225-245 Martin Road, Bradfield SSD-97711727

Bulk Earthworks, Rehabilitation and Quarrying

Civil Engineering Report

24/06/2026

225-245 Martin Road, Bradfield

Bulk Earthworks, Rehabilitation and Quarrying (SSD-97711727) – Civil Engineering Report

24/06/2026

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Acronyms and Abbreviations

Acronym	Definition
ACHAR	Aboriginal Cultural Heritage Assessment Report
AEP	Annual Exceedance Probability
AR&R	Australian Rainfall & Runoff
ARP	Asset Relocation Package
AGRD	Austroads Guide to Road Design
AS	Australian Standards
ASS	Acid Sulfate Soils
BEL	Bulk Earthwork Levels
CBR	California Bearing Ratio
DA	Development Application
BYDA	Before You Dig Australia
DA	Development Application
DPHI	Department of Planning, Housing and Infrastructure
DCP	Development Control Plan
DTC	Deemed to Comply
ENM	Excavated Natural Material
EPA	Environmental Protection Authority
ESC	Erosion and Sediment Control
EIS	Environmental Impact Statement
FFL	Finished Floor Level
GITA	Geotechnical Inspection and Testing Authority
GP	Gross Pollutant
GPT	Gross Pollutant Trap
HV	High Voltage
IFC	Issued For Construction
IPG	Inghams Property Group
LCC	Liverpool City Council
MDP	Metropolitan Development Plan
MUSIC	Model for Urban Stormwater Improvement Conceptualisation
NDA	Net Developable Area
NBN	National Broadband Network
OSD	On Site Detention
PMF	Probable Maximum Flood
SCA	Sydney Catchment Authority
SDRP	State Design Review Panel

SEARs	Secretary's Environmental Assessment Requirements
SSDA	State Significant Development Application
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
VENM	Virgin Excavated Natural Material
WSAP	Western Sydney Aerotropolis Plan
WSI	Western Sydney International Airport
WSC	Wianamatta-South Creek
WSUD	Water Sensitive Urban Design

Executive Summary

This Civil Engineering Report has been prepared by Arcadis Australia Pacific Pty Ltd (Arcadis) to address the site-specific Secretary's Environmental Assessment Requirements (SEARs) received in respect of the proposed State Significant Development Application (SSDA) No. 97711727. The proposed development includes Rehabilitation, Quarrying and Bulk Earthworks and is being undertaken by Goodman Property Services (Aust) Pty Ltd (Applicant) on behalf of Goodman Western Sydney Pty Limited as trustee for the Goodman Western Sydney Trust (Owner). The development is located at 225 – 245 Martin Road, Bradfield, 2556 (the Site).

This SSDA seeks approval for the following;

- Site Preparation works only (i.e no buildings, retaining walls or other infrastructure works)
- Rehabilitation of areas disturbed by historic mining and brick-making operations under major project approval MP10_0014 and MP10_0033.
- Bulk Earthworks to the site to align with the Connecting to Country and Precinct Plan principles including both the disturbed and undisturbed portions to capture the following proposed works:
  - Rehabilitation of Pits 1 & 2 using predominantly on-site fill (Engineered fill import required).
  - Preparation of the remaining site area to Bulk Earthwork Levels (BEL) (not including detailed trimming) for the proposed industrial development as considered under SSDA 97688711.
- Quarrying and Export of Bringelly Shale and Clay from select areas of Pit 1 & 2 to rectify the previous approved pit designs to ensure they are geotechnically stable to suit the proposed industrial masterplan.
- Vegetation Removal of 6.97Ha over land that is not certified under the Growth Centre SEPP.
  - Species being cleared involve species protected under both the BC Act and EPBC Act.
  - EPBC Act Referral completed on a precautionary measure given small amount of EPBC listed communities.
- Demolition of any remaining structures on the site.
- Rehabilitation of identified and unidentified contamination and, if required, the construction of a containment cell in the proposed northeastern corner of the site (currently identified as Lot 55 of DP 3050). The containment cell is proposed to trigger Designated Development threshold due to the proposed upper limit storage volume of 100,000m³.
- Relocation of the Jemena Gas main predominantly burdening Lot 3 of DP127878.0
- If required through an Aboriginal Cultural Heritage Assessment Report (ACHAR), relocation and reburial of artefacts.

Additionally, this SSDA application seeks to rely on already existing authority approvals issued under MP10_0014 (subject to any applicable modifications). These are as follows:

- Mining Lease 1771
- Environmental Protection Licence 684
- Ground Water Access Licence WAL24346
- Ground Water Supply Works Approval No. 10WA109463

It is important to note that a number of the proposed activities being sought for approval under this SSDA have previously been assessed and approved under MP10_0014. The existing DA relates to approximately 70Ha of Net Developable Area (NDA), with the new portion of site approx. 36ha NDA. Cumulatively the area is approx. 116ha NDA.

Related Applications/Activities

SSDA 97688711 – 14 warehouse buildings, Active Open Space & amenities precinct (including a café) and internal site infrastructure works

The SSDA seeks approval for the construction, fit-out (including office and standard warehouse racking) and operation of 14 warehouse buildings, Active Open Space & amenities precinct (including a café) and internal site infrastructure works.

This application assumes the bulk earthworks are completed under SSDA 97711727.

Part 5 Activity – External Works Lead in Roads and Services

The Applicant is proposing access to the Site via the following route which will be upgraded to be in accordance with the Precinct Plan

Part 1 - Martin Road / Elizabeth Drive intersection upgrades

- It is expected that these works will be approved by way of amendment to the existing Part 5 approval by Transport for New South Wales ('TfNSW')
- It is understood that Transport for NSW will construct the work with a target completion date of December 2029;

Part 2 - 4 - Martin Road / East West Collector Road / Lawson Road Upgrades

- Further to Part 1, access to the site is proposed to be constructed concurrently as follows:
  - Part 2 – Access from the Martin Road / Elizabeth Drive intersection will continue down Martin Road and join the future East / West Collector Road identified within the Precinct Plan through Lot 36 DP 3050.
    - The portion of road between the Intersection and future East / West Collector Road will be upgraded with a temporary access strategy that is consistent with Condition DS5 of the Precinct Plan.
  - Part 3 – The East / West Collector Road through Lot 36 DP 3050 is proposed to be delivered in ultimate form consistent with the Precinct Plan, connecting Martin Road and Lawson Road;
  - Part 4 – From the East / West Collector Road connection on Lawson Road, the portion of Lawson Road South through to the Site will be upgraded in ultimate form consistent with the Precinct Plan.
- It is expected that these works are completed by December 2029, based on a commencement date of June 2028

It is the Applicants expectation that the above-mentioned works (Part 1-4) are completed prior to the receipt of the first building Occupation Certificate (expected December 2029).

Notwithstanding the above, the Applicant notes that access to the site under SSD 97711727 will continue to be via Martin Road based on the intersection upgrades completed under MP10_0014.

1 Site Overview

The key features of the Site are as follows:

Description	Site Detail
Land Configuration	• Lot 1 DP 1278780 • Lot 2 DP 1278780 • Lot 3 DP 1278780 • Lot 55 DP 3050 • Lot 56 DP 3050
Existing Land Use(s)	The Site is currently used as a Quarry and Brick Making Facility. The structures and hardstand areas used for the quarry operations are located in the central portion of the Site, connected by an internal road network. In addition, three quarry pits are located along the southern and southeast portion of the Site.
Surrounding Land Use	Surrounding land uses include: • North: Land to the north is predominantly characterised by a mix of rural, agricultural, landscape industries and, residential properties accessed by Lawson Road and Martin Roads. It is noted that several sites are subject to existing SSDAs for industrial / warehouse developments. Both Martin Road and Lawson Road intersect with Elizabeth Drive, a major arterial road that provides access to the Western Sydney International Airport (WSI) site and the broader regional road network including the M7, Northern Road and the future M12. • South: The land to the south is currently rural, however, it is subject to the Inghams Property Group (IPG) Master Plan which was approved on 11 July 2025. The approved Master Plan covers 184 hectares and aims to support over 12,400 jobs. Inghams Property Group has allocated around 625,467 sqm for employment space, focusing on advanced manufacturing, logistics, and community services. The plan includes a mix of industrial and commercial zones, a local centre, and accessible public green spaces near the Western Sydney International Airport. Further to the south-west of the Site, is Bradfield City Centre, a 114-hectare planned urban development adjacent to Western Sydney International Airport. Designed to be a hub for innovation, advanced industries, and economic growth, it has the potential to create 20,000 jobs and provide 10,000 homes, including affordable housing. The Bradfield City Master Plan prioritises sustainability, integrating green spaces, climate-resilient infrastructure, and a commitment to achieving net-zero emissions. • East: Further east of the Wianamatta-South Creek which bounds the Site, is the suburb of Kemps Creek. This land is characterised by a mix of open space, rural, agricultural, emerging urban development, and residential properties that are non-initial precincts under the WSAP but intended for employment generating uses • West: To the immediate west of the Site, bound by Badgerys Creek, is Western Sydney International Airport (WSI). Located in Badgerys Creek, WSI is a major federal infrastructure project designed to accommodate Sydney's future aviation needs. Set to commence operations in 2026, WSI will initially handle 10 million passengers annually and operate 24/7. Badgerys Creek Road also travels in a

Description	Site Detail
	north-south direction to the west of the Site. It provides a north-south connection between Elizabeth Drive and the Northern Road
Site Access and Road Network	The Site is currently accessible from Martin Road which is located at the north-eastern boundary.

Figure 1 – Aerial Photo (Source: Urbis)

This civil engineering report outlines and describes the design of the Bulk Earthworks, Rehabilitation and Quarrying package of works. The extents of work are shown in **Figure 2**.

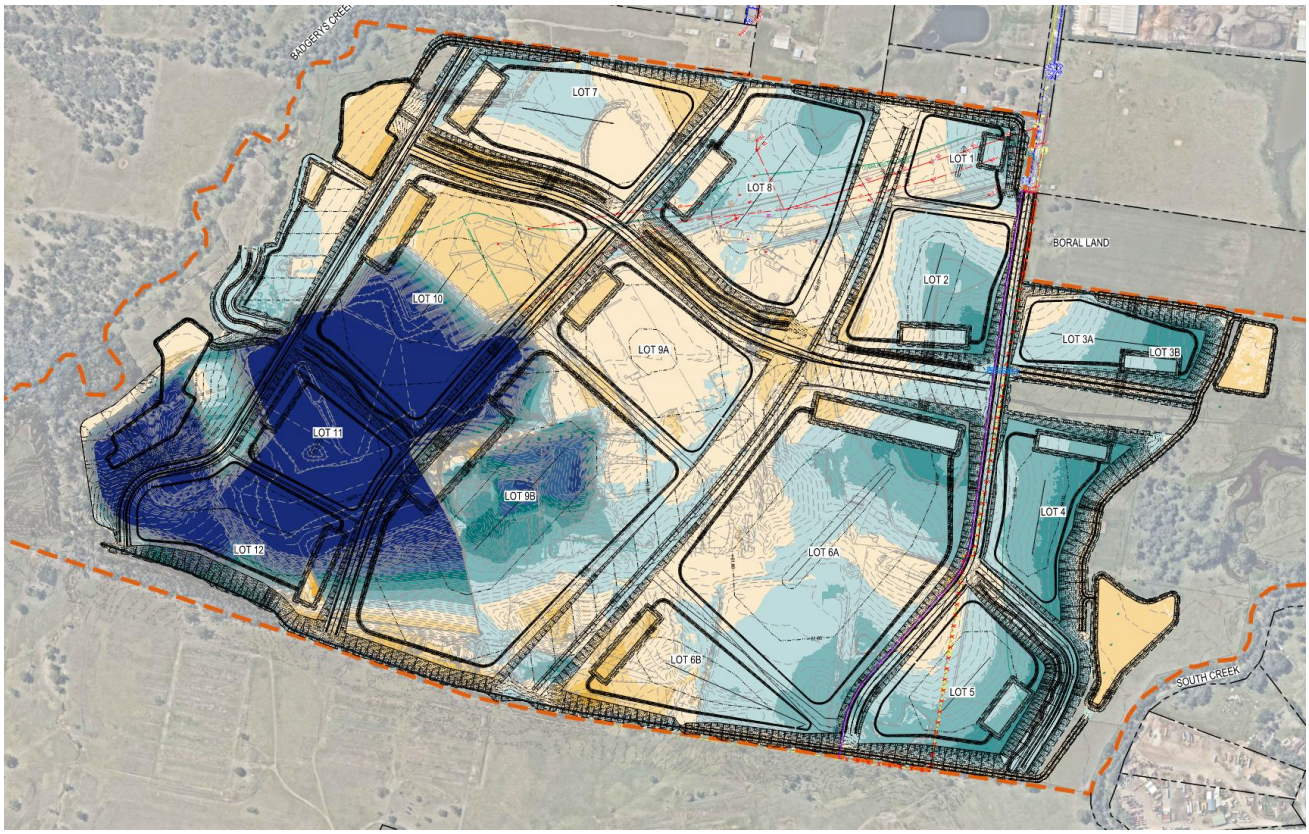

Figure 2 – General Arrangement Plan

The package consists of the following elements:

Site Stripping and Contamination Management

Prior to commencement of work, the Site is to be cleared of all unsuitable material. These works are described in **Section 8.3,** and details of the Containment Cell are outlined in **Section 8.8**

Quarry, Dams and Temporary Basin Dewatering

All existing quarry floors, dams and temporary basins present on the Site are to be drained, desilted and deconstructed. These works are described in **Section 8.4.**

Over Excavation of Existing Quarry Pits 1 and 2

To manage the adverse effects caused by the historical mining of pits 1 and 2, and to facilitate the future construction of the warehouses, the existing pit walls are to be excavated to provide a maximum 1(V):3(H) batter under the building footprints. These works are described in **Section 8.4** and **8.7.**

Bulk Earthworks

Bulk earthworks are required to modify and remediate the existing landform and quarry and develop a suitable formation for the future Estate and On Lot Design works. The works include the backfilling of existing pits 1 and 2, preparing of developable pads for future lots and active open space areas, and supporting the erosion and sediment control strategy, including provision of basins and diversion channels. These works are described in **Section 8.9.**

Erosion and Sediment Control

To provide erosion and sedimentation control during development of the Site, features such as sediment basins, as well as dirty water diversion channels are provided. This package provides earthworks design and sizing for the basins and diversion channels, however the stormwater management and construction soil and

water management strategy is documented in the Surface Water Impact Assessment report, provided by Engeny.

Gas Main Relocation

An existing high pressure gas main is located within the Site extents. To enable the development of this site, this gas main must be relocated in accordance with the proposed masterplan. These works are described in **Section 11.6.**

2 Industry Specific SEARs

2.1 Industry Specific Secretary's Environmental Assessment Requirements (SEARs)

This report responds to the NSW SSD 97711727 Planning Secretary's Environmental Assessment Requirements (SEARs) issued on the 26th of November 2025 by the NSW Department of Planning, Housing and Infrastructure (DPHI). **Table 1** summarises all key civil infrastructure and water management issues raised in the SEARs and how they have been addressed in this report.

Table 1 - Planning Secretary's Environmental Assessment Requirements addressed in this report

Condition	Response
Water – including:	
A detailed site water balance, including a description of site water demands, water disposal methods (inclusive of volume and frequency of any water discharges), water supply infrastructure and water storage structures	Refer to the Bulk Earthworks, Rehabilitation and Quarrying Surface Water Impact Assessment, provided by Engeny
Identification of any licencing requirements or other approvals under the Water Act 1912 and/or Water Management Act 2000	Refer to the Bulk Earthworks, Rehabilitation and Quarrying Surface Water Impact Assessment, provided by Engeny
An assessment of the likely impacts on the quality and quantity of existing surface and ground water resources, including a detailed assessment of proposed water discharge quantities and quality against receiving water quality and flow objectives	Refer to the Bulk Earthworks, Rehabilitation and Quarrying Surface Water Impact Assessment, provided by Engeny
An assessment of the likely impacts of the development on aquifers, watercourses, riparian land, water-related infrastructure, and other water users	Refer to the Bulk Earthworks, Rehabilitation and Quarrying Surface Water Impact Assessment, provided by Engeny
Consideration of any impacts to land adjoining the Site, including in relation to stormwater runoff / flooding and water quality	Refer to the Bulk Earthworks, Rehabilitation and Quarrying Surface Water Impact Assessment, provided by Engeny
A detailed description of the proposed water management system, water monitoring program, erosion and sediment control measures, and other measures to mitigate surface and groundwater impacts	Refer to the Bulk Earthworks, Rehabilitation and Quarrying Surface Water Impact Assessment, provided by Engeny
Infrastructure Requirements - an infrastructure delivery, management and staging plan that includes:	
An assessment of impacts of the development on existing utility infrastructure and service provider assets surrounding the Site, considering Chapter 3 of the WSA Precinct Plan, where relevant; and	Refer to Report **Section 10**
Details of arrangements for the relocation of the Jemena high pressure gas pipeline affecting the Site, including evidence of consultation with Jemena and the details of the outcomes of that consultation.	Refer to Civil Engineering Drawing MAR-AAP-DA-R02-DRG-CI-0021 and 0241 Refer to Report **Section 7** and **Section 10**

Condition	Response
Rehabilitation and Final Landform – including:	
Geotechnical studies to establish appropriate rehabilitation objectives, methodology, monitoring programs, performance standards and proposed completion criteria	Refer to Report **Section 8**
The potential for integrating this strategy with any other strategies in the region.	Refer to Report **Section 8**
Nominated final land use with supporting diagrams and design plans, having regard to any relevant strategic land use planning or resource management plans or policies; and	Refer to Civil Engineering Drawing Set MAR-AAP-DA-R02-CDG-CI-0000
Civil Engineering - Standard SSDA/Agency required documentation.	
Civil Plans	Refer to Civil Engineering Drawing Set MAR-AAP-DA-R02-CDG-CI-0000
Erosion and Sediment Control Plan	Refer to Civil Engineering Drawings MAR-AAP-DA-R02-DRG-CI-0171-0192

2.2 Government Agency Requirements

Table 2 - Government Agency Requirements addressed in this report

Issue and Assessment Requirements	Response
Liverpool City Council	
Flooding – Stormwater Report and Civil Plans required documentation.	
External stormwater runoff from upstream catchments running through the Site must not be obstructed and is to be appropriately conveyed and managed within the Site.	Refer to Surface Water Impact Assessment, provided by Engeny
The proposal should include details of stormwater strategy, including drainage design plans for the proposed work.	Refer to Surface Water Impact Assessment, provided by Engeny
Post-development stormwater discharges from the Site must not exceed pre-development discharge rates at site boundaries for storm events up to the 1% AEP event. On site detention system will require to be incorporated into the proposed work to control post-development flows. Flood modelling that incorporates the detention system and site drainage facility must be provided to confirm compliance with these requirements. Relevant flood mapping for pre- and post-development conditions also be included.	Refer to Flood Impact & Risk Assessment, provided by Colliers
ENZ corridors within the Site must be preserved and excluded from the proposed work.	Refer to Civil Engineering Drawing Set MAR-AAP-DA-R02-CDG-CI-0000
Detailed cut and fill plans must be provided, ensuring consistency with the Site's intended future land use.	Refer to Civil Engineering Drawing MAR-AAP-DA-R02-DRG-CI-0101

Issue and Assessment Requirements	Response
Soil erosion and sediment control measures, including sedimentation basins, must be implemented in accordance with Managing Urban Stormwater: Soils and Construction (The Blue Book). These measures should ensure effective collection and treatment of sediment and pollutants during and after construction, prior to discharge into downstream receiving waters.	Refer to Surface Water Impact Assessment, provided by Engeny
Future subdivision proposals for the Site must include detailed stormwater plans and a comprehensive stormwater management report addressing both quantity and quality controls. The report is to be supported by hydrologic and hydraulic modelling, as well as MUSIC modelling for water quality treatment facilities.	Refer to Surface Water Impact Assessment, provided by Engeny
The proposal must comply with relevant provisions of the Western Sydney Aerotropolis Precinct Plan and Western Sydney Aerotropolis Development Control Plan 2022 in relation to bulk earthwork and rehabilitation works.	Refer to Civil Engineering Drawing Set MAR-AAP-DA-R02-CDG-CI-0000
Environmental Health – Civil Plan required documentation	
<u>Construction Environmental Management Plan (CEMP)</u> Prior to issue of a construction certificate, a Construction Environmental Management Plan (CEMP) for the development must be provided to the Principal Certifying Authority for approval. The environmental site management measures must remain in place and be maintained throughout the period of the development. The CEMP must address all environmental aspects of the development's construction phases, and include (where relevant), but not be limited to, the following: ▪ Asbestos Management Plan; ▪ Project Contact Information; ▪ Site Security Details; ▪ Timing and Sequencing Information; ▪ Site Soil and Water Management Plan; ▪ Noise and Vibration Control Plan; ▪ Dust Control Plan; ▪ Air Monitoring ▪ Odour Control Plan; ▪ Health and Safety Plan; ▪ Waste Management Plan; ▪ Incident management Contingency; and ▪ Unexpected Finds Protocol. The CEMP must be kept on site for the duration of the works and must be made available to Council Officers upon request.	The Construction Environmental Management Plan (CEMP) is to be provided prior to issue of Construction Certificate
<u>Sewage Management</u> Development proposed to rely on any form of on-site sewage management, and/or on properties not currently connected to Sydney Water's reticulated sewerage service, shall incorporate the provisions of Council's On-site Sewage Management Standard.	No sewerage proposed as part of the Bulk Earthworks, Rehabilitation and Quarrying works

Issue and Assessment Requirements	Response
Bradfield Development Authority	
The Authority notes the Site includes ENZ Environment and Recreation zones under the State Environmental Planning Policy (Precincts—Western Parkland City) 2021. It is important the proposed earthworks and remediation work minimises impacts to the undisturbed vegetation riparian corridors of South Creek and Badgerys Creek.	Refer to Civil Engineering Drawing Set MAR-AAP-DA-R02-CDG-CI-0000 Refer to Site Wide Remedial Action plan, provided by JBS&G
Department of Climate Change, Energy, the Environment and Water	
Waterway Health – Water Management Plan required documentation	
The EIS must address sections 2.3 Stormwater, Water Sensitive Urban Design and Integrated Water Management and 2.5.5 Erosion and Sediment Control of the Western Sydney Aerotropolis Development Control Plan.	Refer to Surface Water Impact Assessment, provided by Engeny
The EIS, in accordance with the Technical guidance for achieving Wianamatta-South Creek stormwater management targets (DPE, 2022) (Tech guide), must include a proposed Erosion and Sediment Control plan for construction phase (Chapter 2 in Tech guide) and a Water and Stormwater Management plan for operational phase (Table 7 of Tech guide) demonstrating the approach and timing for meeting stormwater quality and quantity targets.	Refer to Civil Engineering Drawings MAR-AAP-DA-R02-DRG-CI-0171-0192 Refer to Surface Water Impact Assessment, provided by Engeny
To demonstrate the construction phase stormwater quality targets are met, a detailed ESCP should: • be developed and certified by a Certified Professional in Erosion and Sediment Control (CPESC) or a qualified and experienced civil engineer with at least 5 years' experience in the development of site-specific soil and water management plans • illustrate appropriate controls, that when implemented will achieve the construction phase stormwater quality targets in Table 2 of the Tech Guide • be prepared in accordance with the Blue Book (NSW Government 2004) • be prepared in accordance with the WSUD design considerations set out in Chapter 3 of the Tech Guide (especially WSUD measures) • - provide conceptual designs that include the Site, catchment and key features of the ESCP on scaled drawings.	Refer to Surface Water Impact Assessment, provided by Engeny
As the Site area is larger than 2,500m2, the Tech Guide provides best practice initiatives strengthening the elements in the Blue Book. This involves designing and implementing sediment controls that treat at least 80% of the average annual runoff volume (i.e. 80% hydrological effectiveness) to 50 mg/L TSS or less, and pH in the range 6.5–8.5. To achieve these construction phase targets, the design of the basins generally needs to: • be sized and operated in accordance with either a Type-A or Type-B sediment basin as documented in International Erosion Control Association (IECA,2008) • be provided with an automated system of flocculant dosing and a suitable supply of flocculant/coagulant, with the type of	Refer to Surface Water Impact Assessment, provided by Engeny

Issue and Assessment Requirements	Response
flocculant/coagulant determined based on the IECA chemical coagulants and flocculants fact sheet (IECA 2018) • have markers within each basin to show the maximum sediment storage level and any additional water storage capacity for water reuse • limit discharge from the primary outlet system to 50 mg/L TSS, with a pH within the range of 6.5–8.5 • - be operational before any disturbance occurs in the catchment upslope of the basin.	
The EIS must assess the impact of the development on hydrology, including: • Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas. • - Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems.	Refer to Surface Water Impact Assessment, provided by Engeny Refer to Biodiversity Development Assessment Report, provided by SLR
Western Sydney International Airport	
Consideration of any impacts to the WSI owned land adjoining the Site, including in relation to stormwater runoff / flooding, water quality, odour, air quality, and noise. This is to include an assessment for both during construction and operation to ensure there are no adverse impacts to WSI operations.	Refer to Surface Water Impact Assessment, provided by Engeny Refer to Flood Impact & Risk Assessment, provided by Colliers
NSW EPA	
Environmental Impacts of the Project	
The description should include the following for both the construction and operation of the project: • Details of the premises covered by the project including any relationship with any existing Environment Protection Licences • the layout of all the physical elements of the project within the project area, including all buildings, structures, works, haulage activities, pollution controls, stockpile and material handling areas, sealed and unsealed areas, landscaping and open space. • all mitigation measures that will be built into the physical layout and design of the project (such as noise walls) • any ancillary infrastructure for which approval is being sought (such as upgrades to utilities or surrounding roads) • identify those components of the physical layout and design that may change during the detailed design of the project, and set clear limits within which this change may occur without requiring amendments to the DA or modifications to the development consent if the project is approved • plans showing the layout and design in plan-view and cross section.	Refer to Civil Engineering Drawing Set MAR-AAP-DA-R02-CDG-CI-0000
Construction Works	
The EIS must include detail of the construction works including: • any earthworks or site clearing; re-use and disposal of cleared material (including use of spoil on-site).	Refer to Civil Engineering Drawing Set MAR-AAP-DA-R02-CDG-CI-0000

Issue and Assessment Requirements	Response

• Identify, characterise and classify the following in accordance with the EPA's Waste Classification Guidelines (2014):
  ○ all waste that will be generated onsite through excavation, demolition or construction activities, including proposed quantities of the waste;
  ○ all waste that is to be removed to an offsite location, including proposed quantities. Include the commitment to ensure this waste is taken to a facility that can lawfully receive it.
• Note: The EPA's Waste Classification Guidelines (2014) are available at: https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste
• construction timetable and staging; hours of construction; proposed construction methods.
• environment protection measures, including noise mitigation measures - in accordance with the Interim Construction Noise Guideline (DECC, 2009), dust control measures and erosion, and sediment control measures- in accordance with Managing urban stormwater: Soils and construction, vol. 1 (Landcom 2004).
	Refer to Waste Management Plan, provided by SLR

Include a site diagram showing the Site layout and location of environmental controls	Refer to Civil Engineering Drawing Set MAR-AAP-DA-R02-CDG-CI-0000
Water	
The EIS surface water quality assessment must: Demonstrate that all practical measures to prevent, control, abate or mitigate water pollution have been implemented, including a description of options that were explored (such as reuse to avoid a discharge or treatment).	Refer to Surface Water Impact Assessment, provided by Engeny
Provide details of the proposal that are essential for predicting and assessing potential impacts to receiving waters. This could include (but is not limited to): a. Site layout, including details of the existing and proposed water management system. b. Drainage map for the entire site identifying sub-catchments, flow paths, drainage infrastructure, design sizing of structures, water storages, discharge points, and any potential flow paths to receiving waters. c. How stormwater will be managed in all phases of the project. Information should include, where appropriate, measures to avoid or minimise erosion, leachate generation, and sediment mobilisation at the Site. d. Any in-water activities (such as piling or dredging).	Refer to Surface Water Impact Assessment, provided by Engeny
Include water balance(s) for ground and surface water, including any intake and discharge locations, volumes, frequency and duration.	Refer to Surface Water Impact Assessment, provided by Engeny
Identify and estimate the quality and quantity of all pollutants that may be introduced into the water cycle by source and discharge point, including residual discharges after mitigation measures are implemented. This should be undertaken for construction and operational phases.	Refer to Surface Water Impact Assessment, provided by Engeny

Issue and Assessment Requirements	Response
Include a water pollution impact assessment undertaken consistent with the guidance available at https://www.epa.nsw.gov.au/your-environment/water/managing-water-pollutionin-nsw/environment-protection-licensing/water-pollution-discharge-assessments. The level of assessment should be commensurate with the risk to the environment and human health.	Refer to Surface Water Impact Assessment, provided by Engeny
Describe any surface water quality monitoring programs, including proposed monitoring locations, frequency and indicators of surface water quality. Analytical limits of reporting should have regard to any identified guideline values. Water quality monitoring should be undertaken in accordance with the Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (2004) available at: Approved methods for the sampling and analysis of water pollutants in NSW | EPA	Refer to Surface Water Impact Assessment, provided by Engeny
The EIS must describe how stormwater will be managed in all phases of the project, including details of how stormwater and runoff will be managed to minimise pollution. Information should include measures to be implemented to minimise erosion, leachate and sediment mobilisation at the Site. The EIS should consider the guidelines Managing urban stormwater: soils and construction, vol. 1 (Landcom 2004) and vol. 2 (A. Installation of services; C. Unsealed roads; D. Main Roads; E. Mines and quarries) (DECC, 2008).	Refer to Surface Water Impact Assessment, provided by Engeny

3 Design Criteria

3.1 Design Codes and Standards

The latest version of the following design codes, standards and guidelines have been referenced for the project design and where relevant, incorporated as a requirement for the design.

3.1.1 Design Standards

Table 3 - Adopted Design Standards

Standard No.	Description
AGRD Part 5 (February 2021)	Austroads Guide to Road Design Part 5: Drainage – General and Hydrology Considerations
AGRD Part 5A Ed 2.0 (September 2021)	Austroads Guide to Road Design Part 5A: Drainage – Road Surface, Networks, Basins and Subsurface
AGRD Part 5B Ed 1.1 (August 2018)	Austroads Guide to Road Design Part 5B: Drainage – Open Channels, Culverts and Floodways
AR&R 2019	Australian Rainfall and Runoff (2019 v4.2)
AS 3500.3 (April 2025)	Plumbing and Drainage Part 3: Stormwater drainage
LCC Development Design Specification D5 (2003)	Liverpool City Council Stormwater Drainage Design
LCC Handbook for Drainage Design Criteria (2003)	Liverpool City Council Stormwater Drainage Design Criteria
SW Stormwater Scheme Infrastructure Design Guideline (Draft) (2024)	Sydney Water Stormwater Scheme for Western Sydney
WSA Precinct Plan (2022)	Western Sydney Aerotropolis Precinct Plan
WSA DCP (2022)	Western Sydney Aerotropolis Development Control Plan
Western Sydney Street Design Guidelines	Guidelines for service provision to new greenfield development areas
D5 Stormwater Drainage Design	Development Design Specification - Stormwater Drainage Design
WS190098 EDM	Western Sydney Engineering Design Manual
Liverpool City Council Standards Drawings	LCC standards drawings
Liverpool Development Control Plan 2008 Part 1	General controls for all development
Liverpool Development Control Plan 2008 Part 7	Development in industrial areas
Technical guidance for achieving WSC Stormwater Management Targets (2022)	Technical guidance for achieving Wianamatta-South Creek stormwater management targets (2022)
MUSIC Modelling Toolkit for WSC (2022)	MUSIC modelling toolkit for Wianamatta-South Creek (2022)

Managing Urban Stormwater: Soils and Construction (2004)	Landcom Managing Urban Stormwater – Volume 1
GAS-9899-GL-CN-001	Guide to designing, constructing and operating around the existing AS4645 natural gas network guidelines (Jemena)

3.2 Design Software

The design software programs and versions used for the design documented in this report are listed in **Table 4.**

Table 4 - Design Software

Software	Version
12d	15 C1t
AutoCAD	2025
Autodesk Vehicle Tracking	2025
Civil3D	2025
DRAINS	2025

4 Reference Documents

A summary of the reference documents to this project are listed below.

Table 5 - Reference Documents

Document/File Name	Type	Date Received	Prepared By	Description
234411.00.R.001	PDF	19/06/25	Douglas Partners	Due Diligence Geotechnical Investigation
234411.00.R.003	PDF	18/07/25	Douglas Partners	Earthworks Specification
234411.01.R.005	PDF	30/01/26	Douglas Partners	Earthworks Memo
Combined Preliminary and Detailed Site Investigation	PDF	10/03/26	JBS&G	Site Investigation
Site Wide Remedial Action plan	PDF	10/03/26	JBS&G	Site Wide Remedial Action plan
Bulk Earthworks, Rehabilitation and Quarrying Surface Water Impact Assessment	PDF	10/03/26	Engeny	Surface Water Impact Assessment
Groundwater Report	PDF	N/A	Arcadis	Groundwater factual report
52486 001DT Survey	CAD	24/11/25	LTS	Topographical survey
Dam Dewatering Plan	PDF	10/03/26	SLR	Dam Dewatering Plan
Engagement Outcomes Report	PDF	10/03/26	Urbis	Outlines community and stakeholder engagement
C015440.00	PDF	10/03/26	Costin Roe	Ground Improvement Plan and Sections
Flood Impact & Risk Assessment	PDF	10/03/26	Colliers	Flood Impact & Risk Assessment
Waste Management Plan	PDF	10/03/26	SLR	Waste Management Plan
Biodiversity Development Assessment Report	PDF	10/03/26	SLR	Biodiversity Development Assessment Report

5 Related Application Documents

A summary of the related application documents that have been used to inform this design are listed below.

Table 6 – Related Application Documents

Document/File Name	Type	Date Received	Prepared By	Description
MAR-AAP-DA-INT-RPT-CV-0001	PDF	N/A	Arcadis	Internal Works – Estate and Lots – Civil Engineering Report
Integrated Water Cycle Management Plan	PDF	10/03/26	Colliers	Integrated Water Cycle Management Plan
25123_MP02_P15_MASTERPLAN	CAD	26/02/26	SBA	Architectural masterplan

6 Design Compliance

6.1 Assumptions, Interpretations and Clarifications

Erosion and Sediment Control - 50% Settling Zone

The 50% settling zone method has been used to inform the basin sizing

Erosion and Sediment Control - Runoff Coefficient

A runoff coefficient of 0.7 has been used to inform the basin sizing

Bulk Earthworks – Bottom of uncontrolled fill surface

Fill settlement surface in bulk earthworks design has been extrapolated using geotechnical site investigation borehole data

Bulk Earthworks – Topsoil

Depth of design topsoil assumed in bulk earthworks design to be 300mm deep from existing surface

Bulk Earthworks – Base of Pit 1

Extrapolated surface for base of Pit 1 is based on an assumed depth below existing water level based on information provided by Mulgoa from site observations and data.

Containment Cell

The earthworks design of the containment cell is currently designed to accommodate a maximum of 100,000 cubic metres of contaminated material. The volume of actual contaminated material is to be checked and verified on site prior to construction of the containment cell.

6.2 Agreed Non-Compliances

Table 7 - Agreed Non-Compliances

Item No.	Agreed Exception	Affected Locations	Reference	Proposed new requirement
Nil				

6.3 Non-Compliances

Table 8 - Non-Compliances

Item No.	Non-Complaince Description	Affected Locations	Reference	Proposed new requirement
Nil				

7 Consultation

Details of the stakeholder and community engagement that has been undertaken to inform the works are provided in the Engagement Outcomes Report, provided by Urbis. Details of the consultation that has been undertaken to inform the works as it relates to that described in this Civil Engineering Report are summarised below.

Stakeholder	Feedback Received	Response
Department of Planning, Housing and Infrastructure (DPHI)	**Sediment Basins** Concerns were raised of the proposal to use Type D sediment basins instead of the guideline preferred Type A or B. Modelling is required to demonstrate adequate detention and capacity. The conversion timing for the basin was identified as critical to avoid gaps in sediment control. There was support for the use of on lot basins as redundancy.	On lot sediment basins and end of line sediment basins have been designed for the estate and water balancing modelling has been undertaken to ensure requirements are being met.
Department of Planning, Housing and Infrastructure (DPHI)	**Stormwater Harvesting** The interim stormwater harvesting's use for irrigation was considered straightforward. DPHI noted that future site use would require compliance with NSW Health requirements to prevent contamination.	Stormwater harvesting in the interim scenario is to be used for external non-potable irrigation after undergoing a combination of primary, secondary and tertiary treatment, in consideration of the principles in the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (phase 2) Stormwater harvesting and reuse" (July 2009). Goodman will be responsible for the stormwater harvesting in the interim scenario until such a time at which the ultimate Sydney Water regional recycled stormwater infrastructure is operating.
Jemena	Ongoing design discussions were raised undertaken. No concerns were identified with the relocation proposal in principle, subject to it proceeding in accordance with the Jemena relocation proposal. In principle agreement regarding the relations was reached and preliminary cost agreement executed to work through design.	Ongoing consultation is occurring, with Jemena to finalise the approved design.

8 Earthworks

8.1 Existing Conditions and Site Operations

The Site has historically been used for quarrying, including clay and shale extraction to obtain the raw materials for both on-site and off-site brick making operations. These operations are currently ongoing.

Key features of the Site include the following:

- Three main quarry pits
- Material stockpiles
- Sediment basins
- Farm dams
- Brickmaking facilities
- Supporting infrastructure such as roads and truck wash areas

Operations have been conducted under Mining Lease 1771 and Planning Consent MP10_0014, valid until 2031, a groundwater access licence, and an environmental protection licence, with management of pit water and runoff in accordance with approved soil and water management plans. Rehabilitation strategies are in place to progressively stabilise stockpiles and backfill quarry pits using Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM), and tunnel spoil meeting the Environment Protection Authority (EPA) criteria, ensuring the Site will be suitable for future uses once quarrying ceases, as required by relevant approvals and lease conditions.

8.2 Pre-Developed Geotechnical Conditions

An assessment of the geotechnical conditions present on the 225-245 Martin Road, Bradfield site has been completed and documented in the 'Report on Due Diligence Geotechnical Investigation' prepared by Douglas Partners (Refer **Appendix A**). Key sections of that report are summarised below.

8.2.1 Geological Map

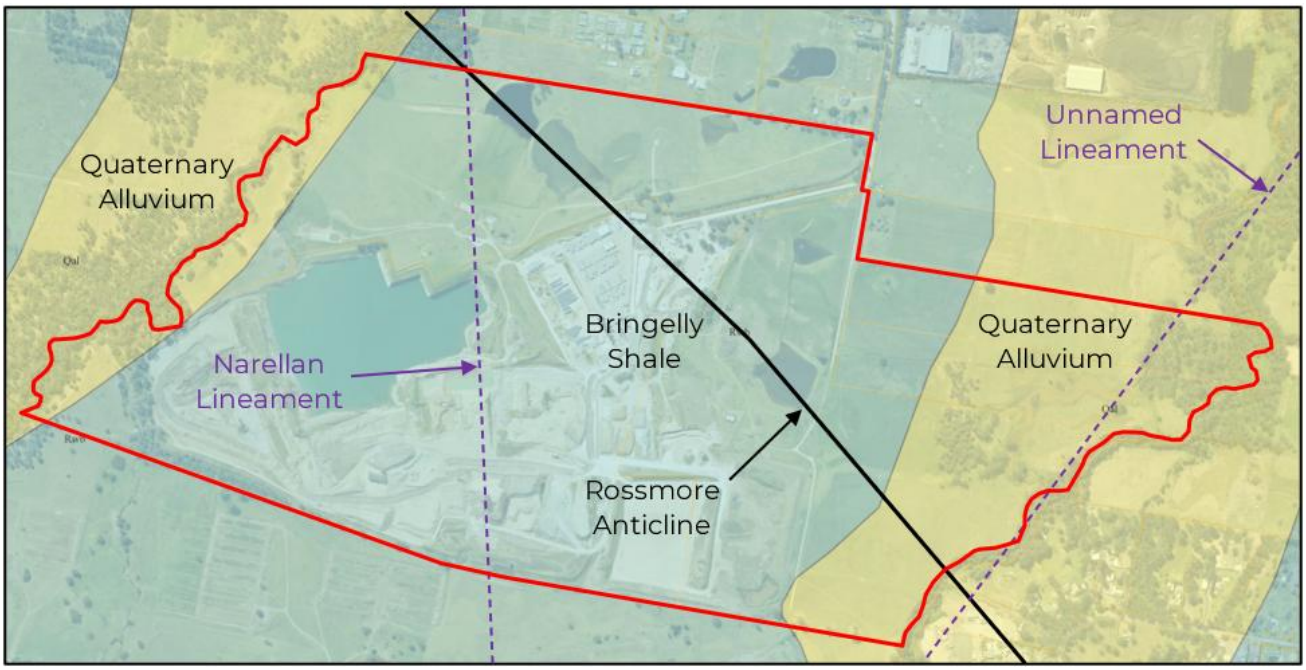

Figure 3 - Geological Map

8.2.2 Ground Information

The Site is predominantly underlain by Bringelly Shale, a geological formation consisting of shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, and occasional coal and tuff. The eastern and western edges of the Site are mapped as alluvial deposits, typically composed of fine-grained sand, silt, and clay, which are associated with the nearby South Creek and Badgerys Creek corridors. Notable geological features in the area include the Rossmore Anticline, an upward-arching fold in the rock layers, and the Narellan Lineament, a significant north-south aligned fault. These features may influence ground conditions and development potential across the Site.

8.2.3 Groundwater

An assessment of the groundwater conditions for the 225-245 Martin Road, Bradfield site has been completed and documented in the 'Groundwater Assessment Report', prepared by Arcadis. The report assesses how groundwater and surface water interact with the site and the potential impacts on South Creek and Badgerys Creek. It identifies nearby groundwater stakeholders (groundwater-dependent ecosystems and registered bores), develops a conceptual hydrogeological model, and evaluates the risk of groundwater interference from the proposed works. The bulk earthworks, rehabilitation and quarrying works have been designed to avoid most groundwater interaction where possible. Where unavoidable, management measures are proposed.

8.2.4 Acid Sulfate Soils (ASS)

Based on the Acid Sulfate Soils (ASS) Risk Map, no known occurrence of acid sulfate soils was identified at the Site. This indicates minimal risk of ASS-related issues for site development

8.2.5 Salinity

The NSW Salinity Potential Map for Western Sydney indicates that a moderate salinity potential category (yellow shading) is relevant for most of the Site and its immediate surroundings. A high salinity potential (orange shading is mapped along Badgerys Creek, with known salinity (red shading) mapped along Badgerys Creek and into the western edge of 225-245 Martin Road, Bradfield. (Refer **Figure 4**)

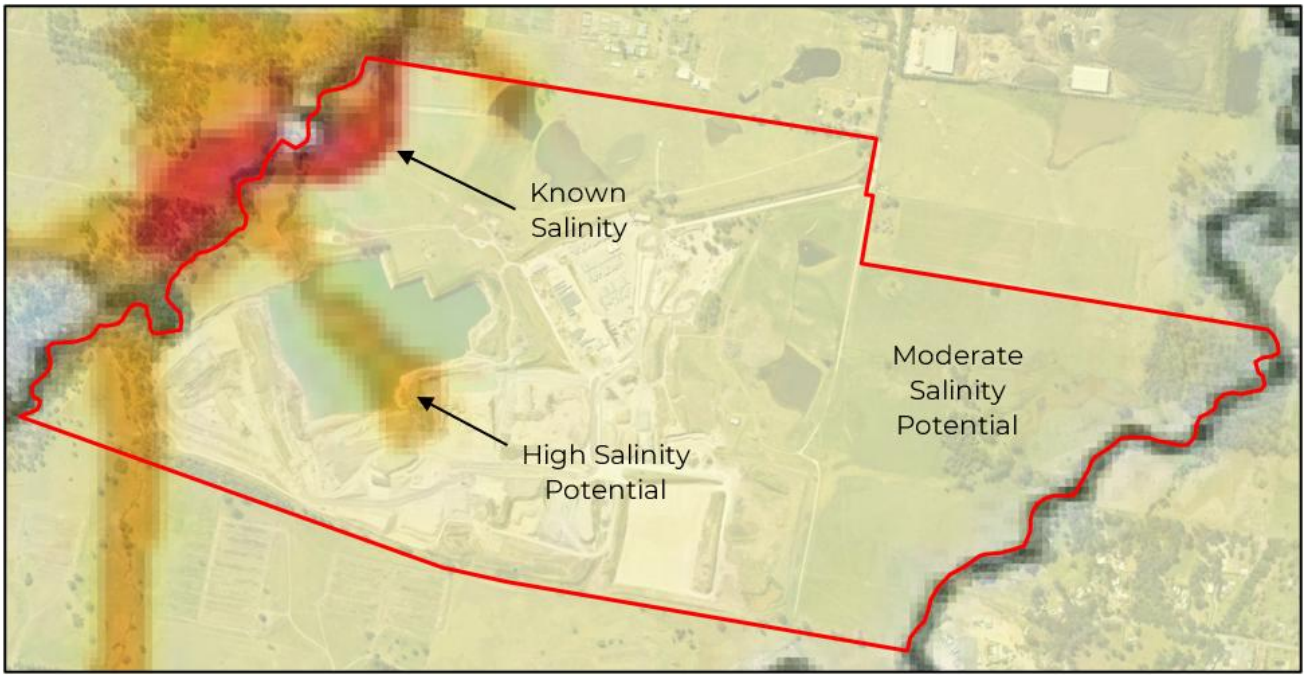

Figure 4 - NSW Salinity Potential Map

8.2.5.1 Impacts of Soil Salinity on Soil Resources and Riparian Land

Saline soils can impact soil resources and riparian land as the presence of salts create environments that limit vegetation growth to salt tolerant species. Soil salinity typically coincides with sodic soils which are prone to erosion. Sodic soils within riparian corridors, such as along watercourse banks, can be eroded from overland and watercourse flows, which is further exacerbated where limited vegetation coverage is present.

8.2.5.2 Impacts of Soil Salinity on Proposed Development

Salinity can affect urban structures in a number of ways including break up of roads, attack on buried infrastructure, reduced ability to grow vegetation and increased erosion potential. Salinity affects the durability of concrete and steel by causing premature breakdown of concrete and corrosion of steel. This has impacts on the longevity of structures in contact with these materials. Structures should therefore be constructed in accordance with the durability requirements of AS 2159, AS 3600 and AS 4058.

8.2.6 Key Geotechnical Issues

8.2.6.1 Trafficability and Fill Placement

Poor trafficability in alluvial soils, especially during wet conditions, may require surface reworking.

8.2.6.2 Salinity

Variable and sometimes significant salinity levels necessitate robust material selection and site management.

8.2.6.3 Groundwater

Presence of groundwater close to the existing surface necessitates lifting the proposed warehouse finished floor levels (FFL) up to remain outside this extent.

8.2.6.4 Water Management

Large volumes of surface and stored water require careful handling to avoid soil saturation and work delays.

8.2.6.5 Soil Reactivity

Low California Bearing Ratio (CBR) and high swell potential in soils indicate potential for ground movement and require appropriate engineering responses.

8.3 Site Stripping

Prior to placement of approved fill, the Site is to be cleared of all unsuitable material in accordance with 234411.00.R.003 (Earthworks Specification) prepared by Douglas Partners (Refer Appendix B), including but not limited to:

- Soils with high silt content
- Vegetation or organic matter
- Existing uncontrolled fill (stockpiled material, existing in-situ fill or similar)
- Any foreign objects, scattered or buried waste, or dumped materials (if present)
- Contaminated soil (if present)
- Unsatisfactory or excessively wet soils

8.4 Quarry, Dams and Temporary Basin Dewatering

Geotechnical Requirements

All existing quarry floors, dams and temporary basins are to be drained, desilted and deconstructed in accordance with 234411.00.R.003 (Earthworks Specification) prepared by Douglas Partners (Refer Appendix B). Details of these works are summarised below.

