logs

Development Risk Management Pty Ltd
Suite 7, 265-271 Pennant Hills Road Thornleigh, NSW 2120
Phone: +61 450 715 562

Geotechnical Log - Borehole

BH01

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -34.72803	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 149.78937	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 7.5 m BGL	Date	: 26/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing: Type	Testing: Blows per 150mm	Testing: N	Testing: Recovery	Sampling	Remarks & Other Observations
ADT	L		1.0		ML	SILT: low plasticity, grey.	M	St						
					CH	Gravelly CLAY: high plasticity, fine sized gravel, brown grey.	D	St					0.40-0.60, EMC	
									SPT	0.50-0.95, 4 5 7	12	100 %	0.50-0.70, Ec/pH	
													0.80-1.10, CBR	
													1.00-1.20, Ec/pH	
			2.0		CH	Gravelly CLAY: high plasticity, fine sized gravel, brown grey mottled.	D	VSt	SPT	1.50-1.95, 5 7 8	15	100 %	1.50-1.70, Ec/pH	
					CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, brown grey red mottled.	D	VSt					2.50-2.70, Ec/pH	Ironstone
			3.0						SPT	3.00-3.45, 4 8 13	21	100 %		
	H				CI	Gravelly CLAY: medium plasticity, fine sized gravel, yellow brown.	D	H					3.70-3.90, Ec/pH	Rock structure visible, decomposed granite

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Geotechnical Log - Borehole

BH01

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -34.72803	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 149.78937	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 7.5 m BGL	Date	: 26/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing: Type	Testing: Blows per 150mm	Testing: N	Testing: Recovery	Sampling	Remarks & Other Observations
ADT	H		5.0		Cl	Gravelly CLAY: medium plasticity, fine sized gravel, yellow brown.	D	H					4.30-4.50, Ec/pH	
									SPT	4.50-4.54, 5/40mm	R	11 %		Decomposed granite, fine gravel
	H		6.0						SPT	6.00-6.03, 5/30mm	R	5 %		Decomposed granite, fine to medium gravel
			7.0			BH01 Refusal at 7.5 m (Auger refusal)								

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Geotechnical Log - Borehole

BH02

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 8 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
ADT	L		1.0		CL	SILT: low plasticity, grey.	D	S						
					Cl	Gravelly CLAY: medium plasticity, fine sized gravel, brown.	D	H					0.40-0.60, Moisture	
									SPT	0.50-0.95 9 14 13	27	100 %		
					Cl	Gravelly CLAY: medium plasticity, fine to medium sized gravel, yellow brown.	D	St						
			2.0						SPT	1.50-1.95 5 5 7	12	100 %		Ironstone
					CH	Gravelly CLAY: high plasticity, fine sized gravel, brown grey mottled.	D	St						
			3.0		CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, brown, grey white mottled.	D	H						
									SPT	3.00-3.09 9/90 mm	0	100 %		
	H				Cl	Gravelly CLAY: medium plasticity, fine sized gravel, brown grey mottled.	D	H						Rock structure visible, decomposed granite

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Geotechnical Log - Borehole

BH02

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 8 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
					Cl	Gravelly CLAY: medium plasticity, fine sized gravel, yellow brown.	D	H	SPT	4.50-4.53 5/30 mm	R	100 %		
	H		5.0											
ADT			6.0											Decomposed granite, extremely weathered. rock structure visible
	H		7.0											
						BH02 Terminated at 8 m								

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Geotechnical Log - Borehole

BH03

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 8 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing: Type	Testing: Blows per 150mm	Testing: N	Testing: Recovery	Sampling	Remarks & Other Observations
					SP	Fill: Gravelly SAND, fine grained, fine sized gravel, brown, medium plasticity.	D							FILL
					GM	SILT: low plasticity, grey.	D	St						
					CH	Gravelly CLAY: high plasticity, medium sized gravel, brown grey mottled.	D	St						Ironstone
									SPT	0.50-0.95 4 5 6	11	100 %	0.50-0.70, Moisture	
			1.0		CH	Gravelly CLAY: high plasticity, coarse sized gravel, brown grey mottled, trace gravel.	D	St						Trace Gravel
									SPT	1.50-1.95 3 5 7	12	100 %		
ADT	L		2.0											
			3.0		CI	Gravelly CLAY: medium plasticity, fine sized gravel, yellow.								Decomposed Granite
									SPT	3.00-3.45 9 11 13	24	100 %		

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Geotechnical Log - Borehole

BH03

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 8 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
ADT	L		5.0		Cl	Gravelly CLAY: medium plasticity, fine sized gravel, yellow brown.	D	H	SPT	4.50-4.55 5/50 mm	R	100 %		Rock structure visible; fine gravel.
			6.0		Cl	Gravelly CLAY: medium plasticity, fine to medium sized gravel, yellow brown.	D	H	SPT	6.00-6.05 6/50 mm	R	100 %		Fine gravel
	H		7.0			BH03 Terminated at 8 m								Fine gravel, decomposed granite, extremely weathered

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Geotechnical Log - Borehole

BH04

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 5.4 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing: Type	Testing: Blows per 150mm	Testing: N	Testing: Recovery	Sampling	Remarks & Other Observations
					GM	SILT: low plasticity, grey.	D	H						
					CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, black brown.	D	H						
									SPT	0.50-0.95 8 14 15	29	100 %	0.50-0.70, EC/pH 0.50-0.70, EMC 0.70-1.00, CBR	
			1.0											
													1.10-1.30, EC/pH	
					CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, brown grey mottled.	D	H						
	L								SPT	1.50-1.95 6 9 16	25	100 %	1.50-1.70, EC/pH	
ADT			2.0		CI	Gravelly CLAY: medium plasticity, fine sized gravel, yellow brown.	D	H						Ironstone
													2.50-2.70, EC/pH	
			3.0											
	H								SPT	3.00-3.36 7 14 6/60 mm	R	100 %		
													3.50-3.70, EC/pH	
	H				CI	Gravelly CLAY: medium plasticity, fine to medium sized gravel, brown.	D	H						Decomposed granite

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Geotechnical Log - Borehole

BH04

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 5.4 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
ADT	H				Cl	Gravelly CLAY: medium plasticity, fine to medium sized gravel, brown. (continued)	D	H	SPT	4.50-4.52 4/20 mm	R	100 %		Decomposed granite
	H		5.0		Cl	Gravelly CLAY: medium plasticity, fine to medium sized gravel, brown.	D	H						More decomposed granite
						BH04 Refusal at 5.4 m (Auger refusal)								

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Geotechnical Log - Borehole

BH05

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 8 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing: Type	Testing: Blows per 150mm	Testing: N	Testing: Recovery	Sampling	Remarks & Other Observations
					GM	SILT: low plasticity, grey.	D	St						
					CH	Gravelly CLAY: high plasticity, brown grey.	D	St						
									SPT	0.50-0.95 3 4 6	10	100 %	0.50-0.70, Moisture 0.50-0.80, CBR	Ironstone
	L		1.0		CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, red brown.	D	St						
					CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, brown grey mottled.	D	St	SPT	1.50-1.95 1 5 6	11	100 %		
ADT			2.0											Ironstone, quartz gravel
					Cl	Gravelly CLAY: medium plasticity, fine to medium sized gravel, brown orange.	D	St						
					Cl	Gravelly CLAY: medium plasticity, fine to medium sized gravel, brown.	D	St						
	H		3.0						SPT	3.00-3.32 1 7 10/20 mm	R	100 %		
					Cl	Gravelly CLAY: medium plasticity, fine to medium sized gravel, brown.	D	H						Rock structure visible, decomposed granite

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Geotechnical Log - Borehole

BH05

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 8 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
					Cl	Gravelly CLAY: medium plasticity, brown.			SPT	4.50-4.53 4/30 mm	R	100 %		
	H		5.0											
ADT			6.0											
	H		7.0											
						BH05 Terminated at 8 m								

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Geotechnical Log - Borehole

BH06

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 7.3 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing: Type	Testing: Blows per 150mm	Testing: N	Testing: Recovery	Sampling	Remarks & Other Observations
					CL	SILT: low plasticity, grey.	D	H						
					CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, black brown.	D	H						
									SPT	0.50-0.95 10 18 12	30	100 %	0.50-0.70, M+ATT+Linear Shrinkage 0.60-0.90, CBR	
			1.0		CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, brown grey mottled.	D	F					1.00-1.20, M+ATT+Linear Shrinkage	
									SPT	1.50-1.95 2 3 4	7	100 %	1.50-1.70, M+ATT+Linear Shrinkage	
ADT	L		2.0											Ironstone, quartz gravel conglomerate
					CI	Gravelly CLAY: medium plasticity, fine to medium sized gravel, yellow brown.	D	St-VSt						
			3.0						SPT	3.00-3.45 5 9 11	20	100 %		
	H				CI	Gravelly CLAY: medium plasticity, fine sized gravel, brown.	D	VSt						Rock structure visible, decomposed granite

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Geotechnical Log - Borehole

BH06

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 7.3 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
					Cl	Gravelly CLAY: medium plasticity, fine sized gravel, brown. (continued)	D	VSt						
									SPT	4.50-4.57 7/70 mm	R	100 %		
	H													Rock structure visible, decomposed granite
			5.0											
ADT					Cl	Gravelly CLAY: medium plasticity, fine to medium sized gravel, brown.	D	H						
			6.0						SPT	6.00-6.05 7/50 mm	0	100 %		
	L													
			7.0											
						BH06 Refusal at 7.3 m (AUGER REFUSAL)								

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Geotechnical Log - Borehole

BH07

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 8 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
ADT	L		1.0		GM	SILT: low plasticity, grey.	D	H						
					CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, brown red mottled.	D	H						
									SPT	0.50-0.95 13 18 11	29	100 %	0.50-0.70, Moisture	
					CH	Gravelly CLAY: high plasticity, fine sized gravel, brown grey mottled.	M	F						Ironstone, quartz gravel
									SPT	1.50-1.95 3 3 4	7	100 %		
			2.0		CH	CLAY: high plasticity, brown grey mottled.								
			3.0		CH	Gravelly CLAY: high plasticity, fine sized gravel, brown grey white.	D	F						Trace gravel, ironstone
									SPT	3.00-3.18 14 3/30 mm	R	100 %		
	H				CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, brown.	D	F						Ironstone

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Geotechnical Log - Borehole

BH07

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 8 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
					CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, brown. (continued)	D	F						Ironstone
					CH	Gravelly CLAY: high plasticity, fine sized gravel, brown.	D	F	SPT	4.50-4.64 15/140 mm	R	100 %		
			5.0											
ADT	H		6.0						SPT	6.00-6.11 10/110 mm	R	100 %		Rock structure visible, potentially augered fines
			7.0											
						BH07 Terminated at 8 m								

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Geotechnical Log - Borehole

BH08

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 7.5 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing: Type	Testing: Blows per 150mm	Testing: N	Testing: Recovery	Sampling	Remarks & Other Observations
ADT	L				CL	SILT: low plasticity, grey.	D	VSt						
													0.30-0.50, EMC	
					CH	Gravelly CLAY: high plasticity, fine sized gravel, brown red mottled.	D	VSt						
									SPT	0.50-0.95 4 6 8	14	100 %	0.50-0.70, EC&pH	
			1.0		CI	Gravelly CLAY: medium plasticity, fine sized gravel, brown.	D	St					1.00-1.20, EC&pH	
													1.00-1.30, CBR	
									SPT	1.50-1.95 3 3 4	7	100 %	1.50-1.70, EC&pH	
			2.0											
					CH	Gravelly CLAY: high plasticity, fine sized gravel, brown mottled grey.	D	VSt					2.50-2.70, EC&pH	
			3.0						SPT	3.00-3.45 5 11 12	23	100 %	3.00-3.20, EC&pH	Trace gravel
					CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, brown.	D	H						Rock structure visible