The following general procedure forms the minimum requirements:

- All existing ponded waters are to be pumped out or otherwise drained to a discharge area that is located at least 50 m away from any existing waterway, or as otherwise required by Liverpool City Council (LCC).
- All vegetation and other deleterious material (such as saturated silt and clay) is to be excavated to expose the underlying stiff clay, weathered rock or unaffected underlying previously approved fill.
- All existing dam and basin walls formed in fill are to be removed.
- The exposed surfaces are to be benched to a near-horizontal surface (<10% grade) prior to fill placement.
- Exposed surfaces are to be proof rolled with six passes of a 12-tonne dead weight roller operating in static mode, with the final pass undertaken in the presence of the Geotechnical Consultant or Geotechnical Inspection and Testing Authority (GITA) (as delegated by the Geotechnical Consultant) to identify areas requiring additional work.
- Saturated 'organic' soils from the dam and basin sides and base can be spread out and dried at a suitable location away from the general fill placement area. Once dried the material can be blended with other suitable granular fills (ripped rock) at a ratio of 1 in 20 (i.e. maximum 5% organic soils) and mixed into the lower fill layers. Organic soils are to be stripped of vegetation and significant roots prior to blending.

- Any saturated 'non-organic' soils can be spread out and dried. Once moisture conditioned the material can be blended with other suitable fills (clays and ripped rock) at a ratio of 1 in 5 (i.e. maximum 20% non-organic soils) and used as engineered fill below a depth of 3m below finished bulk earthworks level (BEL)

Environmental Requirements

Details of the Dam Dewatering Environmental methodology are provided in the Dam Dewatering Plan, provided by SLR Consulting, and summarised below.

1. Licence Requirements

- A qualified ecologist must be onsite during and after dewatering to manage fauna care and relocation.
- Required licences:
  - NSW Animal Ethics Licence
  - Section 37 Miscellaneous Permit (Fisheries Management Act 1994)
  - NSW Scientific Licence
- Specific translocation licence from NSW DPIRD Fisheries and Forestry

2. Reducing Water Levels

- Water is pumped from quarry pits and dams and irrigated onto adjacent paddocks.
- Pump inlet uses a float and 4 mm mesh filter to avoid fauna injury and uptake of eggs/juveniles.
- Water level monitored daily until approximately 1 m depth to enable fauna capture.
- Dam walls are deconstructed post-dewatering to prevent refilling; re-dewatering may be required after rain.

3. Dewatering Procedures

- Ecologist inspects mesh filters and supervises fauna rescue when water reaches ~1 m depth.
- Periodic checks ensure oxygen levels and mesh integrity.
- Native fauna (frogs, turtles, fish) are captured and relocated the same day.
- Pest/sick fauna are humanely euthanised per animal welfare laws.
- Sediment and erosion controls installed downslope to prevent environmental impact.
- Excavators may be used to safely retrieve fauna from deep silty sediment.

4. Relocation Sites

- Three relocation sites selected based on proximity, vegetation quality, and creek connectivity:
  - Wetland within the site (retained area)
  - South Creek
  - Badgerys Creek

5. Staffing and Equipment

- Minimum two qualified ecologists required, equipped with holding tanks, buckets, pumps, and transport vehicles.
- All staff hold appropriate scientific and ethics licences.

6. Timing and Schedule

- Dewatering avoided during heavy rain.
- Typical schedule:
- Days 1-2: Dewatering with ecologist supervising mesh filter installation
- Days 3-4: Fauna capture and relocation
- Day 5: Post-dewatering inspection and sign-off

7. Fauna Handling Protocol

- Ecologists conduct fauna capture and decide on euthanasia or veterinary care.
- Injured animals likely to survive transport are taken to nearby veterinary clinics (listed).

- Proper handling protocols for amphibians, turtles, eels/native fish, and introduced fish (which are euthanised humanely).

8. Transport Protocols

- Fauna transported in aerated containers with water from capture site.
- Equipment cleaned to prevent pest species spread.

9. Post-Dewatering

- Ecologist inspects sediments for remaining fauna.
- Dam left undisturbed for 24 hours to allow fauna relocation.
- Ecologist provides written confirmation of compliance before further works proceed.

8.5 Existing Stockpiles and Uncontrolled Fill

Management of existing stockpiles and uncontrolled fill is to be in accordance with 234411.00.R.003 (Earthworks Specification) prepared by Douglas Partners (Refer Appendix B). Details of these works are summarised below.

All existing stockpiles and uncontrolled fills on site, including materials such as ripped shale, sandstone, and clay-based soils, are subject to progressive assessment to determine their suitability for reuse as engineered fill. Approved materials may be used following processes such as particle size breakdown and moisture conditioning. All unsuitable materials, including those with high silt or organic content, contamination, or excessive moisture, must be identified through geotechnical and environmental assessments and either disposed of offsite or managed in accordance with strict controls (such as encapsulation cells) if retained onsite. Suitable site-won soils may be blended with other granular materials to meet required fill standards before placement, while ongoing blending and conditioning are used to produce uniform and compliant fill materials for construction. Refer to 234411.00.R.003 (Earthworks Specification) for further details.

8.6 Unsuitable Material

Unsuitable and/or Surplus and/or Contaminated Material Requiring Off-Site Disposal Will Be Tested and Classified in Accordance with the Remedial Action Plan (RAP) and Relevant NSW EPA Made and Approved Guidelines and disposed of to a Suitable Licenced Facility Where Required. Unsuitable Material Includes but Is Not Limited to Topsoil, Clay and Silt.

8.7 Over Excavation/Quarrying Works

To manage the adverse effects caused by the historical mining of pits 1 and 2, and to facilitate the future construction of the estate and on lot works, over excavation and backfilling may be required in certain areas that will be subject to future warehouse development. This work will be designed by the Geotechnical Consultant and is aimed at reducing the risk of adverse settlements caused by sudden changes in fill depth. Over excavation of existing quarry batters are to be conducted in accordance with 234411.00.R.003 (Earthworks Specification) prepared by Douglas Partners (Refer Appendix B). Details of these works are summarised below.

Where the placement of fill is undertaken within an existing quarry, the lower layers of fill are to be placed directly against the inclined quarry batters following preparation and stripping in accordance with **Section 8.3**. At the lower layers of fill, horizontal benching and 'keying in' of the fill layers is restricted by the presence of higher strength in situ rock. As rock strengths reduce within the upper reaches of the quarry batters, horizontal benching is achievable, and the extent of the fill is to be extended beyond the quarry batter to step the fill / batter interface and thus provide an appropriate seal against moisture ingress from the fill surface to the quarry base.

Once the surface of the fill reaches a level equal to the top of low strength rock, the quarry batters shall be laterally over-excavated to create a level bench of a minimum 6m width. Over-excavation will be required on all sides of all quarries, unless otherwise advised by the Geotechnical Consultant following a detailed review of final project earthworks drawings. Over-excavation is to be completed in accordance with the following methodology:

- The Earthworks Contractor is to advise the Superintendent and Geotechnical Consultant when the fill surface is nearing the top of low strength rock.
- The Geotechnical Consultant is to inspect the Site and provide a report advising the appropriate benching levels and extent along the quarry perimeter.
- The Earthworks Contractor is to provide suitable plant to site and is to excavate a level bench of at least 6 m width along the required perimeter of the quarry.
- The batter faces created in rock above the bench is to be battered to a temporary grade of 1H:1V.
- The batter faces created in soil above the bench is to be excavated to a temporary grade of 2H:1V by cutting 1.2m wide additional horizontal benches at 0.6m height intervals (i.e. at every second fill layer) as the fill height increases.
- All excavated natural material is to be re-used as fill after approval for re-use is obtained.
- All new fill layers are to be keyed into the new batter profiles during placement and compaction.

8.7.1 Pit 1 Over Excavation/Quarrying Works

The design criteria for the Pit 1 Over Excavation Works is listed in **Table 9**.

Table 9 – Design Criteria – Pit 1 Over Excavation Works

Requirement	Requirement Criteria	Reference	Comment
Over Excavation – Pit 1			
Batter (Under Warehouse Footprint)	1(V):3(H)	234411.00.R.003	1(V):3(H) extends a minimum of 10m outside proposed warehouse footprint
Batter (All other locations)	1(V):1(H)	234411.00.R.003	

The extents of the pit 1 over excavation works are highlighted in and **Figure 6** and a typical section is shown in **Figure 7** and **Figure 8.**

Figure 5 – Pit 1 Over Excavation Works Plan – North-East

Figure 6 – Pit 1 Over Excavation Works Plan – South-West

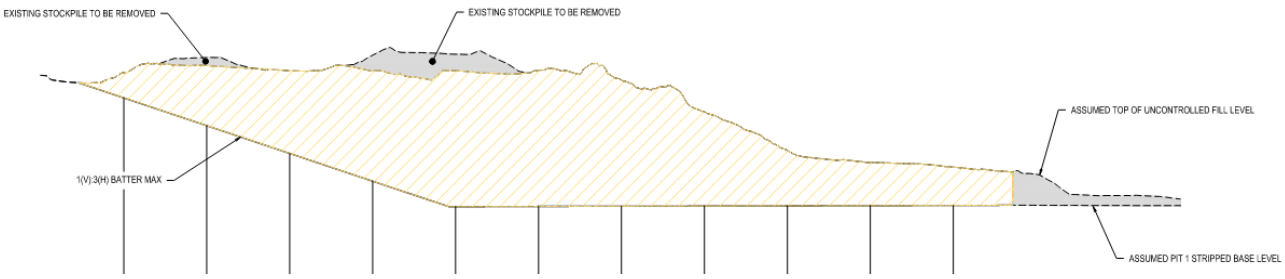

Figure 7 – Pit 1 Over Excavation Works Typical Section – North-East

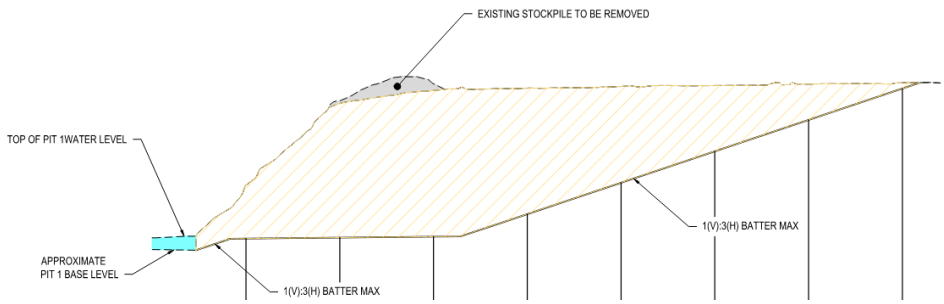

Figure 8 – Pit 1 Over Excavation Works Typical Section – South-West

8.7.2 Pit 2 Over Excavation Works

The design criteria for the Pit 2 Over Excavation Works is listed in **Table 10**.

Table 10 – Design Criteria – Pit 2 Over Excavation Works

Requirement	Requirement Criteria	Reference	Comment
Over Excavation – Pit 2			
Batter (Under Warehouse Footprint)	1(V):3(H)	234411.00.R.003	1(V):3(H) extends a minimum of 10m outside proposed warehouse footprint
Batter (All other locations)	1(V):1(H)	234411.00.R.003	
Bench RL Under Warehouse	61.5	C015440.00-S02 (Sketch Provided by Costin Roe)	1m Depth (From warehouse FFL)
Bench RL Adjacent to Warehouse	62	C015440.00-S02 (Sketch Provided by Costin Roe)	0.5m Depth (From warehouse FFL)
Retaining wall bench offset	2.4m	Offset nominated by Costin Roe	Bench at low side of retaining wall is used to inform the excavation required from the existing Pit 2 base. Retaining wall not to be constructed as part of these works
Temporary Piling Bench			
Bench Width	5m	Width provided by Contractor	
Piling Bench Batter	1(V):1(H)	234411.00.R.003	1(V):3(H) extends a minimum of 10m outside proposed warehouse footprint

The extents of the pit 2 over excavation works are highlighted in **Figure 9** and a typical section is shown in **Figure 10**.

Figure 9 – Pit 2 Over Excavation Works Plan

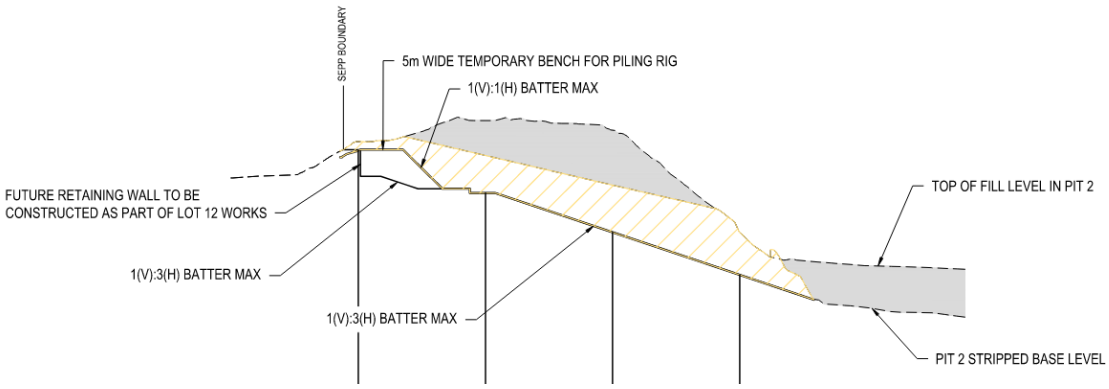

Figure 10 – Pit 2 Over Excavation Works Typical Section

8.8 Contamination

8.8.1 Contamination Cell

A containment cell is to be provided within the future Lot 3A and Lot 3B area for contaminated material located on the Site in accordance with the strategy presented in the Site Wide Remedial Action plan provided by JBS&G. The design criteria for the Containment Cell are listed in **Table 11**.

Table 11 – Design Criteria – Containment Cell

Requirement	Requirement Criteria	Reference	Comment
Containment Cell			
Contaminated Material Volume	100,000m³ MAX	Site Wide Remedial Action plan provided by JBS&G	Containment Cell Volume shown is a maximum, and if not required, will be filled with geotechnically suitable material in accordance with the RAP
Batters	1(V):1(H) MAX	234411.00.R.003	Batter toe to be located outside of Warehouse Footprint

The extents of the containment cell are highlighted in ***Figure 11***.

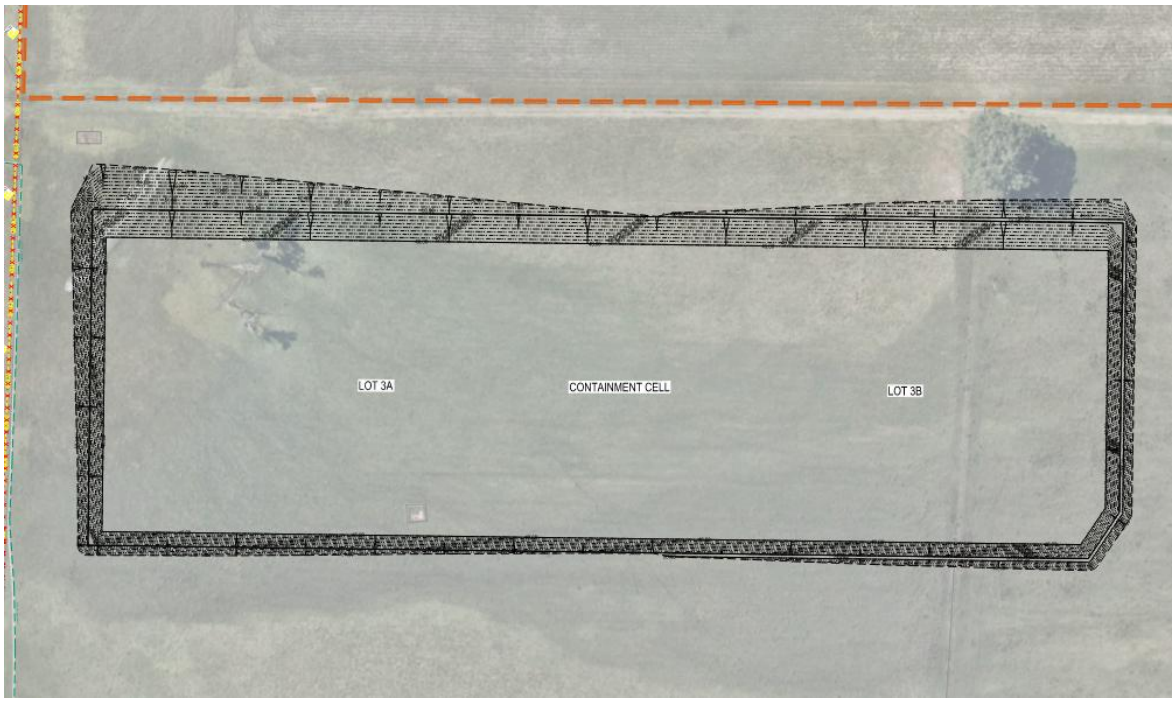

Figure 11 – Containment Cell Plan

8.9 Bulk Earthworks

All bulk earthworks shall be undertaken in accordance with 234411.00.R.003 (Earthworks Specification) prepared by Douglas Partners.

8.9.1 Developable Lot Pads

The bulk earthworks design includes the provision of developable pads for the 14 proposed lots. The developable lot pad earthworks levels are designed to minimise the volumes of earthworks required to bring the design to finished floor levels at the On-ot design stage, whilst providing a graded pad of no less than 0.5% fall to the adjacent erosion and sediment control swales. Detailed trimming of earthworks and finalisation of levels is proposed to occur under SSD 97688711. Each lot will include its own erosion and sediment control basin and diversion channels.

8.9.2 Active Open Spaces

The bulk earthworks design includes the provision of a graded pad for the proposed active open spaces area, provided as part of the Estate and On Lot works package. The earthworks levels are designed to minimise the volumes of earthworks required to bring the design to finished levels at the Estate and On-lot design stage. The open spaces area will include its own basin and diversion channels.

8.9.3 Erosion and Sediment Control Basins and Diversion Channels

Erosion and sediment control basins and diversion channels are provided throughout the Site, in accordance with the strategy outlined in the Bulk Earthworks, Rehabilitation and Quarrying Surface Water Impact Assessment provided by Engeny. The earthworks for each basin allows for sediment settling and storage zone volumes in accordance with that specified in the Bulk Earthworks, Rehabilitation and Quarrying Surface Water Impact Assessment, as well as a minimum of 750mm freeboard. Diversion channels are provided throughout the Site to enable conveyance of the dirty water from construction works to the basins.

9 Stormwater Management / Construction Soil and Water Management

Refer to Bulk Earthworks, Rehabilitation and Quarrying Surface Water Impact Assessment by Engeny.

10 Erosion and Sediment Control

10.1 Design of Erosion and Sediment Control Measures

Erosion and Sediment Control measures are required throughout each stage of construction, and have been designed and documented in accordance with the following criteria:

- Western Sydney Aerotropolis Development Control Plan
- Liverpool City Councils Guidelines and Specifications
- Managing Urban Stormwater: Soils and Construction, Landcom, 4th Edition 2004 (The "Blue Book") Volume 1 and 2
- Technical guidance for achieving WSC Stormwater Management Targets (2022)

All erosion and sediment control measures shown in this package, including basins and swales, are indicative only. Flexibility is required due to the staged nature of construction, where final sequencing, access constraints, and temporary drainage conditions will evolve throughout the works. Basin and swale locations are to be adjusted during construction to suit staging, access, and the progression of earthworks, Similarly, basin dimensions, depths, and storage capacities may be refined by the contractor to respond to actual site conditions, catchment extents at each stage, and contractor methodology. Any adjustments shall maintain the required erosion and sediment control performance and be consistent with the overall design intent, relevant guidelines and the Surface Water Impact Assessment, prepared by Engeny. Any adjustments to the proposed erosion and sediment control measures required during construction are subject to approval by a Certified Professional in Erosion and Sediment Control (CPESC).

In addition to these measures, contractors will develop plans such as site establishment details, maintenance schedules and checklists. The contractor will ensure that all soil and water management measures are implemented and maintained to suit the construction staging and the expected weather conditions. It is the contractor's responsibility to ensure all erosion and sediment control devices are maintained in good working order and operate effectively. The proposed erosion and sediment control measures, layout and strategy is to be confirmed by the contractor prior to commencement of construction activities. Erosion and sediment control measure may include, but are not limited to, the following items:

- Stockpiles (SD 4-1)
- Temporary Waterway Crossing (SD 5-1)
- Earth Bank Low Flow (SD 5-5)
- Earth Bank High Flow (SD 5-6)
- Sediment Basin (SD 6-4)
- Straw Bale Filter (SD 6-7)
- Sediment Fence (SD 6-8)
- Mesh and Gravel Inlet Filter (SD 6-11)
- Stabilised Site Access and Truck Wash down area (SD 6-14)

In addition to erosion and sediment control measures incorporated into the civil works drawings and Surface Water Impact Assessment, the contractor is expected to minimise the extent of disturbed area on site at any one time and undertake stabilisation of disturbed areas or previously completed earthworks as necessary.

11 Utilities

11.1 Potable Water

11.1.1 Existing Infrastructure

No existing potable water infrastructure is present in the works area.

11.1.2 Proposed Infrastructure

No potable water works are to be undertaken as part of the Bulk Earthworks, Rehabilitation and Quarrying Works package. These works are proposed to occur under SSD 97688711. Refer to Internal Works – Estate and Lots – Civil Engineering Report (MAR-AAP-DA-INT-RPT-CV-0001) for details of proposed estate and lead in potable water design.

11.2 Recycled Water

11.2.1 Existing Infrastructure

No existing recycled water infrastructure is present in the works area.

11.2.2 Proposed Infrastructure

No recycled water works are to be undertaken as part of the Bulk Earthworks, Rehabilitation and Quarrying Works package. These works are proposed to occur under SSD 97688711. Refer to Internal Works – Estate and Lots – Civil Engineering Report (MAR-AAP-DA-INT-RPT-CV-0001) for details of proposed estate and lead in recycled water design.

11.3 Wastewater

11.3.1 Existing Infrastructure

Existing wastewater septic tanks are present on the Site. Septic tanks are to be removed and disposed of as part of the Rehabilitation Works package.

11.3.2 Proposed Infrastructure

No wastewater works are to be undertaken as part of the Bulk Earthworks, Rehabilitation and Quarrying Works package. These works are proposed to occur under SSD 97688711. Refer to Internal Works – Estate and Lots – Civil Engineering Report (MAR-AAP-DA-INT-RPT-CV-0001) for details of proposed estate and lead in wastewater design.

11.4 Electrical

11.4.1 Existing Infrastructure

Existing overhead high voltage (HV) spans are present on the Site, entering the Site area from Martin Road. A new Asset Relocation Package (ARP) application will need to be created with Endeavour Energy to allow for the removal of these lines and these works must occur prior to the subdivision works.

11.4.2 Proposed Infrastructure

No electrical works are to be undertaken as part of the Bulk Earthworks, Rehabilitation and Quarrying Works package. These works are proposed to occur under SSD 97688711. Refer to Internal Works – Estate and Lots – Civil Engineering Report (MAR-AAP-DA-INT-RPT-CV-0001) for details of proposed estate and lead in Electrical design.

11.5 Telecommunications and NBN

11.5.1 Existing Infrastructure

No existing telecommunications infrastructure is present in the works area.

11.5.2 Proposed Infrastructure

No telecommunications or National Broadband Network (NBN) works are to be undertaken as part of the Bulk Earthworks, Rehabilitation and Quarrying Works package. These works are proposed to occur under SSD 97688711. Refer to Internal Works – Estate and Lots – Civil Engineering Report (MAR-AAP-DA-INT-RPT-CV-0001) for details of proposed estate and lead in Telecommunications and NBN design.

11.6 Gas

11.6.1 Existing Infrastructure

An existing 300kpa 200 DN high pressure gas main is present on the Site, extending into the Site via the existing Martin Road and continuing to the southern site boundary.

11.6.2 Proposed Infrastructure

The existing 300kpa high pressure gas main is to be relocated within the Site extents as part of the Rehabilitation Works. The gas main relocation works are to be completed in accordance with the Jemena Guide to Designing, Constructing and Operating around the existing AS4645 natural gas network guidelines. These works are currently under assessment by Jemena, Application number 13161790. Two preliminary relocation options are currently being investigated and remain subject to Jemena approval.

Requirement	Requirement Criteria	Reference	Comment
High Pressure Gas Main			
Diameter	200mm	N/A	Diameter as per existing gas main
Cover (MIN)	900mm	GAS-9899-GL-CN-001 Section 4.14 Table 1	
Cover (MAX)	1500mm	GAS-9899-GL-CN-001 Section 4.14 Table 1	
Boundary Offset	2.4m	GAS-9899-GL-CN-001 Section 4.5.2	Offset to provide suitable lateral offset to proposed substations (3.0m MIN)

Refer to **Appendix E** for preliminary proposed gas layout plan options.

11.6.3 Consultation

Refer to **Section 7** for details of consultation with Jemena.

Appendix A

Appendix A - 234411.00.R.001 - Report on Due Diligence Geotechnical Investigation

Douglas PARTNERS

GROUNDED EXPERTISE

Report on Due Diligence Geotechnical Investigation

Project Maverick

265 Martin Road, Bradfield NSW

Prepared for Goodman Property Services (Aust) Pty Ltd

Project 234411.00

19 June 2025

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Document History

Details

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Revision 0	Lachlan O'Reilly, Goodman Property Services (Aust) Pty Ltd

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

Signature		Date
Author		19 June 2025
Reviewer		19 June 2025

FS604853

Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

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Report on Due Diligence Geotechnical Investigation
Project Maverick
265 Martin Road, Bradfield NSW

1. Introduction

This report presents the results of a due diligence geotechnical investigation undertaken by Douglas Partners Pty Ltd (DP) as part of the proposed property purchase of 265 Martin Road, Bradfield NSW (the site) with view to future industrial development of the land. The investigation was commissioned by Lachlan O'Reilly of Goodman Property Services (Aust) Pty Ltd and was undertaken in accordance with DP's proposal 234411.00.P.001.Rev0 dated 20 February 2025, including agreed scope amendments.

It is understood that the proposed development will include subdivision of the site into a 14 lot industrial estate for warehouses that will vary in size from approximately 3,000 m^2 to 100,000 m^2. The industrial estate will be serviced by several roads, including the future north-south aligned Eastern Ring Road, and east-west aligned primary arterial road. The current concept masterplan (Drawing No. MAR MP06(A)), prepared by design+, is presented in Appendix B.

The aim of the investigation was to assess the subsurface conditions across the site to provide:

- An assessment of the geotechnical suitability of the site for the proposed development.
- An assessment of relevant geotechnical constraints to the proposed development.
- An assessment of the existing on-site materials for beneficial reuse within the development.
- Comments on development design and construction relating to site excavation, earthworks, mine rehabilitation, retaining walls, footings, foundations, settlements, pavements, salinity, soil erodibility, soil durability and groundwater.

The investigation included the excavation of 44 test pits, drilling of 14 boreholes (BHs), five cone penetration tests (CPTs) and laboratory testing of selected samples. The details of the field work are presented in this report, together with comments and recommendations on the items outlined above.

This report must be read in conjunction with all appendices, including the notes presented in Appendix A.

2. Site Description

For the purposes of this report, the site is referred to as 265 Martin Road, Bradfield, and is situated within the Liverpool City Council local government area, in the Parish of Bringelly, County of Cumberland.

The overall site (see Figure 1) is located at the southern end of the existing Martin Road and is formed by six individual properties legally described as:

- Lot 1 in DP1278780 – forming the north-western triangular area.

- Lot 2 in DP1278780 – forming the south-western area encompassing the three quarry pits.
- Lot 3 in DP1278780 – forming an irregular shaped central to south-eastern area south of Martin Road.
- Part Lot 54 in DP3050 – forming part of the northern elongated lot on the eastern side of the site.
- Lot 55 in DP3050 – forming the central elongated lot on the eastern side of the site.
- Lot 56 in DP3050 – forming the southern elongated lot on the eastern side of the site.

The combined site is irregularly shaped, is understood to cover an area of approximately 196 hectares and is situated within an area zoned for commercial and industrial use. It lies approximately 1 km south-east of the new Western Sydney International (Nancy-Bird Walton) Airport. The site is shown in Figure 1.

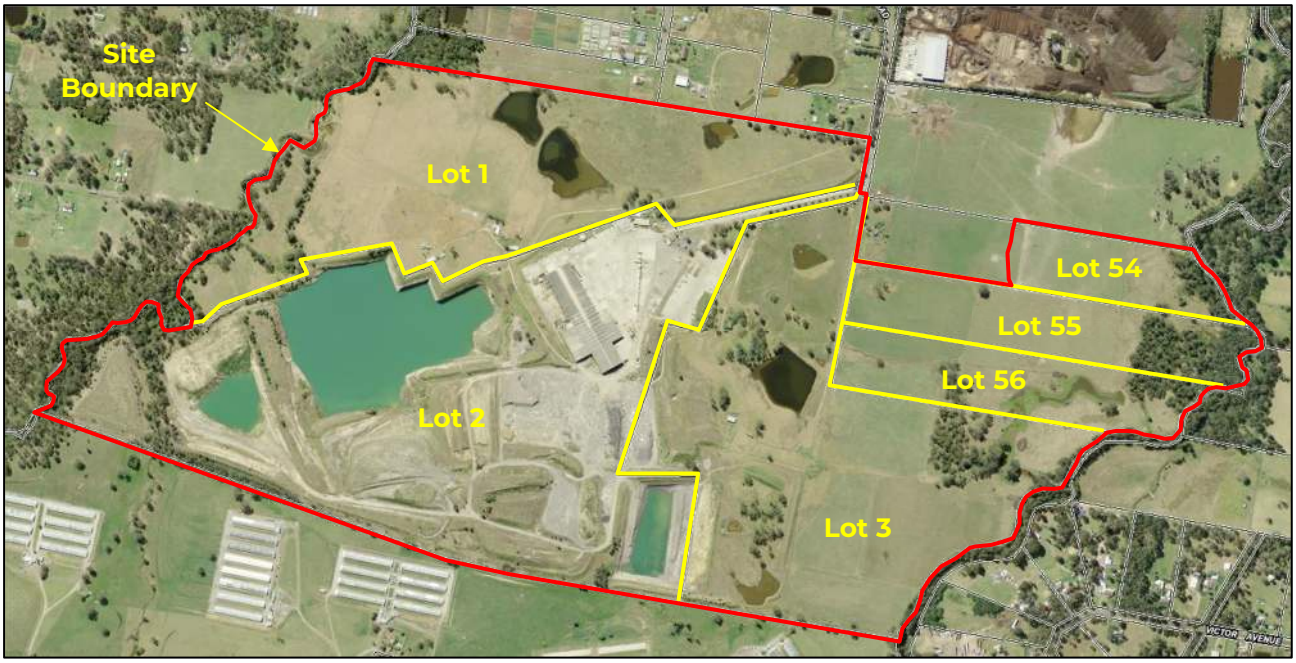

Figure 1: Site Location and Cadastral Lot Boundaries

Surface levels within the site vary between estimated reduced levels (RLs) relative to Australian height datum (AHD) of RL68 within the central southern area of Lot 2 and fall to RL44 in the north-eastern part of the site (Lot 54) adjacent to South Creek along the eastern boundary, and to RL54 in the western part of the site (Lots 1 and 2) adjacent to Badgerys Creek along the western boundary. The site is broadly convex along a north-south axis positioned near the common lot boundary between Lot 2 and Lot 3.

At the time of the investigation, the south-western part of the site (primarily Lot 2 and part of Lot 3) was undergoing mine rehabilitation earthworks to backfill three former quarry pits used for sourcing brick-making materials (i.e. clay and shale). The remaining northern and eastern areas of the site are presently used for grazing approximately 300 head of cattle. A brick manufacturing plant previously occupied the central part of the site to the east of the largest quarry pit, although has since been demolished leaving only the concrete floor slab and adjoining concrete hardstand. Other buildings include brick veneer and portable single storey site

buildings used as site offices (possible former residences) and a hay shed. A concrete entry road provides access from Martin Road and several unsealed access tracks traverse the larger site area.

3. Published Data

3.1 Geology

Reference to the Penrith 1:100,000 Series Geological Sheet indicates that most of the site is underlain by Bringelly Shale. The eastern and western edges of the site are mapped as underlain by alluvial deposits (fluvial sediments), which generally accompany the two creek alignments (South Creek and Badgerys Creek). An annotated extract of the mapping is shown in Figure 2.

Bringelly Shale typically comprises shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff, while the alluvial deposits typically comprise fine-grained sand, silt and clay.

Geological features of note (see Figure 2) include:

- The Rossmore Anticline, a geological feature signifying an upward, curved fold (or arch) in the underlying rock formation whereby the rock layers bend downwards in opposite directions from the fold line (i.e. the anticline alignment).
- The Narellan Lineament, a north to south aligned, deep-seated near-vertical normal fault in the underlying rock formation.
- A second unnamed lineament, likely to be outside of the development area.

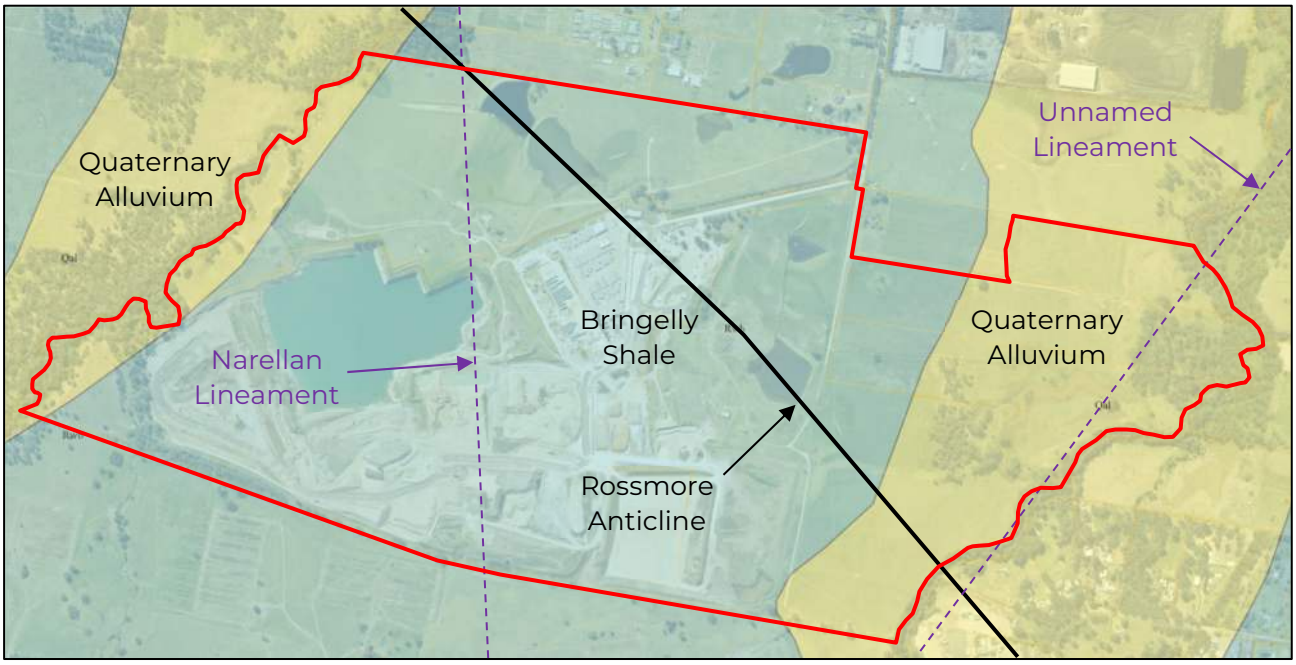

Figure 2: Geology Map Overlay

3.2 Soil Landscape

Reference to the Penrith 1:100,000 Series Soils Landscape Sheet indicates that the site is underlain by the Blacktown and South Creek soils landscapes. An annotated extract of the mapping is shown in Figure 3.

The Blacktown soil landscape underlies most of the central part of the site and is typically a residual landscape associated with gently undulating rises on Wianamatta Group shales with local relief to 30 m and surface slopes of generally less than 5%. Soil types typically include red to brown podzolic soil on crests grading to yellow podzolic soils on lower slopes and along drainage lines. The soils are not typically, although can be affected by high erosion, are of high plasticity and moderate reactivity and have poor drainage characteristics.

The South Creek soil landscape underlies the lower eastern and western edges of the site and is an alluvial landscape typically associated with floodplains, valley flats and drainage depressions of the channels on the Cumberland Plain. The land formation is usually flat with incised and often cleared channels. Soil types typically include deep, layered sediments, including sands, silts, plastic clays, loams, grey clays and leached clays over bedrock or relict soils. The soils have a high erosion hazard and are subject to frequent flooding, suggesting relative softness (low stiffness) and high in situ moisture contents.

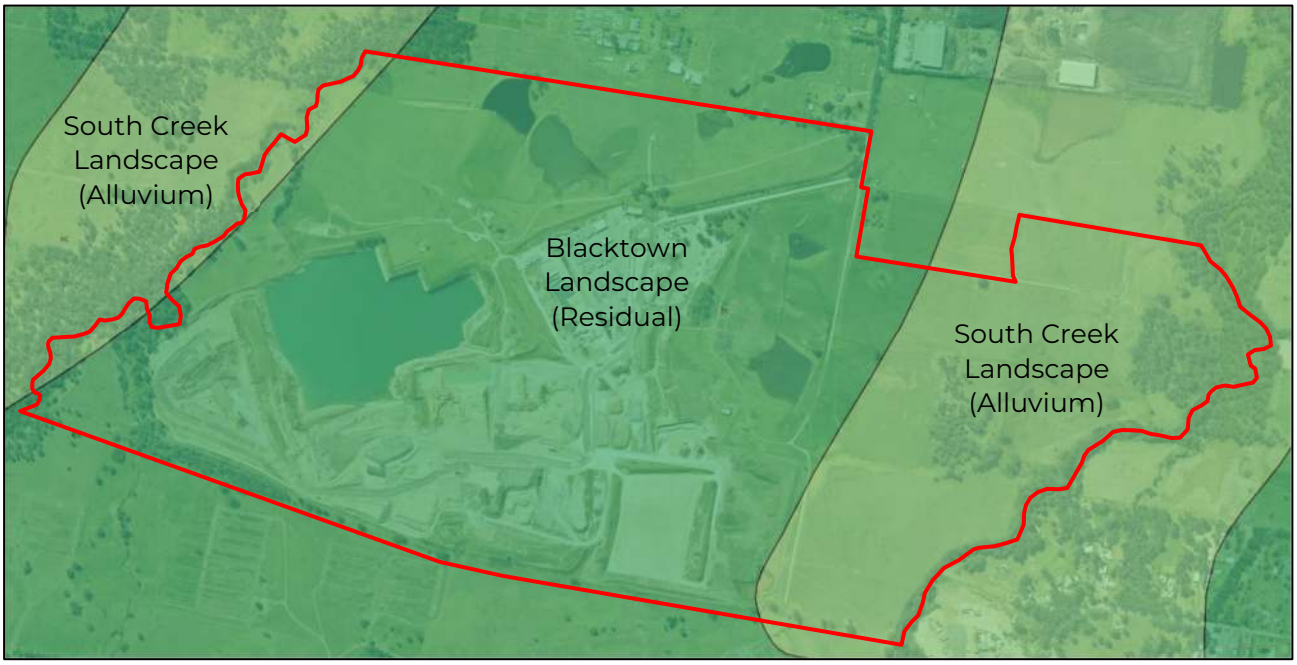

Figure 3: Soil Landscape Map Overlay

3.3 Hydrogeology

Based on the site topography, surface water is expected to partly flow across the surface, partly infiltrate into the near-surface soils, collect in the dams and quarry pits present on site and sheet into creek lines that connect to the closest surface water receptors (i.e. South Creek along the eastern site boundary and Badgerys Creek along the western site boundary).

A search of nearby groundwater bores identified three wells situated within the central part of the site on the south-eastern side of the large quarry pit. They include:

- GW103739 – drilled on 6/4/2001 to a depth of 31.98 m. The drillers bore log indicates a standing water level in the bore at 26.7 m depth and lists the water bearing zone as "unknown".
- GW106636 – drilled on 16/11/2005. There are no further records for this bore.
- GW106735 – Records indicate that this refers to the pump out system for the large quarry pit as at 27/1/2010. There are no further details for this bore.

3.4 Acid Sulphate Soils

Reference to the 1:25 000 Acid Sulphate Soils (ASS) Risk map indicates that the site is within an area of no known occurrence of ASS.

3.5 Salinity

The NSW Salinity Potential Map for Western Sydney indicates a moderate salinity potential category (yellow shading) is relevant for most of the site and its immediate surroundings. A high salinity potential (orange shading) is mapped along Badgerys Creek, with known salinity (red shading) mapped along Badgerys Creek and into the western edge of Lot 1 (refer Figure 4).

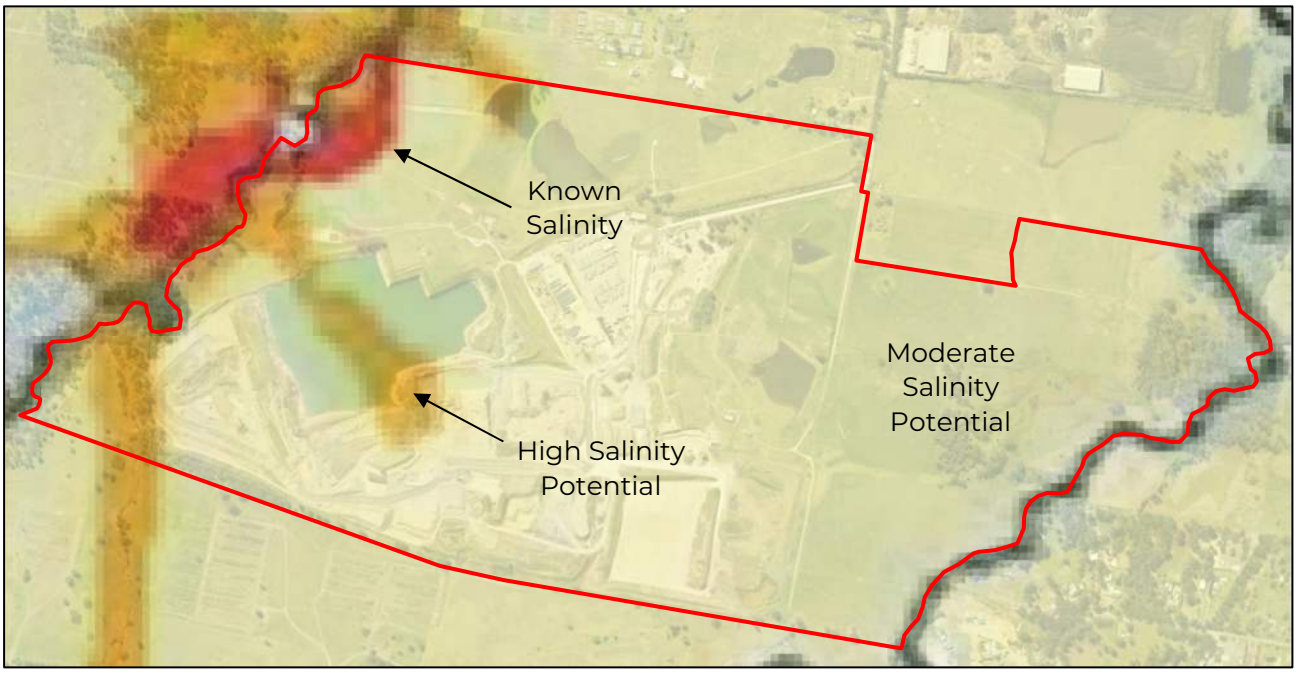

Figure 4: NSW Salinity Potential Map of Western Sydney (excerpt) Overlay

4. Desktop Review

4.1 Historical Aerial Photographs

Several historical aerial photographs of the site were made available in the data room. The following briefly summarises the site conditions over the time frame of the photographs.

- 1955 – the site is mostly cleared and situated in a rural setting. Structures (possibly residences and shedding) are present in the central southern parts of Lot 1 and Lot 3. Unsealed access tracks are present and there are indications of market gardening in Lot 1 and Lot 3. A dam is present in the central northern part of Lot 1.
- 1961 – the site is in a similar condition to 1955, with additional dams evident on Lot 1 and Lot 3.
- 1965 – as per the 1961 photograph, with more extensive market gardening across larger areas of Lot 1 and Lot 3 and a small part of Lot 2.
- 1970 – as per the 1965 photograph.
- 1982 – market gardening appears to have ceased, and quarrying activities have commenced on Lot 2. A new entry road has been constructed along the battle-axe arm of Lot 2 from Martin Road along the current entry road alignment. The current hardstand area is visible, along with the previous brick manufacturing plant building on Lot 2. Quarrying has commenced close to the southern boundary of Lot 2, to the south of the currently visible portion of the larger quarry pit. It appears that the western half of the quarry is deeper than the eastern half, which may only be affected by site stripping of overburden. Several stockpiles surround the quarry.
- 1986 – the site remains as per the 1982 photograph, although quarrying in the western half appears to have been extended further to the north and deeper. Additional stockpiles are present in the image, as are additional dams.
- 1991 – the site is mostly unchanged, although quarrying has extended further to the north into the now visible main quarry pit on the site. The western part of the quarry pit is filled with water.
- 1994 – quarrying has continued to expand to the north and west, west of the brick manufacturing plant. Additional stockpiles are visible in the image.
- 1998 – quarrying has continued to expand further to the west and now links with the initial western part of the quarry visible in the 1982 photograph. Additional stockpiles are visible in the image.
- 2005 – a second quarry in the south-western corner of Lot 2 has been excavated and a new stockpile is present in the south-western corner of the site. The main quarry pit is filled with water, and stockpiling has increased south of the quarries.
- 2007 – as per the 2005 photograph.
- 2014 – a third quarry pit has been excavated centrally along the southern site boundary. All three quarry pits are filled with water.
- 2018 – as per the 2014 photograph.
- 2019 – as per the 2018 photograph.

The above-listed historical aerial photographs are presented in Appendix C.

4.2 Previous Land Uses

From the aerial photograph review, it is apparent that the site has been subject to market gardening since at least the 1950s after which it was partly developed into a brick manufacturing facility that included three deep quarries in the central southern part of the site (Lot 2). It is likely

that brick manufacturing continued to at least the early 2000s or 2010s, although quarrying appears to have ceased between 2007 and 2014.

4.3 Current Land Uses

At the time of the investigation, the south-western part of the site (primarily Lot 2 and part of Lot 3) was undergoing mine rehabilitation earthworks to backfill three former quarry pits recently used for sourcing brick-making materials (i.e. clay and shale). Pit 3, the most recently excavated, has been completely backfilled and backfilling has commenced in Pit 2 (estimated as 10% to 20% complete) in the south-western corner of the site. Backfilling of the main quarry pit (Pit 1) is yet to commence with dewatering of the pit continuing with a current water level of RL42.6 recorded by DP on 6 June 2025. The remaining northern and eastern areas of the site are presently used for grazing approximately 300 head of cattle.

4.4 Existing Services

A before-You-Dig-Australia (BYDA) enquiry was undertaken by DP as part of the due diligence assessment and to facilitate intrusive investigations on the site. Known services include:

- Sewer (Liverpool City Council) – There are no sewer mains servicing this site. Sewage disposal, reported by CSR (current land owner) during a site meeting, is by means of on-site irrigation, although this is currently operating as a pump out system due to maintenance issues with the irrigation system. It is understood that irrigation was applied as evapotranspiration over part of the northern farmland area within Lot 1.
- Electrical (Endeavour Energy) – It is understood that all electrical services are overhead and enter the site slightly north of the site entry road connecting with Martin Road. Minor lengths of the electrical services may be underground where they are close to the plant they service.
- Gas (Jemena Gas West) – A single gas main incorporating a 200 mm diameter steel medium pressure (300 kPa) pipe, a 150 mm diameter steel medium pressure (300 kPa) pipe and a 160 mm diameter polyethylene medium pressure (300 kPa) pipe runs north to south through Lot 3 and then west along southern boundary of Lot 2. The main is clearly marked with signs at regular intervals along the easement.
- Communications (NBN Co NSWACT) – as for the electrical service.
- Water (Sydney Water) – The water supply connects with the public main at the Martin Road site entry and continues along the site entry driveway terminating within the general vicinity of the previous brick manufacturing building and remaining hardstand area.
- Phone (Telstra NSW Central) – as for the electrical service.

From the BYDA enquiry, it is apparent that there are few services on the site and that most are located at relatively shallow depth. It is estimated that most of the existing below ground services are positioned in trenches formed in the natural soil profiles.

4.5 Mine Rehabilitation

Site observations and discussions with existing site personnel, together with information made available by CSR in the data room, has confirmed that rehabilitation earthworks are complete in Pit 3. This area is currently undergoing topsoil placement and is due to be hydroseeded in

coming weeks. It is understood that the earthworks were subjected to a program of geotechnical inspections and testing in accordance with a Level 1 standard, as outlined in AS3798-2007.

Based on survey data provided by CSR, it is understood that the base of Pit 3 lies at a typical level of between RL42 and RL43, possibly slightly deeper in the north-western corner. Survey measurements undertaken by DP during the due diligence investigation indicate that the completed earthworks surface levels vary between RL59.5 and RL60.5, indicating an approximate 17 m to 18 m depth of controlled was placed to backfill Pit 3.

Six settlement monitoring points have been established on the northern part of Pit 3 and are understood to be undergoing monthly survey monitoring. Additional settlement monitoring points are reportedly being installed across the balance of Pit 3. The results of settlement monitoring only cover a period of four months and thus it is too early to draw conclusions on the likely magnitudes of settlement that may be experienced over the service or design life of structures built on deep fill in this location. Currently, survey monitoring indicates settlement rates of up to 2 mm per month, although total cumulative settlements may still be within the range of typical survey measurement levels of accuracy. A longer monitoring period is required before meaningful interpretations can be made of the settlements.

Backfilling of Pit 2 in the south-western corner of the site has commenced. Site observations confirm that the western part of the pit has undergone fill placement (controlled fill under Level 1 geotechnical inspection and testing), whereas the larger eastern part still contains stockpiles of uncontrolled fill across the quarry floor. The uncontrolled fill is currently being excavated to expose the floor and side walls of the quarry. Placement of controlled fill in the western part is crudely estimated as representing approximately 10% to 20% of the total backfilling volume.

Based on survey data provided by CSR, it is understood that the base of Pit 2 lies at a typical level of between RL36 and RL40, with the survey contours indicating a dish-shaped base. Survey measurements undertaken by DP during the due diligence investigation indicate that the current earthworks surface levels (4 June 2025) vary between RL42.8 and RL45.1, indicating an approximate 7 m depth of controlled fill has been placed on the western side of Pit 2. Finished mine rehabilitation earthworks surface levels for this pit are estimated to be in the range of RL57 to RL65, suggesting up to a 26 m thickness of fill may be required to backfill Pit 2.

Mine rehabilitation works have not yet commenced in Pit 1.

4.6 On-site Water Management

Given the presence of deep quarries on the site, together with the large land area, on-site surface water management is considered a geotechnical constraint to the current land use and the site's future development potential. Significant volumes of water are captured on the site in the form of 'sky fall' and 'overland flow'. In the northern and eastern farmlands, overland flow is assisted by ground infiltration and the natural off-site discharge to South Creek and Badgerys Creek. Within the quarrying lands, however, sky fall and overland flow are partly impeded by extensive surface stockpiling of soils and ripped rock, and large quarry footprints which currently act as sediment basins, together with other sediment basins installed within the stockpile storage area. Stored water is currently being used to assist moisture conditioning of controlled fill during placement but the need to empty the quarries prior to backfilling has resulted in approximately one billion litres being pumped across the farmlands in the north and east through an on-site irrigation

system. This will artificially wet the natural soils to above their otherwise natural environmental moisture condition and may lead to localised trafficability issues and areas of water-logged soils.

In addition to the services outlined in Section 4.4, the following private service has also been identified on the site.

- Private Irrigation (CSR Owned) – A ring main is positioned on the ground surface and is a highly visible white pipe that discharges water from the various quarry pits and sediment basins as surface irrigation across the northern and eastern farmlands by way of mobile rotary sprinklers. The main passes underground below the unsealed haul roads on the site.

From documents available in the data room, it is understood that CSR have a licence to discharge water on the site provided it meets the following requirements:

- Maximum salinity = 1500 µS/cm.
- Maximum pH = 9.
- Maximum turbidity = 50 NTU (nephelometric turbidity unit).
- A dissolved oxygen value in the range of 85-115% saturation.

Documents state that the irrigation system automatically shuts down if these values are exceeded during discharge. DP recommends that the automatic shutdown control should be verified as operational.

4.7 Previous Geotechnical Reports

The following discussions present a summary of known previous geotechnical investigations undertaken on the site. It is likely that other unknown parties have completed additional investigations.

4.7.1 Douglas Partners, Project 45982 (March 2009)

A geotechnical investigation was conducted by DP for a proposed packing machine that was to be installed within the previous Boral Brick Plant (Boral as the previous property owner). Investigation was undertaken to provide advice on foundations for new footings and existing floor slab thickness. The investigation included the drilling of five boreholes to depths of between 1.5 m and 2.9 m, and 11 dynamic cone penetrometer (DCP) tests.

The results of the investigation found that the existing concrete floor slab was between 80 mm and 270 mm thick and was reinforced with 6 mm diameter mesh. Fill was encountered below the floor slab and comprised brick rubble and clay to depths of between 0.6 m and 0.8 m. In situ shale was encountered below the fill. Significant groundwater seepage was encountered when drilling boreholes underlain by brick rubble, suggesting trapped water in the high void content granular fill.

4.7.2 Beca Pty Ltd, Document No. 2449285-RPT-3109A-GA-001 (December 2018)

A geotechnical investigation was conducted by Beca to provide design support to three separate projects proposed within the site, including the construction of a brick manufacturing building, a tile manufacturing building and a solar farm. Investigation was undertaken to provide advice on foundations for new footings and access roads. The investigation included the drilling of 22

boreholes to depths of between 0.65 m and 8.61 m using mostly auger drilling methods, although two boreholes were also core drilled into the underlying rock.

The results of the investigation found that the subsurface conditions comprised 0.15 m to 0.4 m of topsoil (silty clay, silty sand, with rootlets), overlying 0.1 m to 2.95 m of uncontrolled fill (variable blends of silt, gravel, sand, clay and brick). Alluvial soils were identified in one borehole to its base depth of 6.45 m, with residual soils (medium to high plasticity silty clay and clayey silt) typically identified below the fill to depths of between 3.1 m and 5 m. In situ shale was encountered below the residual clay and was typically of very low strength, grading to low and medium strength with depth. Groundwater was encountered in two boreholes at depths of 1 m and 3.4 m.

Laboratory test results obtained by Beca, include:

- California bearing ratio (CBR) values of between 1.5% and 2.5%, with high swell values of between 4.0% and 6.2%.
- Plasticity index values of between 14% and 36%, with liquid limits of between 27% and 54%.
- Emerson class number values of 4, 5 and 6.

4.7.3 Douglas Partners, Project 201059.00 (May 2023)

A geotechnical investigation was conducted by DP as part of the proposed rehabilitation of former quarry pits on the site. Investigation was undertaken to provide advice on the extent and type of existing fill and condition of stockpiled materials on the site. The investigation included the excavation of 72 test pits and the drilling of four boreholes to depths of between 0.6 m and 15.5 m.

The results of the investigation found that:

- Natural topsoil was typically 0.3 m to 0.4 m thick but up to 1.2 m thick in one test pit.
- Topsoil fill was typically 0.2 m to 0.4 m thick but was between 1.0 m and 1.5 m thick in three test pits.
- Uncontrolled fill was identified in 39 test pits and three boreholes to depths of between 0.5 m and 14.9 m, and to the termination depths of between 1.0 m and 6.1 m in a further 31 test pits and one borehole.
- Natural silty clay was identified in 4 test pits to depths of between 1.2 m and 3.0 m, and to the termination depths of between 0.6 m and 10.0 m in a further 35 test pits and two boreholes.
- Shale was encountered from depths of 2.0 m to 14.9 m in six test pits and one borehole.
- Groundwater was not encountered in any of the test pits or boreholes during excavation/drilling.

It is noted that many of the deep fill locations correspond to stockpiles present on the site at the time of the investigation.

Laboratory test results obtained by DP, include:

- California bearing ratio (CBR) values of between 1.5% and 16% (one result of 30%), with low to moderate swell values of between 0% and 5%.
- Plasticity index values of between 10% and 50%, with liquid limits of between 24% and 69%.

- Weighted plasticity index (WPI) values of between 187 and 4910, where WPI = Plasticity Index x % passing 425 µm sieve.

With reference to current site conditions:

- The existing triangular stockpile in the south-western corner of the site was determined to be up to 8.6 m thick.
- The existing stockpile sitting on the quarry wall between Pit 2 and Pit 3 was determined to be between 1.0 m and 1.8 m thick.
- The ground surface at the base of the stockpiles in the stockpile storage area south of Pit 1 was determined to be underlain by between 3.0 m and 7.5 m of uncontrolled fill, which may be partly affected by test locations positioned on the lower parts of stockpiles. One borehole location recorded 14.9 m depth of uncontrolled fill south of the eastern half of Pit 1.
- The haul road to the south of Pit 2 was determined to be underlain by more than 3 m of uncontrolled fill.

5. Due Diligence Investigation

5.1 Field Work Methods

The field work for the current due diligence geotechnical investigation was conducted over 10 days from 29 May 2025 to 12 June 2025, and included:

- Walkover/drive over inspection of the site by a principal and associate geotechnical engineer.
- Services scanning to confirm the locations of existing buried services nearby test locations within and surrounding the previous brick plant and hardstand area.
- Excavation of 44 test pits (TP1 to TP45, including TP25A and excluding TP28 and TP32) using an 8-tonne excavator fitted with a 450 mm wide toothed bucket.
- Drilling of 14 augered and cored boreholes (BH1 to BH12, BH14 and BH15) using a Comacchio Geo305 track-mounted drilling rig to assess the deeper in situ rock profile.
- Five cone penetration tests (CPT1 to CPT5) using a truck-mounted CPT rig to assess the condition of the controlled fill placed in Pit 2 and Pit 3.
- Dynamic cone penetrometer (DCP) testing within selected test pits to a depth of 1.2 m or prior refusal to assess the in situ consistency of the near-surface soils. Similarly, Standard penetration tests (SPTs) were undertaken at regular depth intervals in the three cored boreholes (BH11, BH14 and BH15) for the same purpose.
- Sampling of soils to assist in logging and to provide specimens for laboratory testing of soil plasticity, aggressivity, salinity, erodibility and CBR tests.

The ground surface levels at all test locations were measured relative to AHD using a differential global positioning system (dGPS) receiver, which is generally accurate to within ±0.1 m in plan and elevation. Coordinates for each of the test pits and boreholes are measured with reference to Map Grid of Australia MGA202, Zone 56. Coordinates and ground surface levels are recorded on the test pit and borehole logs presented in Appendix D. The test pit locations are shown on Drawings 1, 2 and 3, in Appendix B.

5.1.1 Test Pits

The test pits were excavated to depths of between 1.1 m and 4.2 m to identify the subsurface soil profile with the aim of confirming the top of in situ rock below all soil profiles (not always achieved). The targeted purpose of each test pit is outlined in Table 1.

Table 1: Targeted Purpose of Test Pits

Test Pit No.	Reason for Excavation
1, 2, 5, 6, 9, 12, 13, 14, 18, 21, 23, 24, 41, 42, 43, 44, 45	Identification of subsurface conditions in farmlands potentially unaffected by quarrying activities or prior land disturbance.
3, 4, 8, 10, 25, 25A, 36, 37	Investigate the possible presence of deeper haul road materials and underlying fill beyond the visible edge of the existing haul roads.
7, 11, 39	Investigate potential for wet ground on the downhill side of existing dams, indicating possible dam leakage.
15, 16, 17, 19	Investigate ground conditions for evidence of uncontrolled fill from possible previous illegal fly-tipping on the site, as evidenced from historical aerial photographs.
20, 22	Investigate potential for excessively wet soils immediately surrounding the tributary and billabong on the eastern side of the site.
26, 27, 29, 31, 33	Investigate the condition of existing stockpiles and assess material types for beneficial reuse.
30, 34, 35	Investigate the possibility of further uncontrolled fill existing below the base of the surrounding stockpiles.
38	Investigate the condition of the existing fill in the near-level building pad below a previous, partly demolished residence.
40	Investigate the possibility of remaining uncontrolled fill being left in place after removal of previous stockpiles.

5.1.2 Boreholes

The boreholes were drilled to depths of between 3.0 m and 28.5 m to identify the subsurface soil profile with the aim of confirming the top of in situ rock below all soil profiles and collect rock core samples from selected boreholes to assess rock strengths on the site. The targeted purpose of each borehole is outlined in Table 2 (following page).

Table 2: Targeted Purpose of Boreholes

Borehole No.	Reason for Drilling
1	Identification of subsurface conditions in the large stockpile situated in the south-west corner of the site.
2, 3, 4, 5, 6, 7, 8, 9, 10, 12	Investigate subsurface conditions for potential of deep quarry backfilling below the stockpile storage area.
11, 14, 15	Investigate typical subsurface conditions across site areas potentially unaffected by previous quarrying and stockpiling activities, including obtaining rock core samples for assessment of rock strengths.

5.1.3 Cone Penetration Tests

The CPTs were undertaken to depths of between 7.1 m and 17.7 m to assess the depth, condition and relative stiffness of the controlled fill placed as backfilling within Pit 2 and Pit 3.

During CPT testing, a ballasted truck-mounted test rig is used to push a 35 mm diameter instrumented cone-tipped probe into the soil using a hydraulic ram system. Continuous measurements are made of the end-bearing pressure on the cone tip and the friction on a 135 mm long sleeve located immediately behind the cone. The cone resistance and friction readings are displayed on a digital monitor and stored on a computer for subsequent plotting of results and interpretation. Further information on the test methods and interpretation of CPT results is provided in the notes included with the results in Appendix D.

5.2 Field Work Results

The subsurface conditions encountered in the test pits, boreholes and CPTs are described in the test pit logs, borehole logs, and CPT plots presented in Appendix D, together with notes defining classification methods and descriptive terms. The following sections of the report discuss each targeted grouping of test locations with reference to Tables 1 and 2. A summary table of all soil and rock profiles for all test pit, borehole and CPT locations is presented in Appendix D.

5.2.1 Test Pits in Farmlands (1, 2, 5, 6, 9, 12, 13, 14, 18, 21, 23, 24, 41, 42, 43, 44, 45)

A summary of the typical sequence of subsurface conditions encountered within test pits excavated throughout the northern and eastern farmlands is presented below.

Topsoil and Topsoil Fill: Brown and dark brown silty clay with fine gravel and trace sand was encountered to depths of between 0.2 m and 0.38 m. The natural and filled topsoil was generally of low to medium plasticity, contained grass rootlets, and was soft to firm and wet.

Fill: Red-brown clay fill was encountered to a depth of 0.8 m in TP9. The fill included sandstone gravel and cobbles, was of poor to moderate compaction and wet. The fill was located near the northern border of the site and likely represents a localised area of shallow fill.

Natural Clays: (Alluvial)	Generally, brown and red-brown mottled grey clay with fine to medium ironstone gravels. The alluvial clays were generally of medium to high plasticity and contained some rootlets in the upper 0.5 m. The soils were initially firm to stiff increasing to very stiff, and wet, and extended to depths of 2.5 m to 3.0 m.
Natural Clays: (Residual)	Generally, red-brown mottled grey clay with fine to medium ironstone gravels. The residual clays were generally of medium to high plasticity, were occasionally firm but mostly stiff to very stiff and hard. The clays were generally moist to wet and extended to depths of 1.0 m to 3.6 m.
Weathered Rock:	Grey siltstone and pale grey-brown sandstone was encountered from depths of between 1.0 m and 3.6 m in all test pits excavated in farmlands. Estimated as initially of very low to low strength.

Alluvial soils are typically located through most of the eastern farmlands occupying the central and eastern areas of existing Lots 54 to 56. The alluvial and residual soils are quite similar in appearance, and at times it was difficult to delineate between the two. Deeper clay soils along the eastern and western edges of the site are indicative of alluvial soils.

Groundwater was observed during the excavation of test pit TP18 at a depth of 2.8 m. Groundwater was not observed in any other test pit. Groundwater conditions are typically affected by factors such as soil permeability and seasonal weather conditions and will vary with time. Groundwater monitoring was beyond the scope of this investigation.

5.2.2 Test Pits Adjacent to Existing Haul Roads (3, 4, 8, 10, 25, 25A, 36, 37)

A summary of the typical sequence of subsurface conditions encountered within test pits excavated adjacent to the edges of the existing site haul roads is presented below. It is noted that unsealed haul roads were typically topped with ripped/crushed sandstone gravels understood to have been sourced as TBM spoil from tunnel excavation projects in Sydney. Site personnel have anecdotally reported that the haul road materials are generally 0.3 m to 0.5 m thick and may also contain crushed bricks.

Topsoil:	Brown and dark brown silty clay with trace fine gravel was encountered to depths of between 0.15 m and 0.38 m. The natural topsoil was generally of low to medium plasticity, contained grass rootlets, and was soft to firm and wet.
Fill:	Pale grey and red-brown clay fill with ripped siltstone gravels, cobbles and occasional boulders was encountered at TP25 and TP25A only to depths of more than 2.8 m and 1.9 m, respectively. The fill was of moderate compaction and moist to wet. The fill may comprise remnant stockpiled materials.
Natural Clays: (Residual)	Generally, red-brown mottled grey clay with trace fine to medium ironstone gravels. The residual clays were generally of medium to high plasticity, were occasionally firm (TP8 near cattle feed area) but mostly stiff to very stiff and hard. The clays were generally moist to wet and extended to depths of 1.1 m to 3.0 m.

Weathered Rock:	Grey siltstone and pale grey-brown sandstone was encountered from depths of between 1.1 m and 3.0 m in all test pits excavated adjacent to haul roads except for TP25. Estimated as initially of very low to low strength.

Groundwater was not observed during the excavation of these test pits.

5.2.3 Test Pits Down Slope of Existing Dams (7, 11, 39)

The subsurface conditions encountered within test pits excavated on the down slope side of the existing dams comprised natural topsoil, overlying residual clay and then in situ weathered siltstone. The conditions of each soil and rock profile are consistent with those outlined in Sections 5.2.1 and 5.2.2. It is noted that soil moisture contents were generally unchanged from those encountered in other test pits spread across the northern and eastern farmlands, indicating that the existing dams are generally well-sealed. Topsoil thicknesses varied between 0.3 m and 0.35 m, with the underlying residual clays extending to the rock surface at depths of between 1.1 m and 2.8 m.

Groundwater was not observed during the excavation of these test pits.

5.2.4 Test Pits in Areas of Suspected previous Fly-tipping (15, 16, 17, 19)

The subsurface conditions identified in test pits excavated in areas of possible previous fly-tipping included a 0.3 m to 0.4 m thickness of natural silty clay topsoil, overlying alluvial clay. In situ rock was not encountered within the 3.6 m to 3.7 m depths of excavation. The topsoil and alluvial clay soil profiles were consistent with those outlined in Sections 5.2.1. Based on the results of this test pit, there does not appear to be any remaining evidence of previous fly-tipping at this location.

Groundwater was not observed during the excavation of test pit TP15. Groundwater seepage was observed during the excavation of test pits TP16, TP17 and TP19 at depths of 3.0 m, 2.9 m and 3.0 m, respectively.

5.2.5 Test Pits Adjacent to the Eastern Tributary and Billabong (20, 22)

The subsurface conditions identified in test pits excavated near the eastern tributary and billabong included a 0.3 m and 0.35 m thickness of natural silty clay topsoil, overlying alluvial clay. In situ rock was possibly intersected at the base of test pit TP22 at 3.2 m depth but was not encountered with the 3.9 m depth of excavation at TP20. The topsoil and alluvial clay soil profiles were consistent with those outlined in Sections 5.2.1. Based on the results of the test pits, there appears to be elevated soil moisture contents in this site area, which is likely to worsen closer to the tributary billabong.

Groundwater was not observed during the excavation of test pit TP22. Groundwater was observed during the excavation of test pit TP20 at a depth of 2.5 m.

5.2.6 Test Pits in Existing Stockpiles South of Pit 1 (26, 27, 29, 31, 33)

The subsurface conditions identified in test pits excavated within the existing stockpiles included a 3.8 m to 4.2 m thickness of uncontrolled fill with fill extending beyond the base of the test pits. The stockpiled fill included various blends of silty clay, clay and gravelly clay with bricks, ripped

shale cobbles and boulders and some foreign inclusions (foil, metal, plastic, concrete and tree branches). Based on the results of the test pits, the stockpiled materials appear generally suitable for reuse as fill.

Groundwater was not observed during the excavation of these test pits, except for seepage identified at 3.5 m depth in TP33, indicating some trapped water within the stockpile.

5.2.7 Test Pits at the Base of Existing Stockpiles South of Pit 1 (30, 34, 35)

The subsurface conditions identified in test pits excavated near the base of existing stockpiles included a 2.0 m to 2.2 m thickness of uncontrolled fill overlying natural silty clay topsoil in TP30, then residual clay. In situ rock was possibly intersected at the base of the test pit at 3.5 m depth and was identified in TP34 and TP35 at depths of 2.4 m and 3.4 m respectively. The uncontrolled fill generally comprised an upper 1.6 m thick layer of ripped shale and siltstone, with gravels, cobbles and boulders, over a lower 0.6 m thick layer of uncontrolled clay fill with cobbles and trace of organics for a total 2.2 m thickness of uncontrolled fill in TP30 with varying gravel and clay blends in TP34 and TP35 to 2.0 m to 2.2 m depth. The underlying natural topsoil and residual clay soil profiles were consistent with those outlined in Sections 5.2.1 and 5.2.2. Based on the results of this test pit, there appears to be a widespread depth of uncontrolled fill below the base of the stockpiles evident on the site's surface.

Groundwater was not observed during the excavation of these test pits.

5.2.8 Test Pit in Building Pad (38)

The subsurface conditions identified in TP38, excavated in fill at a previous building pad location, included a 1.8 m thickness of clay fill, overlying rock at 1.8 m depth. Based on the results of this test pit and site observations, the fill appears to be localised to the building pad area.

Groundwater was not observed during the excavation of test pit TP38.

5.2.9 Test Pit in Possible Previous Stockpile Area (40)

The subsurface conditions identified in TP40 included a 0.3 m thickness of natural silty clay topsoil, overlying a 1.4 m thickness residual clay, with in situ rock encountered at a depth of 1.7 m. The topsoil, residual clay and weathered rock profiles were consistent with those outlined in Sections 5.2.1 and 5.2.2. Based on the results of this test pit, there does not appear to be any remaining evidence of previous stockpiled materials at this location.

Groundwater was not observed during the excavation of test pit TP40.

5.2.10 Boreholes in South-Western Stockpile (1)

A summary of the typical sequence of subsurface conditions encountered within borehole BH1 drilled through the large stockpile in the south-western corner of the site is presented below.

Fill: Dark brown, brown and grey clay fill encountered to a depth of 10.5 m in BH1, slightly deeper than the 8.6 m depth of fill reported in documents within the data room. The fill included sandstone and siltstone gravels and trace cobbles and boulders, was of apparent moderate compaction and moist to wet. The fill likely

	represents a stockpile of previously stripped overburden from one or more of the quarry pits.
Natural Clays: (Residual)	Generally, red-brown clay with trace ironstone gravel. The residual clays were generally of medium to high plasticity and were estimated to be very stiff. The clays were generally moist to wet and extended to a depth of 14 m.
Weathered Rock:	Dark grey siltstone was encountered from a depth of 14 m and was estimated as initially of very low to low strength.

Groundwater was not observed during the drilling of borehole BH1.

5.2.11 Boreholes for Deep Uncontrolled Fill South of Pit 1 (2, 3, 4, 5, 6, 7, 8, 9, 10, 12)

A summary of the typical sequence of subsurface conditions encountered within boreholes drilled within the existing stockpile storage area to the south of Pit 1 is presented below.

Fill:	Varying blends of brown and grey clay and gravelly clay uncontrolled fill of medium to high plasticity to depths of between 3.0 m and more than 28.5 m. The fill included sandstone and siltstone gravels, cobbles and boulders, was of apparent moderate compaction and generally moist. The fill likely represents prior backfilling of previously excavated quarry extents evident in historical aerial photographs from 1982 to 1998.
Weathered Rock:	Dark grey and brown siltstone encountered from a depth of 3 m to 20 m and was estimated as initially of very low to low strength.

Groundwater was observed during the drilling of borehole BH2, BH6 and BH7 at depths of 15.5 m, 4.0 m and 2.8 m respectively. Groundwater was not observed in any other borehole in this vicinity.

Based on the results of these boreholes there appears to be widespread shallow and deep fill volumes below the current base of stockpile surface levels in this part of the site.

5.2.12 Boreholes for General Subsurface Conditions on the Site (11, 14, 15)

The subsurface conditions encountered in the three cored boreholes (11, 14 and 15) included a 0.1 m to 1.0 m thickness of uncontrolled fill overlying a 0.31 m thickness of natural silty clay topsoil (BH15 only), then 1 m to 2.7 m thick residual clay. In situ rock was intersected from depths of between 2 m and 3.1 m. The uncontrolled fill generally comprised clay with siltstone and sandstone gravels and cobbles, and brick rubble and was of moderate compaction. The underlying residual clay soil profile was consistent with that outlined in Sections 5.2.1 and 5.2.2. The underlying weathered rock was core drilled to termination depths at between 3.4 m and 7.3 m encountering mostly low and low to medium strength siltstone and sandstone.

Groundwater was not observed during the drilling of these boreholes.

5.2.13 Cone Penetration Tests in Controlled Fill (CPT 1 to CPT5)

The subsurface conditions inferred from the five CPTs conducted in Pit 2 (CPT1 to CPT2) and Pit 3 (CPT3 to CPT5) include well compacted clay fill with gavels and cobbles to depths of 7.1 m and

7.3 m in Pit 2, and 16.9 m to 17.7 m in Pit 3. In situ rock was inferred below the fill based on CPT refusal. Based on the CPT results, it is apparent that the condition of the fill confirms its controlled condition and the reported base depths of the pits are reasonably accurate. The above depth ranges noted include an approximate 0.1 m thick surfacing of topsoil over Pit 3, which has been reportedly placed to facilitate hydroseeding.

Groundwater was not observed within the test holes on withdrawal of the CPT rods.

6. Laboratory Testing

6.1 Laboratory Test Methods

Laboratory testing was carried out on selected soil samples collected from selected test pits and boreholes. Geotechnical and chemical laboratory testing included:

- Atterberg limits to assess soil plasticity (AS1289.3.1.1, AS1289.3.2.1 and AS1289.3.3.1) – 5 samples.
- Shrink swell index to assess soil plasticity and reactivity (AS1289.7.1.1) – 1 sample.
- CBR to inform pavement thickness design considerations (AS1289.6.1.1) – 5 samples.
- Soil aggressivity, including electrical conductivity (EC, Inorg-002), pH (Inorg-001), sulphate and chloride ion concentrations (Inorg-081) – 22 samples.
- Salinity, including textural classification (Inorg-123), calculation of EC_e, cation exchange capacity (CEC, Metals-020) and exchangeable sodium percentage (ESP, Metals-020) to assess salinity potential and sodicity – 18 samples.
- Emerson class number to assess erodibility (AS1289.3.8.1) – 6 samples.
- Point load tests on rock core samples to assess rock strength classification.

6.2 Laboratory Test Results

The detailed laboratory test results are presented in Appendix E and in Tables 3 to 7.

Table 3: Summary of Atterberg Limits and CBR Test Results

TP/BH No.	Depth (m)	Soil Description	LL (%)	PL (%)	PI (%)	CBR (%)	Swell (%)
TP2	0.5 – 1.0	Clay	47	15	32	6	1.0
TP6	0.5 – 1.0	Clay	63	19	44	3.0	2.0
TP12	0.5 – 1.0	Clay	67	23	44	2.0	3.5
TP18	0.5 – 1.0	Clay	54	16	38	5.0	1.0
TP30	2.8 – 3.2	Clay	65	20	45	3.5	2.5

Where: LL = Liquid Limit PL = Plastic Limit PI = Plastic Index CBR = California Bearing Ratio

Table 4: Summary of Shrink Swell Index Test Results

TP/BH No.	Depth (m)	Soil Description	Moisture Content (%)	Shrinkage Strain (%)	Swell (%)	I_{ss} (%)
TP37	0.4 – 0.85	Clay	32.6	6.5	0.5	3.7

Where: I_{ss} = Shrink Swell Index

Table 5: Summary of Emerson Class Number Test Results

Test Pit No.	Depth (m)	Soil Description	Emerson Class Number
TP1	1.5 – 1.6	Clay	2
TP9	1.0 – 1.1	Clay & Sandstone	2
TP13	0.9 – 1.0	Clay	2
TP22	1.5 – 1.6	Clay	2
TP30	2.8 – 3.2	Clay	2
TP40	0.9 – 1.0	Clay	2

Table 6: Summary of Sodicity Test Results

Test Pit	Depth (m)	ESP (%)	Sodicity*
TP1	0.5 – 0.6	11	Sodic
TP1	0.9 – 1.0	21	Highly Sodic
TP1	2.0 – 2.1	25	Highly Sodic
TP1	2.5 – 2.65	27	Highly Sodic
TP9	0.5 – 0.6	4	Non-sodic
TP9	1.0 – 1.1	6	Sodic
TP13	0.5 – 0.6	5	Sodic
TP13	0.9 – 1.0	20	Highly Sodic
TP13	1.5 – 1.6	25	Highly Sodic
TP22	0.5 – 0.6	8	Sodic
TP22	0.9 – 1.0	21	Highly Sodic

Test Pit	Depth (m)	ESP (%)	Sodicity*
TP22	2.0 – 2.1	22	Highly Sodic
TP22	3.0 – 3.1	21	Highly Sodic
TP30	3.0 – 3.1	18	Highly Sodic
TP30	3.4 – 3.5	18	Highly Sodic
TP40	0.5 – 0.6	10	Sodic
TP40	0.9 – 1.0	10	Sodic
TP40	1.5 – 1.6	28	Highly Sodic

Where: ESP = Exchangeable Sodium Percentage,
*As per Department of Land and Water Conservation (2002), Site Investigation for Urban Salinity.

Table 7: Summary of Chemical Laboratory Test Results

Test Pit	Depth (m)	$EC_{1:5}$ (dS/m)	Texture Class	EC_e (dS/m)	pHw (1:5)	Cl (mg/kg)	SO_4 (mg/kg)	CEC (meq%)	Comments	
									Salinity	Acidity
TP1	0.5 – 0.6	0.37	LMC	3.0	6.1	310	210	14	SS	Sl.Ac
TP1	0.9 – 1.0	1.20	MC	8.4	5.4	1,300	220	16	VS	St.Ac
TP1	2.0 – 2.1	0.95	MC	6.6	6.2	99	220	5.6	MS	Sl.Ac
TP1	2.5 – 2.65	1.30	MC	8.9	5.8	1,400	270	17	VS	M.Ac
TP2	0.9 – 1.0	0.38	-	-	7.3	340	160	-	-	Neutral
TP6	0.5 – 0.6	0.23	-	-	6.1	160	140	-	-	Sl.Ac
TP9	0.5 – 0.6	0.27	LMC	2.1	8.2	45	56	36	SS	M.Alk
TP9	1.0 – 1.1	0.40	HC	2.4	9.1	250	91	24	SS	VSt.Alk
TP12	1.0 – 1.1	0.44	-	-	6.4	340	280	-	-	Sl.Ac
TP13	0.5 – 0.6	0.08	MC	0.6	5.9	27	71	7.8	NS	M.Ac
TP13	0.9 – 1.0	0.27	LMC	2.1	5.4	66	87	3.9	SS	St.Ac
TP13	1.5 – 1.6	0.54	MC	3.8	5.1	400	330	11	SS	St.Ac
TP18	0.9 – 1.0	0.73	-	-	5.8	660	300	-	-	M.Ac
TP22	0.5 – 0.6	0.22	MC	1.5	6.0	250	62	6.8	NS	M.Ac
TP22	0.9 – 1.0	0.83	MC	5.8	5.4	880	240	7.9	MS	St.Ac
TP22	2.0 – 2.1	1.30	CL	12	6.6	1,500	100	13	VS	Neutral
TP22	3.0 – 3.1	1.30	MC	9.4	7.1	1,600	75	9.6	VS	Neutral
TP30	3.0 – 3.1	0.71	MC	5.0	4.5	760	110	8.8	MS	VSt.Ac

Test Pit	Depth (m)	$EC_{1:5}$ (dS/m)	Texture Class	EC_e (dS/m)	pHw (1:5)	Cl (mg/kg)	SO_4 (mg/kg)	CEC (meq%)	Comments	
									Salinity	Acidity
TP30	3.4 – 3.5	0.25	MC	1.8	4.8	240	55	5.7	NS	VSt.Ac
TP40	0.5 – 0.6	0.13	LMC	1.0	5.6	69	97	8.0	NS	M.Ac
TP40	0.9 – 1.0	0.12	LMC	1.0	5.7	82	70	7.5	NS	M.Ac
TP40	1.5 – 1.6	0.60	MC	4.2	5.2	680	250	9.4	MS	St.Ac

Where $EC_{1:5}$ = Electrical Conductivity
EC_e = Electrical Conductivity corrected for texture
pH_w = pH in water
Cl = Chloride
SO_4 = Sulphate
CEC = Cation Exchange Capacity
dS/m = Deci-Siemens per metre
CL = Clay Loam
LMC = Light Medium Clay
MC = Medium Clay
HC = Heavy Clay

NS = Non-saline
SS = Slightly Saline
MS = Moderately Saline
VS = Very Saline
Sl.Ac = Slightly Acidic
M.Ac = Moderately Acidic
St.Ac = Strongly Acidic
VSt.Ac = Very Strongly Acidic
M.Alk = Mildly Alkaline
VSt.Alk= Very Strongly Alkaline

7. Proposed Development and Property Purchase

7.1 Masterplan

The current concept masterplan for the site has been prepared by design+ and is referenced MAR MP06(A) and dated 29 May 2025. The masterplan outlines a proposed development that will include the subdivision of the site into 14 industrial lots for warehouse development. Indicative warehouse sizing varies between 3,000 m^2 and 100,000 m^2 and include one high bay area in the northern part of Unit 11.

Development is restricted along the eastern and western fringes of the site due to environment and recreation zones and dedicated areas for stormwater infrastructure, open space and drainage. The developable area covers 1,116,897 m^2, representing approximately 57% of the total site area.

7.2 Bulk Earthworks

Current conceptual bulk earthworks plans, prepared by Arcadis Pty Ltd (Arcadis, Drawing No. MAR-AAP-DA-00-SKT-CI-0008, Issue 03, dated 15 May 2025) indicate proposed cuts of up to 8 m depth (typically 2 m to 4 m) and fill placement to thickness of up to 10 m (typically 2 m to 6 m). Cuts will primarily occur throughout the central part of the site extending to the northern and southern boundaries of the site. Fill placement will primarily occur throughout the eastern and western parts of the site.

Bulk earthworks volumes are yet to be finalised, although it is likely that fill volumes will exceed 1,000,000 m^3. A copy of the current bulk earthworks plan is included in Appendix B. It is noted that the bulk earthworks plan does not include the earthworks associated with the mine rehabilitation scope.

7.3 Mine Rehabilitation

Mine rehabilitation earthworks have been commenced by CSR and include the backfilling of Pits 1, 2 and 3 to agreed rehabilitation surface levels. The backfilling of Pit 3 is essentially complete. Backfilling of Pit 2 has commenced and is estimated to be at an approximate 10% to 20% completion stage. It is understood that further backfilling of Pit 2 is unlikely prior to sale of the property. Backfilling of Pit 1 is yet to commence, as it is currently being emptied of stored water.

It is understood that the current rehabilitation earthworks approach is to backfill the quarry pits after removal of all uncontrolled fill from the quarry floor and after exposing the natural ground profile in all quarry walls. Reshaping of the quarries to suit future subdivisional and on-lot developments does not form part of the current scope of work.

Backfilling of the quarries is being completed by Mulgoa Quarries Pty Ltd (contracted to CSR) with geotechnical engineering and Level 1 inspection and testing services being completed by DP. A project specific earthworks specification has been developed for the rehabilitation earthworks, which closely aligns with the specification Goodman have currently adopted for their Oakdale East Estate project. It is noted that the rehabilitation specification does not consider all aspects of the Oakdale East Estate specification (i.e. consideration of other subdivisional and on-lot development works).

7.4 Roads

The concept masterplan indicates a proposed road network including a north-south aligned future eastern ring road, an east-west aligned primary arterial road, three collector category roads, and two local street category roads. Future road authorities are likely to include both state (Transport for New South Wales , TfNSW) and local (Liverpool City Council) government bodies.

It is currently anticipated that all roads will be of flexible design, generally comprising asphalt wearing courses and varying thickness of bound and unbound road base layers.

7.5 Services

Given the scale of the development, a full range of services are anticipated to be required by the development, including underground electrical, water, recycled water, sewer, gas, communications, etc. Significant services upgrades are envisaged for the local area to facilitate site development.

7.6 Warehouses

The construction of warehouses is likely to include steel portal framed structures clad with sheet metal, supported on shallow pad footings (or piles, subject to design loads) founding within controlled fill, natural soil and weathered rock. Mezzanine offices are anticipated to accompany each warehouse.

The warehouses will include concrete floor slabs that will transition to external concrete hardstand pavements. Preliminary civil design drawings, prepared by Arcadis, indicate building pad levels of between RL59 and RL64 (approx.), although it is understood that these levels are subject to change.

7.7 Other Structures

Other structures likely to be included in the development are cut retaining walls, fill retaining walls, light vehicle pavements, signage and on-site detention basin (etc.). Details of these structures is beyond the current phase of the project.

8. Geotechnical Model

8.1 General

Excluding the presence of the three deep quarry pits on the site and the associated uncontrolled fill within and below the current stockpile storage area, the natural ground conditions typically present throughout the northern and eastern farmlands are considered geotechnically typical of the locality and Western Sydney. The Blacktown soil landscape and underlying Bringelly Shale formation are found widespread through Western Sydney and are similar to those being managed on other Goodman development sites, including the Oakdale East Estate. Accordingly, there are no significant development constraints for this site beyond those normally applicable to other nearby development sites.

The presence of three quarry pits adds to the normal complexity for site development, as additional rehabilitation earthworks are required giving rise to additional cost, bulk earthworks and management of potentially 1.55 million cubic metres (approx.) of in-ground uncontrolled fill and a further 0.75 million cubic metres of stockpiled uncontrolled fill. Although empty quarries facilitate several backfilling options, including quarry wall reshaping to suit subdivisional and on-lot developments, partial completion of those works limit these options where filling has already occurred.

Based on our assessment of the site conditions and the available information in the due diligence data room, the following development constraints are identified.

- Management of significant volumes of stormwater and stored water on the site, including current site irrigation systems and wet near-surface soils.
- Excavation and reuse or off-site disposal of significant topsoil volumes (circa 250,000 m^3 to possibly 300,000 m^3), given limited ability to blend topsoils with site-won natural and stockpiled clayey soils.
- Presence of alluvial soils and their potential for ephemeral seepage flows and flooding following high rainfall. The alluvial soils are likely to affect proposed Units 3, 4 and 5, including the adjoining lengths of the primary arterial road, collector road and local street corridors.
- Typically medium to high plasticity natural clay that will provide relatively lower design parameters for CBR (increasing pavement thicknesses and construction costs), and high shrink and swell ground movements affecting floor slab and hardstand designs.
- Identification and successful removal of all uncontrolled fill, including in-ground and stockpiles materials.
- Beneficial reuse of all uncontrolled fill on the site, including consideration of soil and ripped rock blending to enhance fill material quality.

- Adjustment of existing quarry wall alignments to account for total settlements and appropriate gradation of differential settlements creep settlements below warehouses, roads and services.
- Staging the overall development to allow deep controlled fill placed in Pits 1 and 2 to undergo creep settlement for at least 1 to 2 years before subdivisional and on-lot construction on the affected lots (particularly Units 12 and 13).
- Obtaining suitable granular fill from the import market at the time of earthworks to compliment the available site materials that are predominantly clayey.
- The possible need to construct capping layers or undertaken subgrade improvement by in situ stabilisation to facilitate cost effective pavement layer design and construction.
- Management of moderately and very saline soils and the development of an appropriate salinity management plan (SMP) to manage and guide earthworks and construction activities in highly saline environments.

8.2 Topsoils

The natural and filled topsoils on the site are estimated as being of medium to high plasticity and are currently wet and typically soft to firm. Their condition may have been exacerbated by recent heavy rainfall prior to our field investigation, however, long-term and ongoing irrigation on the site, together with cattle grazing suggests that their current condition may be more typical than otherwise anticipated. The topsoils support a thick grass cover and are heavily root affected.

Wet topsoils are generally harder to traffic, strip, stockpile, blend and de-vegetate than when dry. If opportunities are to be investigated for potential on-site reuse of inorganic topsoil at low blend ratios within the controlled fill, then it will be essential that the topsoils are dried from their current moisture condition before such options are feasible. Although topsoils will be required in open space, landscape and deep soil areas, opportunities to 'lose' topsoil into the adjoining lands to the east and west of the developable site area should be investigated.

The condition of the topsoil is such that after the stripping of organic and root affected ground, any remaining non-organic materials may be potentially suitable for reintroduction into the general fill volume provided it is suitably blended. Blending ratios would need to be determined by earthworks trials during construction, although a preliminary blend ratio of no more than one part topsoil with 20 parts natural soil/ripped rock is suggested (i.e. an approximate 5% maximum topsoil blend). It is noted, however, that even if a 5% blend can be achieved, it is unlikely that blending would account for any more than about 10% to 20% of the total topsoil volume on the site.

8.3 Alluvial Soils

The alluvial soils present throughout the eastern and part western areas of the site are likely to pose trafficability issues and may give rise to extensive rectifications or reworking of stripped surfaces prior to fill placement. Periodic flooding and shallow ephemeral groundwater seepages are likely to affect these soils, particularly near the tributary and billabong on the eastern part of the site, which may extend inside the developable area near Units 3B, 4 and 5.

The alluvial soils will have a higher salinity potential than the residual soils and thus consideration of these during cut and fill earthworks, and the installation of services will be required. Salinity

levels will require the need for increased concrete strengths and pipe classifications due to durability requirements (refer Section 18).

8.4 Residual Soils

The residual soils on the site are typically of low bearing strength due to their high plasticity and low shear strength. Although typical of other Western Sydney sites, marginally poorer conditions should be anticipated for this development site. Considerations for earthworks should include management of soil moisture contents, potential for soil heave during compaction, unfavourable stripped surface response to proof rolling and the need to moisture condition soils that are currently wet of their Standard optimum moisture content. Scattered areas of residual soil with a firm consistency have been identified on the site.

8.5 Rock

In situ rock has been shown to comprise siltstone and sandstone (i.e. sandstone beds formed in Bringelly Shale) of a typical very low to low strength at the rock surface. From the three cored boreholes, it is apparent that rock strengths increase with depth to low to medium strength and medium strength within the upper 4 m of the rock profile. This rock profile is likely to be capable of providing sufficient bearing capacity to satisfy most structural design requirements for this development.

Yet to be fully considered in the due diligence assessment are the two geological features affecting the site, including the Rossmore Anticline and Narellan Lineament. The Rossmore Anticline is associated with an arched shaped fold that is understood to be relatively gentle in its bedding angles. Rock bedding observations within Pit 1 generally indicate near-horizontal bedding, which was confirmed in the three cored boreholes (BH11, BH14 and BH15). Accordingly, it is unlikely that this feature will pose any significant effect on the site development. This will be assessed further prior to our final revision of this report.

Possibly concerning is the Narellan Lineament, which is understood to be a north to south aligned, deep-seated near-vertical normal fault in the underlying rock formation. Evidence of the fault can be seen in the northern face of Pit 2 where rock bedding is near-horizontal on the western side of Pit 2 but progressively steepens downwards on the eastern side of Pit 2. By comparison, rock bedding angles within the western part of Pit 1 again appear near-horizontal, indicating a potential fault line between Pit 1 and Pit 2. The effects of this are unlikely to pose any significant effects on the development. A second lineament crosses the eastern part of the site, however, it is likely that this lies outside of the developable site area.

8.6 On-site Stockpiled Materials

Site observations indicate a primary occurrence of clayey soils within most stockpiles on the site. Evidence of some ripped rock materials does exist, including sandstone tunnel spoil and ripped siltstone and shale, however, a significant predominance of clay is estimated.

Stockpiled materials primarily included various blends of silty clay, clay and gravelly clay with bricks, ripped shale cobbles and boulders and some foreign inclusions (foil, metal, plastic, concrete and tree branches). Based on the results of the test pits, the stockpiled materials appear generally suitable for reuse as fill but will require some conditioning to remove unsuitable soils (minor contents) and breakdown of larger rock particles.

8.7 Inground Uncontrolled Fill

The results of boreholes and test pits completed within areas of in-ground uncontrolled fill have predominantly identified clayey soils with some presence of ripped siltstone, shale and sandstone. The extent of the in-ground uncontrolled fill has been determined through the current field investigation program and through other available test pit and borehole data available in the data room. It is noted that there are some discrepancies between the data sets, which may be explained by localised deeper excavations that have since been backfilled.

Investigation of inground uncontrolled fill has been significantly limited by the presence of the largest stockpiles on the site being located directly over the estimated deepest areas of inground uncontrolled fill. Borehole drilling has been forced to commence up to 9 m higher than the surrounding base of stockpile ground surface levels, increasing the drilling lengths and extending the time required to complete the drilling. Areas not covered by our boreholes are affected by ground surface levels up to 15 m (or more) above the base of the stockpiles, which could conceivably increase borehole depths to as much as 45 m to find the deeper Pit 1 floor.

The main considerations required for inground uncontrolled fill is quantifying its volume to facilitate appropriate costing and the provision of allowances to deal with unsuitable materials that may be present.

8.8 Dam and Quarry Floor Sediments

Existing rural dams on the site have apparently been operational for several decades. It is likely that these dams will contain up to 0.5 m of sediment at their base following pump out of the dam waters. Further, it is reported by site personnel that Pit 1 is apparently affected by up to 2 m of sediment due to its use as a water storage body for many years. All sediments are likely to comprise blends of fine sand, silt and clay with little to no structure. The sediments are essentially saturated and very soft and will require significant drying and blending with other suitable soils before they can be beneficially reused, or otherwise 'lost' within the controlled fill volume.

8.9 Groundwater

It is anticipated that the regional groundwater table in the area would be relatively deep and within the underlying rock. Perched seepage flows are anticipated to occur along the soil and rock interface and may also occur within fractured bedrock or along the top of less permeable beds. Seepage flows are likely to increase following periods of extended wet weather. Isolated occurrences of groundwater were noted in the test pits and boreholes. Perched seepage is likely to pose some difficulty for excavations and fill placement, however, should be appropriately managed through normal catch drain methods. Any near-surface groundwater, including the removal of waters from the existing dams, pits and basins, may pose trafficability and material management issues if not properly controlled during the rehabilitation and bulk earthworks.

Subject to groundwater seepage source, if groundwater is received from the adjoining creek alignments, particularly Badgerys Creek to the west, there is a potential for the groundwater to have elevated Salinity levels.

9. Comments

9.1 Excavation and Site Stripping

Excavation will include the removal of existing stockpiles, in-ground uncontrolled fill, stripping of all vegetation and organic / root affected topsoil and localised areas of fill, as encountered across the site. Bulk excavation will require excavations of up to 8 m depth encountering mostly residual soils (possibly some alluvium), and rock likely grading from very low to medium strength. Further detailed excavations for footings and service trenches will also be required on completion of the bulk earthworks once building pads have been created for each warehouse.

Subject to the condition of the site at the time of excavation, some trafficability issues are likely to be experienced when stripping or excavating within the vicinity of existing dams and the lower lying areas in the eastern and western parts of the site. Further, trafficability will likely be problematic when dewatering and desilting dam, pit and basin floors.