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Geotechnical Log - Borehole

BH08

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 7.5 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
					CH	Gravelly CLAY: high plasticity, fine to medium sized gravel, brown. (continued)	D	H						
					CH	Gravelly CLAY: high plasticity, fine sized gravel.	D	H	SPT	4.50-4.61 11/110 mm	R	100 %		Rock structure visible, decomposed granite
			5.0											
ADT	H				CI	Gravelly CLAY: medium plasticity, fine sized gravel, brown.	D	H						Decomposed granite, some fine gravel
			6.0						SPT	6.00-6.23 12 7/75 mm	28	33 %		
			7.0											
						BH08 Refusal at 7.5 m (Auger refusal)								

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Geotechnical Log - Borehole

BH09

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 5.9 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
ADT	L		0.0		CL	SILT: low plasticity, grey.	D	VSt						
					CH	Gravelly CLAY: high plasticity, fine sized gravel, dark brown.	D	VSt						
									SPT	0.50-0.95 3 7 8	15	100 %	0.50-0.70, M+ATT+Linear Shrinkage	
			1.0		CH	Gravelly CLAY: high plasticity, fine sized gravel, brown grey mottled.	D	VSt					1.00-1.20, M+ATT+Linear Shrinkage	Ironstone
									SPT	1.50-1.95 3 6 6	12	100 %	1.50-1.70, M+ATT+Linear Shrinkage	
			2.0		CI	Gravelly CLAY: medium plasticity, fine sized gravel, brown.	D	H						Rock structure observed, decomposed granite
	H		3.0						SPT	3.00-3.33 12 14 4/30 mm	R	100 %		Rock structure visible

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Geotechnical Log - Borehole

BH09

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 5.9 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
ADT	H		5.0		G C	Clayey GRAVEL: medium sized, grey.	D		SPT	4.50-4.54 5/40 mm	R	100 %		Decomposed granite, trace clay
						BH09 Refusal at 5.9 m (Auger refusal)								

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Geotechnical Log - Borehole

BH10

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 8 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
ADT	L		1.0		CL	SILT: low plasticity, grey.	D	VSt						
					CL	Gravelly to Silty CLAY: low plasticity, fine sized gravel, dark brown.	D	VSt	SPT	0.50-0.95 6 11 11	22	100 %	0.50-0.70, M+ATT+Linear Shrinkage	Ironstone
													1.00-1.20, M+ATT+Linear Shrinkage	
			2.0		CH	Gravelly CLAY: high plasticity, fine sized gravel, brown mottled grey.	M	VSt	SPT	1.50-1.95 2 3 5	8	100 %	1.50-1.70, M+ATT+Linear Shrinkage	
	H		3.0		CH	Gravelly CLAY: high plasticity, fine sized gravel, yellow brown.	D	St	SPT	3.00-3.23 7 8/80 mm	30	100 %		
					GC	Clayey GRAVEL: brown, with trace clay.	D							

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Geotechnical Log - Borehole

BH10

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 8 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing: Type	Testing: Blows per 150mm	Testing: N	Testing: Recovery	Sampling	Remarks & Other Observations
ADT	H		5.0		GC	Clayey GRAVEL: fine sized, brown, with trace clay.	D		SPT	4.50-4.53 6/30 mm	0	100 %		More crushed gravel observed with trace clay
			6.0						SPT	8.00-6.01 8/7 mm	0	100 %		Rock structure, augered gravel
			7.0			BH10 Terminated at 8 m								Ironstone, quartz gravel

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Geotechnical Log - Borehole

BH11

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 8 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
					CL	SILT: low plasticity, grey.	D	F						
					CH	Gravelly CLAY: high plasticity, fine sized gravel, brown mottled grey.	D	F						
									SPT	0.50-0.95 3 3 4	7	100 %	0.50-0.70, M+ATT+Linear Shrinkage	
			1.0										1.00-1.20, M+ATT+Linear Shrinkage	
									SPT	1.50-1.95 4 4 4	8	100 %	1.50-1.70, M+ATT+Linear Shrinkage	
ADT	L		2.0		CH	Gravelly CLAY: high plasticity, fine sized gravel, light brown.	D	St						
					CH	Gravelly CLAY: high plasticity, fine sized gravel, brown.	D	VSt						
			3.0						SPT	3.00-3.45 10 11 12	23	100 %		

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Geotechnical Log - Borehole

BH11

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 8 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
					C H	Gravelly CLAY: high plasticity, fine sized gravel, brown.	D	VS t						
									SPT	4.50-4.67 12 4/20 mm	R	100 %		
			5.0											
ADT	H		6.0						SPT	6.00-6.09 8/90 mm	0	100 %		
			7.0											
									SPT	7.50-7.58 6/80 mm	0	100 %		
						BH11 Terminated at 8 m								

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Geotechnical Log - Borehole

BH12

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 7.5 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
ADT	L		1.0		CL	SILT: low plasticity, grey.	D	St					0.30-0.50, Moisture+EMC	
									SPT	0.50-0.95 7 5 5	10	100 %		
					CH	Gravelly CLAY: high plasticity, fine sized gravel, light brown.	W-M	F						
			2.0						SPT	1.50-1.95 2 2 3	5	100 %		
			3.0		CH	Gravelly CLAY: high plasticity, fine sized gravel, brown grey mottled.	D	VSt					3.00-3.20, Moisture	
									SPT	3.00-3.45 7 10 13	23	100 %		Ironstone, quartz gravel

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Geotechnical Log - Borehole

BH12

UTM	: 56H	Drill Rig	: Auger Drill GT-10	Job Number	: DRM P24.1039.V01
Latitude	: -33.73141	Driller Supplier	: Geoanalysis	Client	: Sincorp Properties Pty Ltd
Longitude	: 151.08089	Logged By	: Dilanka Premadasa	Project	: Geotechnical Investigation
Ground Elevation	: 550.62 (m)	Reviewed By	: VDS	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Total Depth	: 7.5 m BGL	Date	: 20/02/2026	Loc Comment	:

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
ADT	H				CL	Gravelly CLAY: low plasticity, fine sized gravel, brown.	D	VSt						
					CL	Gravelly CLAY: low plasticity, fine sized gravel, trace gravel.	D	VSt	SPT	4.50-4.53 6/30 mm	0	100 %		Ironstone, quartz gravel
			5.0											
			6.0		GC	Clayey GRAVEL: fine sized, with trace clay.	D		SPT	6.00-6.10 13/100 mm	0	100 %		Rock structure visible
			7.0											
						BH12 Refusal at 7.5 m (Anger refusal)								

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Soil Boring Log - BH13

Latitude	: -33.73141	Sample Method	: ADT	Job Number	: DRM P24.1039.V01
Longitude	: 151.08089	Excavator	: Auger Drill GT-10	Client	: Sincorp Properties Pty Ltd
Ground Elevation	: 550.62 m	Excavator Supplier	:	Project	: Geotechnical Investigation
Total Depth	: 6.8 m BGL	Logged By	: Dilanka Premadasa	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Date/Time Start	: 24/02/2026 11:00	Reviewed By	: VDS	Loc Comment	:
Date/Time End	:				

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
ADT	L		1.0		SC	Clayey SAND: trace fine sized gravel, low plasticity clay, brown.	D		SPT	0.50-0.95 11 8 9	17	100 %	0.50-0.70, EC/pH 0.80-1.00, EC/pH	
			2.0		CH	Gravelly CLAY: high plasticity, fine sized gravel, brown, some gravel.	D	VSt	SPT	1.50-1.95 6 11 14	25	100 %	1.50-1.80, EC/pH 1.80-2.00, EC/pH	
	H		3.0						SPT	3.00-3.26 8 14/110 mm	38	100 %	3.00-3.20, EC/pH	Trace ironstone, gravel

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Soil Boring Log - BH13

Latitude	: -33.73141	Sample Method	: ADT	Job Number	: DRM P24.1039.V01
Longitude	: 151.08089	Excavator	: Auger Drill GT-10	Client	: Sincorp Properties Pty Ltd
Ground Elevation	: 550.62 m	Excavator Supplier	:	Project	: Geotechnical Investigation
Total Depth	: 6.8 m BGL	Logged By	: Dilanka Premadasa	Location	: Coolabah, 88 Murrays Flat Rd, Towrang NSW 2580, Australia
Date/Time Start	: 24/02/2026 11:00	Reviewed By	: VDS	Loc Comment	:
Date/Time End	:				

Drill Method	Drill Resistance	Water	Depth (m)	Graphic Log	Classification	Material Description	Moisture	Consistency	Testing				Sampling	Remarks & Other Observations
									Type	Blows per 150mm	N	Recovery		
ADT	H		5.0		CH	Gravelly CLAY: high plasticity, fine sized gravel, brown, some gravel. (continued)	D	VSt	SPT		R			Trace ironstone, gravel
			6.0		CH	Gravelly CLAY: high plasticity, fine sized gravel, brown.	D	H	SPT	6.00-6.10 12/100 mm	R	100 %		Some gravel ironstone, gravel
						BH13 Refusal at 6.8 m (Auger refusal)								

Appendix E
Laboratory Test Results – A

Material Test Report

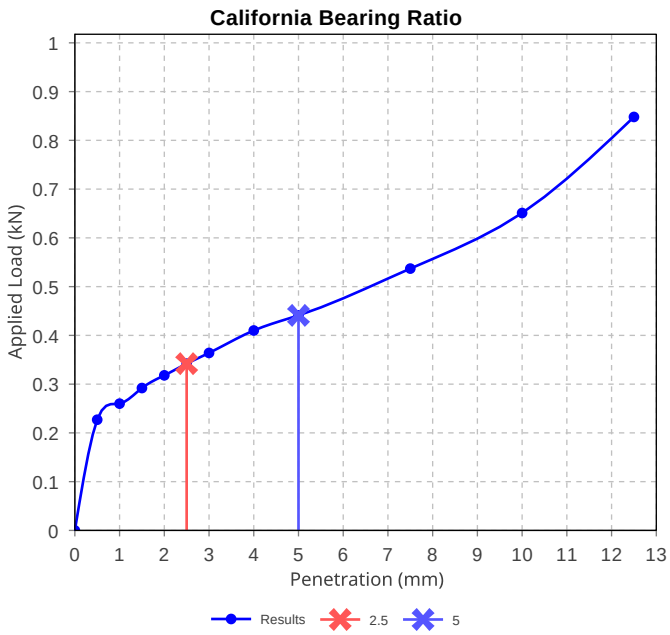
Benchmark Geotechnical Pty Ltd
Unit 3, 39 Eddie Road Minchinbury NSW 2770
Phone: 1300 919 000
Email: matt@bmgeo.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Hamish Barsing
Laboratory Manager
Laboratory Number: 20634

Report Number:	**P261238-1**
Issue Number:	1
Date Issued:	16/03/2026
Client:	Development Risk Management
	37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact:	Nalin De Silva
Project Number:	P261238
Project Name:	Geotechnical Investigation
Project Location:	88 Murrays Flat Road, Towrang NSW 2580
Client Reference:	P24.1039.V01
Work Request:	5716
Sample Number:	26-5716A
Date Sampled:	25/02/2026
Dates Tested:	25/02/2026 - 13/03/2026
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection:	Selected by Client
Sample Location:	**BH08, Depth: 1.0 - 1.3 m**
Material:	Brown Silty Clay with Gravel
Material Source:	In-Situ