Based on the test pit and borehole logs and anticipated development, excavation is likely to extend through all soil and rock profiles outlined in Section 5.2. The excavatability of the materials likely to be encountered during bulk and detailed excavation works is summarised in Table 8.

Table 8: Summary of Soil and Rock Excavatability

Material	Excavatability
Fill / Topsoil / Clay	Readily excavated using toothed buckets fitted to conventional excavators of medium or larger size.
Very Low to Low (VL-L) Strength Weathered Rock	The very low strength layers may be excavated using toothed buckets fitted to excavators, particularly if fitted with 'rock teeth'. Medium sized plant may be capable of completing excavation work, although larger plant may be required to achieve economic production. Sandstone beds within the siltstone and shale formation may pose high resistance to bucket excavation.
Medium Strength (M) and Stronger Rock	Large plant combined with heavy ripping, progressing towards the use of hydraulic rock hammers for upper medium and high strength rock, and for rock with few defects / discontinuities.

At this early stage of the project, it is not yet possible to accurately differentiate between the rock strengths and excavation volumes within the cuttings. Further geotechnical investigation will be required to provide this information. As a preliminary guide, it is considered that medium strength or stronger rock is likely to be encountered from depths of about 4 m below the rock surface.

9.2 Topsoil Stripping

Based on the total development area stated on the concept masterplan, together with test pit and borehole data, it is roughly estimated that 300,000 m^3 of topsoil (possibly more) may be present on the site. This is based on a typical average thickness of 0.3 m. All topsoils must be fully stripped, including fibrous rootlets and grubbing of more substantial roots (trees, etc.). Beneficial reuse of topsoil should also consider all applicable environmental (contamination) requirements.

9.3 Quarry Batters

It is recommended in Section 13 of this report that sections of the existing quarry batters in Pit 1 and Pit 2 are regraded to flatten their existing grade from approximately 1H:1V to either 2H:1V or 3H:1V. This is to facilitate gradation of differential settlements due to soil creep in deep fill. Flattening of quarry batters will need to be undertaken from a top-down approach and will require extensive ripping.

9.4 Disposal of Excavated Material

It should be noted that any off-site disposal of spoil will generally require assessment for re-use or classification in accordance with current *Waste Classification Guidelines* (NSW EPA 2014).

9.5 Excavation Induced Vibrations

Although vibrations are anticipated to be induced by heavy ripping or rock hammer excavations, the site is large and remote from adjoining properties. The effects of vibrations caused by rock excavation can essentially be ignored for this project.

10. Earthworks

10.1 General Cut to Fill

It is understood that cut and fill bulk earthworks following mine rehabilitation earthworks will require approximately 1.0 to 1.2 million cubic metres of fill placement and a smaller cut volume requiring importation of fill at some point during he works. Given the scale and complexity of the site developments, all earthworks must be accompanied by a rigorous geotechnical oversight, including a detailed programme of geotechnical inspections and tests consistent with a Level 1 standard, as defined in AS3798-2007. The scale of the earthworks suggests that an on-site soils laboratory may be required to adequately service the project.

10.2 Quarry Backfill

It is understood that cut and fill earthworks associated with the mine rehabilitation works (and possible quarry batter regrading earthworks) will require approximately 2.5 to 3.0 million cubic metres of earthworks. We note that the advice outlined in Section 10.1, applies equally to these works.

10.3 Specifications

The proposed rehabilitation and bulk earthworks scope is similar to that being completed for Goodman at the Oakdale East Estate site. It is recommended that all aspects of the earthworks specification in use at the Oakdale Easte Estate, prepared by DP, is adopted for Project Maverick. A copy of that specification has already been distributed to the wider Project Maverick consultant and contractor team, and we recommend that all earthworks approaches, civil designs, preliminary costings and budgets are based on that specification.

It is noted that CSR currently has an earthworks specification in use for the current mine rehabilitation earthworks. The specification was also prepared by DP and is closely aligned with

that in use at the Oakdale East Estate. It is noted that some differences do exist and that these should be reviewed prior to adopting a final specification for this project. It is possible that a hybrid form could be developed to better serve the earthworks, although it is likely that the works completed for the Oakdale East Estate (i.e. specification and other engineering reports) have already dealt with most issues likely to arise under this new project.

We suggest a specification review and workshop is held with Goodman, the civil designer and the contractor prior to commencing work on the site.

11. Retaining Walls

11.1 Batter Grades

To assist preliminary planning and costing, it is recommended that temporary batters of up to 4 m in height do not exceed the grades outlined in Table 9 during mine rehabilitation and bulk excavation and earthworks.

Table 9: Preliminary Maximum Batter Grades for Exposed Material (up to 4 m high)

Exposed Material	Maximum Temporary Batter Grade (H:V)	Maximum Permanent Batter Grade (H:V)
Uncontrolled Fill & Topsoil	1.5:1	2:1
Natural Soil & Controlled Fill	1:1	2:1
VL-L (Class IV#) Rock	0.75:1*	1:1
M (or stronger) Rock	0.25:1 to Vertical*	0.25:1 to Vertical*

Note: * Subject to further geotechnical investigation and inspections during excavation / construction.
Rock classification as suggested by Pells et al

For higher batters and steeper grades, it would be necessary to undertake geotechnical slope stability analyses to verify suitability. For permanent batters up to 4 m high, a flatter grade of 3H:1V (18 degrees) should be adopted if maintenance access is required (i.e. mowing, or similar). Permanent batters of more than 4 m high are not anticipated for this development. Flatter grades may also be appropriate for on-site temporary and permanent water bodies.

Retaining walls may also be required to retain slopes that are steeper than those outlined in Table 9. Several retaining walls are indicated in the general arrangement plan prepared by Arcadis.

11.2 Retaining Walls

Cut and fill walls are unlikely to exceed a maximum height of about 6 m on this project. It is anticipated that all retaining walls will be of a reinforced soil wall design adopting keystone block facing units with reinforcing grids locked in high quality ripped sandstone fill immediately behind the blocks. Subject to design loads, offsets to nearest warehouse structural and floor slab loadings and vehicular surcharges, experience indicates that the length of reinforcing grids typically lies between 0.8 and 1.2 times the wall height above foundation levels (i.e. including any wall embedment). Preliminary subdivisional layout design should allow sufficient space for retaining wall construction.

11.3 Nominal Design Parameters

Table 10 provides a list of nominal retaining wall design parameters that could be used for preliminary design and budget construction cost estimates.

Table 10: Nominal Retaining Wall Design Parameters

Soil/Rock Profile	Friction Angle Φ' (Degrees)	Cohesion c' (kPa)	Unit Weight γ' (kN/m3)
Retained Zone (Controlled Clayey Fill)	26	5	20
Retained Zone (Clay)	25	2 (Firm) / 5 (Stiff)	20
Foundation Zone (Weathered Siltstone)	30	10	22
Foundation Zone (Controlled Clayey Fill)	26	5	20
Foundation Zone (Clay)	25	2 (Firm) / 5 (Stiff)	20
Foundation Zone (Siltstone)	Impenetrable		
Retaining Wall	Impenetrable		
Foundation Allowable Bearing Pressure	150 – 200 kPa – Stiff Clay and Controlled Fill 700 – 1000 kPa – In situ weathered rock		

It is noted that effective drainage must be provided to prevent hydrostatic pressure behind the retaining wall and within the wall foundation.

Preliminary consideration of surcharge loads acting on retaining walls could adopt the following nominal parameters, although these should be subjected to review by the project's structural design consultant.

- Uniform Dead Load of 5 kPa for full wall width and further to the rear of the wall.
- Uniform Live Load of 20 kPa for traffic loads above the wall.
- Uniform Live Load of 40 kPa for internal racking loads within adjoining warehouses.
- Uniform live load of 150 kPa over a length of at least 2 m representing a pad footing located on the warehouse perimeter and over or nearby the retaining wall.

11.4 Specifications

The proposed retaining walls for Project Maverick are anticipated to be similar to those being designed and constructed for Goodman at the Oakdale East Estate site. It is recommended that all aspects of the retaining wall specification in use at the Oakdale Easte Estate, prepared by DP, is adopted for Project Maverick. A copy of that specification can be made available to the wider Project Maverick consultant and contractor team. We recommend that all retaining wall designs, preliminary costings and budgets are based on that specification.

12. Footings and Floor Slabs

12.1 Footing Types

The results of the investigation suggest that on completion of all earthworks, footings for new warehouses will most likely comprise shallow pads founding within the upper 1 m of the new controlled filling, natural clays and weathered bedrock. Alternatively, bored piles founding within the upper 1 m to 2 m of bedrock could be adopted, particularly in areas of deep filling, subject to column loads. Additionally, foundations formed in similar materials may also be required for retaining walls, signage and other isolated structures.

12.2 Nominal Design Parameters

The parameters listed in Table 11 are suggested for concept footing design and cost budgeting at this early stage of the development.

Table 11: Nominal Footing Design Parameters

Material	End Bearing (kPa)		Shaft Adhesion (kPa)	
	Allowable	Ultimate	Allowable	Ultimate
Existing Fill & Topsoil	0	0	0	0
Natural (Stiff or better) Soil & Controlled Fill	150	500	15	25
VL-L (Class IV) Rock	1000	3000	100	150
M (or stronger) Rock	2000 – 3,500	10,000 – 20,000	100 - 350	300 – 600

Notes: VL = Very Low Strength, L = Low Strength, M = Medium Strength
The values listed in Table 11 are subject to confirmation during construction.
Values for medium and stronger rock assume a minimum 0.5 m penetration of the footing into rock.

To confirm the appropriateness of the adopted design footing parameters, it is recommended that all footing excavations are subjected to geotechnical inspection and dynamic cone penetrometer testing (DCP, where applicable) during construction to verify that the listed bearing pressures are available.

Shallow footings founding near excavations (i.e. lift wells / pits, service trenches, OSD tanks or similar) must have all loads transferred to below an influence line inclined upwards at 1.5H:1V from the lowest and closest side of the excavation or trench base. Pad footings can be deepened to accommodate this load transfer or alternatively pile footings may be used.

Local variations in rock strength and depth may occur across the site. All pile or footing excavations in weathered rock should be inspected by a geotechnical engineer or engineering geologist and approved prior to concreting to confirm reduced pressures are not warranted due to extensively weathered or jointed zones.

Further geotechnical investigations should be undertaken to verify the suitability of the design parameters outlined in Table 11 prior to final design and construction.

13. Settlements

13.1 Elastic Settlement

Footings designed in accordance with the allowable parameters listed in Table 11 can be considered to undergo elastic settlements in the order of 1% of the footing width. In addition to elastic settlements, creep settlements may be experienced in controlled fills with total depths of more than about 5 m.

13.2 Creep Settlement

Based on the proposed bulk and mine rehabilitation earthworks, it is understood that the placement of controlled fill to depths of up to about 24 m will be required within the footprint of Pit 1, approximately 20 m within the footprint of Pit 2, and 17 m in Pit 3 (already placed). The change in fill thickness throughout the fill areas will be subject to possible rapid changes over relatively short plan distances where fill traverses buried quarry wall batters. Subject to the final scope of the rehabilitation earthworks, the change in fill thickness may occur over buried batters graded at between 1H:1V (45 degrees) to 3H:1V (18.5 degrees).

For fill areas where the thickness of fill is generally less than about 5 m, total settlements are anticipated to occur as an elastic response due to increased load from structures and, as such are estimated to be within the typical range commonly accounted for in structural design (i.e. up to 1% of the total footing width), with differential settlements approximately half that value.

For fill thicknesses in excess of 5 m, additional settlement considerations are required to account for long-term creep settlements associated with deep fill. These settlements are in addition to normal elastic settlements.

Creep settlement occurs due to the self-weight of the fill resulting in constant high stresses that cause consolidation of lower fill layers. Creep settlements will continue for many years after completion of earthworks and they are directly related to the type of fill, depth of fill and the degree of compaction applied. Creep settlement can be expressed as:

$$\text{Creep Settlement} = C\alpha \times \text{filling thickness} \times \text{change in log time}$$

Cα typically lies within the range of 0.35% to 0.5% for well compacted granular and clayey filling.

Important to the effects of creep settlement is the timing of fill placement and the change in thickness of fill across a site. The change in log time will be the time of assessment since placement of the fill. The depth of fill across the site can be determined from the work-as-executed, or design total earthworks thickness contours.

For preliminary purposes, it is considered that creep settlements at the Maverick site can be based on an average Cα of 0.35%, with a conservative assessment check adopting a Cα of 0.40%. The lower value results in estimated creep settlement of approximately 66.5 mm per log cycle of time for the maximum 24 m depth of fill. Table 12 (following page) provides preliminary estimates for the total creep settlements likely to occur for a range of development design periods and fill thicknesses following placement of the fill.

Table 12: Preliminary Estimates of Total Creep Settlement (Cα = 0.35%)

Fill Thickness (m)	Estimated Creep Settlement (mm) / Design Period				
	10 years	20 years	30 years	40 years	50 years
<5	Nil	Nil	Nil	Nil	Nil
6	3.5	4.6	5.2	5.6	5.9
8	10.5	13.7	15.5	16.8	17.8
10	17.5	22.8	25.8	28.0	29.7
12	24.5	31.9	36.2	39.3	41.6
14	31.5	41.0	46.6	50.5	53.5
16	38.5	50.1	56.9	61.7	65.4
18	45.5	59.2	67.2	72.9	77.3
20	52.5	68.3	77.5	84.1	89.2
22	59.5	77.4	87.9	95.3	101.1
24	66.5	86.5	98.2	106.5	113.0

It is important to note that any estimation of creep settlement is prone to a high degree of uncertainty. The estimates presented in Table 12 should be considered as having a potential variation of up to ±25%.

Differential settlements can be determined by calculating the difference in total creep settlements for any two given points of known fill thickness. Where fill depths change rapidly over short plan distances, differential settlements will be high and potentially close to the total creep value.

To alleviate the effects of creep settlement on the structural design of buildings, floor slabs, inground significant services and pavements, consideration could be given to stiffening footing and slab systems across site areas underlain by deep fill and the intervening fill depth transition zones. The installation of controlled modulus columns (CMCs) could be used to reduce the total and differential settlements by improving the overall strength and modulus of the fill placed. This is particularly prudent where only parts of structures are underlain by deep fill, such as where proposed Units 6 and 7 pass over the steep inclined buried batters of Pit 3, and Units 11, 12 and 13 where they pass over buried batters associated with Pits 1 and 2.

As an alternative to using CMCs, regrading of quarry batters to a maximum grade of 3H:1V may be sufficient (subject to structural design review) to sufficiently grade the differential effects of creep settlement to negate the need for CMCs. A preliminary model for an earthworks quarry wall batter regrading is shown on the marked up copy of the combined site survey presented in Appendix B.

14. Site Classification

Although the proposed development will be of an industrial warehouse nature, it is important to note that the results of the shrink swell index, Atterberg limits and CBR tests have indicated a moderate to high susceptibility of the natural clays to undergo considerable shrink and swell movement as a result of changes in ground moisture contents (i.e. seasonal, or otherwise).

Based on the test results and ignoring any stockpiles or areas of localised existing fill, the plasticity and thus reactivity of the soils at the site are generally considered representative of Class M to Class H1 conditions when assessed in accordance with AS2870-2011. As a preliminary guide, the site conditions should be assumed to be equivalent to at least Class H1. The presence of trees will result in abnormal moisture variation and more severe classification.

15. Pavements

15.1 Road Classifications and Types

Road classifications indicated on the concept masterplan include the future eastern ring road, a primary arterial road, collector roads and local streets. Excluding the local streets, other road categories will likely require approval from both state and/or local government departments, the ring road and arterial road are likely to be of substantial construction thickness due to high anticipated design traffic loads and low subgrade CBR values.

15.2 Road Subgrades

With proper earthworks management and attention to detail when stripping and preparing road subgrades, it is considered that the site's soils will be capable of providing support to new pavements. That said, there is likely to be a need to include subgrade improvement works including subgrade capping or in situ lime stabilisation of low CBR natural clays. A provisional allowance for these costs is recommended.

15.3 Nominal Design Parameters

Based on the laboratory test results presented in Section 6.2, Table 3, it is recommended that a preliminary design CBR value of 3% is adopted for this site. Subsoil drains will need to be installed on both sides of all roads at depths of at least 0.6 m below subgrade levels throughout their full length.

16. Salinity

16.1 Salinity Test Results

The NSW Salinity Potential map for Western Sydney indicates moderate, high and known salinity potential categories apply to this site (refer Section 3.5). The test results obtained for samples subjected to salinity analysis indicate ranged values from non-saline to very saline, suggesting that the mapping is generally an accurate representation of the salinity conditions.

Soil salinity is assessed with respect to electrical conductivity after conversion of the result to EC_e (electrical conductivity of a saturated extract) by multiplication with a factor dependent on soil texture. Once converted, the EC_e value is compared to the guideline ranges listed in Table 13.

Table 13: Soil Salinity Classification

Class	EC_e (dS/m)	Implication
Non-Saline	<2	Salinity effects mostly negligible
Slightly Saline	2 – 4	Yields of sensitive crops effected
Moderately Saline	4 – 8	Yields of many crops effected
Very Saline	8 – 16	Only tolerant crops yield satisfactorily
Highly Saline	>16	Only a few very tolerant crops yield satisfactorily

During the site assessment, samples from the upper 3.5 m of the soil profile were collected from six test pits scattered across the site. This level of assessment is of a preliminary nature only with a higher sampling density required to fully characterise the site. A total of 18 samples underwent chemical testing in a preliminary attempt to 'ground truth' the relevance of the mapped conditions. The results of the testing (Section 6.2, Table 7) show that non, slightly, moderately and very saline soil conditions are present on the site. Given the results obtained, it will be necessary undertake additional site investigations and to prepare an appropriate salinity management plan (SMP) to guide the civil constructions and earthworks.

16.2 Assessment of Salinity Risks

With respect to salinity risks, the site has been preliminarily assessed by chemical means, indicating that non, slightly, moderately and very saline soils are present. Higher salinity levels are typically associated with the alluvial soils present along the eastern and western edges of the site. The results suggest that the salinity of the soil increases with depth and is generally favourable in the upper 0.5 m to possibly 1 m depth.

In consideration of salinity risk management, strategies are required for salinity levels of moderately saline and higher. The assessment has shown that soils below a depth of 1 m typically fall into this category. Accordingly, where fill is to be placed, moderately and very saline soils will only be an issue if detailed excavations or services trenches extend more than 1 m into the underlying natural soils. Where cutting is required to depths of more than 1 m, moderately and very saline soils will be routinely intersected and probably transported to adjacent fill areas. Earthworks should be designed so that the moderately and very saline soils are preferentially excavated and placed deep within fill areas and below the influence zone of new structures and their associated excavation and trenching depths. This may require some specific consideration during the positioning of any proposed buried on-site detention tanks.

Earthworks design further highlights the need for the preparation of a salinity management plan. Control measures that are likely to form part of the plan may include the use of higher strength concrete in footings and buried services / pipes, the potential lining of service trenches and controls on the order of excavation and replacement of site won soils during earthworks.

17. Soil Erosion

The results of Emerson class number tests indicate a high potential for soil slaking and a slight to moderate potential for soil dispersion. All samples tested resulted in Class 2 (Section 6.2, Table 5), which is typical for residual and alluvial soils overlying Bringelly Shale in Western Sydney. Sodicity test results support the Emerson test results.

Soils on the site will require ongoing management once topsoils are stripped to mitigate the effects of soil erosion. Similarly, site won clays are unlikely to be suitable for use as clay liner materials for temporary or permanent basins.

18. Soil Aggressivity

Provided the samples analysed represent the broader soils present at the site, then the soil conditions can be considered as being non-aggressive to mildly aggressive to buried concrete and moderately aggressive to buried steel elements. Aggressivity is elevated due to acidic soils (low pH) and electrical conductivity/resistivity test results. The aggressivity assessment is made with reference to the guidelines given within Australian Standard AS2159 (2009).

19. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at 265 Martin Road, Bradfield NSW in line with DP's proposal dated 20 February 2025 and acceptance received from Lachlan O'Reilly of Goodman Property Services (Aust) Pty Ltd dated 23 May 2025. The work was carried out under the agreed contractual terms. This report is provided for the exclusive use of Goodman Property Services (Aust) Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

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

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

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

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

The scope of work for this investigation did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of fill of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such fill may contain contaminants and hazardous building materials.

Appendix A

About this Report

About this Report

October 2024

Introduction

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

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

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Engagement Terms for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

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

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

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

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

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

Site Inspection

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

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Appendix B

Drawings

PROPOSED LOT SCHEDULE

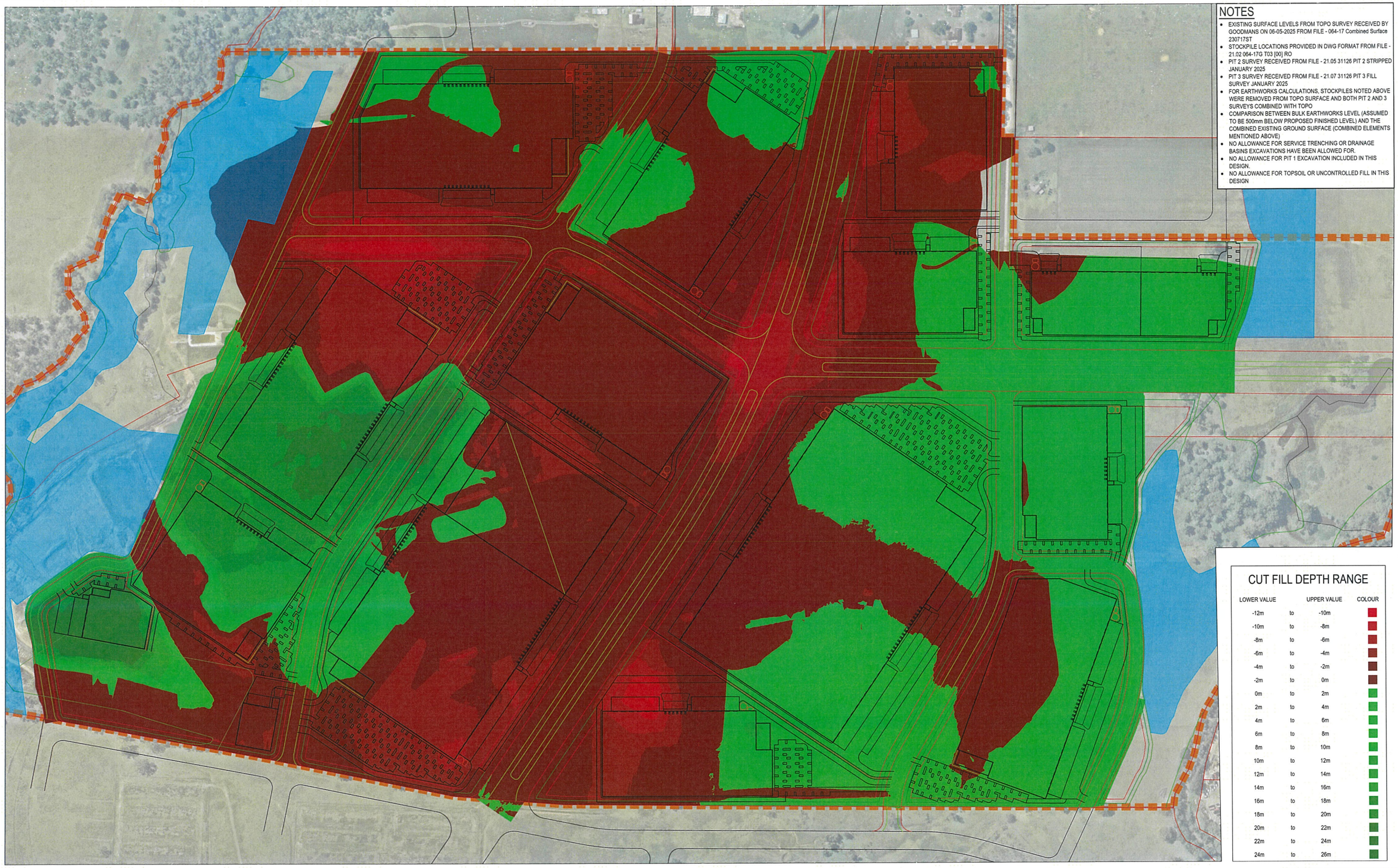
LOT #	GLA	LOT AREA
LOT 1	26,750 sqm	47,722 sqm
LOT 2	22,050 sqm	45,276 sqm
LOT 3	20,300 sqm	46,436 sqm
LOT 4	22,850 sqm	48,031 sqm
LOT 5	40,050 sqm	73,099 sqm
LOT 6	103,100 sqm	181,185 sqm
LOT 7	29,050 sqm	69,534 sqm
LOT 8	41,050 sqm	80,511 sqm
LOT 9	42,200 sqm	91,737 sqm
LOT 10	42,150 sqm	72,126 sqm
LOT 11	103,100 sqm	172,829 sqm
LOT 12	57,600 sqm	106,890 sqm
LOT 13	38,050 sqm	73,373 sqm
LOT 14	3,300 sqm	8,148 sqm

DEVELOPMENT AREA SCHEDULE

TOTAL SITE AREA	1,958,062 sqm
ENVIRONMENT & REC (ENZ)	384,058 sqm
STORM., OPEN SP. & DRAIN.	102,903 sqm
HIGH BIODIVERSITY VALUES	452 sqm
ACTIVE OPEN SPACE	26,979 sqm
PRIMARY ARTERIAL ROADS	137,259 sqm
COLLECTOR ROADS	71,773 sqm
RIPARIAN STREETS	15,798 sqm
TRUNK DRAINAGE	12,450 sqm
LOCAL STREETS	38,352 sqm
WEST RESIDUAL LAND	45,113 sqm
BASIN	6,028 sqm
DEVELOPABLE SITE AREA	1,116,897 sqm
WAREHOUSE	565,900 sqm
OFFICE (2 LEVELS)	24,800 sqm
DOCK OFFICE (1 LEVEL)	900 sqm
TOTAL BUILDING AREA	591,600 sqm
AWNING (20m)	63,549 sqm
AWNING (3m)	3,356 sqm
EFFICIENCY	53.0 %
HARDSTAND PAVEMENT	226,697 sqm
LIGHT DUTY PAVEMENT	72,999 sqm
CARPARKING MINIMUM	2,529 spaces
CARPARKING PROPOSED	2,533 spaces

design+ | Project Maverick | **Concept Masterplan** | 1:4000 @ A1 1:8000 @ A3 | 29 May 25 KG | MAR MP06 (A)

0 80 400



NOTES

- EXISTING SURFACE LEVELS FROM TOPO SURVEY RECEIVED BY GOODMANS ON 06-05-2025 FROM FILE - 064-17 Combined Surface 230717ST
- STOCKPILE LOCATIONS PROVIDED IN DWG FORMAT FROM FILE - 21.02 064-17G T03 [00] RO
- PIT 2 SURVEY RECEIVED FROM FILE - 21.05 31126 PIT 2 STRIPPED JANUARY 2025
- PIT 3 SURVEY RECEIVED FROM FILE - 21.07 31126 PIT 3 FILL SURVEY JANUARY 2025
- FOR EARTHWORKS CALCULATIONS, STOCKPILES NOTED ABOVE WERE REMOVED FROM TOPO SURFACE AND BOTH PIT 2 AND 3 SURVEYS COMBINED WITH TOPO
- COMPARISON BETWEEN BULK EARTHWORKS LEVEL (ASSUMED TO BE 500mm BELOW PROPOSED FINISHED LEVEL) AND THE COMBINED EXISTING GROUND SURFACE (COMBINED ELEMENTS MENTIONED ABOVE)
- NO ALLOWANCE FOR SERVICE TRENCHING OR DRAINAGE BASINS EXCAVATIONS HAVE BEEN ALLOWED FOR.
- NO ALLOWANCE FOR PIT 1 EXCAVATION INCLUDED IN THIS DESIGN.
- NO ALLOWANCE FOR TOPSOIL OR UNCONTROLLED FILL IN THIS DESIGN

CUT FILL DEPTH RANGE

LOWER VALUE		UPPER VALUE	COLOUR
-12m	to	-10m	
-10m	to	-8m	
-8m	to	-6m	
-6m	to	-4m	
-4m	to	-2m	
-2m	to	0m	
0m	to	2m	
2m	to	4m	
4m	to	6m	
6m	to	8m	
8m	to	10m	
10m	to	12m	
12m	to	14m	
14m	to	16m	
16m	to	18m	
18m	to	20m	
20m	to	22m	
22m	to	24m	
24m	to	26m	

Issue	Description	DR	CH	VE	Date
03	ISSUED FOR INFORMATION	CF	-	-	15.05.25
02	ISSUED FOR INFORMATION	CF	-	-	13.05.25
01	ISSUED FOR INFORMATION	CF	-	-	10.05.25

Scales

N

0 50 100 150 200 250m

1 : 2500

Surveyor

-

Architect

-

Client

-

Status

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	C.FANNER	Original Size	A1
Designed	C.FANNER	Height Datum	AHD
Project Manager	K.MCAREAVEY	Grid	
Verified			

Project

PROJECT MAVERICK

Title

EARTHWORKS OPTION 2 & PIT 1
EXCAVATION PLAN

ARCADIS

Arcadis Australia Pacific Pty Limited
Level 16, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289

Tel No: +61 2 8907 9000
www.arcadis.com/au

Project Number: 30271198

Drawing No.: MAR-AAP-DA-00-SKT-CI-0008

Issue: 03

100mm or Original

Date Plotted: 15 May 2025 - 11:55AM File Name: C:\Users\cf109030\DC\ACCDocs\Arcadis ACC AU\AAU-30271198-265 Martin Road\Project Files\10_WIP\10_Civil\STG_00\DRG\MAR-AAP-DA-00-SKT-XX-0008-EarthworksOP2&Pit1ExcavationPlan.dwg

REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
1	Test Location Plan	19.06.2025	AT

SCALE: 0 50 100 150 200 m
1:7500 @ A3

Douglas PARTNERS
OFFICE: SYDNEY
96-98 Hermitage Rd, West Ryde NSW 2114
(02)9809 0666

CLIENT:
Goodman Property Services (Aust) Pty Ltd

NOTE:
1: Basemap from MetroMap (Dated 23.02.2025

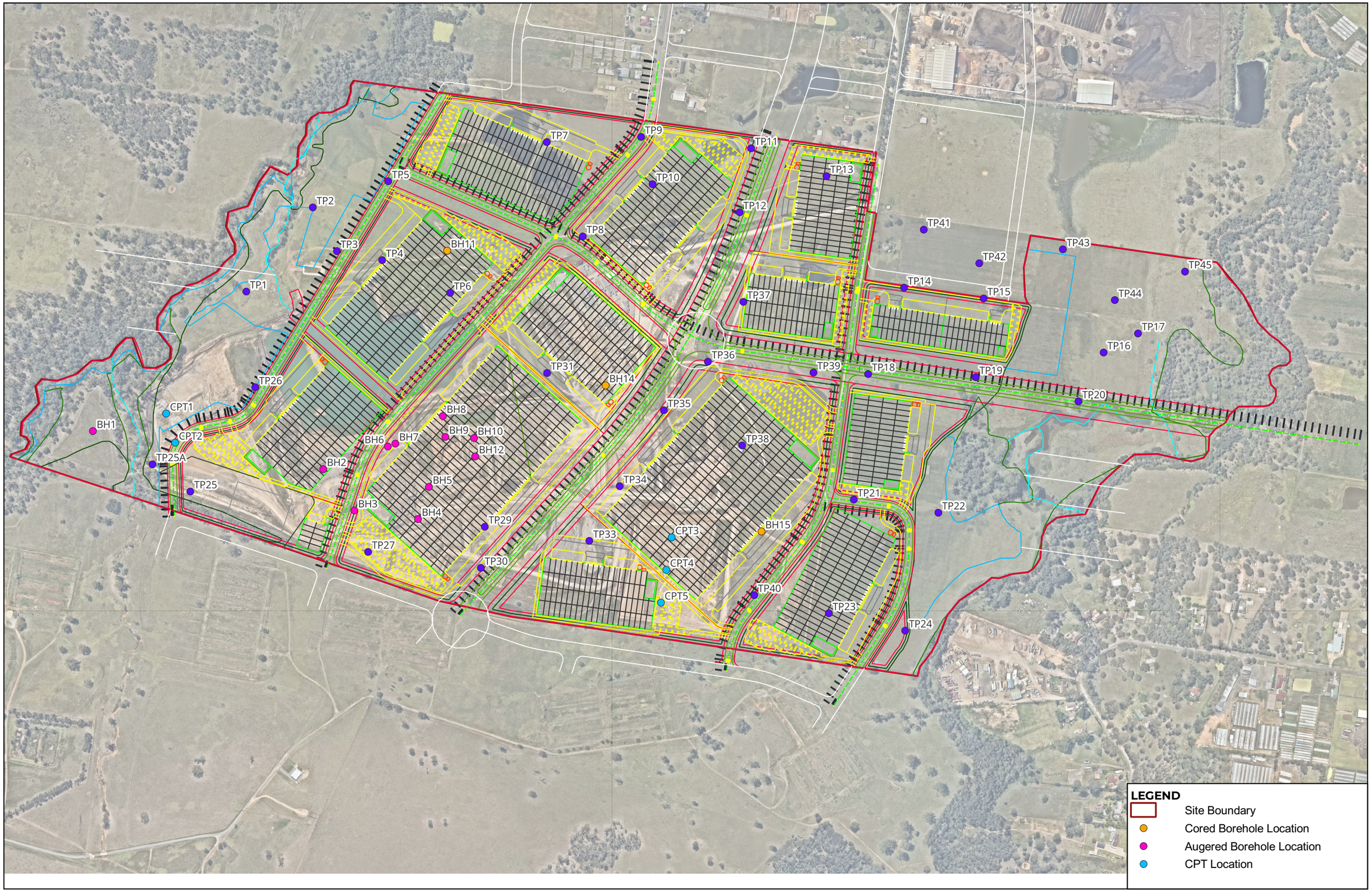
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 56

PROJECT NAME:
Project Maverick

PROJECT ADRESS:
265 Martin Road, Bradfield

DRAWING TITLE:
Test Location Plan

PROJECT NO: **234411.00**
DRAWING NO: **1**
REVISION: **1**



REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
1	TEST LOCATION ON PROPOSED	19.06.2025	AT
	DEVELOPMENT PLAN		

SCALE: 0 50 100 150 200 m
1:7500 @ A3

N

Douglas PARTNERS
OFFICE: SYDNEY
96-98 Hermitage Rd, West Ryde NSW 2114
(02)9809 0666

CLIENT:
Goodman Property Services (Aust) Pty Ltd

NOTE:
1: Basemap from MetroMap (Dated 23.02.2025
2: Baseplan from MAR-AAP-DA-02-XRF-CI-0220-RoadAlignments KMZ file.

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 56

PROJECT NAME:
Project Maverick

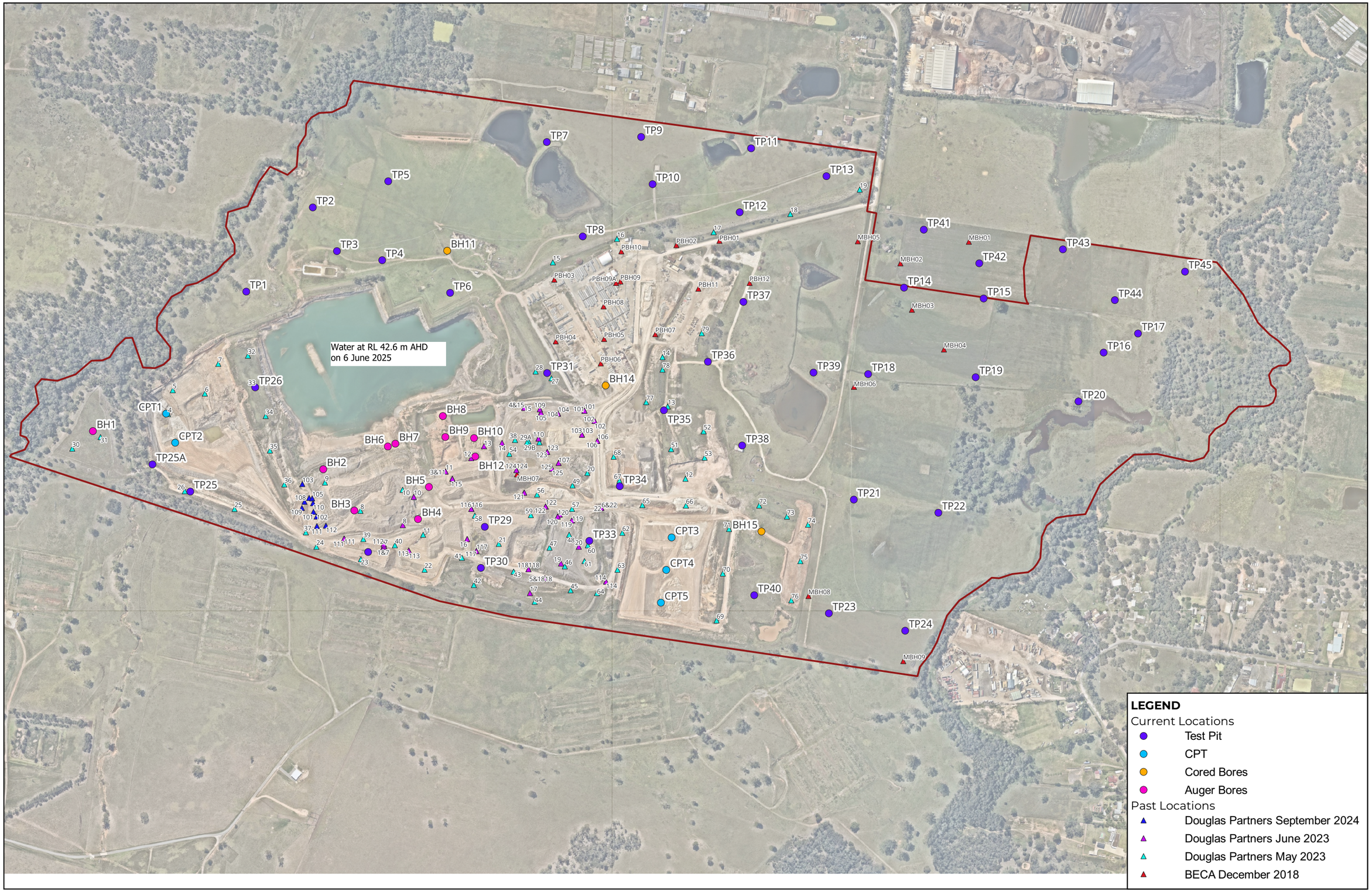
PROJECT ADRESS:
265 Martin Road, Bradfield

DRAWING TITLE:
Test Location on Proposed Development Plan

PROJECT NO: **234411.00**

DRAWING NO: **2**

REVISION: **1**



REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0	PAST TESTS	19.06.2025	AT

SCALE: 0 50 100 150 200 m
1:7500 @ A3

Douglas PARTNERS
OFFICE: SYDNEY
96-98 Hermitage Rd, West Ryde NSW 2114
(02)9809 0666

CLIENT:
Goodman Property Services (Aust) Pty Ltd

NOTE:
1: Basemap from MetroMap (Dated 23.02.2025

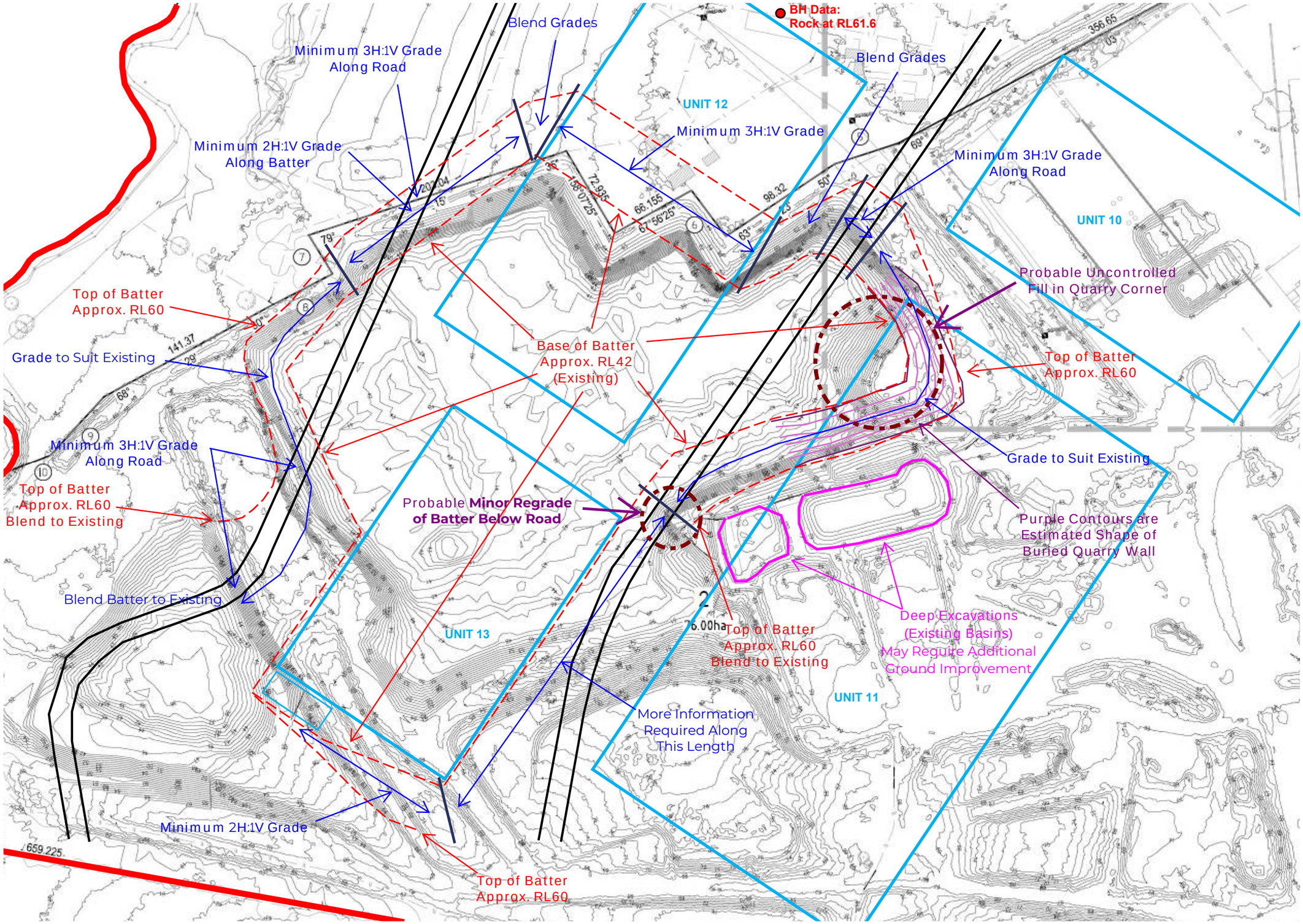
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 56

PROJECT NAME:
Project Maverick

PROJECT ADRESS:
265 Martin Road, Bradfield

DRAWING TITLE:
Test Location Plan With Past Tests

PROJECT NO: **234411.00**
DRAWING NO: **3**
REVISION: **0**

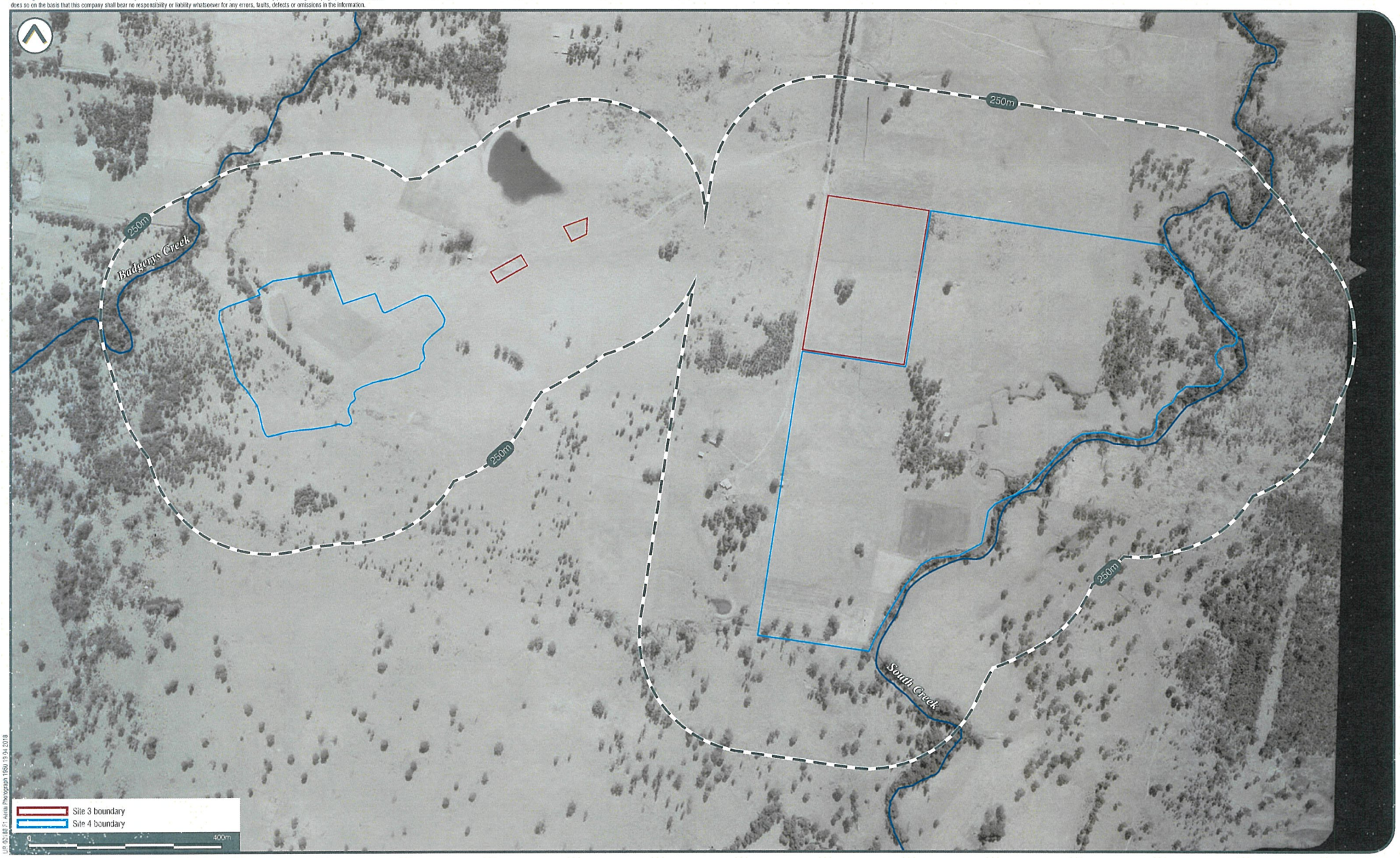


Combined Survey Plan with Batter Regrade Mark Up

Appendix C

Historical Aerial Photographs

Land Insight & Resources do no warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that this company shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