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**2.5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS1289.5.1.1 & 2.1.1		
Method used to Determine Plasticity	Tactile		
Additive Type	None		
Additive Percent (%)	0		
Maximum Dry Density (t/m^3)	1.84		
Optimum Moisture Content (%)	16.5		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	98.5		
Dry Density after Soaking (t/m^3)	1.83		
Field Moisture Content (%)	16.0		
Moisture Content at Placement (%)	16.2		
Moisture Content Top 30mm (%)	20.4		
Moisture Content Rest of Sample (%)	17.7		
Mass Surcharge (kg)	9.0kg		
Soaking Period (days)	4		
Curing Hours (h)	76		
Swell (%)	1.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.7		



Material Test Report

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Unit 3, 39 Eddie Road Minchinbury NSW 2770
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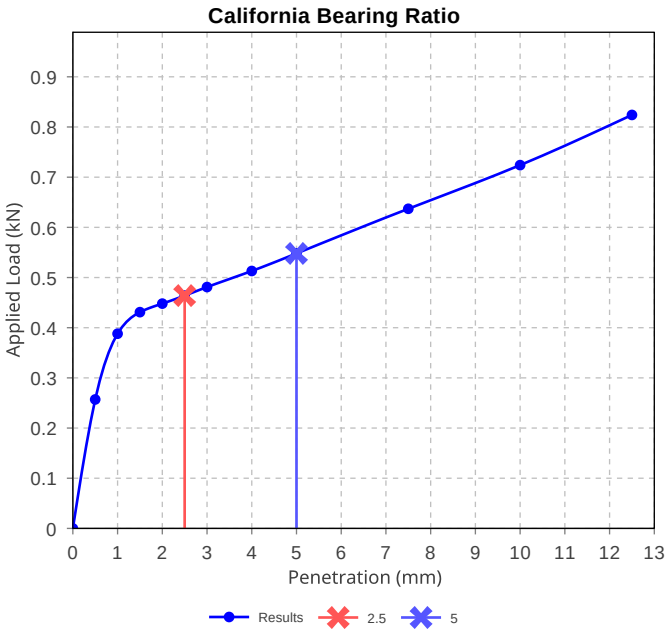
Approved Signatory: Hamish Barsing
Laboratory Manager
Laboratory Number: 20634

Report Number: **P261238-1**
Issue Number: 1
Date Issued: 16/03/2026
Client: Development Risk Management
37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact: Nalin De Silva
Project Number: P261238
Project Name: Geotechnical Investigation
Project Location: 88 Murrays Flat Road, Towrang NSW 2580
Client Reference: P24.1039.V01
Work Request: 5716
Sample Number: 26-5716B
Date Sampled: 25/02/2026
Dates Tested: 25/02/2026 - 13/03/2026
Sampling Method: Sampled by Client
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection: Selected by Client
Sample Location: **BH06, Depth: 0.6 - 0.9 m**
Material: Light Brown Silty Clay with Gravel
Material Source: In-Situ

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**3.5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS1289.5.1.1 & 2.1.1		
Method used to Determine Plasticity	Tactile		
Additive Type	None		
Additive Percent (%)	0		
Maximum Dry Density (t/m^3)	1.61		
Optimum Moisture Content (%)	22.5		
Laboratory Density Ratio (%)	100.5		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m^3)	1.61		
Field Moisture Content (%)	20.0		
Moisture Content at Placement (%)	22.3		
Moisture Content Top 30mm (%)	28.5		
Moisture Content Rest of Sample (%)	24.9		
Mass Surcharge (kg)	9.0kg		
Soaking Period (days)	4		
Curing Hours (h)	72		
Swell (%)	0.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

Benchmark Geotechnical Pty Ltd
Unit 3, 39 Eddie Road Minchinbury NSW 2770
Phone: 1300 919 000
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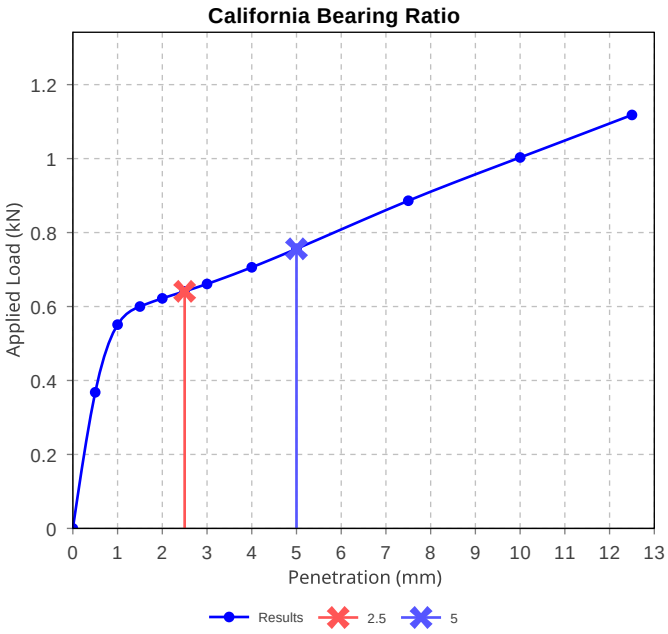
Approved Signatory: Hamish Barsing
Laboratory Manager
Laboratory Number: 20634

Report Number:	**P261238-1**
Issue Number:	1
Date Issued:	16/03/2026
Client:	Development Risk Management
	37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact:	Nalin De Silva
Project Number:	P261238
Project Name:	Geotechnical Investigation
Project Location:	88 Murrays Flat Road, Towrang NSW 2580
Client Reference:	P24.1039.V01
Work Request:	5716
Sample Number:	26-5716C
Date Sampled:	25/02/2026
Dates Tested:	25/02/2026 - 13/03/2026
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection:	Selected by Client
Sample Location:	**BH05, Depth: 0.5 - 0.8 m**
Material:	Light Brown Silty Clay with Gravel
Material Source:	In-Situ

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**5.0**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS1289.5.1.1 & 2.1.1		
Method used to Determine Plasticity	Tactile		
Additive Type	None		
Additive Percent (%)	0		
Maximum Dry Density (t/m^3)	1.56		
Optimum Moisture Content (%)	23.5		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m^3)	1.53		
Field Moisture Content (%)	19.9		
Moisture Content at Placement (%)	23.6		
Moisture Content Top 30mm (%)	28.5		
Moisture Content Rest of Sample (%)	26.5		
Mass Surcharge (kg)	9.0kg		
Soaking Period (days)	4		
Curing Hours (h)	77.2		
Swell (%)	1.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



Material Test Report

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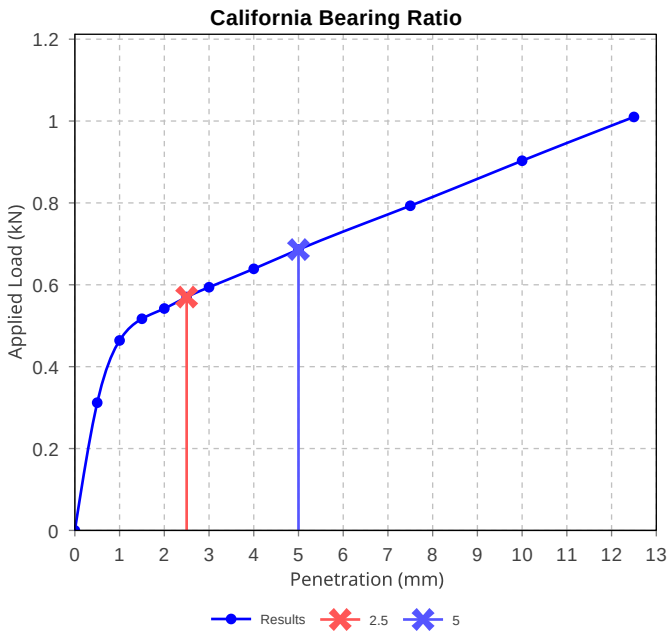
Laboratory Manager
Laboratory Number: 20634

Report Number:	**P261238-1**
Issue Number:	1
Date Issued:	16/03/2026
Client:	Development Risk Management
	37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact:	Nalin De Silva
Project Number:	P261238
Project Name:	Geotechnical Investigation
Project Location:	88 Murrays Flat Road, Towrang NSW 2580
Client Reference:	P24.1039.V01
Work Request:	5716
Sample Number:	26-5716D
Date Sampled:	25/02/2026
Dates Tested:	25/02/2026 - 13/03/2026
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection:	Selected by Client
Sample Location:	**BH04, Depth: 0.7 - 1.0 m**
Material:	Light Brown Silty Clay with Gravel
Material Source:	In-Situ

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**4.5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS1289.5.1.1 & 2.1.1		
Method used to Determine Plasticity	Tactile		
Additive Type	None		
Additive Percent (%)	0		
Maximum Dry Density (t/m^3)	1.61		
Optimum Moisture Content (%)	22.5		
Laboratory Density Ratio (%)	100.5		
Laboratory Moisture Ratio (%)	99.5		
Dry Density after Soaking (t/m^3)	1.60		
Field Moisture Content (%)	20.4		
Moisture Content at Placement (%)	22.5		
Moisture Content Top 30mm (%)	26.1		
Moisture Content Rest of Sample (%)	24.5		
Mass Surcharge (kg)	9.0kg		
Soaking Period (days)	4		
Curing Hours (h)	77.1		
Swell (%)	1.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



Material Test Report

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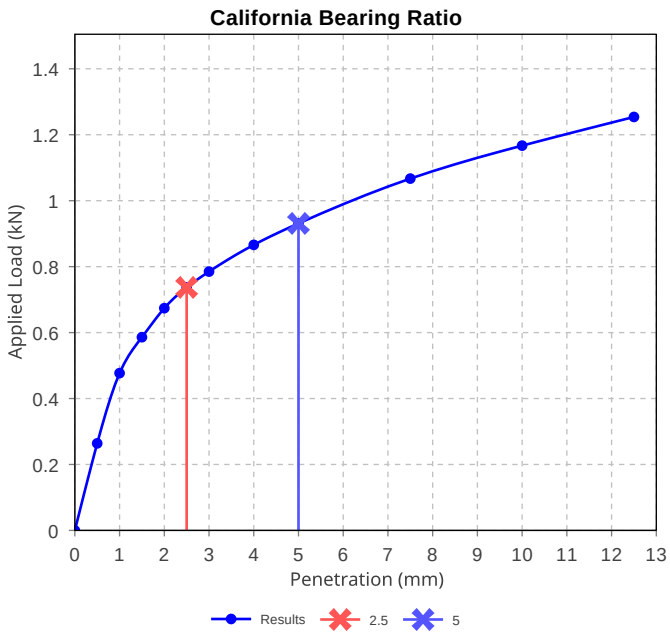
Approved Signatory: Hamish Barsing
Laboratory Manager
Laboratory Number: 20634

Report Number:	**P261238-1**
Issue Number:	1
Date Issued:	16/03/2026
Client:	Development Risk Management
	37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact:	Nalin De Silva
Project Number:	P261238
Project Name:	Geotechnical Investigation
Project Location:	88 Murrays Flat Road, Towrang NSW 2580
Client Reference:	P24.1039.V01
Work Request:	5716
Sample Number:	26-5716E
Date Sampled:	26/02/2026
Dates Tested:	26/02/2026 - 13/03/2026
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection:	Selected by Client
Sample Location:	**BH01, Depth: 0.8 - 1.1 m**
Material:	Brown Silty Clay with Gravel
Material Source:	In-Situ

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**6**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS1289.5.1.1 & 2.1.1		
Method used to Determine Plasticity	Tactile		
Additive Type	None		
Additive Percent (%)	0		
Maximum Dry Density (t/m^3)	1.76		
Optimum Moisture Content (%)	18.0		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	101.5		
Dry Density after Soaking (t/m^3)	1.74		
Field Moisture Content (%)	16.7		
Moisture Content at Placement (%)	18.5		
Moisture Content Top 30mm (%)	20.2		
Moisture Content Rest of Sample (%)	19.3		
Mass Surcharge (kg)	9.0kg		
Soaking Period (days)	4		
Curing Hours (h)	77.6		
Swell (%)	0.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



Material Test Report

Benchmark Geotechnical Pty Ltd
Unit 3, 39 Eddie Road Minchinbury NSW 2770
Phone: 1300 919 000
Email: matt@bmgeo.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Hamish Barsing
Laboratory Manager
Laboratory Number: 20634

Report Number: **P261238-1**
Issue Number: 1
Date Issued: 16/03/2026
Client: Development Risk Management
37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact: Nalin De Silva
Project Number: P261238
Project Name: Geotechnical Investigation
Project Location: 88 Murrays Flat Road, Towrang NSW 2580
Client Reference: P24.1039.V01
Work Request: 5716
Sample Number: 26-5716F
Date Sampled: 26/02/2026
Dates Tested: 26/02/2026 - 04/03/2026
Sampling Method: Sampled by Client
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection: Selected by Client
Sample Location: **BH01, Depth: 0.4 - 0.6 m**
Material: Brown Silty Clay with Gravel
Material Source: In-Situ

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	**2**		
Soil Description	Brown Silty Clay with Gravel		
Nature of Water	Distilled		

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Laboratory Manager
Laboratory Number: 20634

Report Number: **P261238-1**
Issue Number: 1
Date Issued: 16/03/2026
Client: Development Risk Management
37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact: Nalin De Silva
Project Number: P261238
Project Name: Geotechnical Investigation
Project Location: 88 Murrays Flat Road, Towrang NSW 2580
Client Reference: P24.1039.V01
Work Request: 5716
Sample Number: 26-5716G
Date Sampled: 25/02/2026
Dates Tested: 25/02/2026 - 04/03/2026
Sampling Method: Sampled by Client
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection: Selected by Client
Sample Location: **BH04, Depth: 0.5 - 0.7 m**
Material: Brown Silty Clay with Gravel
Material Source: In-Situ

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	**4 ***		
Soil Description	Brown Silty Clay with Gravel		
Nature of Water	Distilled		
* Mineral Present	Carbonate and Gypsum		

Material Test Report

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Approved Signatory: Hamish Barsing
Laboratory Manager
Laboratory Number: 20634

Report Number: **P261238-1**
Issue Number: 1
Date Issued: 16/03/2026
Client: Development Risk Management
37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact: Nalin De Silva
Project Number: P261238
Project Name: Geotechnical Investigation
Project Location: 88 Murrays Flat Road, Towrang NSW 2580
Client Reference: P24.1039.V01
Work Request: 5716
Sample Number: 26-5716H
Date Sampled: 25/02/2026
Dates Tested: 25/02/2026 - 04/03/2026
Sampling Method: Sampled by Client
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection: Selected by Client
Sample Location: **BH08, Depth: 0.3 - 0.5 m**
Material: Light Brown Silt with Gravel, trace Clay
Material Source: In-Situ

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	**3**		
Soil Description	Tan Silt with Gravel, Trace Clay		
Nature of Water	Distilled		

Material Test Report

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Laboratory Manager

Laboratory Number: 20634

Report Number: **P261238-1**
Issue Number: 1
Date Issued: 16/03/2026
Client: Development Risk Management
37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact: Nalin De Silva
Project Number: P261238
Project Name: Geotechnical Investigation
Project Location: 88 Murrays Flat Road, Towrang NSW 2580
Client Reference: P24.1039.V01
Work Request: 5716
Sample Number: 26-5716I
Date Sampled: 24/02/2026
Dates Tested: 24/02/2026 - 04/03/2026
Sampling Method: Sampled by Client
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection: Selected by Client
Sample Location: **BH12, Depth: 0.3 - 0.5 m**
Material: Light Brown Silt with Gravel, Trace Clay
Material Source: In-Situ

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	**3**		
Soil Description	Tan Silt with Gravel, Trace Clay		
Nature of Water	Distilled		

Material Test Report

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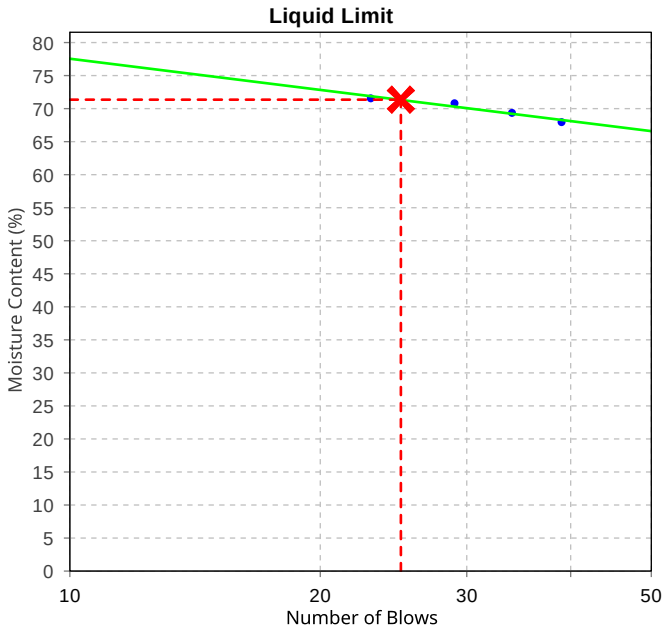
Laboratory Manager

Laboratory Number: 20634

Report Number:	**P261238-1**
Issue Number:	1
Date Issued:	16/03/2026
Client:	Development Risk Management
	37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact:	Nalin De Silva
Project Number:	P261238
Project Name:	Geotechnical Investigation
Project Location:	88 Murrays Flat Road, Towrang NSW 2580
Client Reference:	P24.1039.V01
Work Request:	5716
Sample Number:	26-5716P
Date Sampled:	25/02/2026
Dates Tested:	25/02/2026 - 13/03/2026
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection:	Selected by Client
Sample Location:	**BH06, Depth: 1.0 - 1.2 m**
Material:	Brown Clay with Gravel
Material Source:	In-Situ

Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	71		
Plastic Limit (%)	18		
Plasticity Index (%)	**53**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.1		
Linear Shrinkage (%)	**9.0**		
Cracking Crumbling Curling	Cracking & Curling		



Material Test Report

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Unit 3, 39 Eddie Road Minchinbury NSW 2770
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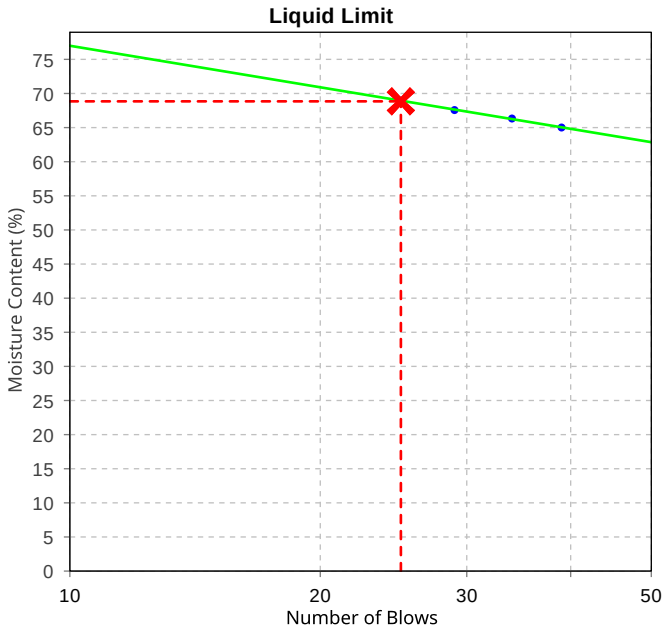
Laboratory Manager

Laboratory Number: 20634

Report Number:	**P261238-1**
Issue Number:	1
Date Issued:	16/03/2026
Client:	Development Risk Management
	37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact:	Nalin De Silva
Project Number:	P261238
Project Name:	Geotechnical Investigation
Project Location:	88 Murrays Flat Road, Towrang NSW 2580
Client Reference:	P24.1039.V01
Work Request:	5716
Sample Number:	26-5716S
Date Sampled:	25/02/2026
Dates Tested:	25/02/2026 - 12/03/2026
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection:	Selected by Client
Sample Location:	**BH09, Depth: 1.0 - 1.2 m**
Material:	Brown Silty Clay with Gravel
Material Source:	In-Situ

Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	69		
Plastic Limit (%)	17		
Plasticity Index (%)	**52**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.1		
Linear Shrinkage (%)	**11.5**		
Cracking Crumbling Curling	Cracking & Curling		



Material Test Report

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Phone: 1300 919 000
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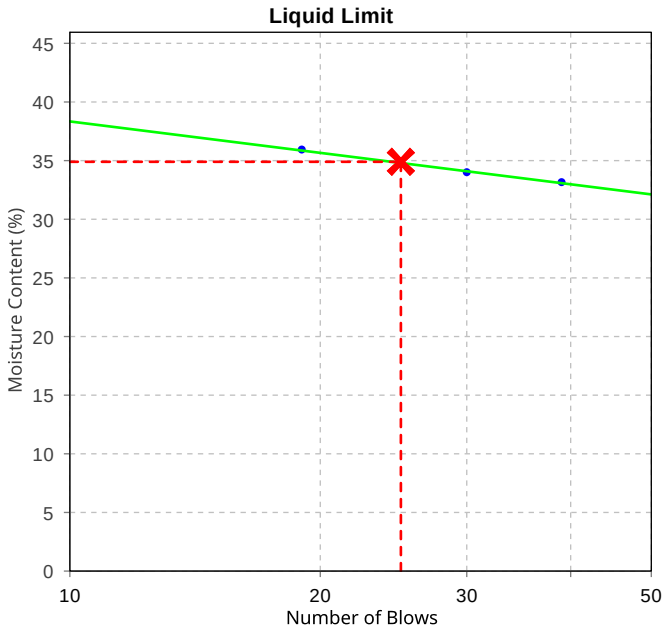
Approved Signatory: Hamish Barsing
Laboratory Manager

Laboratory Number: 20634

Report Number:	**P261238-1**
Issue Number:	1
Date Issued:	16/03/2026
Client:	Development Risk Management
	37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact:	Nalin De Silva
Project Number:	P261238
Project Name:	Geotechnical Investigation
Project Location:	88 Murrays Flat Road, Towrang NSW 2580
Client Reference:	P24.1039.V01
Work Request:	5716
Sample Number:	26-5716U
Date Sampled:	24/02/2026
Dates Tested:	24/02/2026 - 12/03/2026
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection:	Selected by Client
Sample Location:	**BH10, Depth: 0.5 - 0.7 m**
Material:	Dark Brown Silty Clay
Material Source:	In-Situ

Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	35		
Plastic Limit (%)	13		
Plasticity Index (%)	**22**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.1		
Linear Shrinkage (%)	**9.0**		
Cracking Crumbling Curling	Curling		



Material Test Report

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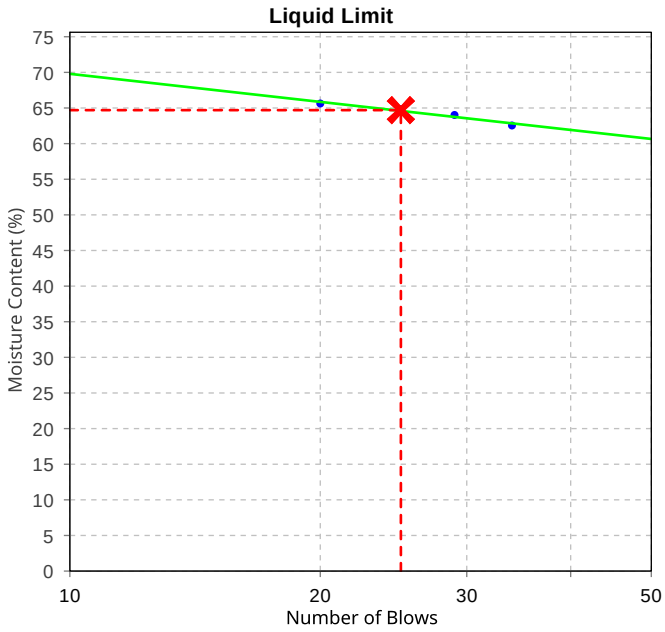
Laboratory Manager

Laboratory Number: 20634

Report Number:	**P261238-1**
Issue Number:	1
Date Issued:	16/03/2026
Client:	Development Risk Management
	37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact:	Nalin De Silva
Project Number:	P261238
Project Name:	Geotechnical Investigation
Project Location:	88 Murrays Flat Road, Towrang NSW 2580
Client Reference:	P24.1039.V01
Work Request:	5716
Sample Number:	26-5716W
Date Sampled:	24/02/2026
Dates Tested:	24/02/2026 - 12/03/2026
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection:	Selected by Client
Sample Location:	**BH10, Depth: 1.5 - 1.7 m**
Material:	Brown Clay with Silt & Gravel
Material Source:	In-Situ

Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	65		
Plastic Limit (%)	17		
Plasticity Index (%)	**48**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.1		
Linear Shrinkage (%)	**10.5**		
Cracking Crumbling Curling	Cracking & Curling		



Material Test Report

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Unit 3, 39 Eddie Road Minchinbury NSW 2770
Phone: 1300 919 000
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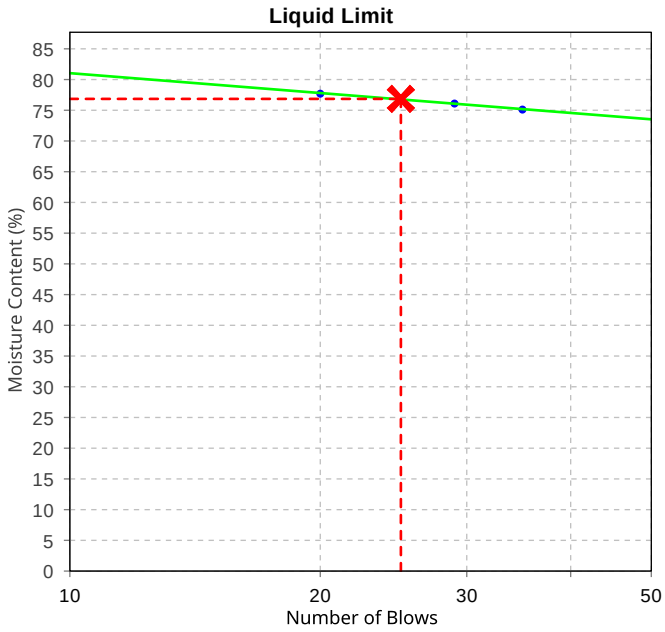
Approved Signatory: Hamish Barsing
Laboratory Manager

Laboratory Number: 20634

Report Number:	**P261238-1**
Issue Number:	1
Date Issued:	16/03/2026
Client:	Development Risk Management
	37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact:	Nalin De Silva
Project Number:	P261238
Project Name:	Geotechnical Investigation
Project Location:	88 Murrays Flat Road, Towrang NSW 2580
Client Reference:	P24.1039.V01
Work Request:	5716
Sample Number:	26-5716Z
Date Sampled:	24/02/2026
Dates Tested:	24/02/2026 - 12/03/2026
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Site Selection:	Selected by Client
Sample Location:	**BH11, Depth: 1.5 - 1.7 m**
Material:	Light Brown Silty Clay with Gravel
Material Source:	In-Situ

Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	77		
Plastic Limit (%)	16		
Plasticity Index (%)	**61**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.1		
Linear Shrinkage (%)	**9.5**		
Cracking Crumbling Curling	Cracking & Curling		



Material Test Report

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Email: matt@bmgeo.com.au

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Approved Signatory: Hamish Barsing
Laboratory Manager
Laboratory Number: 20634

Report Number: **P261238-1**
Issue Number: 1
Date Issued: 16/03/2026
Client: Development Risk Management
37 Mount Pleasant Avenue, Normanhurst NSW 2076
Contact: Nalin De Silva
Project Number: P261238
Project Name: Geotechnical Investigation
Project Location: 88 Murrays Flat Road, Towrang NSW 2580
Client Reference: P24.1039.V01
Work Request: 5716
Date Sampled: 24/02/2026
Dates Tested: 24/02/2026 - 04/03/2026
Sampling Method: Sampled by Client
The results apply to the sample as received
Preparation Method: No sampling – field test only
Site Selection: Selected by Client
Location: 88 Murray Flat Road, Toowrand: Boreholes 1 - 12
Material Source: In-Situ

Moisture Content AS 1289 2.1.1

Sample Number	Sample Location	Moisture Content (%)	Min	Max	Material
26-5716F	BH01, Depth: 0.4 - 0.6 m	7.9 %	**	**	Brown Silty Clay with Gravel
26-5716J	BH03, Depth: 0.5 - 0.7 m	22.7 %	**	**	Brown Silty Clay with Gravel
26-5716M	BH12, Depth: 3.0 - 3.2 m	16.1 %	**	**	Brown Silty Clay with Gravel
26-5716P	BH06, Depth: 1.0 - 1.2 m	19.3 %	**	**	Brown Clay with Gravel
26-5716S	BH09, Depth: 1.0 - 1.2 m	18.4 %	**	**	Brown Silty Clay with Gravel
26-5716T	BH09, Depth: 1.5 - 1.7 m	20.7 %	**	**	Brown Clay with Gravel
26-5716U	BH10, Depth: 0.5 - 0.7 m	10.9 %	**	**	Dark Brown Silty Clay
26-5716V	BH10, Depth: 1.0 - 1.2 m	12.4 %	**	**	Brown Silty Clay with Gravel
26-5716W	BH10, Depth: 1.5 - 1.7 m	23.5 %	**	**	Brown Clay with Silt & Gravel
26-5716X	BH11, Depth: 0.5 - 0.7 m	9.0 %	**	**	Light Brown Silty Clay with Gravel
26-5716Z	BH11, Depth: 1.5 - 1.7 m	20.1 %	**	**	Light Brown Silty Clay with Gravel

BENCHMARK GEOTECHNICAL

Test Request (I Test Request (Lab Docket) Form

Client Details					
Client:	Development Risk Mangement	Client Rep:	Dilanka Premadasa	Date:	27/02/2026
Project Name:	Geotechnical Investigation	Mobile:	0450 715 562	Work Request:	
Project No:	P24.1039.V01	Email:	results@drm.ltd nalin_desilva@drm.ltd	Project:	
Project Location:	88 Murrays Flat Road, Towrang NSW	Client's PO:	P24.1039.V01	Date Sampled:	24,25,26 February 2026

Test Details

Specify Method:		Tests Required:	Moisture Content	Compaction (MDD)	Compaction (Rapid)	Grading (PSD)	Liquid Limt	Plastic Limit	Plasticity Index	Atterberg Limit	Linear Shrinkage	CBR	Emerson	Density Index	Comments
AS 1289 2.1.1 , 5.7.1															
Sample No	Sample Date	Location													
A	25/02/2026	BH08_1.0-1.3										X			
B	25/02/2026	BH06_0.6-0.9										X			
C	25/02/2026	BH05_0.5-0.8										X			
D	25/02/2026	BH04_0.7-1.0										X			
E	26/02/2026	BH01_0.8-1.1										X			
F	26/02/2026	BH01-0.4-0.6	X										X		
G	25/02/2026	BH04_0.5-0.7											X		
H	25/02/2026	BH08_0.3-0.5											X		
I	24/02/2026	BH12_0.3-0.5											X		
J	26/02/2026	BH03_0.5-0.7	X												
K	26/02/2026	BH02_0.4-0.6													
L	25/02/2026	BH05_0.5-0.7													
M	24/02/2026	BH12_3.0-3.2	X												
N	25/02/2026	BH07_0.5-0.7													

O	25/02/2026	BH06_0.5-0.7													
P	25/02/2026	BH06_1.0-1.2	X							X	X				
Q	25/02/2026	BH06_1.5-1.7													
R	25/02/2026	BH09_0.5-0.7													
S	25/02/2026	BH09_1.0-1.2	X							X	X				
T	25/02/2026	BH09_1.5-1.7	X												
U	24/02/2026	BH10_0.5-0.7	X							X	X				
V	24/02/2026	BH10_1.0-1.2	X												
W	24/02/2026	BH10_1.5-1.7	X							X	X				
X	24/02/2026	BH11_0.5-0.7	X												
Y	24/02/2026	BH11_1.0-1.2													
Z	24/02/2026	BH11_1.5-1.7	X							X	X				

Client Representative						
Name:	Name:	Dilanka Premadasa	Signature:		Date:	27/02/2026

By Signing, the client acknowledges the technician has followed instructions & works undertaken detailed above and accepts all associated costs included.