LIR_QLD_Fl - Aerial Photograph 1950 / 19.04.2018

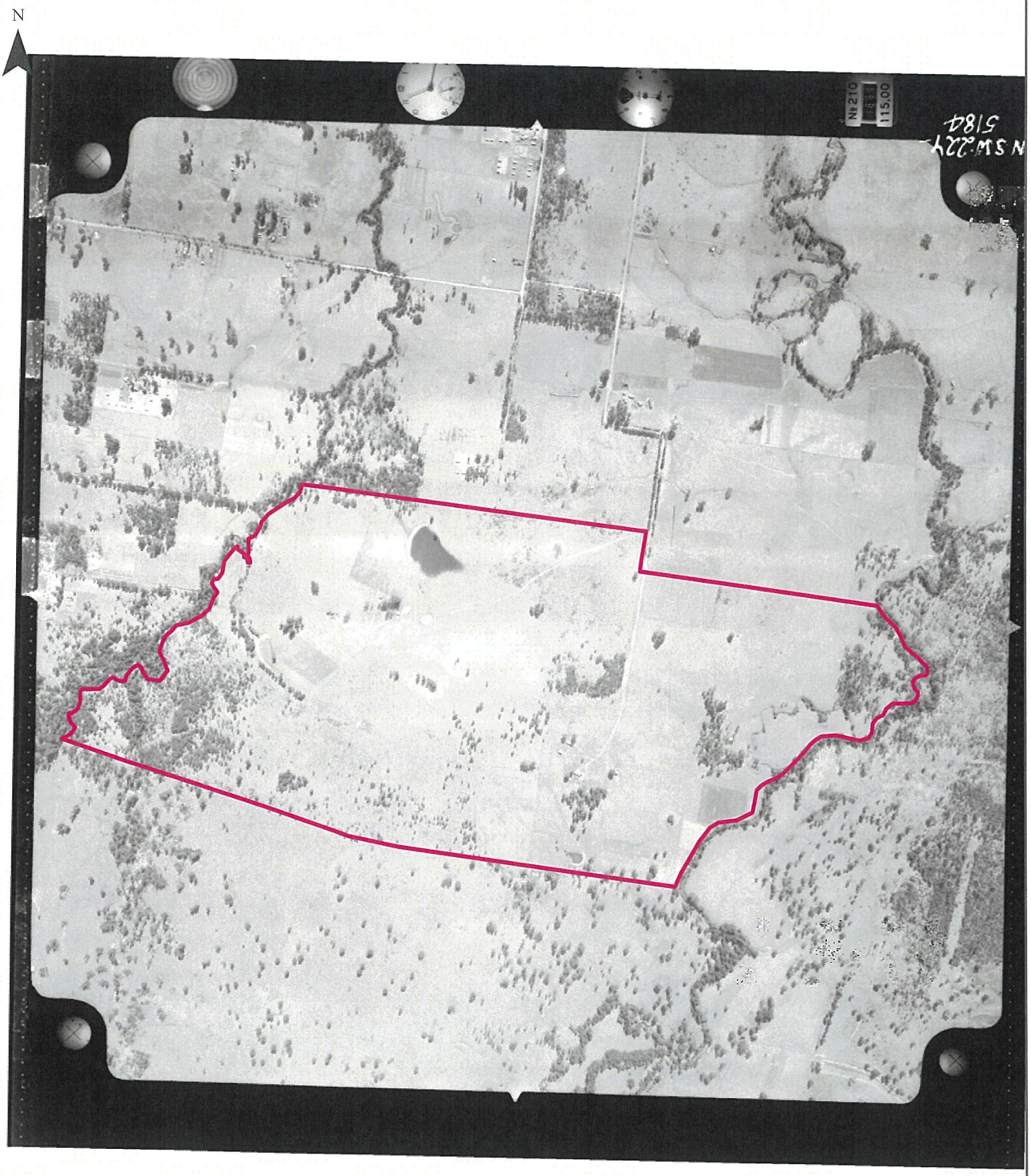
HISTORICAL AERIAL PHOTOGRAPHY - 1950

LAND INSIGHT & RESOURCES

MAP 1

Aerial Imagery 1955

235 Martin Road, Badgerys Creek, NSW 2555



Legend

Site Boundary

Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 13 December 2019
0 210 420 630 840 Meters	© NSW Department Finance, Services & Innovation	GDA 1994 MGA Zone 56	

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LR-001g-F1 Aerial Photograph 1961-19-04-2018

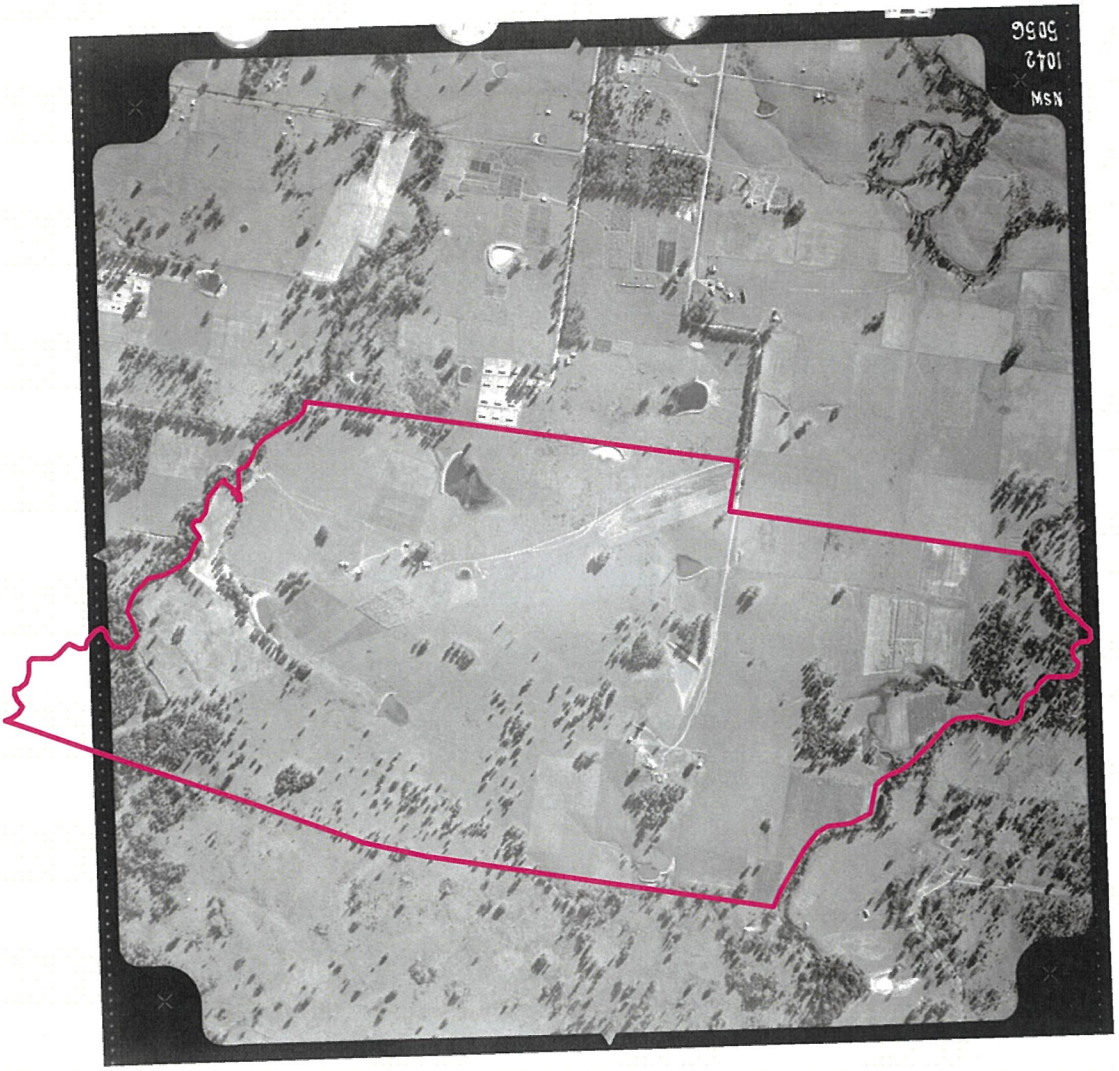
HISTORICAL AERIAL PHOTOGRAPHY - 1961

LAND INSIGHT & RESOURCES

MAP 2

Aerial Imagery 1961

235 Martin Road, Badgerys Creek, NSW 2555



Legend

Site Boundary

Scale:

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Meters

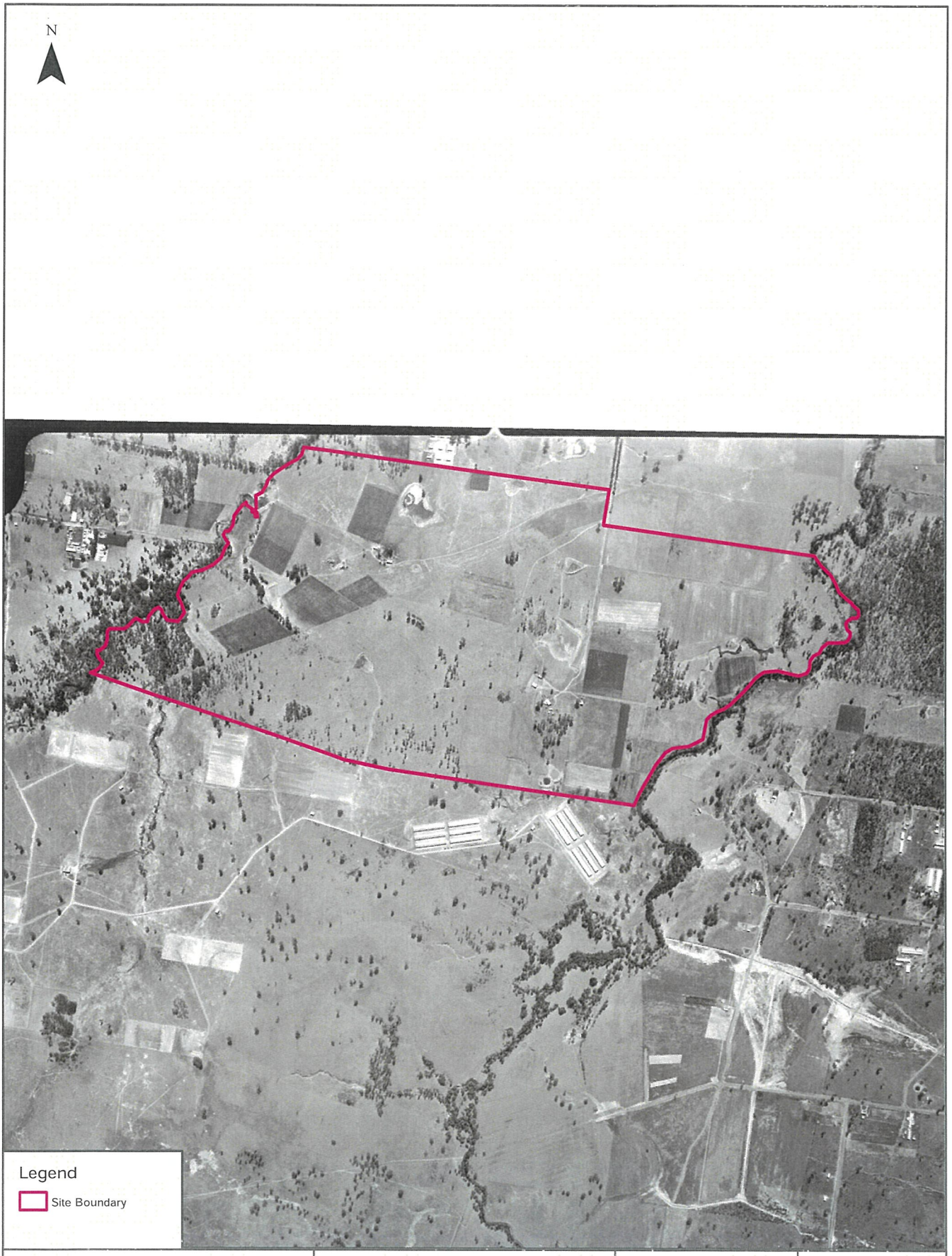
Data Source Aerial Imagery:
© NSW Department Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 13 December 2019

Aerial Imagery 1965

235 Martin Road, Badgerys Creek, NSW 2555



Scale:
0 210 420 630 840
Meters

Data Source Aerial imagery:
© NSW Department Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 13 December 2019

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LI-00182 F3 Aerial Photograph 1970 15 04 2018

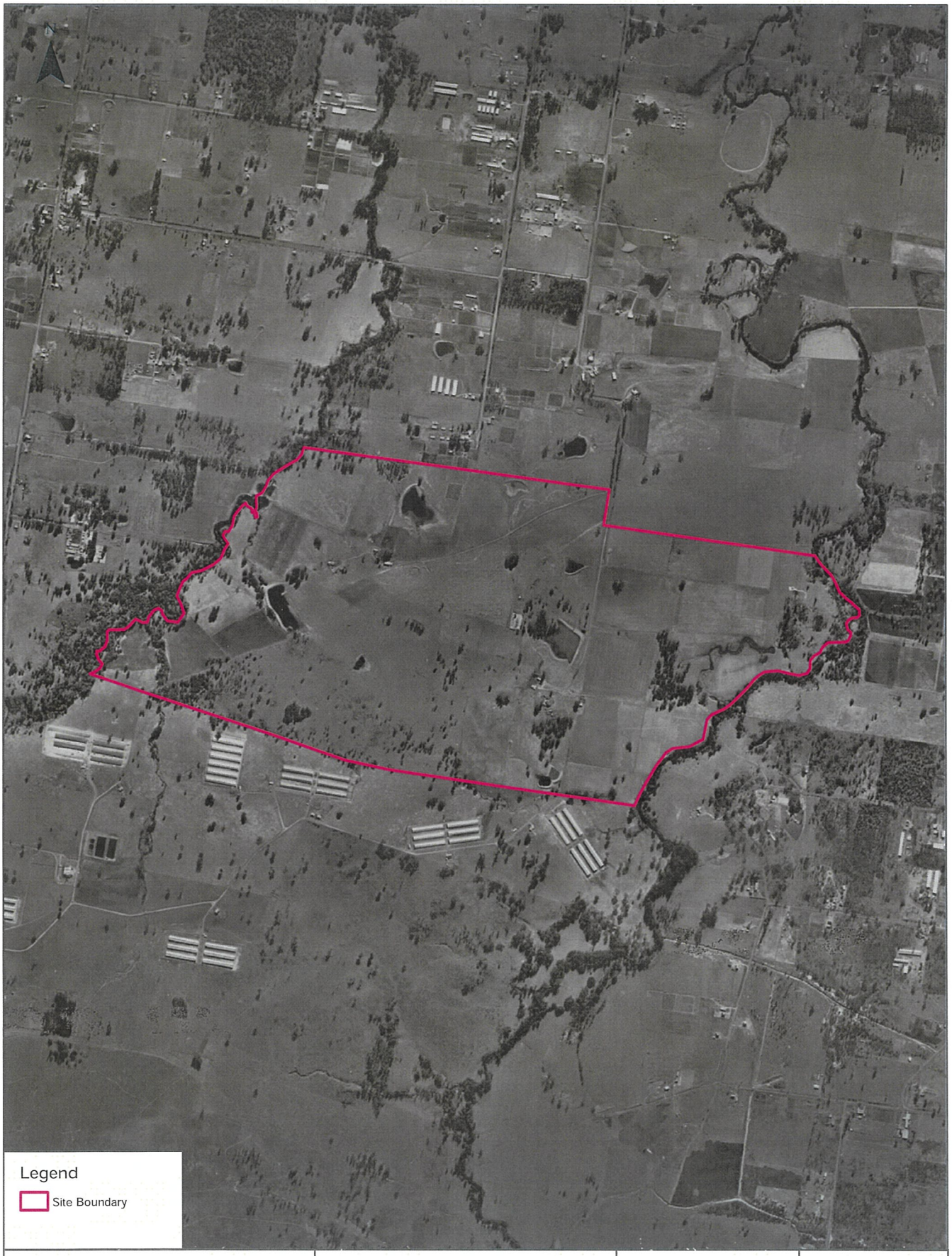
HISTORICAL AERIAL PHOTOGRAPHY - 1970

LAND INSIGHT & RESOURCES

MAP 3

Aerial Imagery 1970

235 Martin Road, Badgerys Creek, NSW 2555



Scale:	Data Sources: Aerial Imagery © Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 16 December 2019
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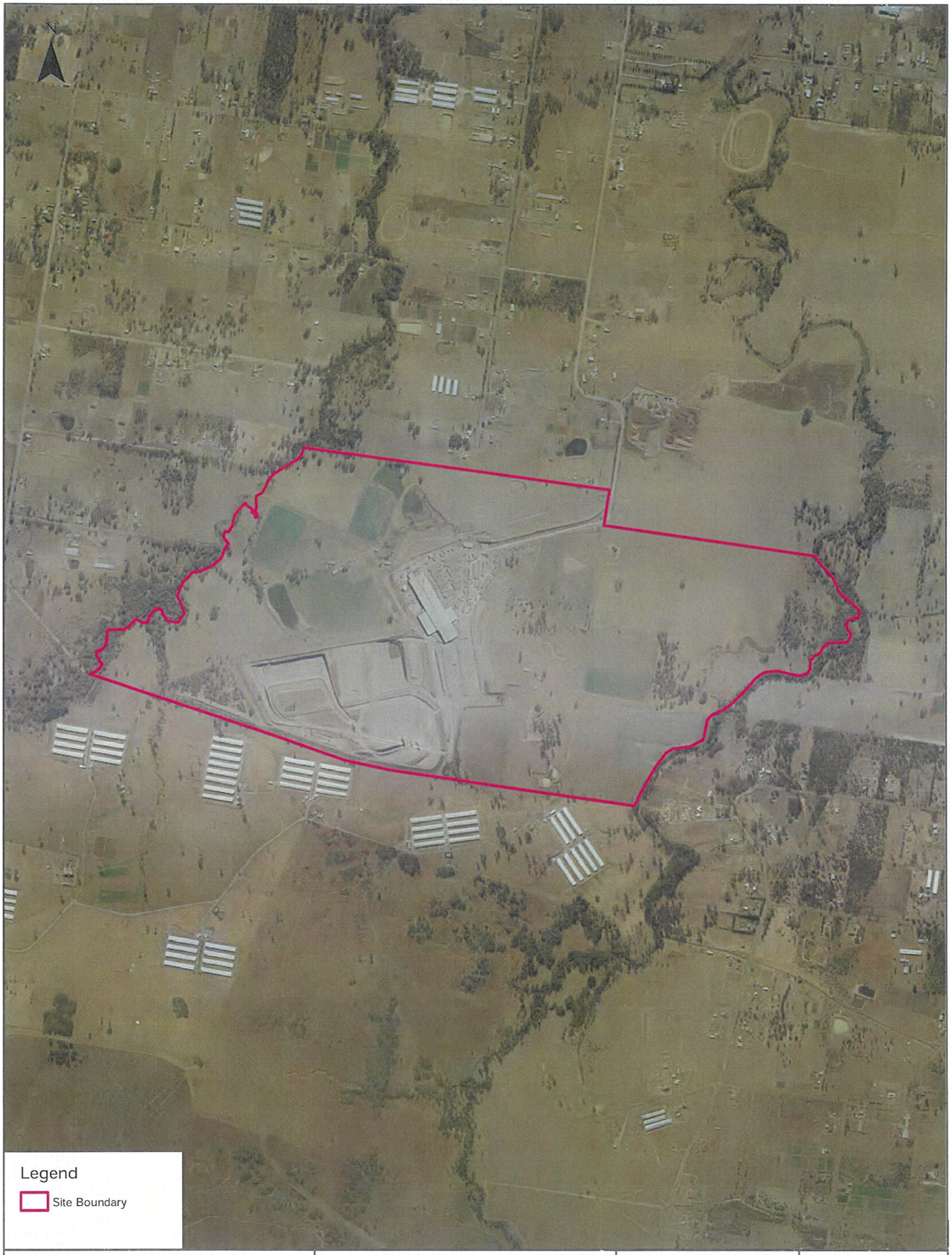
Aerial Imagery 1982

235 Martin Road, Badgerys Creek, NSW 2555



Scale:	Data Sources: Aerial Imagery © Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 16 December 2019
0 210 420 630 840 Meters			

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LIR-00188 Fig Aerial Photograph 1986 19.04.2018

HISTORICAL AERIAL PHOTOGRAPHY - 1986

LAND INSIGHT & RESOURCES

MAP 4

Aerial Imagery 1991

235 Martin Road, Badgerys Creek, NSW 2555

Scale:

0 210 420 630 840
Meters

Data Sources: Aerial Imagery © Department of Finance, Services & Innovation

Coordinate System: GDA 1994 MGA Zone 56

Date: 16 December 2019

Aerial Imagery 1994

235 Martin Road, Badgerys Creek, NSW 2555

Legend

Site Boundary

Buffer 150m

Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 16 January 2020
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Aerial Imagery 1998

235 Martin Road, Badgerys Creek, NSW 2555

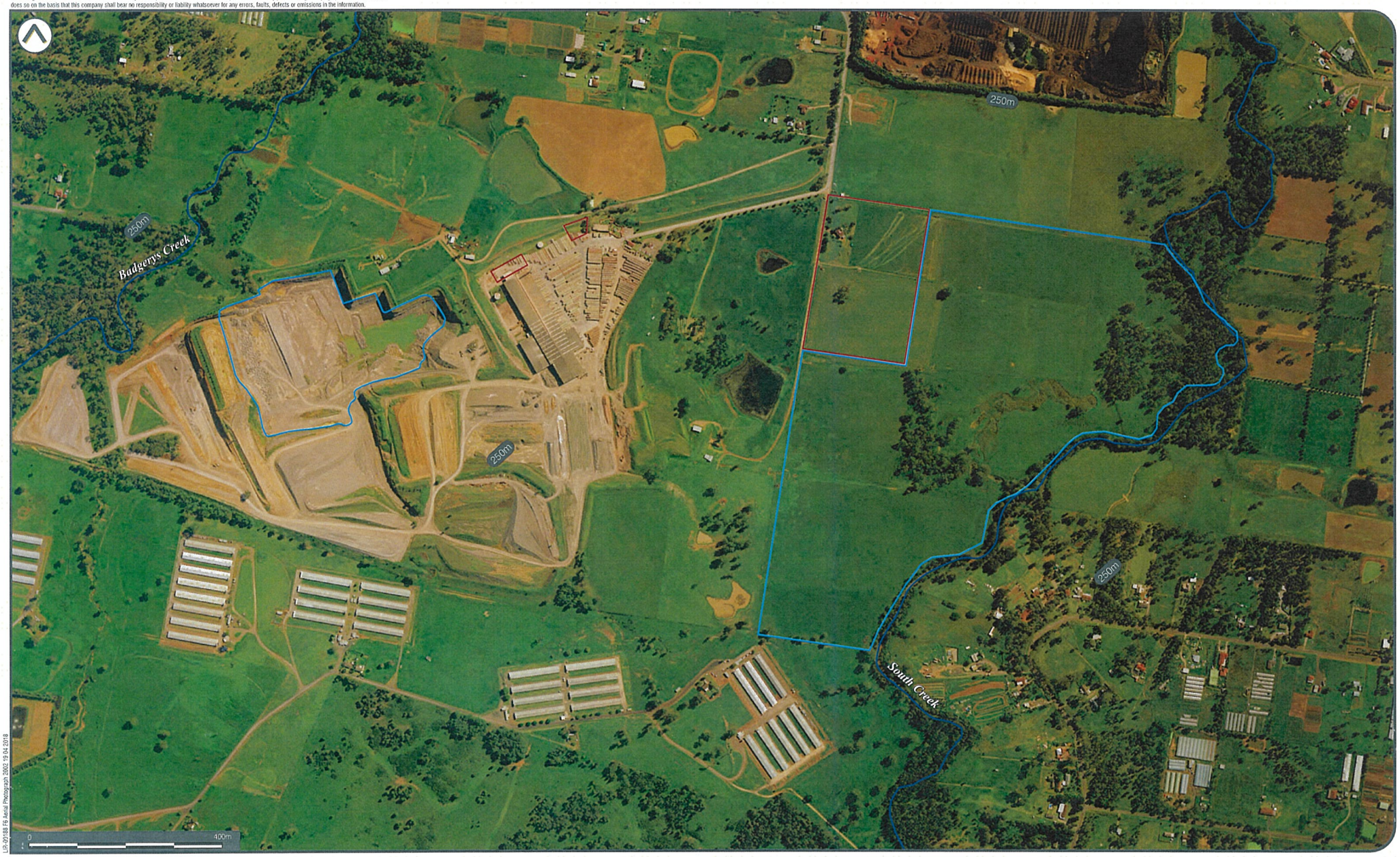
Scale:
0 210 420 630 840
Meters

Data Source Aerial Imagery:
© NSW Department of Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 16 January 2020

Land Insight & Resources do no warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that this company shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



LR-02168 F6 Aerial Photograph 2002 19.04.2018

HISTORICAL AERIAL PHOTOGRAPHY - 2002

LAND INSIGHT & RESOURCES

MAP 6

Aerial Imagery 2005

235 Martin Road, Badgerys Creek, NSW 2555

Scale:
0 210 420 630 840
Meters

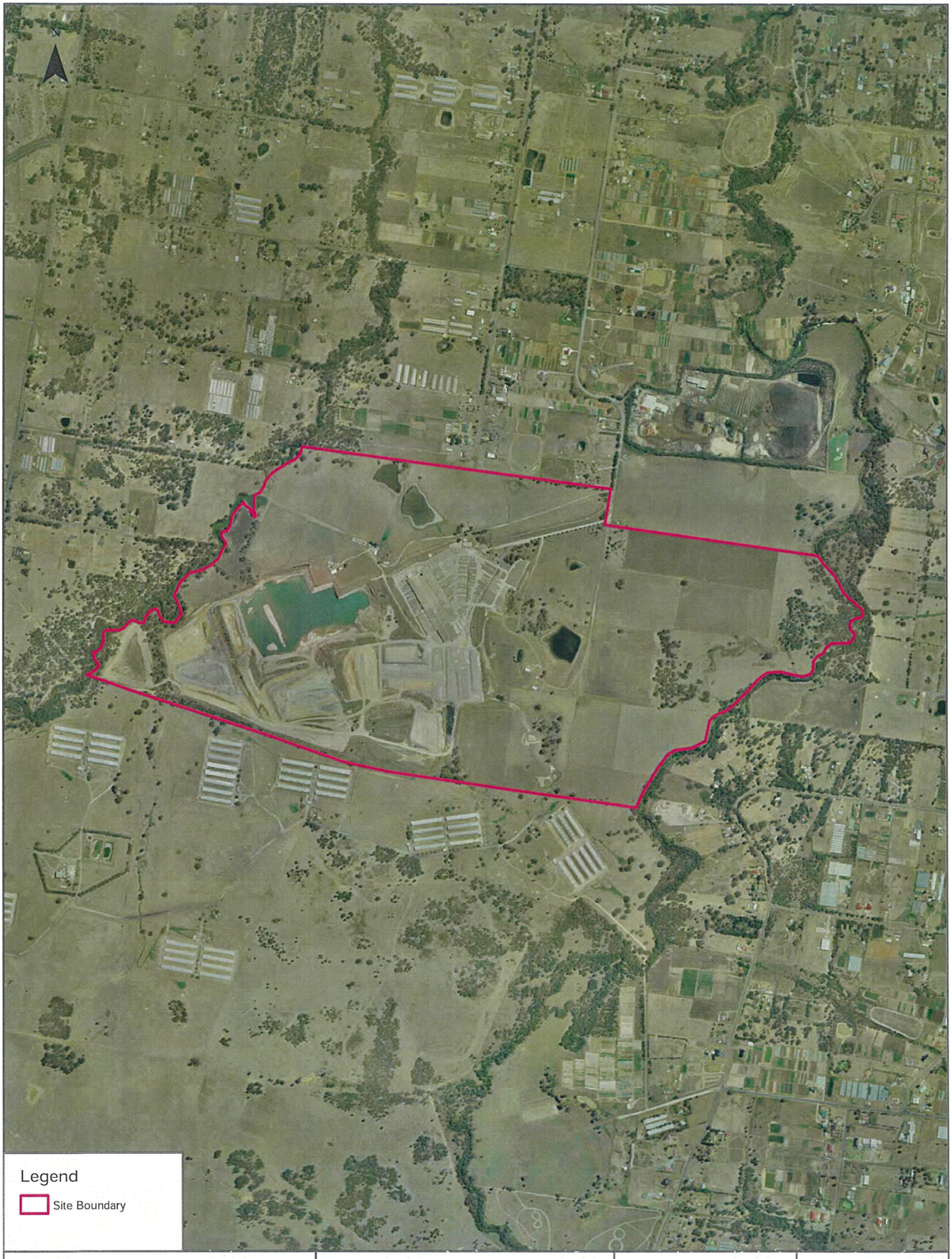
Data Sources Aerial Imagery: © Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 56

Date: 16 January 2020

Aerial Imagery 2007

235 Martin Road, Badgerys Creek, NSW 2555



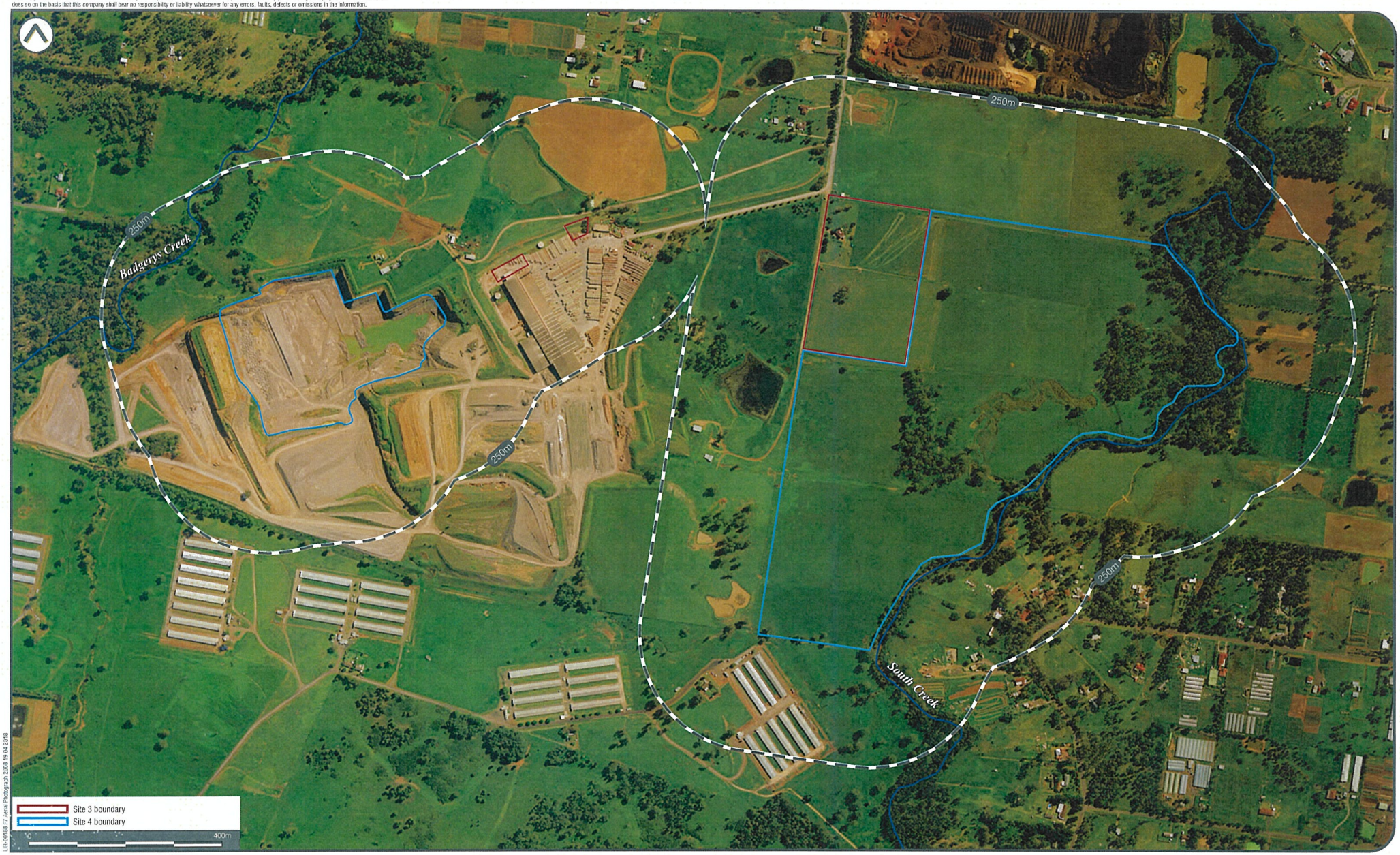
Scale:
0 210 420 630 840
Meters

Data Sources: Aerial Imagery © Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 56

Date: 16 December 2019

Land Insight & Resources do no warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that this company shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



LIR-00168 F7 Aerial Photograph 2008 19.04.2018

HISTORICAL AERIAL PHOTOGRAPHY - 2008

LAND INSIGHT & RESOURCES

MAP 7

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LR-00188 F8 Aerial Photograph 2010 19.04.2018

HISTORICAL AERIAL PHOTOGRAPHY - 2010

LAND INSIGHT & RESOURCES

MAP 8

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L-L-00188 F9 Aerial Photograph 2012 19.04.2018

HISTORICAL AERIAL PHOTOGRAPHY - 2012

LAND INSIGHT & RESOURCES

MAP 8

Aerial Imagery 2014

235 Martin Road, Badgerys Creek, NSW 2555

Scale:	Data Sources: Aerial Imagery © Aerometrex Pty Ltd	Coordinate System: GDA 1994 MGA Zone 56	Date: 16 December 2019
0 210 420 630 840 Meters			

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LR-00168-F11-Aerial Photograph 2016-19.04.2018

HISTORICAL AERIAL PHOTOGRAPHY - 2016

LAND INSIGHT & RESOURCES

MAP 11

Aerial Imagery 2018

235 Martin Road, Badgerys Creek, NSW 2555

Scale:	Data Sources: Aerial Imagery © Department Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 16 December 2019
0 210 420 630 840 Meters			

Aerial Imagery 2019

235 Martin Road, Badgerys Creek, NSW 2555

Scale:
0 210 420 630 840
Meters

Data Sources: Aerial Imagery © Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 56

Date: 16 December 2019

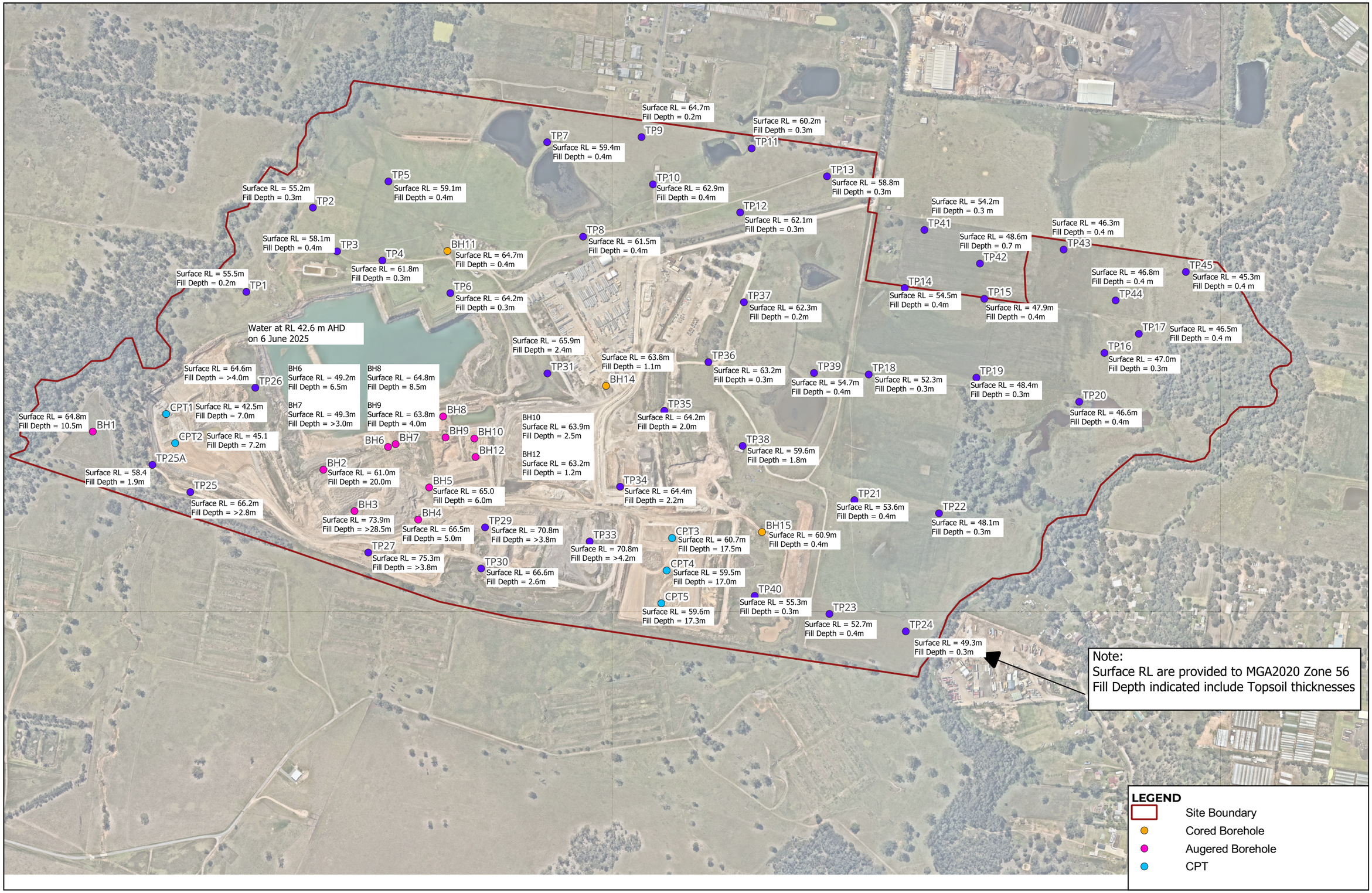
Appendix D

Field Work Results

Geotechnical Model Test Location		TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8	TP9	TP10	TP11	TP12	TP13	TP14	TP15	TP16	TP17	TP18	TP19	TP20	TP21	TP22	TP23	TP24	TP25	TP25A	TP26	TP27	TP29	TP30	TP31	TP33	TP34	TP35	TP36	TP37	TP38	TP39	TP40	TP41	TP42	TP43	TP44	TP45
Surface RL	m AHD	55.5	55.5	58.1	61.8	59.0	64.2	59.5	61.5	64.7	62.9	60.2	62.1	58.8	54.5	47.9	47.0	46.5	52.3	48.4	46.4	53.6	48.1	52.7	49.3	66.2	58.4	64.6	75.3	70.8	66.6	65.9	70.8	64.4	64.2	63.2	62.3	59.6	54.7	55.3	54.2	48.6	46.3	46.8	45.3
Top of Topsoil Fill RL	m AHD									64.7																																48.6			
Depth to Top	m									0																																0			
Thickness	m									0.2																																0.2			
Top of Fill RL	m AHD									64.5																66.2	58.4	64.6	75.3	70.8	66.6		70.8	64.4	64.2			59.6				48.4			
Depth to Top	m									0.2																0	0	0	0	0	0		0	0	0			0				0.2			
Thickness	m									0.6																2.8	1.9	4	3.8	3.8	2.2		4.2	2.2	2			1.8				0.45			
Top of Natural Topsoil RL	m AHD	55.5	55.5	58.1	61.8	59.0	64.2	59.5	61.5		62.9	60.2	62.1	58.8	54.5	47.9	47.0	46.5	52.3	48.4	46.4	53.6	48.1	52.7	49.3						64.4	65.9				63.2	62.3		54.7	55.3	54.2		46.3	46.8	45.3
Depth to Top	m	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						2.2	0				0	0		0	0	0		0	0	0
Thickness	m	0.2	0.3	0.35	0.3	0.35	0.25	0.35	0.38		0.35	0.3	0.25	0.3	0.35	0.4	0.3	0.35	0.25	0.3	0.35	0.35	0.3	0.38	0.3						0.4	0.15				0.3	0.15		0.35	0.3	0.3		0.37	0.38	0.35
Top of Natural Clay (alluvial or Residual) RL	m AHD	55.3	55.2	57.8	61.5	58.7	64.0	59.2	61.1	63.9	62.6	59.9	61.9	58.5	54.2	47.5	46.7	46.2	52.1	48.1	46.1	53.3	47.8	52.3	49.0		56.5				64.0	65.8		62.2	62.2	62.9	62.2		54.4	55.0	53.9	48.0	45.9	46.4	45.0
Depth to Top	m	0.2	0.3	0.35	0.3	0.35	0.25	0.35	0.38	0.8	0.35	0.3	0.25	0.3	0.35	0.4	0.3	0.35	0.25	0.3	0.35	0.35	0.3	0.38	0.3		1.9				2.6	0.15		2.2	2	0.3	0.15		0.35	0.3	0.3	0.65	0.37	0.38	0.35
Thickness	m	2.42	2.2	1.85	0.8	1.35	1.95	0.75	1.62	0.2	1.95	1.1	2.15	1.2	1.05	3.2	3.35	3.25	3.35	3.4	3.55	1.15	2.7	0.82	2.7		1.1				0.7	2.25		0.2	1.4	2.2	1.15		2.5	1.4	1.6	3.2	3.38	3.32	3.85
Top of VL-L Bedrock (siltstone/sandstone)	m AHD	52.9	53.0	55.9	60.7	57.3	62.0	58.4	59.5	63.7	60.6	58.8	59.7	57.3	53.1				48.7			52.1	45.1	51.5	46.3		55.4				63.3	63.5		62.0	60.8	60.7	61.0	57.8	51.9	53.6	52.3	44.8			
Depth to Top	m	2.62	2.5	2.2	1.1	1.7	2.2	1.1	2	1	2.3	1.4	2.4	1.5	1.4				3.6			1.5	3	1.2	3		3				3.3	2.4		2.4	3.4	2.5	1.3	1.8	2.85	1.7	1.9	3.85			
Thickness	m	0	0	0	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.15	0.2	0.1	0.2				0			0.2	0.2	0.1	0		0				0	0.1		0.2	0.1	0	0.1	0	0.15	0.15	0.2	0			
Top of M+ Bedrock (siltstone/sandstone)	m AHD																																												
Depth to Top	m																																												
Thickness	m																																												
Base of Pit/Borehole	m	2.62	2.5	2.2	1.3	1.8	2.3	1.2	2.1	1.1	2.5	1.55	2.6	1.6	1.6	3.6	3.65	3.6	3.6	3.7	3.9	1.7	3.2	1.3	3	2.8	3	4	3.8	3.8	3.3	2.5	4.2	2.6	3.5	2.5	1.4	1.8	3	1.85	2.1	3.85	3.75	3.7	4.2
Cored borehole																																													
Alluvial soils present		yes	yes													yes	yes	yes		yes	yes		yes		yes																	yes	yes	yes	yes
Organic materials in Fill																												yes	yes	yes	yes		yes	yes	yes			yes				yes			

Geotechnical Model

Test Location		BH1	BH2	BH3	BH4	BH5	BH6	BH7	BH8	BH9	BH10	BH11	BH12	BH14	BH15	CPT1	CPT2	CPT3	CPT4	CPT5
Surface RL	m AHD	64.8	61.0	73.8	66.4	65.1	49.1	49.3	64.8	63.8	63.9	64.6	63.2	63.8	60.8	42.8	45.1	60.7	59.5	59.6
Top of Topsoil Fill RL	m AHD	64.8																		
Depth to Top	m	0																		
Thickness	m	0.1																		
Top of Fill RL	m AHD	64.7	61.0	73.8	66.4	65.1	49.1	49.3	64.8	63.8	63.9	64.6	63.2	63.8	60.8	42.8	45.1	60.7	59.5	59.6
Depth to Top	m	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thickness	m	10.4	20	0	4.95	6	6.5	3	8.5	4	2.5	0.4	1.2	1.05	0.09	7	7.25	17.5	16.9	17.3
Top of Natural Topsoil RL	m AHD														60.7					
Depth to Top	m														0.09					
Thickness	m														0.31					
Top of Natural Clay (alluvial or Residual) RL	m AHD	54.3										64.2		62.8	60.4					
Depth to Top	m	10.5										0.4		1.05	0.4					
Thickness	m	3.5										2.67		0.95	2.66					
Top of VL-L Bedrock (siltstone/sandstone)	m AHD	50.8	41.0		61.5	59.1	42.6	46.3	56.3	59.8	61.4	61.5	62.0	61.8	57.7	35.8	37.9	43.2	42.7	42.3
Depth to Top	m	14	20		4.95	6	6.5	3	8.5	4	2.5	3.07	1.2	2	3.06	7	7.25	17.5	16.9	17.3
Thickness	m	0.8	2		1.75	6	2.3	0	2	5	3.5	4.15	1.8	1.41	3.13	0.09	0.04	0.18	0.07	0.06
Top of M+ Bedrock (siltstone/sandstone)	m AHD														54.6					
Depth to Top	m														6.19					
Thickness	m														1.07					
Base of Pit/Borehole	m	14.8	22	28.5	6.7	12	8.8	3	10.5	9	6	7.22	3	3.41	7.26	7.09	7.29	17.7	16.9	17.4
Cored borehole												yes		yes	yes					
Alluvial soils present																				
Organic materials in Fill								yes	yes	yes										



REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
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SCALE: 0 50 100 150 200 m
1:7500 @ A3

Douglas PARTNERS
OFFICE: SYDNEY
96-98 Hermitage Rd, West Ryde NSW 2114
(02)9809 0666

CLIENT:
Goodman Property Services (Aust) Pty Ltd

NOTE:
1: Basemap from MetroMap (Dated 23.02.2025

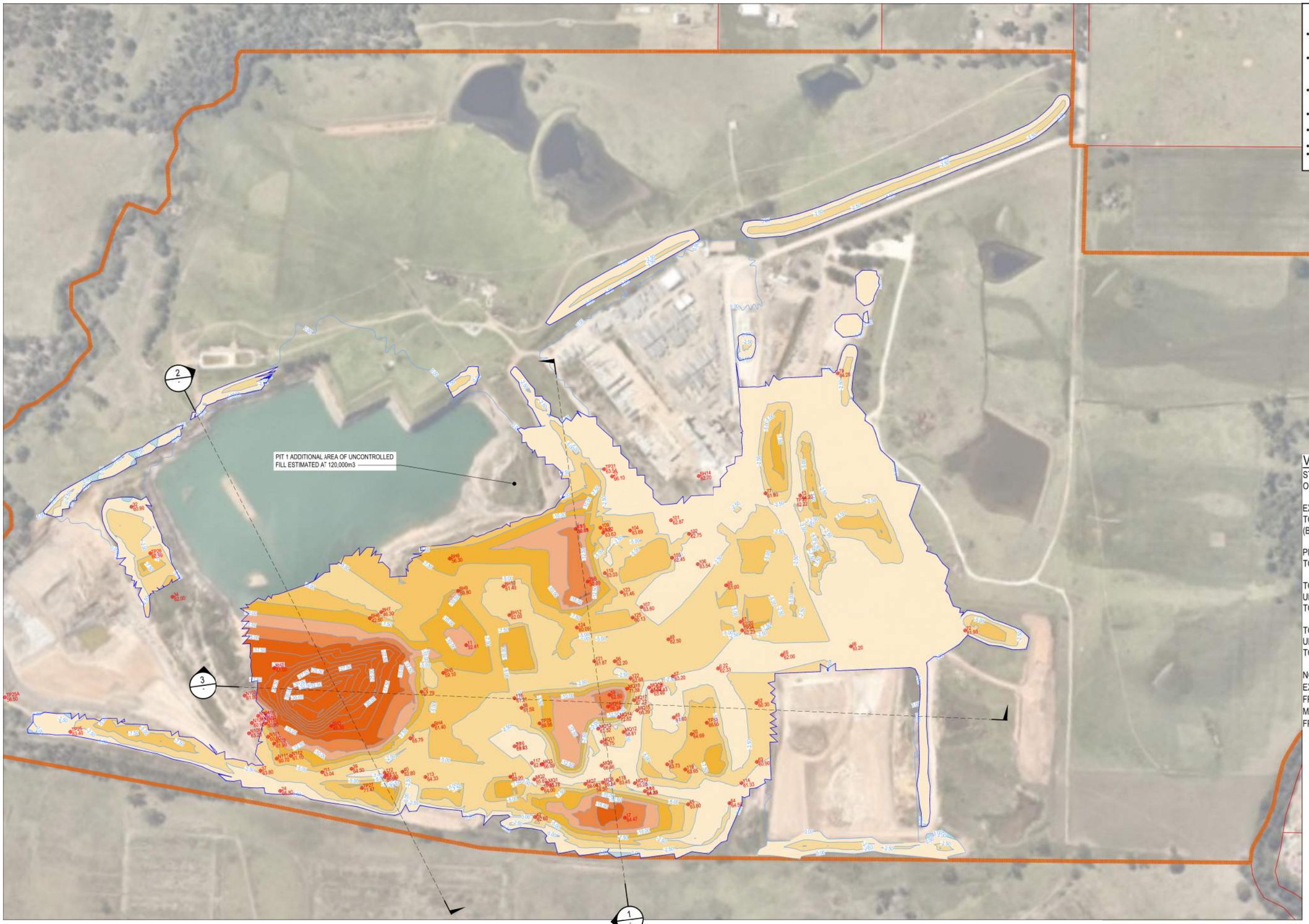
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 56