Legend

- Approximate development area extent
- Approximate borehole Locations

N

Development Risk Management Pty Ltd

Scale: 100 m

Date: 19 February 2026

Drawn By: DP

Drawing Number: P24.1039 - SAQP-F1

Client:

Project: Geotechnical Investigation

Location: 88 Murrays Flat Road, Towrang NSW

Title: Figure 1 - Borehole Location Plan

Appendix F
Laboratory Test Results - B

E-MAILED
27/2 @ 12:38pm

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name:	Development Risk Management	Project Name/No:	DRM P24.1039.V01- Towrang
Address:	Suite 14, 265-271 Pennant Hills Road	Purchase Order No:	NA
	Thornleigh, NSW 2120	Results Required By:	Results by COB 6 March 2026 (5-day TAT)
		Telephone:	0424 540 991
Contact Name:	DILANKA PREMADASA	Facsimile:	NA
		Email Results:	results@drm.ltd DILANKA_PREMADASA@DRM.LTD

Relinquished By:	DILANKA PREMADASA	Date/Time:	26/02/2026	Courier Ref:	48013084
Received By:		Date/Time:	26/2 6:15 pm		
Relinquished By		Date/Time:			
Received By:		Date/Time			
Samples Intact: Yes/ No		Temperature: Ambient / Chilled			
Sample Cooler Sealed: Yes/ No		Laboratory Quotation No:	1772515 and 1654186V2		

Client Sample ID	Date Sampled	Lab Sample ID	WATER SOIL PRESERVATIVE NO OF CONTAINERS	EC/pH	CEC and ESP	Aggressivity Suite (Cl, Resistivity, SO4)		???	???										COMMENTS
BH01_0.5-0.7	26/02/2026	1	x x	X	X	X													
BH01_1.0-1.2	26/02/2026	2	x x	X															
BH01_1.5-1.7	26/02/2026	3	x x	X	X														
BH01_2.5-2.7	26/02/2026	4	x x	X															
BH01_3.7-3.9	26/02/2026	5	x x	X															
BH01_4.3-4.5	26/02/2026	6	x x	X															
BH04_0.5-0.7	25/02/2026	7	x x	X															
BH04_1.1-1.3	25/02/2026	8	x x	X	X														
BH04_1.5-1.7	25/02/2026	9	x x	X															
BH04_2.5-2.7	25/02/2026	10	x x		X														
BH04_3.5-3.7	25/02/2026	11	x x	X															
BH08_0.5-0.7	25/02/2026	12	x x	X															
BH08_1.0-1.2	25/02/2026	13	x x	X	X	X													
BH08_1.5-1.7	25/02/2026	14	x x	X															
BH08_2.5-2.7	25/02/2026	15	x x		X														
BH08_3.0-3.2	25/02/2026	16	x x	X															
BH13_0.5-0.7	24/02/2026	17	x x	X															
BH13_0.8-1.0	24/02/2026	18	x x	X	X	X													
BH13_0.5-0.9	24/02/2026	19	x x	X															
BH13_1.5-1.7	24/02/2026	20	x x	X															
BH13_1.8-2.0	24/02/2026	21	x x	X															
BH13_3.0-3.2	24/02/2026		x x	X															

SGS EHS Sydney COC
SE298004

SAMPLE RECEIPT ADVICE

SE298004

CLIENT DETAILS

Contact	Dilanka Premadasa
Client	DEVELOPMENT RISK MANAGEMENT PTY LTD
Address	37 MOUNT PLEASANT AVENUE NORMANHURST NSW 2076
Telephone	(Not specified)
Facsimile	(Not specified)
Email	dilanka_premadasa@drm.ltd
Project	**DRM P24.1039.V01 - Towrang**
Order Number	**DRM P24.1039.V01**
Samples	21

LABORATORY DETAILS

Manager	Shane McDermott
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Thu 26/2/2026
Report Due	Fri 6/3/2026
SGS Reference	**SE298004**

SUBMISSION DETAILS

This is to confirm that 21 samples were received on Thursday 26/2/2026. Results are expected to be ready by COB Friday 6/3/2026. Please quote SGS reference SE298004 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	21 Soil	Type of documentation received	COC
Date documentation received	27/2/2026@12;38pm	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	5.5°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice	Samples clearly labelled	Yes
Complete documentation received	Yes		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

Sample BH13_0.5-0.9 not received.

SAMPLE RECEIPT ADVICE

SE298004

CLIENT DETAILS

Client DEVELOPMENT RISK MANAGEMENT PTY LTD

Project DRM P24.1039.V01 - Towrang

SUMMARY OF ANALYSIS

No.	Sample ID	Conductivity (1:2) in soil	Conductivity and TDS by Calculation - Soil	Exchangeable Cations and Cation Exchange Capacity	Moisture Content	pH in soil (1:2)	pH in soil (1:5)	Soluble Anions in Soil from 1:2 DI Extract by Ion
001	BH01_0.5-0.7	2	1	13	1	1	1	2
002	BH01_1.0-1.2	-	1	-	1	-	1	-
003	BH01_1.5-1.7	-	1	13	1	-	1	-
004	BH01_2.5-2.7	-	1	-	1	-	1	-
005	BH01_3.7-3.9	-	1	-	1	-	1	-
006	BH01_4.3-4.5	-	1	-	1	-	1	-
007	BH04_0.5-0.7	-	1	-	1	-	1	-
008	BH04_1.1-1.3	-	1	13	1	-	1	-
009	BH04_1.5-1.7	-	1	-	1	-	1	-
010	BH04_2.5-2.7	-	-	13	1	-	-	-
011	BH04_3.5-3.7	-	1	-	1	-	1	-
012	BH08_0.5-0.7	-	1	-	1	-	1	-
013	BH08_1.0-1.2	2	1	13	1	1	1	2
014	BH08_1.5-1.7	-	1	-	1	-	1	-
015	BH08_2.5-2.7	-	-	13	1	-	-	-
016	BH08_3.0-3.2	-	1	-	1	-	1	-
017	BH13_0.5-0.7	-	1	-	1	-	1	-
018	BH13_0.8-1.0	2	1	13	1	1	1	2
019	BH13_1.5-1.7	-	1	-	1	-	1	-
020	BH13_1.8-2.0	-	1	-	1	-	1	-
021	BH13_3.0-3.2	-	1	-	1	-	1	-

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Dilanka Premadasa
Client	DEVELOPMENT RISK MANAGEMENT PTY LTD
Address	37 MOUNT PLEASANT AVENUE NORMANHURST NSW 2076
Telephone	(Not specified)
Facsimile	(Not specified)
Email	dilanka_premadasa@drm.ltd
Project	**DRM P24.1039.V01 - Towrang**
Order Number	**DRM P24.1039.V01**
Samples	21

LABORATORY DETAILS

Manager	Shane McDermott
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE298004 R0**
Date Received	26/2/2026
Date Reported	5/3/2026

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES

Dong LIANG
Metals/Inorganics Team Leader

Ly Kim HA
Organic Section Head

pH in soil (1:5) [AN101] Tested: 3/3/2026

PARAMETER	UOM	LOR	BH01_0.5-0.7 SOIL - 26/2/2026 SE298004.001	BH01_1.0-1.2 SOIL - 26/2/2026 SE298004.002	BH01_1.5-1.7 SOIL - 26/2/2026 SE298004.003	BH01_2.5-2.7 SOIL - 26/2/2026 SE298004.004	BH01_3.7-3.9 SOIL - 26/2/2026 SE298004.005
pH	pH Units	0.1	6.5	7.5	7.8	7.9	8.8

PARAMETER	UOM	LOR	BH01_4.3-4.5 SOIL - 26/2/2026 SE298004.006	BH04_0.5-0.7 SOIL - 25/2/2026 SE298004.007	BH04_1.1-1.3 SOIL - 25/2/2026 SE298004.008	BH04_1.5-1.7 SOIL - 25/2/2026 SE298004.009	BH04_3.5-3.7 SOIL - 25/2/2026 SE298004.011
pH	pH Units	0.1	8.4	7.0	7.7	7.4	7.9

PARAMETER	UOM	LOR	BH08_0.5-0.7 SOIL - 25/2/2026 SE298004.012	BH08_1.0-1.2 SOIL - 25/2/2026 SE298004.013	BH08_1.5-1.7 SOIL - 25/2/2026 SE298004.014	BH08_3.0-3.2 SOIL - 25/2/2026 SE298004.016	BH13_0.5-0.7 SOIL - 24/2/2026 SE298004.017
pH	pH Units	0.1	6.7	7.5	7.5	7.5	6.4

PARAMETER	UOM	LOR	BH13_0.8-1.0 SOIL - 24/2/2026 SE298004.018	BH13_1.5-1.7 SOIL - 24/2/2026 SE298004.019	BH13_1.8-2.0 SOIL - 24/2/2026 SE298004.020	BH13_3.0-3.2 SOIL - 24/2/2026 SE298004.021
pH	pH Units	0.1	6.4	6.7	8.4	8.1

pH in soil (1:2) [AN101] Tested: 3/3/2026

PARAMETER	UOM	LOR	BH01_0.5-0.7 SOIL - 26/2/2026 SE298004.001	BH08_1.0-1.2 SOIL - 25/2/2026 SE298004.013	BH13_0.8-1.0 SOIL - 24/2/2026 SE298004.018
pH (1:2)	pH Units	-	**6.9**	**7.5**	**6.6**

Conductivity and TDS by Calculation - Soil [AN106] Tested: 3/3/2026

PARAMETER	UOM	LOR	BH01_0.5-0.7 SOIL - 26/2/2026 SE298004.001	BH01_1.0-1.2 SOIL - 26/2/2026 SE298004.002	BH01_1.5-1.7 SOIL - 26/2/2026 SE298004.003	BH01_2.5-2.7 SOIL - 26/2/2026 SE298004.004	BH01_3.7-3.9 SOIL - 26/2/2026 SE298004.005
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	130	180	380	350	610

PARAMETER	UOM	LOR	BH01_4.3-4.5 SOIL - 26/2/2026 SE298004.006	BH04_0.5-0.7 SOIL - 25/2/2026 SE298004.007	BH04_1.1-1.3 SOIL - 25/2/2026 SE298004.008	BH04_1.5-1.7 SOIL - 25/2/2026 SE298004.009	BH04_3.5-3.7 SOIL - 25/2/2026 SE298004.011
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	470	170	210	220	370

PARAMETER	UOM	LOR	BH08_0.5-0.7 SOIL - 25/2/2026 SE298004.012	BH08_1.0-1.2 SOIL - 25/2/2026 SE298004.013	BH08_1.5-1.7 SOIL - 25/2/2026 SE298004.014	BH08_3.0-3.2 SOIL - 25/2/2026 SE298004.016	BH13_0.5-0.7 SOIL - 24/2/2026 SE298004.017
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	120	260	310	350	49

PARAMETER	UOM	LOR	BH13_0.8-1.0 SOIL - 24/2/2026 SE298004.018	BH13_1.5-1.7 SOIL - 24/2/2026 SE298004.019	BH13_1.8-2.0 SOIL - 24/2/2026 SE298004.020	BH13_3.0-3.2 SOIL - 24/2/2026 SE298004.021
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	68	87	260	120

Conductivity (1:2) in soil [AN106] Tested: 3/3/2026

PARAMETER	UOM	LOR	BH01_0.5-0.7 SOIL - 26/2/2026 SE298004.001	BH08_1.0-1.2 SOIL - 25/2/2026 SE298004.013	BH13_0.8-1.0 SOIL - 24/2/2026 SE298004.018
Conductivity (1:2) @25 C*	µS/cm	1	**200**	**520**	**130**
Resistivity (1:2)*	ohm cm	-	**4900**	**1900**	**7600**

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) [AN122] Tested: 4/3/2026

PARAMETER	UOM	LOR	BH01_0.5-0.7 SOIL - 26/2/2026 SE298004.001	BH01_1.5-1.7 SOIL - 26/2/2026 SE298004.003	BH04_1.1-1.3 SOIL - 25/2/2026 SE298004.008	BH04_2.5-2.7 SOIL - 25/2/2026 SE298004.010	BH08_1.0-1.2 SOIL - 25/2/2026 SE298004.013
Exchangeable Calcium, Ca	mg/kg	2	640	450	350	690	750
Exchangeable Calcium, Ca	meq/100g	0.01	3.2	2.3	1.7	3.4	3.7
Exchangeable Calcium Percentage*	%	0.1	19.9	15.6	19.6	22.3	21.7
Exchangeable Potassium, K	mg/kg	2	140	130	77	150	120
Exchangeable Potassium, K	meq/100g	0.01	0.36	0.34	0.20	0.40	0.30
Exchangeable Potassium Percentage*	%	0.1	2.2	2.4	2.2	2.6	1.7
Exchangeable Magnesium, Mg	mg/kg	2	1100	930	460	840	1100
Exchangeable Magnesium, Mg	meq/100g	0.02	9.3	7.6	3.8	6.9	8.6
Exchangeable Magnesium Percentage*	%	0.1	57.9	52.6	42.6	44.5	50.1
Exchangeable Sodium, Na	mg/kg	2	740	970	730	1100	1000
Exchangeable Sodium, Na	meq/100g	0.01	3.2	4.2	3.2	4.7	4.6
Exchangeable Sodium Percentage*	%	0.1	20.0	29.3	35.6	30.7	26.4
Cation Exchange Capacity	meq/100g	0.02	16	14	8.9	15	17

PARAMETER	UOM	LOR	BH08_2.5-2.7 SOIL - 25/2/2026 SE298004.015	BH13_0.8-1.0 SOIL - 24/2/2026 SE298004.018
Exchangeable Calcium, Ca	mg/kg	2	810	1400
Exchangeable Calcium, Ca	meq/100g	0.01	4.0	6.9
Exchangeable Calcium Percentage*	%	0.1	22.1	37.8
Exchangeable Potassium, K	mg/kg	2	160	160
Exchangeable Potassium, K	meq/100g	0.01	0.40	0.41
Exchangeable Potassium Percentage*	%	0.1	2.2	2.2
Exchangeable Magnesium, Mg	mg/kg	2	1000	1200
Exchangeable Magnesium, Mg	meq/100g	0.02	8.5	9.7
Exchangeable Magnesium Percentage*	%	0.1	46.9	52.9
Exchangeable Sodium, Na	mg/kg	2	1200	300
Exchangeable Sodium, Na	meq/100g	0.01	5.3	1.3
Exchangeable Sodium Percentage*	%	0.1	28.8	7.1
Cation Exchange Capacity	meq/100g	0.02	18	18

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography [AN245] Tested: 3/3/2026

PARAMETER	UOM	LOR	BH01_0.5-0.7 SOIL - 26/2/2026 SE298004.001	BH08_1.0-1.2 SOIL - 25/2/2026 SE298004.013	BH13_0.8-1.0 SOIL - 24/2/2026 SE298004.018
Chloride	mg/kg	0.25	**16**	**170**	**21**
Sulfate	mg/kg	0.5	**80**	**100**	**33**

Moisture Content [AN002] Tested: 3/3/2026

PARAMETER	UOM	LOR	BH01_0.5-0.7 SOIL - 26/2/2026 SE298004.001	BH01_1.0-1.2 SOIL - 26/2/2026 SE298004.002	BH01_1.5-1.7 SOIL - 26/2/2026 SE298004.003	BH01_2.5-2.7 SOIL - 26/2/2026 SE298004.004	BH01_3.7-3.9 SOIL - 26/2/2026 SE298004.005
% Moisture	%w/w	1	16.9	13.5	14.9	14.1	11.9

PARAMETER	UOM	LOR	BH01_4.3-4.5 SOIL - 26/2/2026 SE298004.006	BH04_0.5-0.7 SOIL - 25/2/2026 SE298004.007	BH04_1.1-1.3 SOIL - 25/2/2026 SE298004.008	BH04_1.5-1.7 SOIL - 25/2/2026 SE298004.009	BH04_2.5-2.7 SOIL - 25/2/2026 SE298004.010
% Moisture	%w/w	1	10.8	8.8	12.4	10.8	15.9

PARAMETER	UOM	LOR	BH04_3.5-3.7 SOIL - 25/2/2026 SE298004.011	BH08_0.5-0.7 SOIL - 25/2/2026 SE298004.012	BH08_1.0-1.2 SOIL - 25/2/2026 SE298004.013	BH08_1.5-1.7 SOIL - 25/2/2026 SE298004.014	BH08_2.5-2.7 SOIL - 25/2/2026 SE298004.015
% Moisture	%w/w	1	13.3	13.2	16.2	14.4	17.5

PARAMETER	UOM	LOR	BH08_3.0-3.2 SOIL - 25/2/2026 SE298004.016	BH13_0.5-0.7 SOIL - 24/2/2026 SE298004.017	BH13_0.8-1.0 SOIL - 24/2/2026 SE298004.018	BH13_1.5-1.7 SOIL - 24/2/2026 SE298004.019	BH13_1.8-2.0 SOIL - 24/2/2026 SE298004.020
% Moisture	%w/w	1	12.0	8.9	14.2	13.1	13.7

PARAMETER	UOM	LOR	BH13_3.0-3.2 SOIL - 24/2/2026 SE298004.021
% Moisture	%w/w	1	14.3

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, sediments and sludges, an extract with water (or 0.01M CaCl2) is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos /cm or µS/cm @ 25°C. For soils, an extract of as received sample with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Salinity can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. Reference APHA 2510 B.
AN106	Resistivity of the extract is reported on the extract basis and is the reciprocal of conductivity. Salinity and TDS can be calculated from the extract conductivity and is reported back to the soil basis.
AN122	Exchangeable Cations, CEC and ESP: Soil sample is extracted in 1M Ammonium Acetate at pH=7 (or 1M Ammonium Chloride at pH=7) with cations (Na, K, Ca & Mg) then determined by ICP OES/ICP MS and reported as Exchangeable Cations. For saline soils, these results can be corrected for water soluble cations and reported as Exchangeable cations in meq/100g or soil can be pre-treated (aqueous ethanol/aqueous glycerol) prior to extraction. Cation Exchange Capacity (CEC) is the sum of the exchangeable cations in meq/100g.
AN122	The Exchangeable Sodium Percentage (ESP) is calculated as the exchangeable sodium divided by the CEC (all in meq/100g) times 100. ESP can be used to categorise the sodicity of the soil as below: ESP < 6% non-sodic ESP 6-15% sodic ESP >15% strongly sodic Method is referenced to Rayment and Lyons, 2011, sections 15D3 and 15N1.-
AN245	Anions by Ion Chromatography: A water sample or extract is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR			
***	Indicates that both * and ** apply.		Sample listed, but not received.		
NAD	No Asbestos Detected.	NA	Not Applicable.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: https://www.sgs.com/en-au/industry/environmental-health-and-safety.

STATEMENT OF QA/QC PERFORMANCE

SE298004 R0

CLIENT DETAILS

Contact	Dilanka Premadasa
Client	DEVELOPMENT RISK MANAGEMENT PTY LTD
Address	37 MOUNT PLEASANT AVENUE NORMANHURST NSW 2076
Telephone	(Not specified)
Facsimile	(Not specified)
Email	dilanka_premadasa@drm.ltd
Project	**DRM P24.1039.V01 - Towrang**
Order Number	**DRM P24.1039.V01**
Samples	21

LABORATORY DETAILS

Manager	Shane McDermott
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE298004 R0**
Date Received	26 Feb 2026
Date Reported	05 Mar 2026

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Analysis Date	Conductivity and TDS by Calculation - Soil	5 items

SAMPLE SUMMARY

Sample counts by matrix	21 Soil	Type of documentation received	COC
Date documentation received	27/2/2026@12;38pr	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	5.5°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE298004 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Conductivity (1:2) in soil — Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.5-0.7	SE298004.001	LB379747	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	05 Mar 2026	03 Mar 2026
BH08_1.0-1.2	SE298004.013	LB379747	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH13_0.8-1.0	SE298004.018	LB379747	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	03 Mar 2026	03 Mar 2026

Conductivity and TDS by Calculation - Soil — Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.5-0.7	SE298004.001	LB379734	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	05 Mar 2026	04 Mar 2026
BH01_1.0-1.2	SE298004.002	LB379734	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	05 Mar 2026	04 Mar 2026
BH01_1.5-1.7	SE298004.003	LB379734	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	05 Mar 2026	04 Mar 2026
BH01_2.5-2.7	SE298004.004	LB379734	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	05 Mar 2026	04 Mar 2026
BH01_3.7-3.9	SE298004.005	LB379734	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	05 Mar 2026	04 Mar 2026
BH01_4.3-4.5	SE298004.006	LB379734	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	05 Mar 2026	04 Mar 2026
BH04_0.5-0.7	SE298004.007	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	04 Mar 2026
BH04_1.1-1.3	SE298004.008	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	04 Mar 2026
BH04_1.5-1.7	SE298004.009	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	04 Mar 2026
BH04_3.5-3.7	SE298004.011	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	04 Mar 2026
BH08_0.5-0.7	SE298004.012	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	04 Mar 2026
BH08_1.0-1.2	SE298004.013	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	04 Mar 2026
BH08_1.5-1.7	SE298004.014	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	04 Mar 2026
BH08_3.0-3.2	SE298004.016	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	04 Mar 2026
BH13_0.5-0.7	SE298004.017	LB379734	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	03 Mar 2026	04 Mar 2026†
BH13_0.8-1.0	SE298004.018	LB379734	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	03 Mar 2026	04 Mar 2026†
BH13_1.5-1.7	SE298004.019	LB379734	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	03 Mar 2026	04 Mar 2026†
BH13_1.8-2.0	SE298004.020	LB379734	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	03 Mar 2026	04 Mar 2026†
BH13_3.0-3.2	SE298004.021	LB379734	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	03 Mar 2026	04 Mar 2026†

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) — Method: ME-(AU)-[ENV]AN122

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.5-0.7	SE298004.001	LB379807	26 Feb 2026	26 Feb 2026	26 Mar 2026	04 Mar 2026	26 Mar 2026	04 Mar 2026
BH01_1.5-1.7	SE298004.003	LB379807	26 Feb 2026	26 Feb 2026	26 Mar 2026	04 Mar 2026	26 Mar 2026	04 Mar 2026
BH04_1.1-1.3	SE298004.008	LB379807	25 Feb 2026	26 Feb 2026	25 Mar 2026	04 Mar 2026	25 Mar 2026	04 Mar 2026
BH04_2.5-2.7	SE298004.010	LB379807	25 Feb 2026	26 Feb 2026	25 Mar 2026	04 Mar 2026	25 Mar 2026	04 Mar 2026
BH08_1.0-1.2	SE298004.013	LB379807	25 Feb 2026	26 Feb 2026	25 Mar 2026	04 Mar 2026	25 Mar 2026	04 Mar 2026
BH08_2.5-2.7	SE298004.015	LB379807	25 Feb 2026	26 Feb 2026	25 Mar 2026	04 Mar 2026	25 Mar 2026	04 Mar 2026
BH13_0.8-1.0	SE298004.018	LB379807	24 Feb 2026	26 Feb 2026	24 Mar 2026	04 Mar 2026	24 Mar 2026	04 Mar 2026