PROJECT NAME:
Project Maverick

PROJECT ADRESS:
265 Martin Road, Bradfield

DRAWING TITLE:
Sketch 1: Test Locations With Fill Depths

PROJECT NO: **234411.00**
DRAWING NO: **SK1**
REVISION: **0**



NOTES

- EXISTING SURFACE LEVELS FROM TOPO SURVEY RECEIVED BY MATHEW FREEBURN SURVEYING ON 12-05-2025 FROM FILE - 31126 250512 Stockpiles.dwg
- FOR UNCONTROLLED FILL CALCULATIONS, STOCKPILES WERE REMOVED FROM EXISTING SURFACE THEN THE BOREHOLE DATA WAS USED TO CREATE A INTERPOLATED UNCONTROLLED FILL SURFACE
- BOREHOLE DATA HAS BEEN READ FROM THE DATA ROOM FROM REPORTS LISTED BELOW AND CURRENT GEOTECH REPORT FROM DOUGLAS PARTNERS (234411.00.R.001.DftA)
- 09.01.04 02_DOUGLAS PARTNERS PIT FILL INVESTIGATION JUNE 2023
- 09.01.05 03_DOUGLAS PARTNERS DETAILED GEOTECH INVESTIGATION MAY 2023
- 09.01.06 04_MQ TEST PIT INVESTIGATION JULY 2024
- 09.01.07 05_DOUGLAS PARTNERS INVESTIGATION SEPT 2024

VOLUMES

STOCKPILE VOLUMES BASED ON SURVEYED BASE OF BANK = 749,061.450m^3

EXTRA OVER STOCKPILES UNCONTROLLED FILL TO BE EXTRACTED (BASED ON BOREHOLE DATA) = 1,424,082.898m^3

PIT 1 ADDITIONAL UNCONTROLLED FILL TO BE EXTRACTED = 120,000m^3

TOTAL (INC STOCKPILE) UNCONTROLLED FILL TO BE EXTRACTED = 2,293,144.348m^3

TOTAL (**NOT INC** STOCKPILE) UNCONTROLLED FILL TO BE EXTRACTED = 1,544,082.898m^3

NOTE: VOLUMES WHICH INCLUDE THE CUT OF EXISTING STOCKPILES HAVE BEEN MEASURED FROM EXISTING SURVEYED SURFACE FROM MATHEW FREEBURN SURVEYING ON 12-05-2025 FROM FILE - 31126 250512 Stockpiles.dwg

CUT RANGE TABLE

Lower_value		Upper_value	Colour
-999	to	-15	3
-15	to	-12.5	3
-12.5	to	-10	3
-10	to	-7.5	3
-7.5	to	-5	3
-5	to	-2.5	3
-2.5	to	0.00	3

Issue	Description	DR	CH	VE	Date
02	ISSUED FOR INFORMATION	KR	-	-	17.06.25
01	ISSUED FOR INFORMATION	KR	-	-	13.06.25

100mm on Original

Scales

0 50 100 150 200 250m

1 : 2500

Surveyor

LTS

Client

Goodman

Status

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	K.ROBINSON	Original Size	A1
Designed	K.ROBINSON	Height Datum	AHD
Project Manager	K.MCAREAVEY	Grid	
Verified			

Project

PROJECT MAVERICK

Title

TOTAL SITE
UNCONTROLLED FILL
CUT ISOPACH AND
DEPTH CONTOUR PLAN

ARCADIS

Arcadis Australia Pacific Pty Limited
Level 16, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289

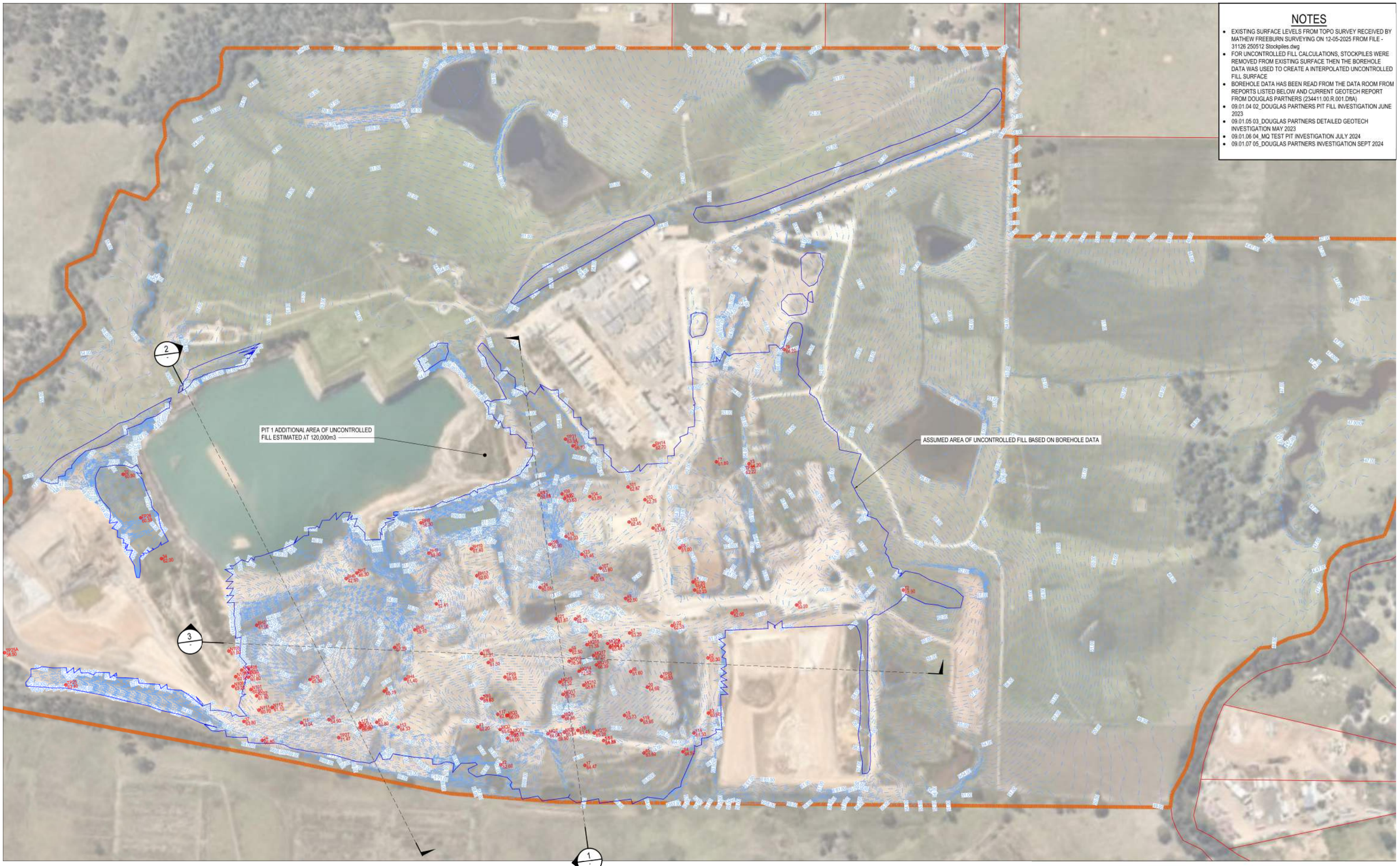
Tel No: +61 2 8907 9000
www.arcadis.com/au

Project Number: 30271198

Drawing No.: MAR-AAP-DA-00-SKT-CI-0201

Issue: 02

Date Plotted: 18 Jun 2025 - 10:13AM File Name: C:\Users\kr107872\DC\ACCDocs\Arcadis ACC AU\AAU-30271198-265 Martin Road\Project Files\10_WIP\10_Civil\STG_00\DRG\MAR-AAP-DA-00-SKT-XX-0201-UncontrolledFillHeatMapPlan.dwg



NOTES

- EXISTING SURFACE LEVELS FROM TOPO SURVEY RECEIVED BY MATHEW FREEBURN SURVEYING ON 12-05-2025 FROM FILE - 31126 250512 Stockpiles.dwg
- FOR UNCONTROLLED FILL CALCULATIONS, STOCKPILES WERE REMOVED FROM EXISTING SURFACE THEN THE BOREHOLE DATA WAS USED TO CREATE A INTERPOLATED UNCONTROLLED FILL SURFACE
- BOREHOLE DATA HAS BEEN READ FROM THE DATA ROOM FROM REPORTS LISTED BELOW AND CURRENT GEOTECH REPORT FROM DOUGLAS PARTNERS (234411.00.R.001.DftA)
- 09.01.04 02_DOUGLAS PARTNERS PIT FILL INVESTIGATION JUNE 2023
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Issue	Description	DR	CH	VE	Date
02	ISSUED FOR INFORMATION	KR	-	-	17.06.25
01	ISSUED FOR INFORMATION	KR	-	-	13.06.25

100mm on Original

Scales

0 50 100 150 200 250m

1 : 2500

Surveyor

LTS

Client

Goodman

Status

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	K.ROBINSON	Original Size	A1
Designed	K.ROBINSON	Height Datum	AHD
Project Manager	K.MCAREAVEY	Grid	
Verified			

Project

PROJECT MAVERICK

Title

UNCONTRLLED FILL CONTOUR PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 16, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289
Tel No: +61 2 8907 9000
www.arcadis.com/au

Project Number 30271198

Drawing No. MAR-AAP-DA-00-SKT-CI-0202

Issue 02

Date Plotted: 18 Jun 2025 - 10:05AM File Name: C:\Users\kr107872\DC\ACCDocs\Arcadis ACC AU\AAU-30271198-265 Martin Road\Project Files\10_WIP\10_Civil\STG_00\DRG\MAR-AAP-DA-00-SKT-XX-0202-UncontrolledFillContourPlan.dwg

NOTES

- EXISTING SURFACE LEVELS FROM TOPO SURVEY RECEIVED BY MATHEW FREEBURN SURVEYING ON 12-05-2025 FROM FILE - 31126 250512 Stockpiles.dwg
- FOR UNCONTROLLED FILL CALCULATIONS, STOCKPILES WERE REMOVED FROM EXISTING SURFACE THEN THE BOREHOLE DATA WAS USED TO CREATE A INTERPOLATED UNCONTROLLED FILL SURFACE
- BOREHOLE DATA HAS BEEN READ FROM THE DATA ROOM FROM REPORTS LISTED BELOW AND CURRENT GEOTECH REPORT FROM DOUGLAS PARTNERS (234411.00.R.001.DftA)
- 09.01.04 02_DOUGLAS PARTNERS PIT FILL INVESTIGATION JUNE 2023
- 09.01.05 03_DOUGLAS PARTNERS DETAILED GEOTECH INVESTIGATION MAY 2023
- 09.01.06 04_MQ TEST PIT INVESTIGATION JULY 2024
- 09.01.07 05_DOUGLAS PARTNERS INVESTIGATION SEPT 2024

VOLUMES

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TOTAL (**NOT INC** STOCKPILE) UNCONTROLLED FILL TO BE EXTRACTED = 1,544,082.898m^3

NOTE: VOLUMES WHICH INCLUDE THE CUT OF EXISTING STOCKPILES HAVE BEEN MEASURED FROM EXISTING SURVEYED SURFACE FROM MATHEW FREEBURN SURVEYING ON 12-05-2025 FROM FILE - 31126 250512 Stockpiles.dwg

CUT RANGE TABLE

Lower_value		Upper_value	Colour
-999	to	-15	3
-15	to	-12.5	3
-12.5	to	-10	3
-10	to	-7.5	3
-7.5	to	-5	3
-5	to	-2.5	3
-2.5	to	0.00	3

Issue	Description	DR	CH	VE	Date
02	ISSUED FOR INFORMATION	KR	-	-	17.06.25
01	ISSUED FOR INFORMATION	KR	-	-	13.06.25

Scales

0 50 100 150 200 250m

1 : 2500

Surveyor: LTS

Client: Goodman

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	K.ROBINSON	Original Size	A1
Designed	K.ROBINSON	Height Datum	AHD
Project Manager	K.MCAREAVEY	Grid	
Verified			

Project: PROJECT MAVERICK

Title: EXTRA OVER STOCKPILES UNCONTRLLED FILL CUT ISOPACH AND DEPTH CONTOUR PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 16, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289
Tel No: +61 2 8907 9000
www.arcadis.com/au

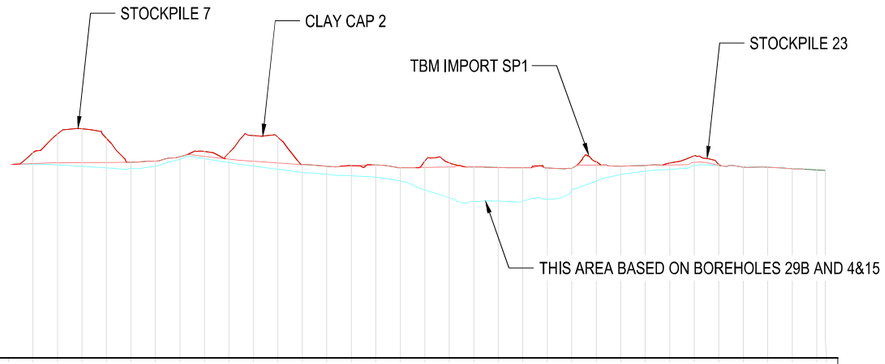
Project Number: 30271198

Drawing No.: MAR-AAP-DA-00-SKT-CI-0203

Issue: 02

100mm on Original

Date Plotted: 18 Jun 2025 - 10:12AM File Name: C:\Users\kr107872\DC\ACCDocs\Arcadis ACC AU\AAU-30271198-265 Martin Road\Project Files\10_WIP\10_Civil\STG_00\DRG\MAR-AAP-DA-00-SKT-XX-0203-UncontrolledFillExtraOver.dwg

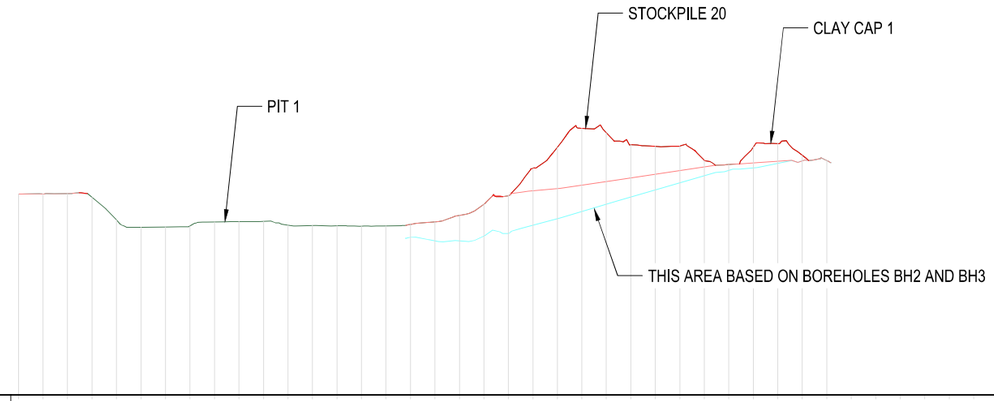


DATUM RL -13.0

CHAINAGE	EXISTING LEVEL LESS STOCKPILES	UNCONTROLLED FILL LEVELS	EXISTING LEVEL FREEBURN SURVEY 12-05-25
0.000			
20.000			
40.000			
60.000			
80.000			
100.000	66.321	66.031	70.76
120.000	66.647	65.790	78.40
140.000	66.719	65.174	80.50
160.000	66.790	64.559	76.71
180.000	66.883	64.337	66.88
200.000	67.410	65.290	67.41
220.000	69.154	68.155	69.15
240.000	69.331	68.328	71.31
260.000	68.205	66.710	70.65
280.000	67.336	65.284	77.73
300.000	66.617	63.971	77.10
320.000	65.937	62.694	65.94
340.000	65.253	62.016	65.25
360.000	65.438	61.394	65.49
380.000	65.780	60.787	65.78
400.000	64.702	59.239	64.70
420.000	64.763	55.560	67.50
440.000	64.958	52.391	66.65
460.000	64.982	50.813	64.99
480.000	64.791	51.051	64.79
500.000	64.662	50.939	64.66
520.000	64.528	51.914	64.53
540.000	64.414	55.844	64.41
560.000	65.748	59.227	67.12
580.000	65.335	61.858	65.34
600.000	65.580	63.220	65.58
620.000	65.807	63.964	66.54
640.000	66.818	65.494	69.46
660.000	65.646	65.506	66.07
680.000	64.935	64.935	64.94
700.000	64.862	64.862	64.86
720.000	64.192	64.192	64.19
740.000			63.71
746.984			63.80

LONGITUDINAL SECTION 1

SCALE 1:2500 HORI.
1:1250 VERT.

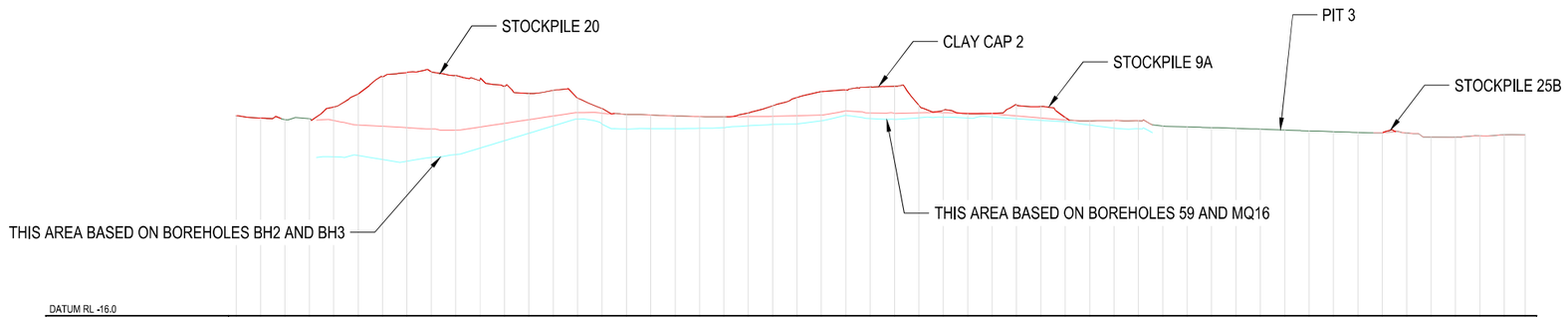


DATUM RL -26.0

CHAINAGE	EXISTING LEVEL LESS STOCKPILES	UNCONTROLLED FILL LEVELS	EXISTING LEVEL FREEBURN SURVEY 12-05-25
0.000	56.026	56.026	56.03
20.000	56.058	56.058	56.06
40.000	56.192	56.192	56.19
60.000			54.72
80.000			45.43
100.000			42.47
120.000			42.57
140.000			42.99
160.000			44.63
180.000			44.76
200.000			44.89
220.000			43.34
240.000			43.20
260.000			43.09
280.000			42.95
300.000			42.99
320.000	43.629	38.328	43.63
340.000	44.644	36.904	44.64
360.000	47.292	36.914	47.29
380.000	51.847	38.829	51.85
400.000	55.387	39.977	55.39
420.000	57.313	43.324	66.53
440.000	58.248	45.922	75.11
460.000	59.654	48.882	82.82
480.000	61.122	51.891	80.99
500.000	62.602	54.837	76.15
520.000	64.092	57.735	75.48
540.000	65.581	60.633	75.50
560.000	67.071	63.532	69.68
580.000	68.057	66.696	68.06
600.000	68.681	66.686	75.14
620.000	69.392	68.538	76.54
640.000	69.521	69.521	71.83
660.000	69.688	69.688	69.69
680.000			
700.000			
720.000			
740.000			
760.000			
780.000			
800.000			
820.000			
821.444			

LONGITUDINAL SECTION 2

SCALE 1:2500 HORI.
1:1250 VERT.



DATUM RL -16.0

CHAINAGE	EXISTING LEVEL LESS STOCKPILES	UNCONTROLLED FILL LEVELS	EXISTING LEVEL FREEBURN SURVEY 12-05-25
0.000			65.88
20.000			64.89
40.000			64.29
60.000			64.67
80.000	63.902	49.100	69.46
100.000	62.115	49.657	74.73
120.000	61.583	47.999	81.77
140.000	61.001	47.286	83.59
160.000	60.436	48.809	83.88
180.000	60.004	49.972	82.45
200.000	61.252	52.600	80.64
220.000	62.750	55.631	78.00
240.000	64.247	58.663	74.96
260.000	65.744	61.695	76.28
280.000	67.104	64.506	73.08
300.000	66.902	62.564	68.87
320.000	66.420	60.416	66.42
340.000	66.175	60.576	66.18
360.000	65.751	60.558	65.75
380.000	65.527	60.739	65.53
400.000	65.432	60.995	65.43
420.000	65.519	61.750	67.00
440.000	65.667	62.416	69.93
460.000	65.846	62.528	73.37
480.000	66.167	63.773	75.76
500.000	67.833	66.051	76.47
520.000	67.013	64.692	77.61
540.000	66.917	64.441	77.97
560.000	67.070	64.999	70.11
580.000	67.115	65.299	68.10
600.000	66.986	64.916	66.73
620.000	66.614	65.389	66.89
640.000	65.769	64.678	70.25
660.000	64.924	63.968	69.62
680.000	64.157	63.374	65.17
700.000	63.788	62.064	63.79
720.000	63.896	60.819	63.90
740.000	63.652	60.526	63.85
760.000			61.67
780.000			61.35
800.000			61.04
820.000			60.74
840.000			60.38
860.000			60.01
880.000			59.68
900.000			59.35
920.000			59.03
940.000	58.858	58.858	58.86
960.000	58.801	58.801	58.80
980.000	57.194	57.194	57.19
1000.000	57.136	57.136	57.14
1020.000	57.679	57.679	57.68
1040.000	58.027	58.027	58.03
1057.175	58.081	58.081	58.08

LONGITUDINAL SECTION 3

SCALE 1:2500 HORI.
1:1250 VERT.

Issue	Description	DR	CH	VE	Date
02	ISSUED FOR INFORMATION	KR	-	-	17.06.25
01	ISSUED FOR INFORMATION	KR	-	-	13.06.25

100mm on Original

Scales

0 50 100 150 200 250m
1 : 2500

0 25 50 75 100 125m
1 : 1250

Surveyor: LTS

Client: Goodman

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	K.ROBINSON	Original Size	A1
Designed	K.ROBINSON	Height Datum	AHD
Project Manager	K.MCAREAVEY	Grid	
Verified			

Project: PROJECT MAVERICK

Title: UNCONTRLLED FILL LONGITUDINAL SECTIONS

ARCADIS
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Project Number: 30271198

Drawing No.: MAR-AAP-DA-00-SKT-CI-0204

Issue: 02

Date Plotted: 18 Jun 2025 - 10:06AM File Name: C:\Users\kr107872\DC\ACCDocs\Arcadis ACC AU\AAU-30271198-265 Martin Road\Project Files\10_WIP\10_Civil\STG_00\DRG\MAR-AAP-DA-00-SKT-XX-0204-UncontrolledFillSections.dwg

Terminology, Symbols and Abbreviations

November 2023

Introduction to Terminology, Symbols and Abbreviations

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

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

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

Abbreviation Codes

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

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

Data Integrity Codes

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

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

Graphic Symbols

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

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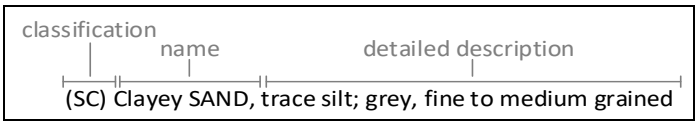
Soil Descriptions

Introduction

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



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

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

Particle size designation and Behaviour Model

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

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

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

[1] – refer grain size subdivision descriptions below

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

Component proportions

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

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

[1] As defined in AS1726-2017 6.1.4.4
[2] In the detailed material description, minor components are split into two further sub-categories. Refer "identification of minor components" below.

Composite Materials

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

Soil Descriptions

Classification

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

Soil Name

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

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

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

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

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

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

Identification of minor components

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

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

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

Soil Composition

Plasticity

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

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

Grain Size

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

Grading

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

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

Soil Descriptions

Soil Condition

Moisture

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

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

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

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

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

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

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

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

Consistency (fine grained soils)

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

Relative Density (coarse grained soils)

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

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

Soil Descriptions

Compaction (anthropogenically modified soil)

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

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

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

Soil Origin

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

Cobbles and Boulders

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

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

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Rock Strength

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

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

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

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

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

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

Degree of Weathering

The degree of weathering of rock is classified as follows:

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

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

Rock Descriptions

Degree of Alteration

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

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

Degree of Fracturing

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

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

Rock Quality Designation

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

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

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

Stratification Spacing

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

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

Rock Descriptions

Defect Descriptions

Defect Type

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

Rock Defect Orientation

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

Rock Defect Coating

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

Rock Defect Infill

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

Rock Defect Shape/Planarity

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

Rock Defect Roughness

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

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

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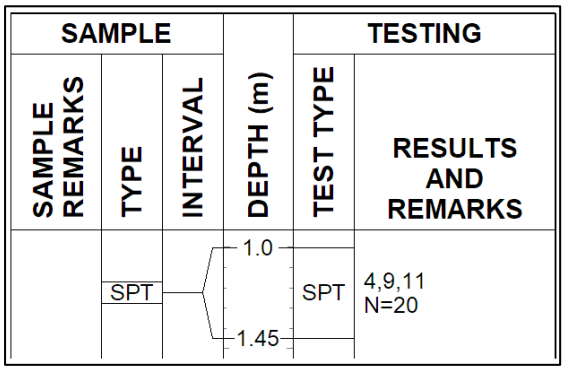
Sampling and Testing

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



Sampling

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

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

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

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

Field and Laboratory Testing

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

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

Groundwater Observations

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

Drilling or Excavation Methods/Tools

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

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

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

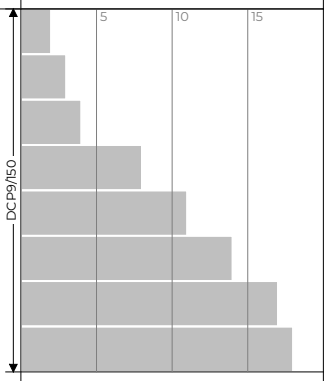
TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 55.5 AHD
COORDINATE: E:291710.5, N:6247213.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP1
PROJECT No: 234411.00
DATE: 29/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
29/05/25 No Free Groundwater Observed Whilst Augering		0.20	TOPSOIL / Silty CLAY: dark brown; low plasticity; with fine ironstone gravel, trace fine sand and rootlets.	TS TS TS TS	TOP	NA	w<PL		D		0.10 0.20	DCP9/150	
	55	0.60	CLAY (CI-CH): brown; medium to high plasticity; trace fine to medium ironstone gravel and rootlets.		ALV	St	w<PL		D		0.50 0.60		
		1	CLAY (CI-CH): pale grey and brown; medium to high plasticity; with fine to coarse ironstone gravel, trace rootlets.		ALV	VSt H	w<PL		D D		0.90 1.00		
	54	1.80							D		1.50 1.60		
		2	CLAY (CI-CH): pale grey, mottled red-brown; medium to high plasticity; with fine to coarse ironstone gravel.		RS or possibly XWM	(H)	w<PL		D		2.00 2.10		
	53		2.30m: ironstone band						D		2.50 2.62		
			Test Pit discontinued at 2.62m depth. Refusal on ironstone band.										
		3											
	52	4											
	51												



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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: Likely on natural ground

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D.Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 55.5 AHD
COORDINATE: E:291849.5, N:6247389.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

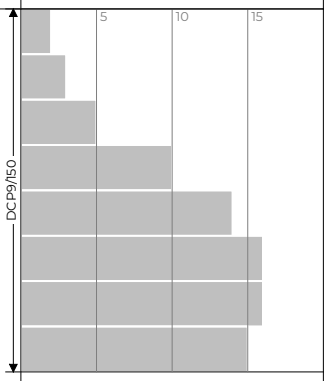
LOCATION ID: TP2
PROJECT No: 234411.00
DATE: 29/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
29/05/25 No Free Groundwater Observed Whilst Augering	55	0.30	TOPSOIL / Silty CLAY: brown and dark brown; low plasticity; trace fine ironstone gravel and rootlets.	TS	TOP	NA	w<PL		D		0.10, 0.20
		1	CLAY (CI-CH): red-brown; medium to high plasticity; with fine to medium ironstone gravel, trace silt.		ALV	St, VSt	w<PL		D		0.50, 0.60
			From 0.80m: trace fine grained sand						B		
			From 1.00m: red-brown mottled pale grey			H			D		0.90, 1.00
	54	1.50	CLAY (CI-CH): yellow-brown mottled pale grey; with fine sand, trace fine to coarse ironstone gravel and cobbles up to 80mm.		ALV	(VSt) to (H)	w<PL		D		1.50, 1.60
		2	2.00m: ironstone band						D		2.00, 2.10
	53		Test Pit discontinued at 2.50m depth. Refusal on ironstone band.						D		2.40, 2.50
	52	3									
	51	4									

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS



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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 58.1 AHD
COORDINATE: E:291899.9, N:6247298.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP3
PROJECT No: 234411.00
DATE: 10/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*)	DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
10/06/25 No Free Groundwater Observed Whilst Augering	58		TOPSOIL / Silty CLAY: dark brown; low to medium plasticity; trace rootlets and ironstone gravel.	TS	TOP	NA		ND		A		0.10 0.20	DCP9/150	5 10 15
		0.35	CLAY (CI-CH): red-brown mottled pale grey; medium to high plasticity; trace ironstone gravel. 0.50m-0.60m: trace roots		RS	St		w<PL		A		0.50 0.60		
	57	1	From 0.95m: becoming pale grey			(VSt)						1		
			From 1.50m: becoming with ironstone bands			(H)				A		1.50 1.60		
	56	2	From 2.00m: becoming extremely weathered rock							A		2 2.10 2.20		
			Test Pit discontinued at 2.20m depth. Refusal on ironstone band in extremely weathered rock.											
	55	3												
	54	4												

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M.Gounder)
LOGGED: D. Keeling
METHOD: 450mm toothed bucket
REMARKS: Adjacent haul road consist of approx 150mm thick silty clay fill with ironstone gravel

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 61.8 AHD
COORDINATE: E:291994.5, N:6247279.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP4
PROJECT No: 234411.00
DATE: 10/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No Free Groundwater Observed Whilst Augering 10/06/25			TOPSOIL / Silty CLAY: dark brown; low to medium plasticity; trace rootlets, ironstone gravel and cobbles, possibly topsoil fill.	TS	TOP	ND	NA		A		0.10 0.20	DCP9/150	5 10 15
		0.30	CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel. From 0.80m: becoming pale grey and pale brown		RS	St to VSt	w<PL		A A		0.50 0.60 0.90 1.00		
	61	1											
		1.10	SANDSTONE: pale grey to pale brown, fine to medium grained; very low to low strength. Bringelly Shale.		XWM	NA	NA		A		1.20 1.30		
			Test Pit discontinued at 1.30m depth. Refusal in very low to low strength rock.										
	60	2											
	59	3											
	58	4											
	57												

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M.Gounder)
LOGGED: D. Keeling
METHOD: 450mm toothed bucket
REMARKS: Adjacent haul road consists of approx 200mm thick silty clay fill with ironstone gravels

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 59.1 AHD
COORDINATE: E:292007.0, N:6247444.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

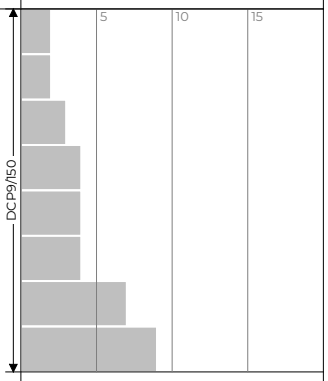
LOCATION ID: TP5
PROJECT No: 234411.00
DATE: 10/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
10/06/25 No Free Groundwater Observed whilst Augering	59		TOPSOIL / Silty CLAY: dark brown; low to medium plasticity; trace rootlets and ironstone gravel.	TS	TOP	ND			A		0.10 – 0.20
		0.35	CLAY (CI-CH): red-brown mottled pale grey; medium to high plasticity; trace ironstone gravel.		RS	F	w=PL		A		0.50 – 0.60
	58	1				St to VSt			A		0.90 – 1.00
		1.50	CLAY (CI-CH): pale grey-brown mottled red-brown; medium to high plasticity; trace silt, sand and ironstone gravel.		RS	(H)	w<PL		A		1.50 – 1.60
		1.70	SILTSTONE: dark grey and red-brown; very low to low strength. Bringelly Shale.		XWM	NA	NA		A		1.70 – 1.80
	57	2	Test Pit discontinued at 1.80m depth. Refusal in very low to low strength rock.								
	56	3									
	55	4									

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS



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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 64.2 AHD
COORDINATE: E:292136.3, N:6247211.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP6
PROJECT No: 234411.00
DATE: 29/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
29/05/25 No Free Groundwater Observed Whilst Augering	64	0.25	TOPSOIL / Silty CLAY: dark brown; medium to high plasticity; trace rootlets, ironstone and siltstone gravel.	TS	TOP	NA	w=PL		D		0.10 0.20	DCP9/150	RF 25/90mm
			CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel.		RS	St	w<PL		D		0.50 0.60		
			From 0.70m: red-brown and pale grey			H			B		1.00		
	63	1.50	CLAY (CI-CH): pale grey and red-brown; medium to high plasticity; with ironstone bands.		RS		w<PL		D		1.50 1.60		
		2	From 2.00m: grading to extremely weathered rock						D		2.00 2.10		
	62	2.20	SANDSTONE: pale brown and pale grey, fine to medium grained; very low to low strength. Bringelly Shale.		XWM	NA	NA						
			Test Pit discontinued at 2.30m depth. Refusal in very low to low strength rock.										
	61	3											
	60	4											

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 59.5 AHD
COORDINATE: E:292338.4, N:6247526.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP7
PROJECT No: 234411.00
DATE: 10/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*)	DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
Free Groundwater Observed Whilst Augering			TOPSOIL / Silty CLAY: dark brown; low to medium plasticity; trace rootlets and ironstone gravel.	TS	TOP	ND				A		0.10 0.20	DCP9/150	5 10 15
	59	0.35	CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel. 0.70m: trace ironstone gravel From 1.00m: grading to pale brown and brown		RS	F St to VSt		w=PL		A		0.50 0.60		
		1 1.10	SILTSTONE: red-brown to dark brown; very low to low strength. Bringelly Shale.		XWM	NA		NA		A A		1.00 1.10 1.20		
10/06/25 No	58		Test Pit discontinued at 1.20m depth. Refusal in very low to low strength siltstone bedrock.											
		2												
	57													
		3												
	56													
		4												
	55													

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M.Gounder)
LOGGED: D.Keeling
METHOD: 450mm toothed bucket
REMARKS: No apparent wet ground within test pit, dam wall consists of reworked natural clay with ironstone gravels

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 61.5 AHD
COORDINATE: E:292413.4, N:6247329.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP8
PROJECT No: 234411.00
DATE: 10/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
10/06/25 No Free Groundwater Observed Whilst Augering			TOPSOIL / Silty CLAY: dark grey, red-brown; low to medium plasticity; trace rootlets and ironstone gravel.	TS, T	TOP	NA			A		0.10, 0.20	DCP9/150	5, 10, 15
	61	0.38	CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel.		RS	F	w=PL		A		0.50, 0.60		
		1	From 1.10m: becoming pale grey and red-brown						A		0.90, 1.00		
	60		From 1.80m: grading to extremely weathered rock			(St) to (VSt)	w<PL		A		1.50, 1.60		
						(H)							
		2.00	SILTSTONE: pale brown to pale grey; very low to low strength. Bringelly shale.		XWM	NA			A		2.00, 2.10		
	59	3	Test Pit discontinued at 2.10m depth. Refusal in very low to low strength bedrock.										
	58	4											
	57												

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M.Gounder)
LOGGED: D.Keeling
METHOD: 450mm toothed bucket
REMARKS: Adjacent haul road consists of 170mm thick ripped sandstone

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 64.7 AHD
COORDINATE: E:292535.4, N:6247536.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP9
PROJECT No: 234411.00
DATE: 29/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
29/05/25 No Free Groundwater Observed Whilst Augering	64	0.20	FILL / Silty CLAY: brown; low to medium plasticity; trace rootlets and ironstone gravel.		FILL and TOP	NA	w=PL		D		0.10 – 0.20
		0.80	FILL / CLAY: red-brown; medium to high plasticity; with sandstone gravel and occasional ironstone cobbles.		possibly FILL	(MC)	w<PL		D		0.50 – 0.60
		1.00	CLAY (CI-CH): orange-brown, dark grey; medium to high plasticity; with ironstone and siltstone gravel, becoming extremely weathered rock.		RS	H	w<PL		D		0.80 – 1.00
					XWM	NA	NA		D		1.00 – 1.10
			SANDSTONE: dark grey to brown; very low to low strength, with medium strength ironstone bands.								
	63	2	Test Pit discontinued at 1.10m depth. Refusal in very low to low strength rock.								
	62	3									
	61	4									
	60										

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS: 5, 10, 15; 25; 29

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M.Gounder)
LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 62.9 AHD
COORDINATE: E:292559.3, N:6247438.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP10
PROJECT No: 234411.00
DATE: 10/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
10/06/25 No Free Groundwater Observed Whilst Augering			TOPSOIL / Silty CLAY: dark brown; low to medium plasticity; trace fine to medium ironstone gravel and rootlets.	TS	TOP	NA			A		0.10 – 0.20	DCP9/150	5 10 15
		0.35	CLAY (CI-CH): red-brown; medium to high plasticity; trace fine to medium ironstone gravel and rootlets.		RS	F to St	w=PL		A		0.50 – 0.60		
	62	0.85	CLAY (CI-CH): pale grey and red-brown; medium to high plasticity; trace fine to coarse ironstone gravel and fine sand.		RS	VSt to H	w<PL		A		0.90 – 1.00		
		1				(H)			A		1.50 – 1.60		
	61	2	From 2.00m: trace ironstone cobbles						A		2.00 – 2.10		
		2.30	SILTSTONE: brown; very low to low strength. Bringelly Shale.		XWM	NA	NA		A		2.40 – 2.50		
			Test Pit discontinued at 2.50m depth. Refusal on very low to low strength siltstone bedrock.										
	60	3											
	59	4											
	58												

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M.Gounder)
LOGGED: D.Keeling
METHOD: 450mm toothed bucket
REMARKS: Adjacent haul road consist of approx 150mm thick silty clay fill with ironstone gravel

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 60.2 AHD
COORDINATE: E:292765.2, N:6247513.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP11
PROJECT No: 234411.00
DATE: 10/06/25
SHEET: 1 of 1

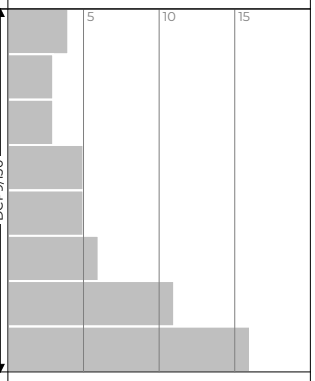
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
10/06/25 No Free Groundwater Observed Whilst Augering	60	0.30	TOPSOIL / Silty CLAY: dark brown; low to medium plasticity; trace fine to medium ironstone gravel and rootlets.	TS	TOP	NA			A		0.10 – 0.20
		0.85	CLAY (CI-CH): red-brown; medium to high plasticity; trace fine to medium ironstone gravel and rootlets.		RS	St	w=PL		A		0.50 – 0.60
	59	1.40	CLAY (CI-CH): brown and pale grey; medium to high plasticity; trace fine to medium ironstone gravel and fine sand.		RS	VSt to H; (H)	w<PL		A		0.90 – 1.00
			SILTSTONE: brown and grey; very low to low strength. Bringelly Shale.		XWM	NA	NA		A		1.45 – 1.55

Test Pit discontinued at 1.55m depth.
Refusal on very low to low strength Bringelly shale.

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS



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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D.Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 62.1 AHD
COORDINATE: E:292741.2, N:6247379.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP12
PROJECT No: 234411.00
DATE: 29/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
29/05/25 No Free Groundwater Observed Whilst Augering	62		TOPSOIL / Silty CLAY: dark brown; low to medium plasticity; trace fine to medium ironstone gravel and rootlets.	TS TS TS TS TS T	TOP	NA	w=PL		D		0.10 0.20	DCP9/150	5 10 15 R 25
		0.25	CLAY (CI-CH): brown mottled pale grey; medium to high plasticity; trace fine to medium ironstone gravel.		RS	St VSt H (H)	w<PL		D B D D D D		0.50 0.60 1.00 1.10 1.50 1.60 2.00 2.10 2.50 2.60		
	61	1											
	60	2	From 2.10m: with ironstone bands										
		2.40	SANDSTONE: pale grey and red-brown; very low to low strength with ironstone bands.		XWM	NA	NA						
	59	3	Test Pit discontinued at 2.60m depth. Refusal in very low to low strength sandstone.										
	58	4											

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 58.8 AHD
COORDINATE: E:292922.5, N:6247455.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP13
PROJECT No: 234411.00
DATE: 29/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
29/05/25 No Free Groundwater Observed Whilst Augering			TOPSOIL / Silty CLAY: brown; low to medium plasticity; trace fine to coarse ironstone gravel and rootlets.	TS	TOP	NA	w<PL		D		0.10 – 0.20
		0.30	CLAY (CI-CH): red-brown; medium to high plasticity; trace fine to coarse ironstone gravel and cobbles.		RS	St	w<PL		D		0.50 – 0.60
	58	1	From 1.00m: becoming pale grey, mottled red-brown with ironstone bands			VSt - H			D		0.90 – 1.00
						(H)					
		1.50	SANDSTONE: brown and pale grey, fine to medium grained; very low to low strength.		XWM	NA	NA		D		1.50 – 1.60
	57	2	Test Pit discontinued at 1.60m depth. Refusal in very low to low strength rock .								
	56	3									
	55	4									
	54										

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS: 5, 10, 15

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 54.5 AHD
COORDINATE: E:293084.6, N:6247222.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP14
PROJECT No: 234411.00
DATE: 10/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*)	DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
10/06/25 No Free Groundwater Observed Whilst Augering	54	0.35	TOPSOIL / Silty CLAY: dark brown; low to medium plasticity; trace rootlets, fine to coarse ironstone gravels and cobbles.	TS	TOP	ND				A		0.10 0.20	DCP9/150	5 10 15
			CLAY (CI-CH): red-brown; medium to high plasticity; trace fine to medium ironstone gravels and rootlets.		RS	F		w=PL		A		0.50 0.60		
		1	From 0.80m: becoming pale grey mottled red-brown							A		0.90 1.00		
			From 1.10m: with ironstone bands			St (St)								
	53	1.40	SILTSTONE: brown and grey; very low to low strength. Bringelly Shale.		XWM	NA		NA		A		1.50 1.60		
			Test Pit discontinued at 1.60m depth. Refusal in very low to low strength siltstone bedrock .											
	52	2												
	51	3												
	50	4												

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D.Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 47.9 AHD
COORDINATE: E:293250.9, N:6247199.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP15
PROJECT No: 234411.00
DATE: 10/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
10/06/25 No Free Groundwater Observed Whilst Augering			TOPSOIL / Silty CLAY: dark brown and dark grey; low to medium plasticity; trace rootlets, fine to coarse ironstone and shale gravels and cobbles.	TS	TOP	NA	w<PL		A		0.10 0.20	DCP9/150	5 10 15
		0.40	CLAY (CI-CH): red-brown; medium to high plasticity; trace fine to medium ironstone gravel, trace silt and rootlets.		ALV	St	w=PL		A		0.50 0.60		
	47	1				VSt			A		1.00 1.10		
									A		1.50 1.60		
	46	2							A		2.00 2.10		
						(VSt)			A		2.50 2.60		
	45	3	From 3.00m: pale grey, mottled yellow-brown, trace fine sand						A		3.00 3.10		
									A		3.50 3.60		
			Test Pit discontinued at 3.60m depth. Limit of excavator reach.										
	44	4											
	43												

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M.Gounder)
LOGGED: D.Keeling
METHOD: 450mm toothed bucket
REMARKS: No evidence of apparent fly tipping, ripped shale was present in topsoil

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 47.0 AHD
COORDINATE: E:293501.5, N:6247087.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

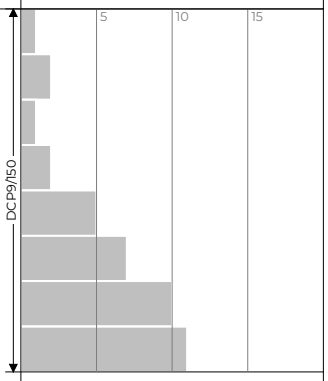
LOCATION ID: TP16
PROJECT No: 234411.00
DATE: 11/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
11/06/25 Groundwater seepage observed at 3.0m			TOPSOIL / Silty CLAY: dark brown and dark grey; low to medium plasticity; trace rootlets, ironstone and shale gravel.	TS	TOP	NA	w<PL		D		0.10 – 0.20
		0.30	Silty CLAY (CI): red-brown and yellow-brown; medium plasticity; trace ironstone gravel.			F			D		0.50 – 0.60
	46	1				St to VSt			D		0.90 – 1.00
			From 1.50m: becoming mottled pale grey, trace fine to coarse ironstone gravels		ALV		w>PL		D		1.50 – 1.60
	45	2							D		2.00 – 2.10
						(St) to (VSt)			D		2.50 – 2.60
	44	3	From 3.00m: trace fine sand						D		3.00 – 3.10
		3.30	Sandy CLAY (CL-CI): pale brown and pale grey; low to medium plasticity; trace siltstone and ironstone gravel.		ALV		w=PL		D		3.55 – 3.65
			Test Pit discontinued at 3.65m depth. Limit of excavator reach.								
	43	4									

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS



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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: No evidence of fly tipping

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 46.5 AHD
COORDINATE: E:293573.4, N:6247126.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

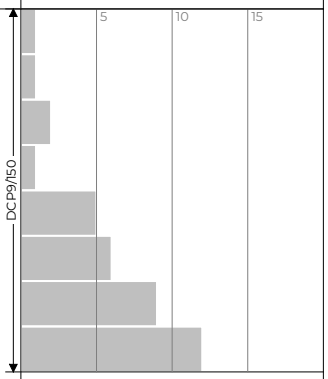
LOCATION ID: TP17
PROJECT No: 234411.00
DATE: 11/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
11/06/25 Groundwater seepage observed from 2.90m			TOPSOIL / Silty CLAY: dark grey; low to medium plasticity; trace rootlets and siltstone gravel.	TS	TOP	NA	w=PL		D		0.10 – 0.20
	46	0.35	Silty CLAY (CI): red-brown and pale brown; low to medium plasticity; trace ironstone gravel.		ALV	S	w>PL		D		0.50 – 0.60
			From 0.80m: trace fine sand			St to VSt			D		0.90 – 1.00
	45	1							D		1.50 – 1.60
		2	From 2.10m: with fine sand			(St) to (VSt)	w=PL		D		2.00 – 2.10
	44	2.50	Sandy CLAY (SC): yellow-brown and pale grey; low to medium plasticity; fine sand; trace silt and shale and ironstone gravel.		ALV				D		2.50 – 2.60
		3							D		3.00 – 3.10
	43		From 3.40m: trace ironstone gravels and cobbles						D		3.50 – 3.60
		4	Test Pit discontinued at 3.60m depth. Limit of excavator reach.								
	42										

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS



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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: No evidence of fly tipping

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 52.3 AHD
COORDINATE: E:293009.5, N:6247041.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP18
PROJECT No: 234411.00
DATE: 30/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
		0.25	TOPSOIL / Silty CLAY: dark grey; medium to high plasticity; with tree roots, trace fine ironstone gravel.	TS	TOP	NA	w>PL		D		0.10 0.20	DCP9/150	5 10 15
	52		CLAY (CI-CH): red-brown mottled pale grey; medium to high plasticity; trace ironstone gravel.			F to St			D B		0.50 0.60		
		1				VSt			D		0.90 1.00		
	51		From 1.50m: pale grey mottled yellow-brown, trace silt and fine sand		RS possibly ALV	(VSt)	w<PL		D		1.50 1.60		
		2							D		2.00 2.10		
	50								D		2.50 2.60		
30/05/25		3							D		3.00 3.10		
	49	3.40			possibly XWM	(H)			D		3.50 3.60		
			Test Pit discontinued at 3.60m depth. Refusal on ironstone band.										
	48	4											

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 48.4 AHD
COORDINATE: E:293234.2, N:6247035.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP19
PROJECT No: 234411.00
DATE: 11/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
11/06/25 Groundwater observed at 3.0m			TOPSOIL / Silty CLAY: dark brown and dark grey; low to medium plasticity; trace rootlets and ironstone gravel.	TS	TOP	NA			A		0.10 – 0.20	DCP9/150	5 10 15
	48	0.30	CLAY (CI-CH): red-brown; medium to high plasticity; trace rootlets and siltstone gravel.		ALV	F to St	w=PL		A		0.50 – 0.60		
		0.90	Silty CLAY (CI): red-brown, mottled pale grey; medium plasticity; trace siltstone and ironstone gravel.		ALV	VSt	w<PL		A		0.90 – 1.00		HB 25/100mm
	47	1							A		1.50 – 1.60		
	46	2				(St) to (VSt)			A		2.00 – 2.10		
									A		2.50 – 2.60		
	45	3							A		3.00 – 3.10		
		3.50	Sandy CLAY (SC): pale grey and yellow-brown; low to medium plasticity; fine sand; with silt.		ALV		w=PL		A		3.60 – 3.70		
	44	4	Test Pit discontinued at 3.70m depth. Limit of excavator reach.										

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 46.6 AHD
COORDINATE: E:293449.0, N:6246984.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP20
PROJECT No: 234411.00
DATE: 11/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*]	DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
11/06/25 Groundwater seepage observed from 2.5m			TOPSOIL / Silty CLAY: dark brown and dark grey; low to medium plasticity; trace rootlets, ironstone gravel.	TS TS TS TS TS	TOP					D		0.10 0.20		
		0.35	CLAY (CI): red-brown; medium plasticity; with silt, trace ironstone gravel.		ALV					D		0.50 0.60		
	46	0.90	Sandy CLAY (SC): yellow-brown and pale grey; low to medium plasticity; fine to medium sand; with silt, trace ironstone gravel.							D		0.90 1.00		
		1						w=PL						
	45									D		1.50 1.60		
		2			ALV	ND				D		2.00 2.10		
	44									D		2.50 2.60		
		3.00	Sandy CLAY: yellow-brown and pale grey; low to medium plasticity; fine to medium sand; with siltstone gravels, trace ironstone gravel.					w>PL		D		3.00 3.10		
	43				ALV									
										D		3.80 3.90		
		4	Test Pit discontinued at 3.90m depth. Limit of excavator reach.											
	42													

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 53.6 AHD
COORDINATE: E:292979.7, N:6246779.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

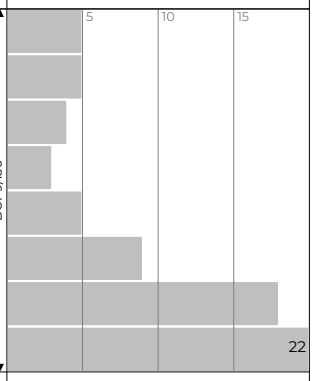
LOCATION ID: TP21
PROJECT No: 234411.00
DATE: 11/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
11/06/25 No free groundwater observed			TOPSOIL / Silty CLAY: dark brown; low to medium plasticity; trace ironstone gravel, rootlets.	TS	TOP				A		0.10 – 0.20
		0.35	CLAY (CI-CH): red-brown and dark brown; medium to high plasticity; trace ironstone gravel.		RS	St	w<PL		A		0.50 – 0.60
	53										
		1	1.00m: dark grey			VSt			A		0.90 – 1.00
		1.20	CLAY (CL-CI): red-brown and dark brown; low to medium plasticity; with ironstone gravel.		XWM	(H)					
		1.30	SILTSTONE: dark grey; inferred very low to low strength. Bringelly Shale.			NA	NA		A A		1.50 1.60 1.70
	52										
			Test Pit discontinued at 1.70m depth. Refusal on very low to low strength siltstone bedrock.								
		2									
	51										
		3									
	50										
		4									
	49										

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS



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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 48.1 AHD
COORDINATE: E:293156.3, N:6246751.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP22
PROJECT No: 234411.00
DATE: 30/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
30/05/25 No Free Groundwater Observed Whilst Augering	48		TOPSOIL / Silty CLAY: dark brown; medium to high plasticity; trace fine ironstone gravel and rootlets.	TS	TOP	NA			D		0.10 – 0.20
		0.30	CLAY (CI-CH): red-brown; medium to high plasticity; trace fine to medium ironstone gravel and rootlets.		ALV	F			D		0.50 – 0.60
			From 0.80m: pale grey and yellow-brown			St	w=PL		D		0.90 – 1.00
	47	1									
									D		1.50 – 1.60
	46	2				(St) to (VSt)			D		2.00 – 2.10
							w<PL		D		2.50 – 2.60
		3.00	CLAY (CI-CH) trace silt: pale grey and yellow-brown; medium to high plasticity; with fine sand and fine ironstone gravel.		ALV or possibly XWM	(H)			D D		3.00 – 3.10 3.10 – 3.20
	45		Test Pit discontinued at 3.20m depth. Refusal on ironstone band in extremely weathered rock.								
	44	4									

TESTING AND REMARKS

TEST TYPE	RESULTS AND REMARKS
DCP9/150	5 10 15

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M.Gounder)
LOGGED: D. Keeling
METHOD: 450mm toothed bucket
REMARKS: New edge of billabong, no apparent ground water down to 1.90m clay was quite soft

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 52.7 AHD
COORDINATE: E:292927.5, N:6246541.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP23
PROJECT No: 234411.00
DATE: 11/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*)	DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
11/06/25 No free groundwater observed	52	0.38	TOPSOIL / Silty CLAY: dark brown; low to medium plasticity; tace rootlets, ironstone and shale gravel.	TS T TS TS TS TS T TS	TOP	NA		w=PL		D		0.10 0.20	DCP9/150	5 10 15
	51	1.00	CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel.		RS	F	(H)	w<PL		D D		0.50 0.60 0.90		HB 25/50mm
		1.20	Sandy CLAY (CI): yellow-brown and pale grey; low to medium plasticity; fine sand; trace ironstone gravel.		XWM							1.00		
		2	SANDSTONE: yellow-brown and dark grey; fine grained, inferred very low to low strength, Bringelly Shale.			NA		NA		D		1.20 1.30		
	50	3	Test Pit discontinued at 1.30m depth. Refusal on very low to low strength sandstone bedrock.											
	49	4												
	48													

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M. Gounder)
LOGGED: D. Keeling
METHOD: 450mm toothed bucket
REMARKS:

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 49.3 AHD
COORDINATE: E:293087.0, N:6246505.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP24
PROJECT No: 234411.00
DATE: 30/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
30/05/25 No Free Groundwater Observed Whilst Augering	49	0.30	TOPSOIL / Silty CLAY: dark brown; medium to high plasticity; trace fine ironstone gravel and rootlets.	TS	TOP	NA			D		0.10 0.20	DCP9/150	5 10 15
			CLAY (CI-CH): red-brown; medium to high plasticity; trace fine to medium ironstone gravel and rootlets.		ALV	F			D		0.50 0.60		
	1					St to VSt			D		0.90 1.00		
	48		From 1.50m: with ironstone gravel bands to 2.1m			(St) to (VSt)	w=PL		D		1.50 1.60		
	2								D		2.00 2.10		
	47	2.50	CLAY (CI-CH): yellow-brown; medium to high plasticity; with fine sand, trace silt and rootlets.		ALV		w<PL		D		2.50 2.60		
	3								D		2.90 3.00		
	46		Test Pit discontinued at 3.00m depth. Refusal on very low strength rock.										
	4												
	45												

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 66.2 AHD
COORDINATE: E:291593.6, N:6246796.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP25
PROJECT No: 234411.00
DATE: 30/05/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
30/05/25 No Free Groundwater Observed Whilst Augering	66		FILL / CLAY: pale grey, red-brown; medium to high plasticity; with ripped siltstone and ironstone gravel, cobbles and occasional siltstone boulder.		FILL	NA	w<PL						
	65	1									1		
	64	2									2		
	63	3	Test Pit discontinued at 2.80m depth. Refusal in tightly packed ripped shale fill..										
	62	4											

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M.Gounder)
LOGGED: D. Keeling
METHOD: 450mm toothed bucket
REMARKS: Adjacent haul road founds on the same profile encountered

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 58.4 AHD
COORDINATE: E:291514.5, N:6246852.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

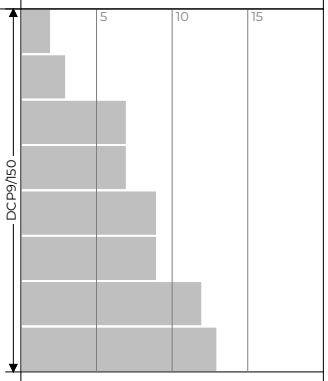
LOCATION ID: TP25A
PROJECT No: 234411.00
DATE: 30/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
30/05/25 No Free Groundwater Observed Whilst Augering	58	0.30	FILL / CLAY: dark grey, brown; low to medium plasticity; with silt and ironstone gravel, trace rootlets.		FILL	NA	w<PL		D		0.10, 0.20
		0.60	FILL / Gravelly CLAY: light brown; low to medium plasticity; ripped shale and ironstone gravels, with ripped shale cobbles and boulders, trace rootlets.		FILL				D		0.50, 0.60
	57	1.90	FILL / CLAY: red-brown; medium to high plasticity; with ironstone gravel, possibly reworked natural clays.		FILL		NA		D, D, D		1.00, 1.10, 1.50, 1.60
	56	3	CLAY (CI-CH): pale grey and pale brown; medium to high plasticity; trace ironstone gravel and rootlets. From 2.80m: grading to extremely weathered rock with ironstone bands		RS		w<PL		D, B, D, D		2.00, 2.10, 2.50, 2.60, 2.90, 3.00
	55, 54		Test Pit discontinued at 3.00m depth. Refusal on ironstone band in extremely weathered rock.								

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS



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

PLANT: 8t excavator
OPERATOR: A&A Hire (M.Gounder)
LOGGED: D. Keeling
METHOD: 450mm toothed bucket
REMARKS: Adjacent haul road founds on the same profile encountered

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 64.6 AHD
COORDINATE: E:291729.3, N:6247013.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP26
PROJECT No: 234411.00
DATE: 12/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
12/06/25 No free groundwater observed	64	1	FILL / Silty CLAY: dark brown; low to medium plasticity; trace rootlets, bricks, ironstone gravel, ironstone cobbles up to 60mm.		FILL	NA	w<PL				1		
	63	1.50	FILL / CLAY: yellow-brown and pale grey; medium to high plasticity; trace ironstone gravel, cobbles up to 60mm, reworked natural.				w=PL						
	62	2	2.50m: organic material throughout, bark, sticks, roots		FILL						2		
	61	3	3.40m-3.80m: topsoil, silty clay with roots, bark, sticks				w>PL				3		
	60	4	Test Pit discontinued at 4.00m depth. Limit of excavator reach.										

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: On existing stockpile

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 75.3 AHD
COORDINATE: E:291965.0, N:6246670.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP27
PROJECT No: 234411.00
DATE: 12/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*]	DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
12/06/25 No free groundwater observed	75		FILL / Gravelly CLAY: red-brown and dark grey; medium to high plasticity; fine to coarse, sandstone, ironstone and shale gravel; cobbles and boulders of shale up to 500mm, trace rootlets and brick fragments.											
		1										1		
	74													
		2			FILL		NA	w<PL				2		
	73													
		3	From 3.10m: trace tree branches									3		
	72													
		4	Test Pit discontinued at 3.80m depth. Limit of excavator reach.											
	71													

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: On existing stockpile

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 70.8 AHD
COORDINATE: E:292208.8, N:6246722.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP29
PROJECT No: 234411.00
DATE: 12/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*]	DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
12/06/25 No free groundwater observed	70	1	FILL / CLAY: dark grey and red-brown; medium to high plasticity; trace shale gravel, silt, bricks, concrete fragments, shale and sandstone cobbles up to 300mm.									1		
								w<PL						
	69	2	2.00m: trace bark, rootlets		FILL	NA						2		
			From 2.50m: bricks and concrete fragments not observed											
	68	3	2.90m: shale boulder approx. 500mm, with ironstone cobbles 3.00m: moist cuttings									3		
								w=PL						
	67	4	Test Pit discontinued at 3.80m depth. Limit of excavator reach.											
	66													

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: On existing stockpile

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 66.6 AHD
COORDINATE: E:292200.6, N:6246636.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP30
PROJECT No: 234411.00
DATE: 30/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
30/05/25 No Free Groundwater Observed Whilst Augering	66		FILL / Gravelly CLAY: pale grey, dark grey, mottled red-brown; medium to high plasticity; fine to coarse, ironstone and ripped shale gravel; with ripped ironstone and shale cobble and boulders.		FILL	NA	w<PL		D D D D		0.10 0.20 0.50 0.60 0.90 1.00 1.50 1.60	DCP9/150	5 10 15 23 29 HB 25/50mm
	65	1.60	FILL / CLAY: red-brown; medium to high plasticity; with ripped siltstone and ironstone gravels and cobbles, trace silt and organics (topsoil, rootlets).		FILL				D D		2.00 2.10		
		2.20	TOPSOIL / Silty CLAY: dark brown; medium to high plasticity; with rootlets and bark fragments, trace ironstone gravel.	TS T TS TS TS TS TS TS T	TOP		NA		D		2.50 2.60		
	64	2.60	CLAY (CI-CH): red-brown, mottled pale grey; medium to high plasticity; trace ironstone gravel. From 3.00m: pale grey and yellow-brown From 3.10m: ironstone band, trace ironstone cobbles to 60mm		RS	(St)	w<PL		B D		2.80 3.00 3.10 3.20		
		3.30	CLAY (CI-CH): pale grey, yellow-brown; medium to high plasticity; with sand, trace ironstone gravel, becoming extremely weathered rock.		RS		w<PL		D		3.40 3.50		
	63		Test Pit discontinued at 3.50m depth. Refusal on ironstone band in extremely weathered rock.										
	62												

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D. Keeling

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Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 65.9 AHD
COORDINATE: E:292338.9, N:6247043.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP31
PROJECT No: 234411.00
DATE: 12/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
12/06/25 No free groundwater observed		0.15	TOPSOIL / Silty CLAY; low to medium plasticity; trace ironstone gravel, rootlets.	TS TS T	TOP	NA							
	65	1	CLAY (CI-CH): red-brown and pale grey; medium to high plasticity; trace ironstone gravel.		RS	(F) to (St)	w<PL				1		
	64	2.00	CLAY (CI-CH): red-brown and pale grey; medium to high plasticity; with ironstone gravel.		XWM	(St) to (VSt) (H)					2		
		2.40	SILTSTONE: dark grey and brown; inferred low to low strength. Bringelly Shale.				NA						
	63	3	Test Pit discontinued at 2.50m depth. Refusal on very low to low strength siltstone bedrock.										
	62	4											
	61												

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M. Gounder)
LOGGED: D. Keeling
METHOD: 450mm toothed bucket
REMARKS: Adjacent stockpile consists of topsoil at the surface underlain by reworked natural clay and ironstone gravels, unable to access on top of stockpile due to power lines

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 70.8 AHD
COORDINATE: E:292427.2, N:6246693.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP33
PROJECT No: 234411.00
DATE: 12/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	70	1	FILL / Gravelly CLAY: dark brown and red-brown; medium to high plasticity; fine to coarse, shale gravel; ripped shale up to 400mm, trace brick and brick fragments, plastic bags, wood.								1		
	69	2			FILL	NA	w<PL				2		
	68		2.50m: mostly bricks and ripped shale cobbles between 80-200mm, some clay (trace amounts)										
		3									3		
12/06/25	67		3.50m: traces of metal (aluminium foil) and plastic fragments, moist/wet material, some voids between bricks				w=PL to w>PL						
		4									4		
	66		Test Pit discontinued at 4.20m depth. Limit of excavator reach.										

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: On existing stockpile

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 64.4 AHD
COORDINATE: E:292490.7, N:6246807.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP34
PROJECT No: 234411.00
DATE: 11/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
11/06/25 No free groundwater observed	64	0.30	FILL / Gravelly CLAY: red-brown and pale grey; medium to high plasticity; fine to coarse gravel; shale and sandstone gravel, trace rootlets, bricks, shale and sandstone cobbles, silt.		FILL	NA	w=PL		D		0.10 0.20		
		0.80	FILL / Sandy GRAVEL: pale grey and dark grey; fine to coarse, sandstone gravel.		FILL		D		D		0.50 0.60		
	63	1 2	FILL / Clayey GRAVEL; fine to coarse, shale gravel; medium to high plasticity clay; with ripped shale cobbles.		FILL	NA	w<PL		D D D D		0.90 1.00 1.50 1.60 2.00 2.10		
	62	2.20 2.40	Sandy CLAY: yellow-brown and pale grey; low to medium plasticity; fine to medium sand.		XWM	(H)			D		2.20 2.30		
			SANDSTONE: red-brown and yellow-brown; fine to medium; inferred very low to low strength Bringelly Shale.			NA	NA		D		2.50 2.60		
	61 60	3 4	Test Pit discontinued at 2.60m depth. Refusal on very low to low strength sandstone bedrock.										

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 64.2 AHD
COORDINATE: E:292582.9, N:6246966.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP35
PROJECT No: 234411.00
DATE: 11/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
11/06/25 No free groundwater observed	64		FILL / Gravelly CLAY: red-brown and pale grey; medium to high plasticity; fine to coarse, sandstone, ironstone and shale gravel; trace silt, rootlets, brick fragments, shale and sandstone cobbles and boulders.		FILL	NA			D		0.10 – 0.20		
			0.50m: plastic bag						D		0.50 – 0.60		
		1							D		0.90 – 1.00		
	63		1.50m: organic material (bark, roots)						D		1.50 – 1.60		
		1.70	FILL / Silty CLAY: dark brown and brown; low to medium plasticity; trace ironstone and shale gravel, fine sand and rootlets.		FILL		w<PL						
		2.00	CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel.		RS	(St)			D		2.00 – 2.10		
	62		2.40m: pale grey mottled red-brown						D		2.50 – 2.60		
		3							D		3.00 – 3.10		
	61	3.20	CLAY (CI-CH): red-brown; medium to high plasticity; with ironstone gravel.		XWM	(H)							
		3.40	SILTSTONE: red-brown and dark grey; inferred very low to low strength. Bringelly Shale.			NA	NA		D		3.40 – 3.50		
			Test Pit discontinued at 3.50m depth. Refusal on very low to low strength siltstone bedrock.										
		4											
	60												

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M. Gounder)
LOGGED: D. Keeling
METHOD: 450mm toothed bucket
REMARKS: Excavated near surrounding stock piles at ground level

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 63.2 AHD
COORDINATE: E:292674.9, N:6247067.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

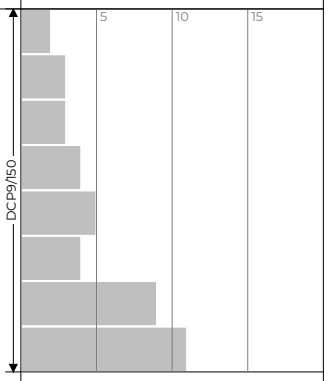
LOCATION ID: TP36
PROJECT No: 234411.00
DATE: 29/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
29/05/25 No Free Groundwater Observed Whilst Augering	63	0.30	TOPSOIL / Silty CLAY: dark brown; medium to high plasticity; trace rootlets and ironstone gravel.	TS	TOP	ND	w<PL		D		0.10, 0.20
			CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel.		RS	St	w<PL		D, B, D		0.50, 0.60, 0.90, 1.00
			From 0.80m: with ironstone bands			VSt - H	w<PL		D, D, D		1.50, 1.60, 2.00, 2.10
	62	1, 2									
	61	2.10	CLAY (CI-CH): dark grey, red-brown; medium to high plasticity; with ironstone gravel.		RS	(VSt) - (H)	w<PL		D		2.40, 2.50
			From 2.40m: becoming extremely weathered rock								
	60	3	Test Pit discontinued at 2.50m depth. Refusal on very low to low strength ironstone bands in extremely weathered rock.								
	59	4									

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS



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

PLANT: 8t excavator
OPERATOR: A&A Hire (M.Gounder)
LOGGED: D. Keeling
METHOD: 450mm toothed bucket
REMARKS: Adjacent haul road consists of approx 250mm thick of ripped sandstone underlain by residual clay.

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 62.3 AHD
COORDINATE: E:292749.0, N:6247192.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP37
PROJECT No: 234411.00
DATE: 29/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
29/05/25 No Free Groundwater Observed Whilst Augering		0.15	TOPSOIL / Silty CLAY: dark brown; medium to high plasticity; trace rootlets and ironstone gravel.	TS	TOP	ND	w<PL		D		0.10 0.20		
	62		CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel.		RS	St to VSt	w<PL		D U		0.40 0.50 0.60	DCP9/150	
			From 0.70m: pale grey and red-brown, with ironstone bands								0.85	PP	450kPa
		1				H			D		0.90 1.00		26 27
	61	1.30	SANDSTONE: pale grey and pale brown, fine to medium grained; very low to low strength.		XWM	NA	NA		D		1.30 1.40		
			Test Pit discontinued at 1.40m depth. Refusal in very low to low strength rock.										
		2											
	60												
		3											
	59												
		4											
	58												

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M.Gounder)
LOGGED: D. Keeling
METHOD: 450mm toothed bucket
REMARKS: Adjacent haul road consists of approx 150mm of ripped sandstone underlain by 50mm then residual clay

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

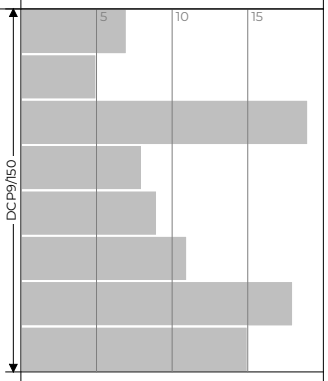
Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 59.6 AHD
COORDINATE: E:292746.4, N:6246892.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP38
PROJECT No: 234411.00
DATE: 11/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
11/06/25 No free groundwater observed	59		FILL / CLAY (CI-CH) trace sandstone: brown and red-brown; medium to high plasticity; fine to coarse; trace shale gravel, plastic bags, rootlets, ironstone and sandstone cobbles and boulders, silt.		FILL	VC	w<PL		A		0.10	DCP9/150	
											0.20		
									A		0.50		
											0.60		
		1							A		0.90		
											1.00		
	58								A		1.50		
											1.60		
											1.70		
									A		1.80		
			Test Pit discontinued at 1.80m depth. Refusal on very low to low strength sandstone.										
		2											
	57												
		3											
	56												
		4											
	55												

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: Fill appears to extend to on top of rock

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 54.7 AHD
COORDINATE: E:292895.4, N:6247044.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP39
PROJECT No: 234411.00
DATE: 11/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
11/06/25 No free groundwater observed			TOPSOIL / Silty CLAY: brown; low to medium plasticity; trace shale and sandstone gravel, fine sand, rootlets.	TS	TOP	NA	w<PL		A		0.10 – 0.20
		0.35	CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel.		RS	F to St	w=PL		A		0.50 – 0.60
	54								A		0.90 – 1.00
		1	1.40m: pale grey, mottled red-brown			(St) to (VSt)			A		1.50 – 1.60
	53								A		2.00 – 2.10
		2	2.70m: ironstone band						A		2.50 – 2.60
	52										
		2.85	SILTSTONE: red-brown and yellow-brown; with ironstone gravels, inferred very low to low strength, Bringelly Shale.			NA	ND		A		2.90 – 3.00
		3	Test Pit discontinued at 3.00m depth. Refusal on very low to low strength siltstone bedrock.								
	51										
		4									
	50										

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS: 5, 10, 15

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

PLANT: 8t excavator
OPERATOR: A&A Hire (M. Gounder)
LOGGED: D. Keeling
METHOD: 450mm toothed bucket
REMARKS: No apparent wet ground at test pit location, dam wall consists of topsoil and clay, reworked natural

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

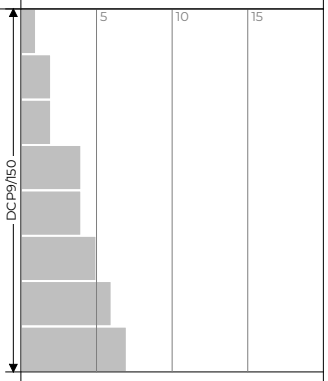
CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 55.3 AHD
COORDINATE: E:292771.6, N:6246579.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP40
PROJECT No: 234411.00
DATE: 30/05/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
30/05/25 No Free Groundwater Observed Whilst Augering	55	0.30	TOPSOIL / Silty CLAY: dark brown; medium to high plasticity; trace rootlets and ironstone gravel.	TS	TOP	ND	w=PL		D		0.10, 0.20
			CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel.		RS	Fr	w<PL				
			From 0.50m-0.60m: tree roots encountered			St			D		0.50, 0.60
		1	From 1.20m: becoming red-brown mottled pale grey						D		0.90, 1.00
	54					(H)			D		1.50, 1.60
		1.70	SILTSTONE: red-brown and dark grey; very low to low strength.		XWM	NA	NA		D		1.75, 1.85
		2	Test Pit discontinued at 1.85m depth. Refusal in very low to low strength rock.								
	53										
		3									
	52										
		4									
	51										

TESTING AND REMARKS

TEST TYPE	RESULTS AND REMARKS
DCP9/150	

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS:

OPERATOR: A&A Hire (M.Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 54.2 AHD
COORDINATE: E:293125.8, N:6247343.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP41
PROJECT No: 234411.00
DATE: 12/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
12/06/25 No free groundwater observed	54		TOPSOIL / Silty CLAY: brown; low to medium plasticity; trace ironstone gravel, rootlets, bark.	TS	TOP	NA			D		0.10 – 0.20
		0.30	CLAY (CI-CH): red-brown mottled pale grey; medium to high plasticity; trace ironstone gravel.		RS	F to St			D		0.50 – 0.60
						VSt					
			0.90m: pale grey mottled red-brown with ironstone bands			H	w<PL		D		0.90 – 1.00
	53	1									
		1.40	CLAY (CI-CH): brown to pale grey; medium to high plasticity; with ironstone gravel.		XWM	(H)			D		1.50 – 1.60
		2	SILTSTONE: dark grey, fine grained; inferred very low to low strength. Bringelly Shale.				NA		D		2.00 – 2.10
	52		Test Pit discontinued at 2.10m depth. Refusal on very low to low strength siltstone bedrock.								
		3									
	51										
		4									
	50										

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS: 5, 10, 15; RF 25/120mm

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: Lot 54 investigation

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 48.6 AHD
COORDINATE: E:293241.7, N:6247273.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

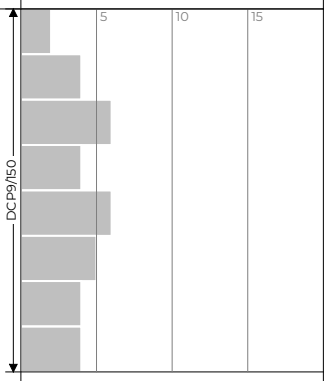
LOCATION ID: TP42
PROJECT No: 234411.00
DATE: 12/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
12/06/25 No free groundwater observed		0.20	TOPSOIL / Silty CLAY: grey-brown; low to medium plasticity; trace ironstone and siltstone gravel, rootlets.		TOP FILL				D		0.10 – 0.20
	48	0.65	FILL / Gravelly CLAY (CI): pale grey and dark red-brown; low to medium plasticity; fine to medium, ironstone gravel; with silt, trace sand, rootlets, possibly natural.		FILL	NA			D		0.50 – 0.60
		1	CLAY (CI-CH): pale grey and red-brown; medium to high plasticity; trace sand and siltstone gravel.			F to St			D		0.90 – 1.00
	47		1.40m: pale grey mottled red-brown		ALV	(St) to (VSt)	w<PL		D		1.50 – 1.60
		2	2.00m-2.40m: ironstone band with fine to coarse ironstone gravels						D		2.00 – 2.10
	46		2.50m: trace fine to coarse ironstone gravel						D		2.50 – 2.60
		2.80	Sandy CLAY (SC): pale grey and yellow-brown; low to medium plasticity; fine sand; trace ironstone and sandstone gravel, silt.		ALV		w=PL		D		3.00 – 3.10
	45	3.50	Gravelly CLAY (CL-CI): pale grey and yellow-brown; low to medium plasticity; ironstone and siltstone gravel.		XWM	(H)			D		3.50 – 3.60
									D		3.75 – 3.85
	44	4	Test Pit discontinued at 3.85m depth. Refusal on inferred very low to low strength sandstone bedrock.								

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS



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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: Lot 54 investigation

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 46.3 AHD
COORDINATE: E:293416.4, N:6247302.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP43
PROJECT No: 234411.00
DATE: 12/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
12/06/25 No free groundwater observed	46	0.37	TOPSOIL / Silty CLAY trace gravel: dark grey; low to medium plasticity; fine to medium, siltstone gravel; rootlets, possibly fill.	TS	TOP	NA			D		0.10–0.20	DCP9/150	
	45	1.50	CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel. From 0.50m: with roots. From 0.90m: trace silt		ALV	F; St to VSt; VSt	w=PL		D		0.50–0.60		
									D		0.90–1.00		
		2.00	CLAY (CI-CH): red-brown; medium to high plasticity; trace siltstone gravel, silt and sand.		ALV				D		1.50–1.60		
12/06/25	44	3	Sandy CLAY (SC): yellow-brown mottled pale grey; low to medium plasticity; fine to medium sand; trace ironstone gravel. From 2.50m: with ironstone and sandstone gravel			(St) to (VSt)	w>PL		D		2.00–2.10		
	43								D		3.00–3.10		
									D		3.65–3.75		
	42	4	Test Pit discontinued at 3.75m depth. Limit of excavator reach, possibly on extremely weathered rock.										

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: Lot 54 investigation

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 46.8 AHD
COORDINATE: E:293525.0, N:6247196.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP44
PROJECT No: 234411.00
DATE: 12/06/25
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
12/06/25 No free groundwater observed			TOPSOIL / Silty CLAY: brown; low to medium plasticity; trace siltstone and ironstone gravel, rootlets.	TS, T	TOP	NA	w<PL		D		0.10 0.20	DCP9/150	5, 10, 15
		0.38	CLAY (CI-CH): red-brown and yellow-brown; medium to high plasticity; trace ironstone gravel and silt.			St			D		0.50 0.60		
	46	1				VSt			D		0.90 1.00		
			1.40m: yellow-brown and pale grey										
	45	2			ALV	(VSt) to (H)	w=PL		D		2.00 2.10		
	44	3	From 3.00m: becoming dark brown and dark grey						D		3.00 3.10		
			From 3.50m: with ironstone bands						D		3.60 3.70		
	43	4	Test Pit discontinued at 3.70m depth. Limit of excavator reach.										
	42												

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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: Lot 54 investigation

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

TEST PIT LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 45.3 AHD
COORDINATE: E:293671.5, N:6247255.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP45
PROJECT No: 234411.00
DATE: 12/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED

GROUNDWATER: 12/06/25 No free groundwater observed

RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE
45	0.35	TOPSOIL / Silty CLAY: dark brown; low to medium plasticity; trace ironstone gravel, rootlets.	TS	TOP	NA	
	0.80	Silty CLAY (CI): dark grey; medium to high plasticity; trace ironstone gravel and fine sand.		ALV	S / St	
	1	CLAY (CI-CH): yellow-brown and pale grey; medium to high plasticity; trace ironstone gravel, fine sand and silt.			VSt	
44						
	2					w=PL
43				ALV		
	3	From 3.00m: trace siltstone gravels			(VSt)	
42						
	4	From 4.00m: with siltstone gravels				w<PL
	4.20	Sandy CLAY (SC): yellow-brown and pale grey; low to medium plasticity; fine to medium sand; trace sandstone gravel and silt.		ALV		w=PL
41		Test Pit discontinued at 4.45m depth. Limit of excavator reach.				

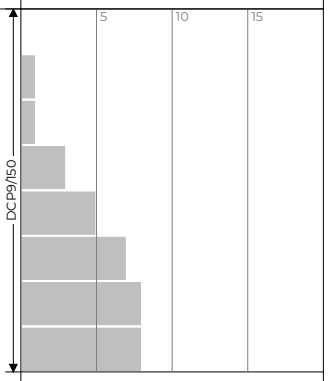
SAMPLE

REMARKS	TYPE	INTERVAL	DEPTH (m)
	D		0.10 – 0.20
	D		0.50 – 0.60
	D		0.90 – 1.00
	D		1.50 – 1.60
	D		2.00 – 2.10
	D		2.50 – 2.60
	D		3.00 – 3.10
	D		3.50 – 3.60
	D		4.00 – 4.10
	D		4.35 – 4.45

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS



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

PLANT: 8t excavator
METHOD: 450mm toothed bucket
REMARKS: Lot 54 investigation

OPERATOR: A&A Hire (M. Gounder)

LOGGED: D. Keeling

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 64.8 AHD
COORDINATE: E:291390.1, N:6246922.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 234411.00
DATE: 06/06/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
06/06/25 No Free Groundwater Observed Whilst Augering		0.10	FILL / Silty CLAY: dark brown; low to medium plasticity; trace rootlets, fine to medium ironstone and siltstone gravel, topsoil fill.		FILL	ND	w<PL						
	64	1	FILL / CLAY: grey and brown; medium to high plasticity; trace fine to coarse sandstone, ironstone and shale gravel.								1		
	63	2			FILL		w<PL				2		
	62	3	From 2.50m-3.00m: shale boulder								3		
		3.50	FILL / CLAY: brown; medium to high plasticity; trace silt, sand and ironstone gravel.										
	61	4									4		
	60	5	From 5.00m: trace sandstone gravel			(MC)					5		
	59	6									6		
	58	7			FILL		w<PL				7		
	57	8									8		
	56	9									9		
	55												

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

PLANT: Comacchio 305
METHOD: SFA to 14.80m
REMARKS:

OPERATOR: Terratest (M.Murray)

LOGGED: D.Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 64.8 AHD
COORDINATE: E:291390.1, N:6246922.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 234411.00
DATE: 06/06/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
			[CONT] FILL / CLAY: brown; medium to high plasticity; trace silt, sand and ironstone gravel.		FILL	(MC)	w<PL						
		10.50	CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel.										
	54	11									11		
	53	12	From 12.00m: trace fine grained sand		RS possibly ALV	(VSt)	w=PL				12		
	52	13									13		
	51	14.00	SILTSTONE: dark grey; very low to low strength. Bringelly Shale.			NA	NA				14		
	50	15	Borehole discontinued at 14.80m depth. Refusal in very low to low strength siltstone.										
	49	16											
	48	17											
	47	18											
	46	19											
	45												

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

PLANT: Comacchio 305
METHOD: SFA to 14.80m
REMARKS:

OPERATOR: Terratest (M.Murray)

LOGGED: D.Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 61.0 AHD
COORDINATE: E:291871.3, N:6246842.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 234411.00
DATE: 05/06/25 - 06/06/25
SHEET: 1 of 3

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	61		FILL / CLAY: brown; medium to high plasticity; trace silt, igneous, siltstone and sandstone gravel.				w<PL						
	60	1	From 1.00m-1.50m: with organic materials (dark-grey clay, trace roots and bark)				w=PL				1		
	59	2			FILL						2		
	58	3									3		
	57	4.00	FILL / Gravelly CLAY: grey; medium to high plasticity; fine to coarse, siltstone gravel.								4		
	56	5				(VC)					5		
							w<PL						
	55	6									6		
	54	7			FILL						7		
	53	8									8		
	52	9									9		

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

PLANT: Comacchio 305
METHOD: SFA to 22.0m
REMARKS:

OPERATOR: Terratest (M.Murray)

LOGGED: D.Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 61.0 AHD
COORDINATE: E:291871.3, N:6246842.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 234411.00
DATE: 05/06/25 - 06/06/25
SHEET: 2 of 3

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	51		[CONT] FILL / Gravelly CLAY: grey; medium to high plasticity; fine to coarse, siltstone gravel.										
	50	11	From 10.50m-12.00m: becoming brown and grey								11		
	49	12					w<PL				12		
	48	13			FILL						13		
	47	14									14		
	46	15				(VC)					15		
Groundwater Observed at approximately 15.5m 05/05/25	45	16.00	FILL / CLAY: grey; medium to high plasticity; trace siltstone and sandstone gravel.								16		
	44	17					w=PL				17		
	43	18	From 17.00m-17.20m: possible cobble or boulder		FILL						18		
	42	19									19		

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

PLANT: Comacchio 305
METHOD: SFA to 22.0m
REMARKS:

OPERATOR: Terratest (M.Murray)

LOGGED: D.Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 61.0 AHD
COORDINATE: E:291871.3, N:6246842.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 234411.00
DATE: 05/06/25 - 06/06/25
SHEET: 3 of 3

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*)	DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	41	20.00	SILTSTONE: dark grey; low to medium strength. Bringelly Shale.											
	40	21				NA		NA				21		
	39	22	Borehole discontinued at 22.00m depth. Refusal in low to medium strength rock.											
	38	23												
	37	24												
	36	25												
	35	26												
	34	27												
	33	28												
	32	29												

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

PLANT: Comacchio 305
METHOD: SFA to 22.0m
REMARKS:

OPERATOR: Terratest (M.Murray)

LOGGED: D.Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 73.9 AHD
COORDINATE: E:291936.3, N:6246756.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH3
PROJECT No: 234411.00
DATE: 03/06/25 - 04/06/25
SHEET: 1 of 3

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
03/06/25 No free groundwater observed whilst augering			FILL / Gravelly CLAY: brown and grey; medium to high plasticity; fine to coarse, ironstone and shale gravel; occasional shale and sandstone boulders.										
	73	1	1.10m: siltstone boulder								1		
	72	2									2		
	71	3									3		
	70	4									4		
	69	5	4.80m-4.90m: possible cobble		FILL	(VC)	w<PL				5		
	68	6	From 6.00m: becoming grey								6		
	67	7									7		
	66	8									8		
	65	9									9		
	64												

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

PLANT: Comacchio 305
METHOD: SFA to 28.5m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 73.9 AHD
COORDINATE: E:291936.3, N:6246756.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH3
PROJECT No: 234411.00
DATE: 03/06/25 - 04/06/25
SHEET: 2 of 3

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
			[CONT] FILL / Gravelly CLAY: brown and grey; medium to high plasticity; fine to coarse, ironstone and shale gravel; occasional shale and sandstone boulders.										
	63	11									11		
			11.50m-12.00m: siltstone boulder										
	62	12									12		
	61	13									13		
	60	14									14		
			14.30m: siltstone boulder										
	59	15			FILL	(VC)	w<PL				15		
	58	16									16		
			16.50m-19.00m: with siltstone cobbles/boulders										
	57	17									17		
	56	18									18		
	55	19									19		
	54												

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

PLANT: Comacchio 305
METHOD: SFA to 28.5m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: Uncased

Generated with CORE-GS by Geroc - Soil Log

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 73.9 AHD
COORDINATE: E:291936.3, N:6246756.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH3
PROJECT No: 234411.00
DATE: 03/06/25 - 04/06/25
SHEET: 3 of 3

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*]	DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
			[CONT] FILL / Gravelly CLAY: brown and grey; medium to high plasticity; fine to coarse, ironstone and shale gravel; occasional shale and sandstone boulders.											
	53	21										21		
			From 21.50m: becoming brown											
	52	22										22		
	51	23										23		
			From 23.50m-25.50m: grey and brown with cobbles/boulders											
	50	24			FILL	(VC)		w<PL				24		
	49	25										25		
	48	26										26		
	47	27										27		
	46	28										28		
	45	29	Borehole discontinued at 28.50m depth. Limit of auger drilling.											
	44													

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

PLANT: Comacchio 305
METHOD: SFA to 28.5m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

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Douglas PARTNERS

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 66.5 AHD
COORDINATE: E:292069.2, N:6246738.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH4
PROJECT No: 234411.00
DATE: 04/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
04/06/25 No free groundwater observed whilst augering	66		FILL / Gravelly CLAY: brown; medium to high plasticity; fine to coarse, ironstone and shale gravel; trace sandstone gravel.										
			From 0.50m: grey and brown										
	65	1									1		
		2									2		
	64				FILL	ND	w<PL						
		3	3.00m-4.50m: possibly reworked natural or extremely weathered rock								3		
	63												
		4									4		
	62												
		4.95	SILTSTONE: dark grey, very low to low strength. Bringelly Shale.								5		
	61					NA	NA						
		6									6		
	60												
		7	Borehole discontinued at 6.70m depth. Refusal in low strength siltstone.										
	59												
		8											
	58												
		9											
	57												

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

PLANT: Comacchio 305
METHOD: SFA to 4.5m, WB to 6.7m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: HQ to 4.5m

Refer to explanatory notes for symbol and abbreviation definitions

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Douglas PARTNERS

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 65.0 AHD
COORDINATE: E:292092.1, N:6246805.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH5
PROJECT No: 234411.00
DATE: 04/06/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*]	DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
04/06/25 No free groundwater observed whilst augering			FILL / Gravelly CLAY: brown and grey; fine to coarse, ironstone and shale gravel; trace sandstone gravel.											
	64	1	1.00m: boulder of shale about 200mm thick									1		
	63	2										2		
	62	3			FILL	ND		w<PL				3		
	61	4	4.00m-4.50m: pale grey with fine to medium shale gravel									4		
	60	5										5		
	59	6.00	SILTSTONE: brown and grey; very low to low strength. Bringelly Shale.									6		
	58	7										7		
	57	8				NA		NA				8		
	56	9.00	SILTSTONE: pale grey and grey; very low to low strength. Bringelly Shale.									9		

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

PLANT: Comacchio 305
METHOD: SFA to 12m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 65.0 AHD
COORDINATE: E:292092.1, N:6246805.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH5
PROJECT No: 234411.00
DATE: 04/06/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*)	DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
			[CONT] SILTSTONE: pale grey and grey; very low to low strength. Bringelly Shale.											
	54	11				NA		NA				11		
	53	12	Borehole discontinued at 12.00m depth. Refusal in low strength siltstone.											
	52	13												
	51	14												
	50	15												
	49	16												
	48	17												
	47	18												
	46	19												

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

PLANT: Comacchio 305
METHOD: SFA to 12m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 49.2 AHD
COORDINATE: E:292006.2, N:6246890.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH6
PROJECT No: 234411.00
DATE: 05/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	49		FILL / Gravelly CLAY: brown and grey; fine to coarse, sandstone and shale gravel; occasional sandstone cobbles and boulders up to 600mm, trace silt and rootlets.										
	48	1			FILL						1		
	47	2					w<PL				2		
		2.50	FILL / CLAY: grey and brown; medium to high plasticity; trace fine to coarse shale and sandstone gravel.										
	46	3				ND					3		
▼ 05/06/25		4									4		
Groundwater (possibly, moist cuttings)	45				FILL								
	44	5					w=PL				5		
	43	6									6		
		6.50	SILTSTONE: pale grey; very low to low strength. Bringelly Shale.										
	42	7				NA	NA				7		
	41	8									8		
	40	9	Borehole discontinued at 8.80m depth. Refusal in low strength siltstone.										

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

PLANT: Comacchio 305
METHOD: SFA to 8.8m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 49.3 AHD
COORDINATE: E:292021.9, N:6246896.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH7
PROJECT No: 234411.00
DATE: 05/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	49		FILL / Gravelly CLAY: brown and grey; fine to coarse, sandstone and siltstone gravel; with occasional sandstone cobbles and boulders, trace silt and rootlets.		FILL	ND							
		1.00	FILL / CLAY: brown and grey; medium to high plasticity; trace fine to coarse shale gravel.				w<PL				1		
	48												
		2			FILL						2		
	47												
▼ 05/06/25		3					w>PL						
Groundwater observed in auger cuttings	46		Borehole discontinued at 3.00m depth. Refusal in low strength siltstone.										
		4											
	45												
		5											
	44												
		6											
	43												
		7											
	42												
		8											
	41												
		9											
	40												

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

PLANT: Comacchio 305
METHOD: SFA to 3m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 64.8 AHD
COORDINATE: E:292121.2, N:6246953.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH8
PROJECT No: 234411.00
DATE: 05/06/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*)	DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	TEST TYPE	RESULTS AND REMARKS
05/06/25 No free groundwater observed whilst augering	64	1	FILL / CLAY: brown and grey; medium to high plasticity; trace fine sand and fine to coarse ironstone gravel.										
	63	2	From 1.50m: trace fine to coarse shale gravel					w<PL					
	62	3	2.90m-3.00m: trace rootlets, bark, organic material										
	61	4			FILL	ND							
	60	5						w=PL					
	59	6											
	58	7	From 7.00m: dark grey and red-brown					w<PL					
	57	8											
		8.50	SILTSTONE: brown and grey; very low to low strength. Bringelly Shale.										
	56	9				NA		NA					
	55												

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

PLANT: Comacchio 305
METHOD: SFA to 10.5m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 64.8 AHD
COORDINATE: E:292121.2, N:6246953.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH8
PROJECT No: 234411.00
DATE: 05/06/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
			[CONT] SILTSTONE: brown and grey; very low to low strength. Bringelly Shale.			NA	NA						
	54	11	Borehole discontinued at 10.50m depth. Refusal in low strength siltstone.										
	53	12											
	52	13											
	51	14											
	50	15											
	49	16											
	48	17											
	47	18											
	46	19											
	45												

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

PLANT: Comacchio 305
METHOD: SFA to 10.5m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 63.8 AHD
COORDINATE: E:292126.3, N:6246910.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH9
PROJECT No: 234411.00
DATE: 05/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
05/06/25 No free groundwater observed whilst augering	63	1	FILL / CLAY: brown; medium to high plasticity; trace fine to coarse siltstone gravel and cobbles, trace rootlets. From 0.90m: yellow-brown and pale grey, trace silt, reworked natural								1		
	62	2			FILL	ND	w<PL				2		
	61	3	From 3.00m: dark grey and red-brown 3.10m-3.30m: shale boulder								3		
	60	4.00	SILTSTONE: dark grey and pale grey; very low to low strength. Bringelly Shale.								4		
	59	5									5		
	58	6				NA	NA				6		
	57	7									7		
	56	8									8		
	55	9	Borehole discontinued at 9.00m depth. Refusal in low strength siltstone.										
	54												

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

PLANT: Comacchio 305
METHOD: SFA to 9m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 63.9 AHD
COORDINATE: E:292186.3, N:6246907.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH10
PROJECT No: 234411.00
DATE: 05/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
05/06/25 No free groundwater observed whilst augering	63	1	FILL / CLAY: brown and grey; medium to high plasticity; trace silt, fine to medium ironstone & shale gravel.		FILL	ND	w<PL				1		
	62	2									2		
		2.50	SILTSTONE: dark grey; very low to low strength. Bringelly Shale.										
	61	3									3		
	60	4				NA	NA				4		
	59	5									5		
	58	6	Borehole discontinued at 6.00m depth. Refusal in low to medium strength siltstone.										
	57	7											
	56	8											
	55	9											
	4												

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

PLANT: Comacchio 305
METHOD: SFA to 6m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 64.7 AHD
COORDINATE: E:292130.3, N:6247299.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH11
PROJECT No: 234411.00
DATE: 02/06/25
SHEET: 1 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
02/06/25 No free groundwater observed whilst augering		0.05	FILL / SAND: brown; fine to medium; trace sandstone and ironstone gravel.		FILL	ND			A		0.10 – 0.20		
		0.40	FILL / Silty CLAY: brown; low to medium plasticity; trace rootlets, sand and gravel, possibly natural.						A		0.50 – 0.60		
	64	1	CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone and sandstone gravel.		RS	VSt to H	w<PL		A		0.90 – 1.00		
									SPT		1.45	SPT	6,8,11 N=19
	63	2										PP	300kPa
		2.65			XWM	H			A		2.40 – 2.50		
									SPT		2.92	SPT	16,24,25/120 (HB)
		3.07	Continued as rock log										
	62	3											
	61	4											
	60	5											
	59	6											
	58	7											
	57	8											
	56	9											
	55												

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

PLANT: Comacchio 305
METHOD: SFA to 3.07m, then NMLC coring to 7.22m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: HW to 3.05m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 64.7 AHD
COORDINATE: E:292130.3, N:6247299.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH11
PROJECT No: 234411.00
DATE: 02/06/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED | **SAMPLE** | **TESTING**

GROUNDWATER: 02/06/25 No free groundwater observed whilst augering

RL (m): 64, 63, 62, 61, 60, 59, 58, 57, 56, 55

DEPTH (m): 1, 2, 3, 4, 5, 6, 7, 8, 9

DESCRIPTION OF STRATA (SOIL STRENGTH (where encountered) / SOIL MOISTURE)

Continued from soil log

SANDSTONE: pale brown, fine to medium grained, distinct and indistinct, bedded. Bringelly Shale.