Moisture Content — Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.5-0.7	SE298004.001	LB379711	26 Feb 2026	26 Feb 2026	12 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH01_1.0-1.2	SE298004.002	LB379711	26 Feb 2026	26 Feb 2026	12 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH01_1.5-1.7	SE298004.003	LB379711	26 Feb 2026	26 Feb 2026	12 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH01_2.5-2.7	SE298004.004	LB379711	26 Feb 2026	26 Feb 2026	12 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH01_3.7-3.9	SE298004.005	LB379711	26 Feb 2026	26 Feb 2026	12 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH01_4.3-4.5	SE298004.006	LB379711	26 Feb 2026	26 Feb 2026	12 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH04_0.5-0.7	SE298004.007	LB379711	25 Feb 2026	26 Feb 2026	11 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH04_1.1-1.3	SE298004.008	LB379711	25 Feb 2026	26 Feb 2026	11 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH04_1.5-1.7	SE298004.009	LB379711	25 Feb 2026	26 Feb 2026	11 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH04_2.5-2.7	SE298004.010	LB379711	25 Feb 2026	26 Feb 2026	11 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH04_3.5-3.7	SE298004.011	LB379711	25 Feb 2026	26 Feb 2026	11 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH08_0.5-0.7	SE298004.012	LB379711	25 Feb 2026	26 Feb 2026	11 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH08_1.0-1.2	SE298004.013	LB379711	25 Feb 2026	26 Feb 2026	11 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH08_1.5-1.7	SE298004.014	LB379711	25 Feb 2026	26 Feb 2026	11 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH08_2.5-2.7	SE298004.015	LB379711	25 Feb 2026	26 Feb 2026	11 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH08_3.0-3.2	SE298004.016	LB379711	25 Feb 2026	26 Feb 2026	11 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH13_0.5-0.7	SE298004.017	LB379711	24 Feb 2026	26 Feb 2026	10 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH13_0.8-1.0	SE298004.018	LB379711	24 Feb 2026	26 Feb 2026	10 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH13_1.5-1.7	SE298004.019	LB379711	24 Feb 2026	26 Feb 2026	10 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH13_1.8-2.0	SE298004.020	LB379711	24 Feb 2026	26 Feb 2026	10 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026
BH13_3.0-3.2	SE298004.021	LB379711	24 Feb 2026	26 Feb 2026	10 Mar 2026	03 Mar 2026	08 Mar 2026	04 Mar 2026

pH in soil (1:2) — Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

SE298004 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

pH in soil (1:2) (continued) — Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.5-0.7	SE298004.001	LB379747	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH08_1.0-1.2	SE298004.013	LB379747	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH13_0.8-1.0	SE298004.018	LB379747	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026

pH in soil (1:5) — Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.5-0.7	SE298004.001	LB379734	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH01_1.0-1.2	SE298004.002	LB379734	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH01_1.5-1.7	SE298004.003	LB379734	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH01_2.5-2.7	SE298004.004	LB379734	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH01_3.7-3.9	SE298004.005	LB379734	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH01_4.3-4.5	SE298004.006	LB379734	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH04_0.5-0.7	SE298004.007	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH04_1.1-1.3	SE298004.008	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH04_1.5-1.7	SE298004.009	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH04_3.5-3.7	SE298004.011	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH08_0.5-0.7	SE298004.012	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH08_1.0-1.2	SE298004.013	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH08_1.5-1.7	SE298004.014	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH08_3.0-3.2	SE298004.016	LB379734	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH13_0.5-0.7	SE298004.017	LB379734	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH13_0.8-1.0	SE298004.018	LB379734	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH13_1.5-1.7	SE298004.019	LB379734	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH13_1.8-2.0	SE298004.020	LB379734	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026
BH13_3.0-3.2	SE298004.021	LB379734	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	04 Mar 2026	03 Mar 2026

Soluble Anions in Soil: from 1:2 DI Extract by Ion Chromatography — Method: ME-(AU)-[ENV]AN245

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH01_0.5-0.7	SE298004.001	LB379753	26 Feb 2026	26 Feb 2026	05 Mar 2026	03 Mar 2026	31 Mar 2026	05 Mar 2026
BH08_1.0-1.2	SE298004.013	LB379753	25 Feb 2026	26 Feb 2026	04 Mar 2026	03 Mar 2026	31 Mar 2026	05 Mar 2026
BH13_0.8-1.0	SE298004.018	LB379753	24 Feb 2026	26 Feb 2026	03 Mar 2026	03 Mar 2026	31 Mar 2026	05 Mar 2026

SURROGATES

SE298004 R0

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Conductivity (1:2) in soil — Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB379747.001	Conductivity (1:2) @25 C*	µS/cm	1	<1

Conductivity and TDS by Calculation - Soil — Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB379734.001	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	0.36

Exchangeable Cations and Cation Exchange Capacity (CEC:ESP:SAR) — Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result
LB379807.001	Exchangeable Sodium, Na	mg/kg	2	1.5033
	Exchangeable Potassium, K	mg/kg	2	0.446
	Exchangeable Calcium, Ca	mg/kg	2	0.3217
	Exchangeable Magnesium, Mg	mg/kg	2	-0.0011

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography — Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result
LB379753.001	Chloride	mg/kg	0.25	<0.25
	Sulfate	mg/kg	0.5	<0.5

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Conductivity (1:2) in soil — Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE298004.018	LB379747.007	Conductivity (1:2) @25 C*	µS/cm	1	130	130	32	2
		Resistivity (1:2)*	ohm cm	-	7600	7800	30	2

Conductivity and TDS by Calculation - Soil — Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE298004.011	LB379734.014	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	370	59.710261569	31	2
SE298004.021	LB379734.024	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	120	11.053322119	32	5

Moisture Content — Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE298004.010	LB379711.011	% Moisture	%w/w	1	15.9	16.2	36	2
SE298004.020	LB379711.022	% Moisture	%w/w	1	13.7	14.2	37	3
SE298004.021	LB379711.024	% Moisture	%w/w	1	14.3	13.3	37	7

pH in soil (1:2) — Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE298004.018	LB379747.007	pH (1:2)	pH Units	-	6.6	6.6	32	1

pH in soil (1:5) — Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE298004.011	LB379734.014	pH	pH Units	0.1	7.9	7.9	31	0
SE298004.021	LB379734.024	pH	pH Units	0.1	8.1	8.1	31	0

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography — Method: ME-(AU)-[ENV]AN245

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE298004.018	LB379753.007	Chloride	mg/kg	0.25	21	21	31	1
		Sulfate	mg/kg	0.5	33	33	36	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Conductivity (1:2) in soil — Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB379747.002	Conductivity (1:2) @25 C*	µS/cm	1	1000	1015	85 - 115	100

Conductivity and TDS by Calculation - Soil — Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB379734.002	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	NA	1015	85 - 115	100

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) — Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB379807.002	Exchangeable Sodium, Na	meq/100g	0.01	0.17	0.188	80 - 120	93
	Exchangeable Potassium, K	meq/100g	0.01	0.13	0.141	80 - 120	93
	Exchangeable Calcium, Ca	meq/100g	0.01	2.0	2.17	80 - 120	91
	Exchangeable Magnesium, Mg	meq/100g	0.02	1.3	1.53	80 - 120	87

pH in soil (1:2) — Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB379747.003	pH (1:2)	pH Units	-	7.4	7.415	98 - 102	100

pH in soil (1:5) — Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB379734.003	pH	pH Units	0.1	7.4	7.415	98 - 102	100

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography — Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB379753.002	Chloride	mg/kg	0.25	40	40	70 - 130	101
	Sulfate	mg/kg	0.5	42	40	70 - 130	105

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spikes were required for this job.

MATRIX SPIKE DUPLICATES

SE298004 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com/en-au/industry/environmental-health-and-safety

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
NA	Not Applicable
①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

Appendix G
Foundation Maintenance Homeowner's Guide (CSIRO BTF-18)

Foundation Maintenance and Footing Performance:
A Homeowner's Guide

CSIRO

BTF 18 replaces Information Sheet 10/91

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 homeowner 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.

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

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. The table below is Table 2.1 from AS 2870, the Residential Slab and Footing Code.

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 are the province of the builder and should be taken into consideration as part of the preparation of the site for construction. Building Technology File 19 (BTF 19) deals with these problems.

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). 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.

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 with only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites, which can experience moderate ground movement from moisture changes
H	Highly reactive clay sites, which can experience high ground movement from moisture changes
E	Extremely reactive sites, which can experience extreme ground movement from moisture changes
A to P	Filled sites
P	Sites which include soft soils, such as soft clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soils subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise

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.
- 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. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Swelling gradually reaches the interior soil as absorption continues. Shrinkage usually begins 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).

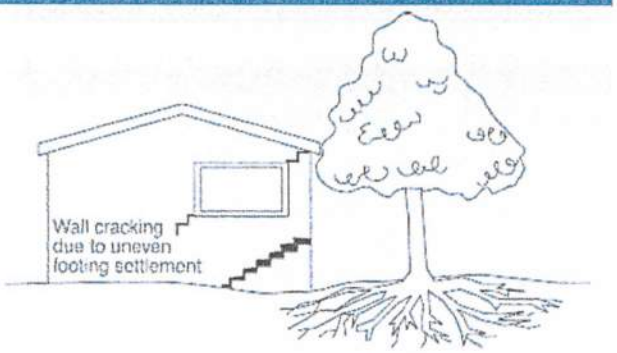
Isolated piers affected by erosion or saturation of foundations will eventually lose contact with the bearers they support and may tilt or fall over. The floors that have lost this support will become bouncy, sometimes rattling ornaments etc.

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.

Trees can cause shrinkage and damage



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 cause 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. The table below is a reproduction of Table C1 of AS 2870.

AS 2870 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/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.

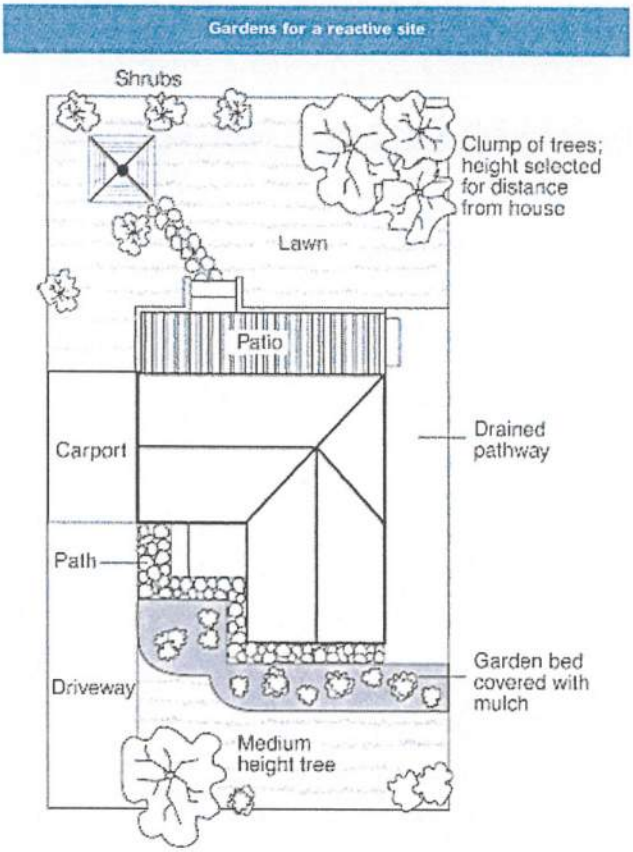
It is, however, sometimes necessary when attempting to prevent water migration that testing be carried out to establish watertable height and subsoil water flows. This subject is referred to in BTF 19 and may properly be regarded as an area for an expert consultant.

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

CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS

Description of typical damage and required repair	Approximate crack width limit (see Note 3)	Damage category
Hairline cracks	<0.1 mm	0
Fine cracks which do not need repair	<1 mm	1
Cracks noticeable but easily filled. Doors and windows stick slightly	<5 mm	2
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
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 depend on number of cracks	4



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 from it (see BTF 19).

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.

Warning: Although this Building Technology File 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.
- 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. For information on plant roots and drains, see Building Technology File 17.

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 homeowner 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.

This BTF was prepared by John Lewer FAIB, MIAMA, Partner, Construction Diagnosis.

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