4.81

SILTSTONE: brown and grey, bedded; with some medium strength iron indurated bands. Bringelly Shale.

Borehole discontinued at 7.22m depth.

GRAPHIC

WEATH. (PS, XW, HW, MW, SW, FR; DW): HW - MW

STRENGTH (VL, L, M, H, VH, EH): 3.07; L; 4.74, 4.81, 4.87 SEAM; 5.00; M; 5.46; L; 5.78, 5.88 SEAM; L - M; 6.41, 6.46 SEAM; L - M

RECOVERY (%): 100; 100

RQD: 80; 92

FRACTURE SPACING (m): 0.01, 0.05, 0.10, 0.50, 1.00, 5.00

DEFECTS & REMARKS:
- 3.30m: B, 0°, PR, Clay 10mm, SM
- 3.47m: B, 10°, PR, Clay 15mm, SM
- 3.64m: JT, 0-90°, PR, Clay 10mm, SM
- 3.67m: CS, 40mm
- 4.13m: JT, 0-20°, UN, Clay 8mm, SM
- 4.49m: JT, 40°, UN, Clay 3mm, SM
- 4.53m: B, 5°, PR, Clay 5mm, SM
- 4.57m: B, 5°, PR, Clay 15mm, SM
- 4.70m: B, 5°, PR, Clay 20mm, SM
- 4.74m: DS, 70mm
- 4.87m: DS, 130mm
- 5.57m: JT, 0-90°, UN, VNR Clay, SM
- 5.63m: B, 8°, UN, SN Fe, RF
- 5.66m: DS, 30mm
- 5.78m: DS, 100mm
- 5.89m: JT, 90°, UN, SN Fe, SM
- 5.95m: B, 0°, PR, Clay 3mm, SM
- 6.09m: B, 0°, PR, SN Fe, SM
- 6.34m: CS, 30mm
- 6.41m: DS, 50mm
- 6.74m: B, 0°, UN, SN Fe, RF
- 7.03m: JT, 45°, PR, VNR Clay, SM

SAMPLE REMARKS | TYPE | INTERVAL | DEPTH (m) | TEST TYPE | RESULTS AND REMARKS | BACKFILL | WELL PIPE

NOTES: [#] Soil origin is "probable" unless otherwise stated.

PLANT: Comacchio 305
OPERATOR: Terratest (M. Murray)
LOGGED: D. Keeling
METHOD: SFA to 3.07m, then NMLC coring to 7.22m
CASING: HW to 3.05m
REMARKS:

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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

CORE PHOTO LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 64.7 AHD
COORDINATE: E:292130.3, N:6247299.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH11
PROJECT No: 234411.00
DATE: 02/06/25
SHEET: 1 of 1

3.07-7.00 m depth

7.00-7.22 m depth

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

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 63.2 AHD
COORDINATE: E:292188.8, N:6246869.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH12
PROJECT No: 234411.00
DATE: 05/06/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
05/06/25 No free groundwater observed whilst augering	63		FILL / CLAY: brown and grey; medium to high plasticity; trace shale and ironstone gravel.		FILL	ND	w<PL						
		1									1		
	62	1.20	SILTSTONE: dark grey; very low to low strength. Bringelly Shale.										
		2				NA	NA				2		
	61												
		3	Borehole discontinued at 3.00m depth. Refusal in low strength siltstone.										
	60												
		4											
	59												
		5											
	58												
		6											
	57												
		7											
	56												
		8											
	55												
		9											
	54												

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

PLANT: Comacchio 305
METHOD: SFA to 3m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 63.8 AHD
COORDINATE: E:292461.2, N:6247018.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH14
PROJECT No: 234411.00
DATE: 06/06/25
SHEET: 1 of 2

06/06/25 No Free Groundwater Observed Whilst Augering

CONDITIONS ENCOUNTERED							SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	TEST TYPE	RESULTS AND REMARKS
		0.17	FILL / CONCRETE SLAB; 10mm □ Ø steel reinforcement at 70mm depth.		FILL		NA					
			FILL / Gravelly CLAY: brown and grey; medium to high plasticity; fine to coarse, ironstone and shale gravel; with brick fragments, silt and sand.		FILL	NA	w<PL		A A	0.17–0.30 0.50–0.60		
	63	1.05	CLAY (CI-CH): dark grey and brown; medium to high plasticity; trace ironstone gravel.		XWM	H	w<PL				SPT	23,25/30 HB
	62	2.00	Continued as rock log									
	61	3										
	60	4										
	59	5										
	58	6										
	57	7										
	56	8										
	55	9										
	54											

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

PLANT: Comacchio 305
METHOD: SFA to 2.0m, NMLC coring to 3.41m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: HWT to 2.1m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 63.8 AHD
COORDINATE: E:292461.2, N:6247018.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH14
PROJECT No: 234411.00
DATE: 06/06/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED | **SAMPLE** | **TESTING**

GROUNDWATER: 06/06/25 No Free Groundwater Observed Whilst Augering

RL (m)	DEPTH (m)	DESCRIPTION OF STRATA (SOIL STRENGTH (where encountered), SOIL MOISTURE)	GRAPHIC	WEATH. (PS, XW, HW, MW, SW, FR; DW)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.01, 0.05, 0.10, 0.50, 1.00, 5.00)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
63	1													1				
62	2	Continued from soil log												2				
61		SILTSTONE: red-brown, dark grey; with medium strength iron indurated bands. Bringelly Shale.		HW to MW	2.00	L				2.06m: JT, 90°, PR, VNR Clay, SM 2.27m: DS, 20mm 2.52m: JT, 80°, PR, SN Fe, RF 2.62m: B, 0°, PR, SN Fe, RF 2.68m: DS, 40mm 2.80m: JT, 0-90°, ST, SN Fe, RF 2.88m: DS, 40mm 3.32m: B, 5°, PR, SN Fe, RF							
					2.72		66	100										
	3	From 2.90m-3.30m: medium strength, fine grained sandstone		FR HW to MW	2.92 3.20	L to M								3				
60	4	Borehole discontinued at 3.41m depth.																
59	5																	
58	6																	
57	7																	
56	8																	
55	9																	
54																		

NOTES: [#] Soil origin is "probable" unless otherwise stated.

PLANT: Comacchio 305
METHOD: SFA to 2.0m, NMLC coring to 3.41m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: HWT to 2.1m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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

CORE PHOTO LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 63.8 AHD
COORDINATE: E:292461.2, N:6247018.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH14
PROJECT No: 234411.00
DATE: 06/06/25
SHEET: 1 of 1

2.00-3.41 m depth

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

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 60.9 AHD
COORDINATE: E:292786.8, N:6246712.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH15
PROJECT No: 234411.00
DATE: 02/06/25 - 03/06/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED

GROUNDWATER: 02/06/25 No free groundwater observed whilst augering

RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE
	0.09	FILL / CLAY: brown; medium to high plasticity; trace rootlets and ironstone gravel.	TS	FILL / TOP	ND	w<PL
	0.40	TOPSOIL / Silty CLAY: dark brown; medium to high plasticity; trace rootlets and ironstone gravel.				
60	1	CLAY (CI-CH): red-brown; medium to high plasticity; trace ironstone gravel and rootlets. From 1.00m: becoming dark grey and red-brown		RS		
	1.70				H	w<PL
59	2			XWM		
58	3					
	3.06	Continued as rock log				
57	4					
56	5					
55	6					
54	7					
53	8					
52	9					
51						

SAMPLE

REMARKS	TYPE	INTERVAL	DEPTH (m)
	A	0.10 – 0.20	0.10
	A	0.50 – 0.60	0.50
	A	0.90 – 1.00	0.90
	SPT	1.50 – 1.95	1.50
	SPT	2.50 – 2.91	2.50

TESTING AND REMARKS

TEST TYPE	RESULTS AND REMARKS
PP	>500kPa
SPT	7,13,29 N=42
SPT	13,24,25/110 HB

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

PLANT: Comacchio 305
METHOD: SFA to 3.06m, then NMLC coring to 7.26m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: HW to 3.06m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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

BOREHOLE LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 60.9 AHD
COORDINATE: E:292786.8, N:6246712.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH15
PROJECT No: 234411.00
DATE: 02/06/25 - 03/06/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED | **SAMPLE** | **TESTING**

GROUNDWATER: 02/06/25 No free groundwater observed whilst augering

RL (m)	DEPTH (m)	DESCRIPTION OF STRATA (SOIL STRENGTH (where encountered) / SOIL MOISTURE)	GRAPHIC	WEATH. (PS, XW, HW, DW, MW, SW, FR)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.01, 0.05, 0.10, 0.50, 1.00, 5.00)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
60	1													1				
59	2													2				
58	3	Continued from soil log												3				
		SILTSTONE: grey to dark grey; with some medium strength, red brown iron indurated bands. Bringelly Shale.			3.06				SEAM	3.06m : DS, 70mm								
					3.13	L												
					3.43					3.46-4.26m: B x6, 0°, UN, SN Fe, SM								
57	4			HW - MW		L - M	100	90		4.31m: B, 0°, UN, Clay 2mm, SM				4				
56	5	From 5.05m: with 10-20% fine grained, pale grey sandstone beds and laminations								5.06m : B, 0°, PR, SN Fe, RF 4.87-5.42m : JT x3, 45°, PR, SN Fe, RF 5.37m: B, 0°, UN, CT CBS, RF 5.38m: B, 0-5°, UN, SN Fe, RF				5				
					5.44													
55	6					L				5.56m: JT, 0-80°, UN, VNR Clay, SM 5.89m : B, 0°, UN, Clay 5mm, RF 6.16m: B, 0°, PR, Clay 2mm, SM				6				
				SW	6.19		100	92										
54	7			FR	6.60	M - H				6.45-6.58m: JT x3, 30-45°, UN, SN Fe, RF 6.85m: B, 0°, PR, VNR Clay, SM 7.08m: B, 0°, PR, SN Fe, RF				7				
		Borehole discontinued at 7.26m depth.																
53	8																	
52	9																	
51																		

NOTES: [#] Soil origin is "probable" unless otherwise stated.

PLANT: Comacchio 305
METHOD: SFA to 3.06m, then NMLC coring to 7.26m
REMARKS:

OPERATOR: Terratest (M. Murray)

LOGGED: D. Keeling
CASING: HW to 3.06m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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

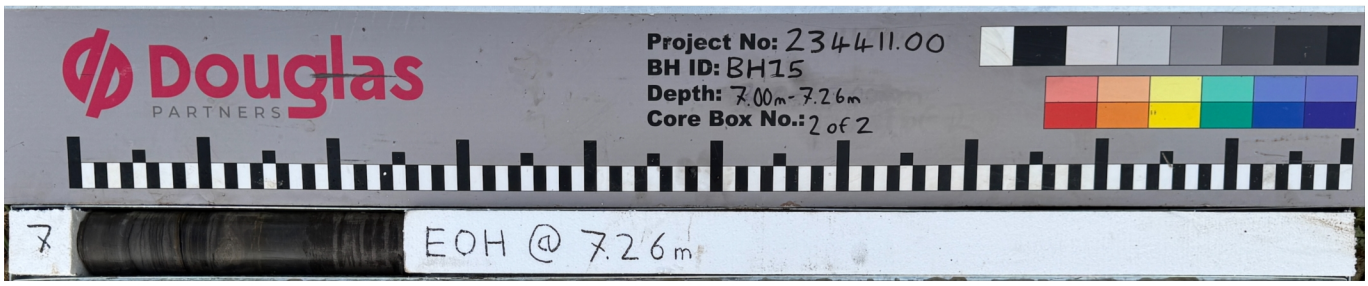
CORE PHOTO LOG

CLIENT: Goodman Property Services (Aust) Pty Ltd
PROJECT: Project Maverick
LOCATION: 265 Martin Road, Bradfield, NSW

SURFACE LEVEL: 60.9 AHD
COORDINATE: E:292786.8, N:6246712.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH15
PROJECT No: 234411.00
DATE: 02/06/25 - 03/06/25
SHEET: 1 of 1

3.06-7.00 m depth



7.00-7.26 m depth

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

Cone Penetration Testing

October 2024

Introduction

The Cone Penetration Test (CPT) is a sophisticated soil profiling test carried out in-situ. A special cone shaped probe is used which is connected to a digital data acquisition system. The cone and adjoining sleeve section contain a series of strain gauges and other transducers which continuously monitor and record various soil parameters as the cone penetrates the soils.

The soil parameters measured depend on the type of cone being used, however they always include the following basic measurements

- Cone tip resistance q_c
- Sleeve friction f_s
- Inclination (from vertical) i
- Depth below ground z

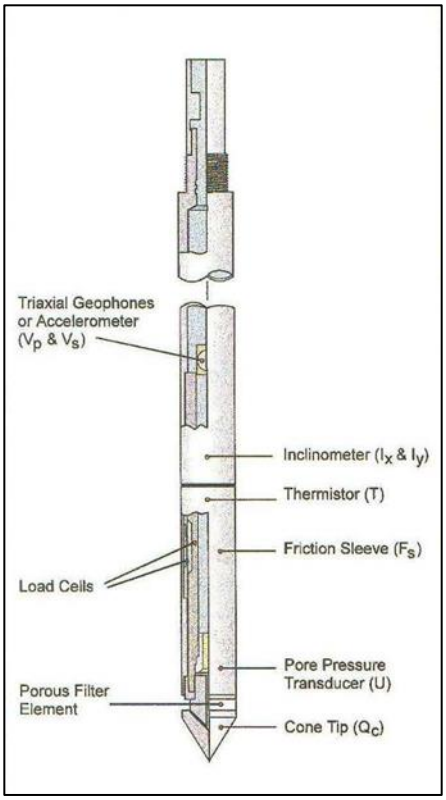


Figure 1: Cone Diagram

The inclinometer in the cone enables the verticality of the test to be confirmed and, if required, the vertical depth can be corrected.

The cone is thrust into the ground at a steady rate of about 20 mm/sec, usually using the hydraulic rams of a purpose built CPT rig, or a drilling rig. The testing is carried out in accordance with the Australian Standard AS1289 Test 6.5.1.

Figure 2: Purpose built CPT rig

The CPT can penetrate most soil types and is particularly suited to alluvial soils, being able to detect fine layering and strength variations. With sufficient thrust the cone can often penetrate a short distance into weathered rock. The cone will usually reach refusal in coarse filling, medium to coarse gravel and on very low strength or better rock. Tests have been successfully completed to more than 60 m.

Types of CPTs

Douglas Partners (and its subsidiary GroundTest) owns and operates the following types of CPT cones:

Type	Measures
Standard	Basic parameters (qc, fs, i & z)
Piezocone	Dynamic pore pressure (u) plus basic parameters. Dissipation tests estimate consolidation parameters
Conductivity	Bulk soil electrical conductivity (□) plus basic parameters
Seismic	Shear wave velocity (Vs), compression wave velocity (Vp), plus basic parameters

Strata Interpretation

The CPT parameters can be used to infer the Soil Behaviour Type (SBT), based on normalised values of cone resistance (Qt) and friction ratio (Fr). These are used in conjunction with soil classification charts, such as the one below (after Robertson 1990)

Cone Penetration testing

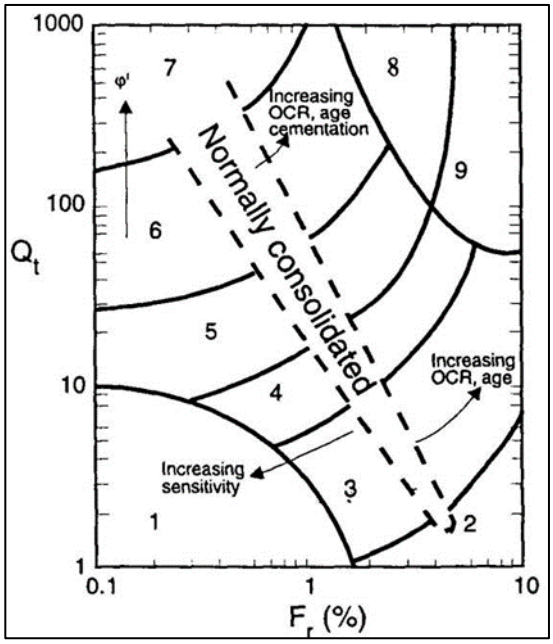


Figure 3: Soil Classification Chart

Douglas' in-house CPT software provides computer aided interpretation of soil strata, generating soil descriptions and strengths for each layer. The software can also produce plots of estimated soil parameters, including modulus, friction angle, relative density, shear strength and over consolidation ratio.

Douglas' CPT software helps our engineers quickly evaluate the critical soil layers and then focus on developing practical solutions for the client's project.

Engineering Applications

There are many uses for CPT data. The main applications are briefly introduced below:

Settlement

CPT provides a continuous profile of soil type and strength, providing an excellent basis for settlement analysis. Soil compressibility can be estimated from cone derived moduli, or known consolidation parameters for the critical layers (eg. from laboratory testing). Further, if pore pressure dissipation tests are undertaken using a piezocone, in-situ consolidation coefficients can be estimated to aid analysis.

Pile Capacity

The cone is, in effect, a small scale pile and, therefore, ideal for direct estimation of pile capacity. Douglas' in-house program ConePile can analyse most pile types and produces pile capacity versus depth plots. The analysis methods are based on proven static theory and empirical studies, taking account of scale effects, pile materials and method of installation.

The results are expressed in limit state format, consistent with the Piling Code AS2159.

Dynamic or Earthquake Analysis

CPT and, in particular, Seismic CPT are suitable for dynamic foundation studies and earthquake response analyses, by profiling the low strain shear modulus G0. Techniques have also been developed relating CPT results to the risk of soil liquefaction.

Other Applications

Other applications of CPT include ground improvement monitoring (testing before and after works), salinity and contaminant plume mapping (conductivity cone), preloading studies and verification of strength gain.

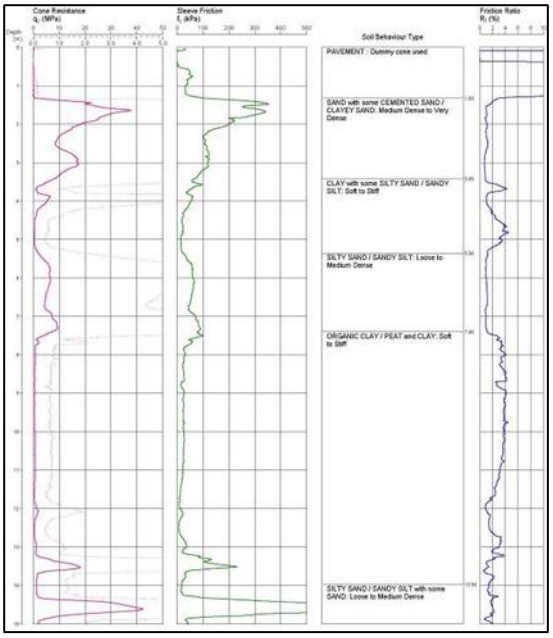


Figure 4: Sample Cone Plot

intentionally blank

CONE PENETRATION TEST

CLIENT: GOODMAN PROPERTY SERVICES (AUST) PTY LTD

PROJECT: PROJECT MAVERICK

LOCATION: 265 MARTIN ROAD, BRADFIELD

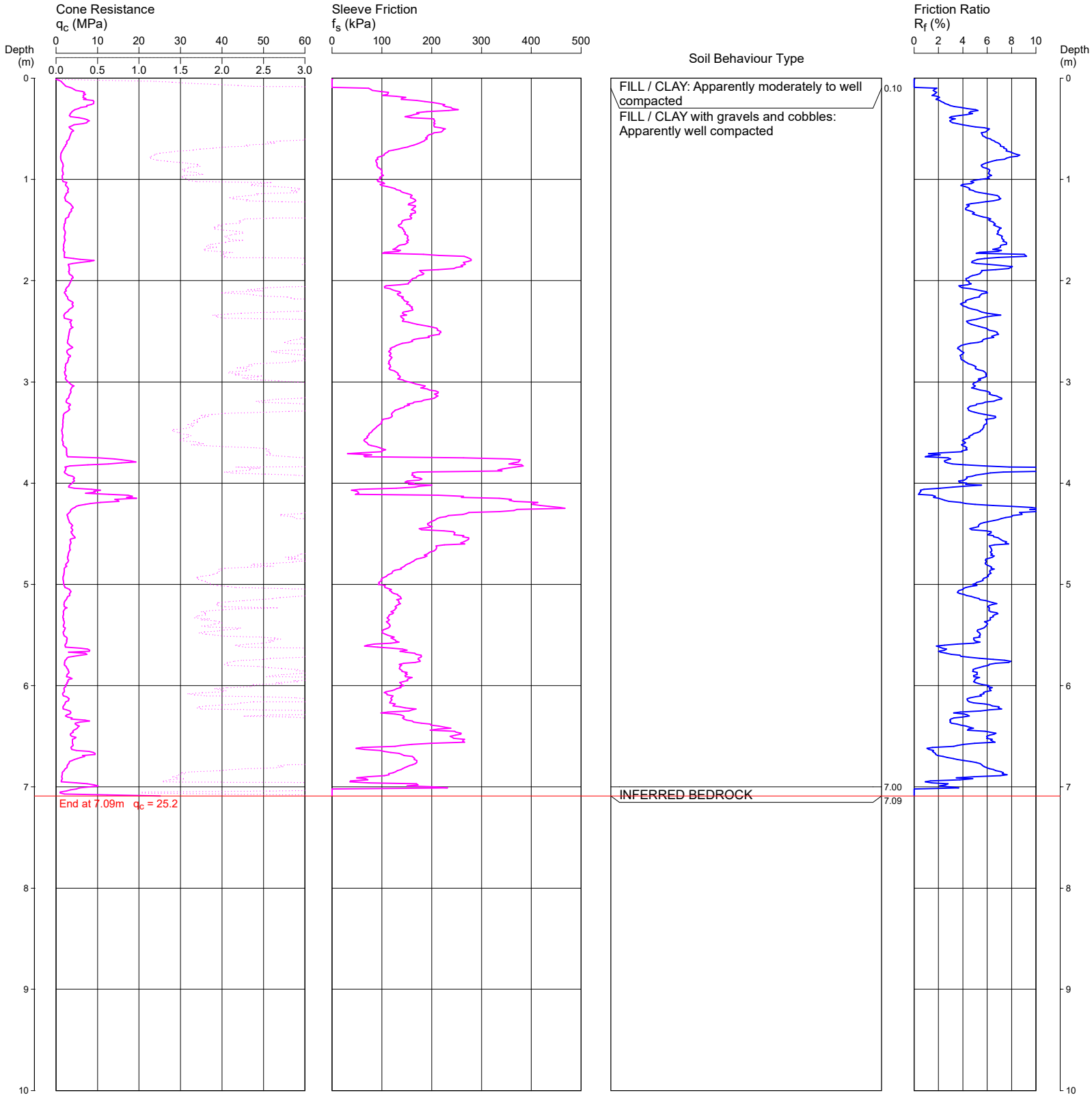
REDUCED LEVEL: 42.8

COORDINATES: 291543.2E 6246959.1N MGA2020

CPT01

DATE 2025, 6, 4

PROJECT No: 234411.00



REMARKS: TEST DISCONTINUED DUE TO REFUSAL ON (or NEAR) INFERRED WEATHERED ROCK (or FILLING)
HOLE COLLAPSED AT 6.05M AFTER WITHDRAWAL OF RODS

File: P:\234411.00 - BADGERYS CREEK, Project Maverick\4.0 Field Work\4.2 Testing\4.2.1 CPT Testing\CPT Files\234411.00_CPT01.CP5
Cone ID: C22515 **Type:** C10CFIIP

ConePlot Version 5.9.2
© 2003 Douglas Partners Pty Ltd

Douglas Partners
Geotechnics / Environment / Groundwater

CONE PENETRATION TEST

CLIENT: GOODMAN PROPERTY SERVICES (AUST) PTY LTD

PROJECT: PROJECT MAVERICK

LOCATION: 265 MARTIN ROAD, BRADFIELD

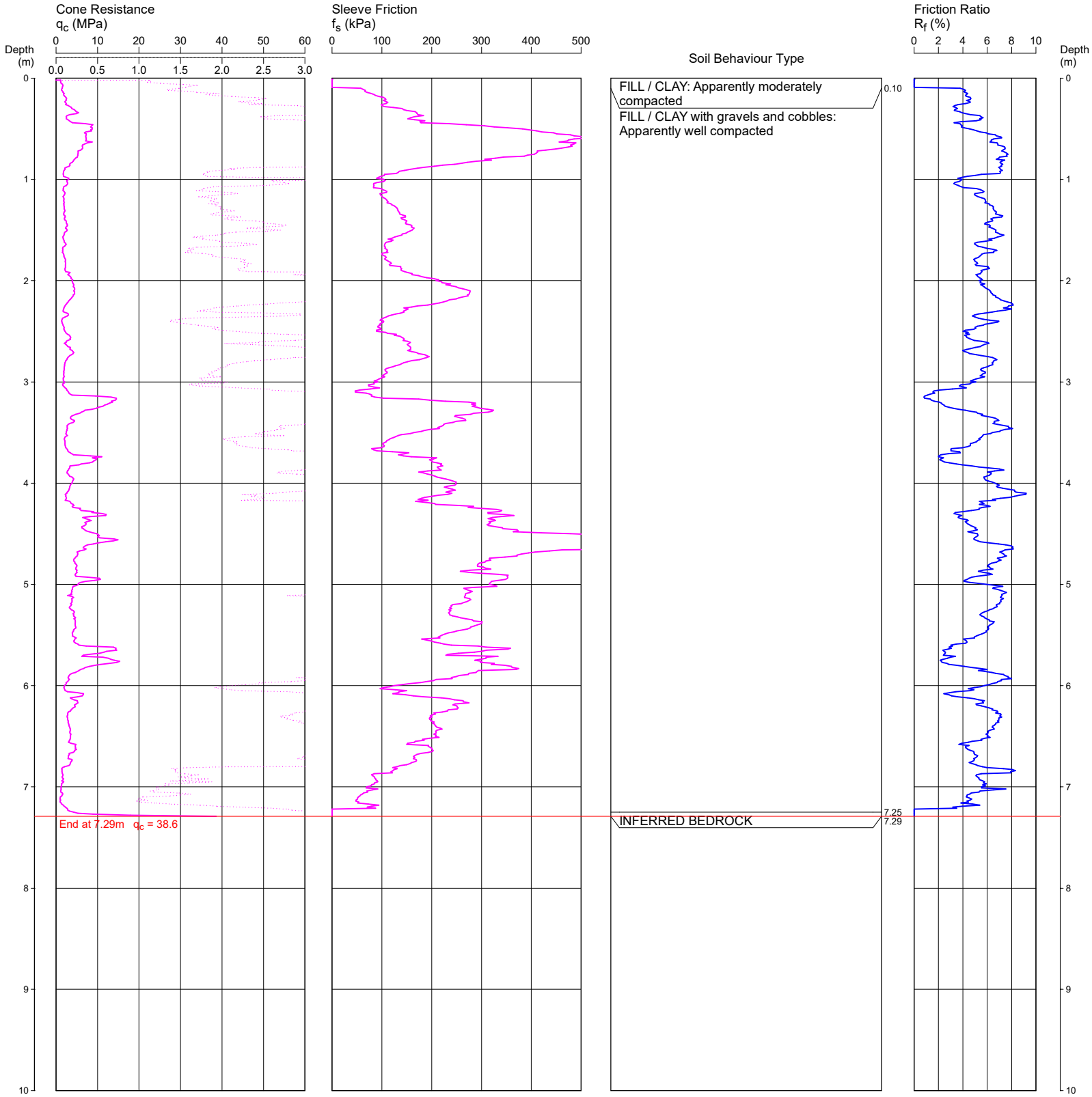
REDUCED LEVEL: 45.1

COORDINATES: 291561.9E 6246898.2N MGA2020

CPT02

DATE 2025, 6, 4

PROJECT No: 234411.00



REMARKS: TEST DISCONTINUED DUE TO REFUSAL ON (or NEAR) INFERRED WEATHERED ROCK (or FILLING)
HOLE COLLAPSED AT 7.0M AFTER WITHDRAWAL OF RODS

File: P:\234411.00 - BADGERYS CREEK, Project Maverick\4.0 Field Work\4.2 Testing\4.2.1 CPT Testing\CPT Files\234411.00_CPT02.CP5
Cone ID: C22515 **Type:** C10CFIIP

ConePlot Version 5.9.2
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CONE PENETRATION TEST

CLIENT: GOODMAN PROPERTY SERVICES (AUST) PTY LTD

PROJECT: PROJECT MAVERICK

LOCATION: 265 MARTIN ROAD, BRADFIELD

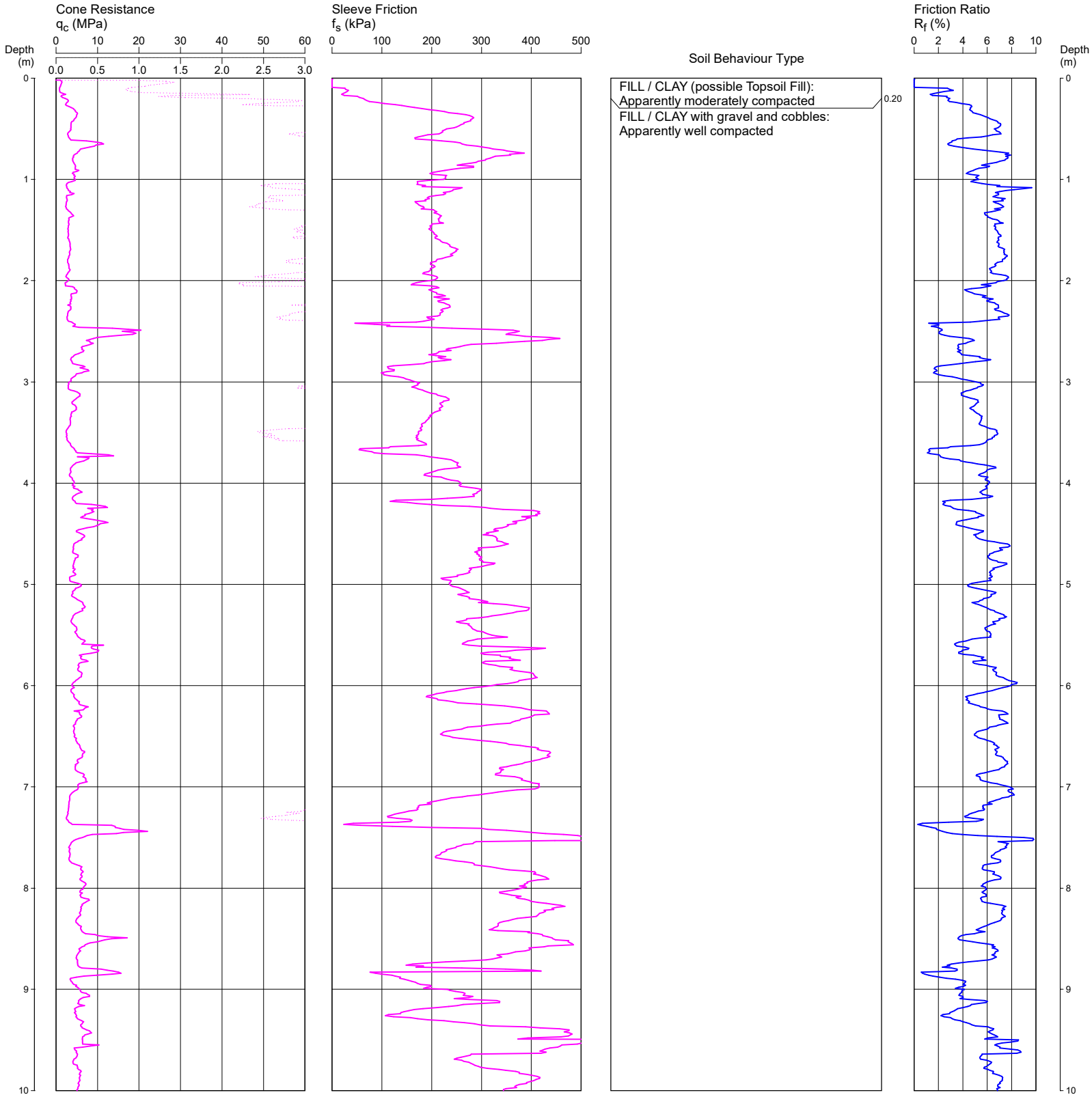
REDUCED LEVEL: 60.7

COORDINATES: 292599.0E 6246700.3N MGA2020

CPT03

DATE 2025, 6, 4

PROJECT No: 234411.00



REMARKS: TEST DISCONTINUED DUE TO REFUSAL ON (or NEAR) INFERRED ROCK
HOLE COLLAPSED AT >10M AFTER WITHDRAWAL OF RODS (LIMIT OF TAPE MEASURE)

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Cone ID: C22515 **Type:** C10CFIIP

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CONE PENETRATION TEST

CLIENT: GOODMAN PROPERTY SERVICES (AUST) PTY LTD

PROJECT: PROJECT MAVERICK

LOCATION: 265 MARTIN ROAD, BRADFIELD

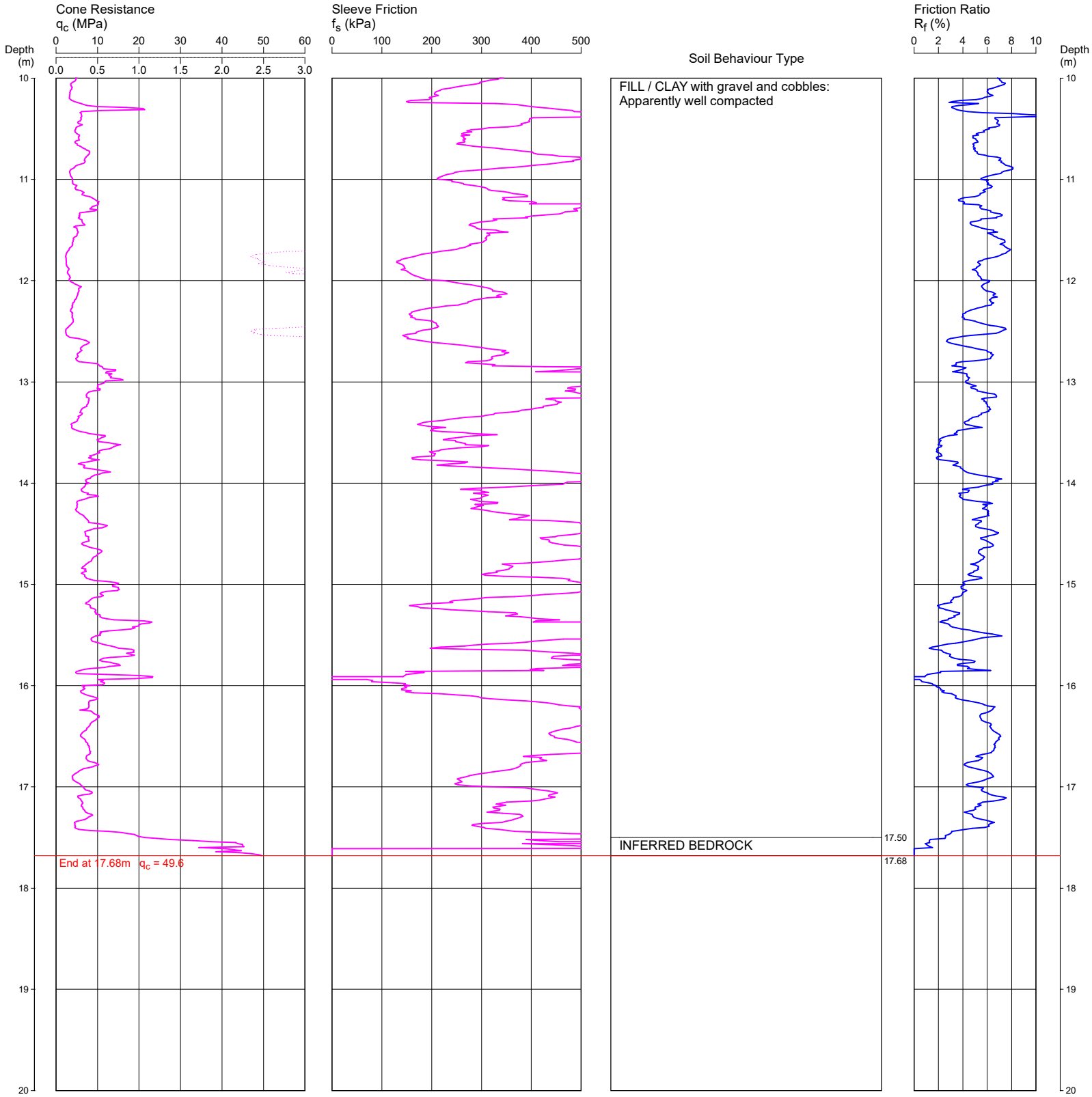
REDUCED LEVEL: 60.7

COORDINATES: 292599.0E 6246700.3N MGA2020

CPT03

DATE 2025, 6, 4

PROJECT No: 234411.00



REMARKS: TEST DISCONTINUED DUE TO REFUSAL ON (or NEAR) INFERRED ROCK
HOLE COLLAPSED AT >10M AFTER WITHDRAWAL OF RODS (LIMIT OF TAPE MEASURE)

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Cone ID: C22515 **Type:** C10CFIIP

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CONE PENETRATION TEST

CLIENT: GOODMAN PROPERTY SERVICES (AUST) PTY LTD

PROJECT: PROJECT MAVERICK

LOCATION: 265 MARTIN ROAD, BRADFIELD

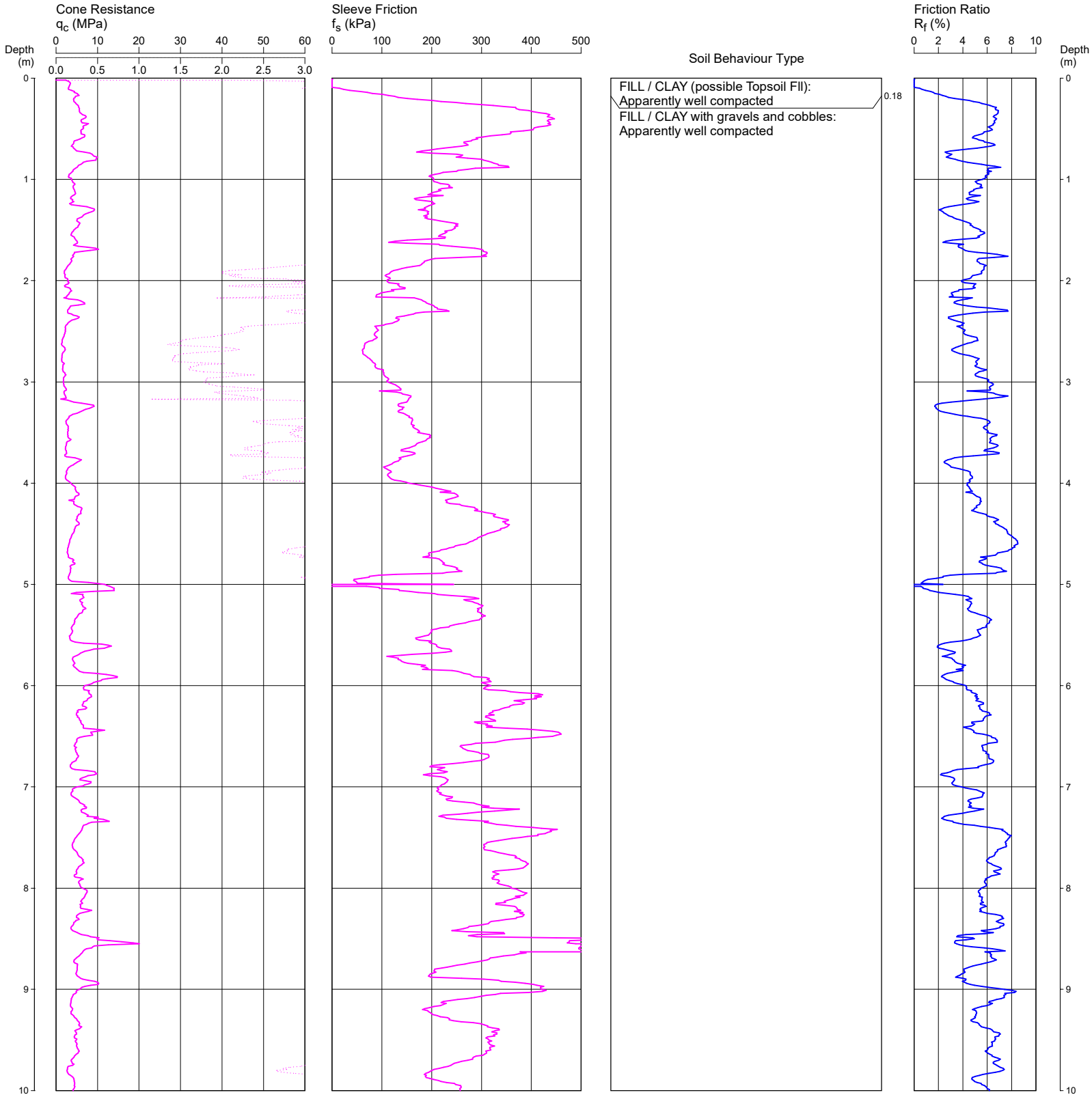
REDUCED LEVEL: 59.5

COORDINATES: 292587.9E 6246632.5N MGA2020

CPT04

DATE 2025, 6, 4

PROJECT No: 234411.00



REMARKS: TEST DISCONTINUED DUE TO REFUSAL ON (or NEAR) INFERRED WEATHERED ROCK
HOLE COLLAPSED AT 1.75M AFTER WITHDRAWAL OF RODS

File: P:\234411.00 - BADGERYS CREEK, Project Maverick\4.0 Field Work\4.2 Testing\4.2.1 CPT Testing\CPT Files\234411.00_CPT04.CP5
Cone ID: C22515 **Type:** C10CFIIP

ConePlot Version 5.9.2
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CONE PENETRATION TEST

CLIENT: GOODMAN PROPERTY SERVICES (AUST) PTY LTD

PROJECT: PROJECT MAVERICK

LOCATION: 265 MARTIN ROAD, BRADFIELD

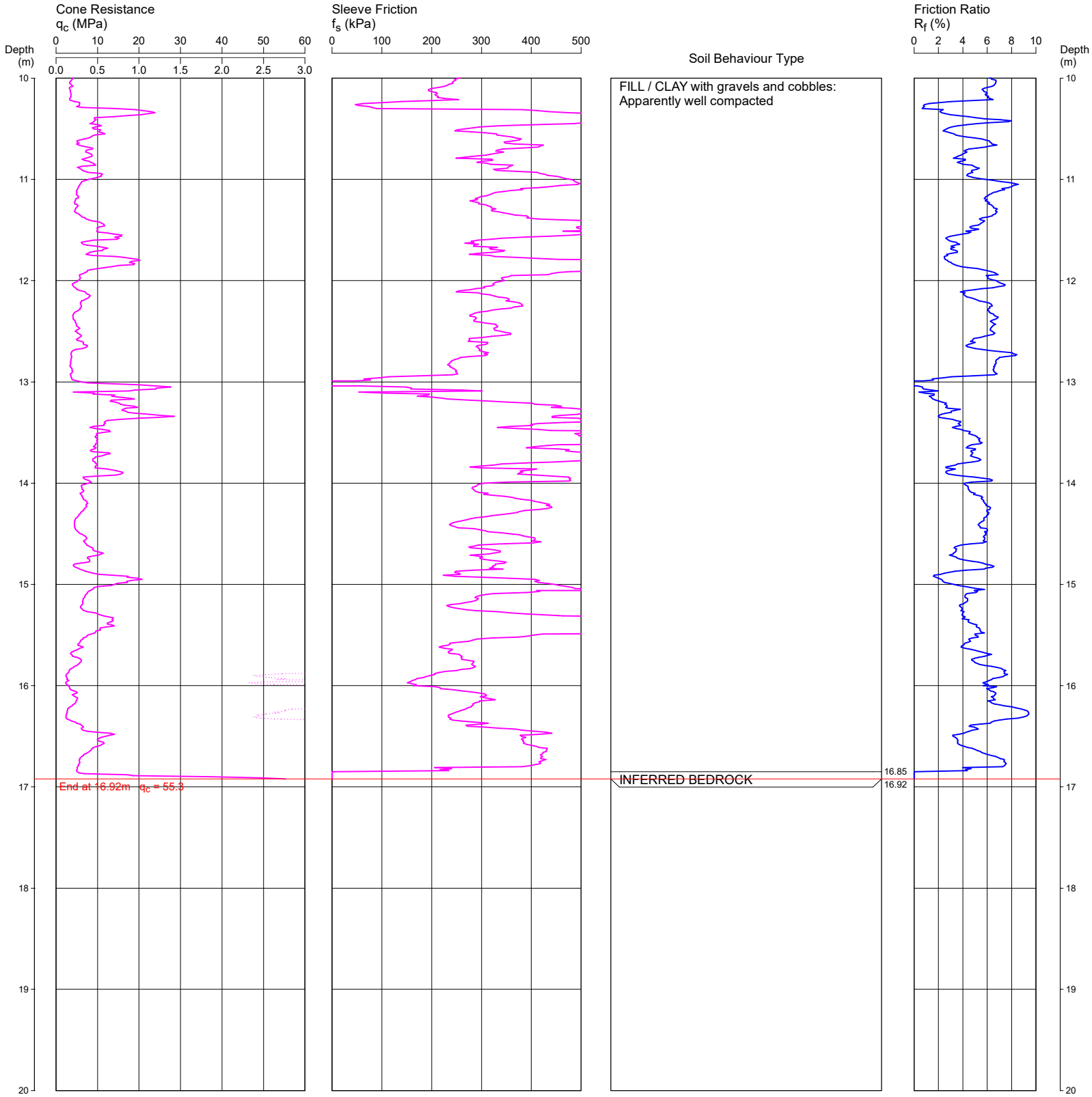
REDUCED LEVEL: 59.5

COORDINATES: 292587.9E 6246632.5N MGA2020

CPT04

DATE 2025, 6, 4

PROJECT No: 234411.00



REMARKS: TEST DISCONTINUED DUE TO REFUSAL ON (or NEAR) INFERRED WEATHERED ROCK
HOLE COLLAPSED AT 1.75M AFTER WITHDRAWAL OF RODS

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Cone ID: C22515 **Type:** C10CFIIP

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CONE PENETRATION TEST

CLIENT: GOODMAN PROPERTY SERVICES (AUST) PTY LTD

PROJECT: PROJECT MAVERICK

LOCATION: 265 MARTIN ROAD, BRADFIELD

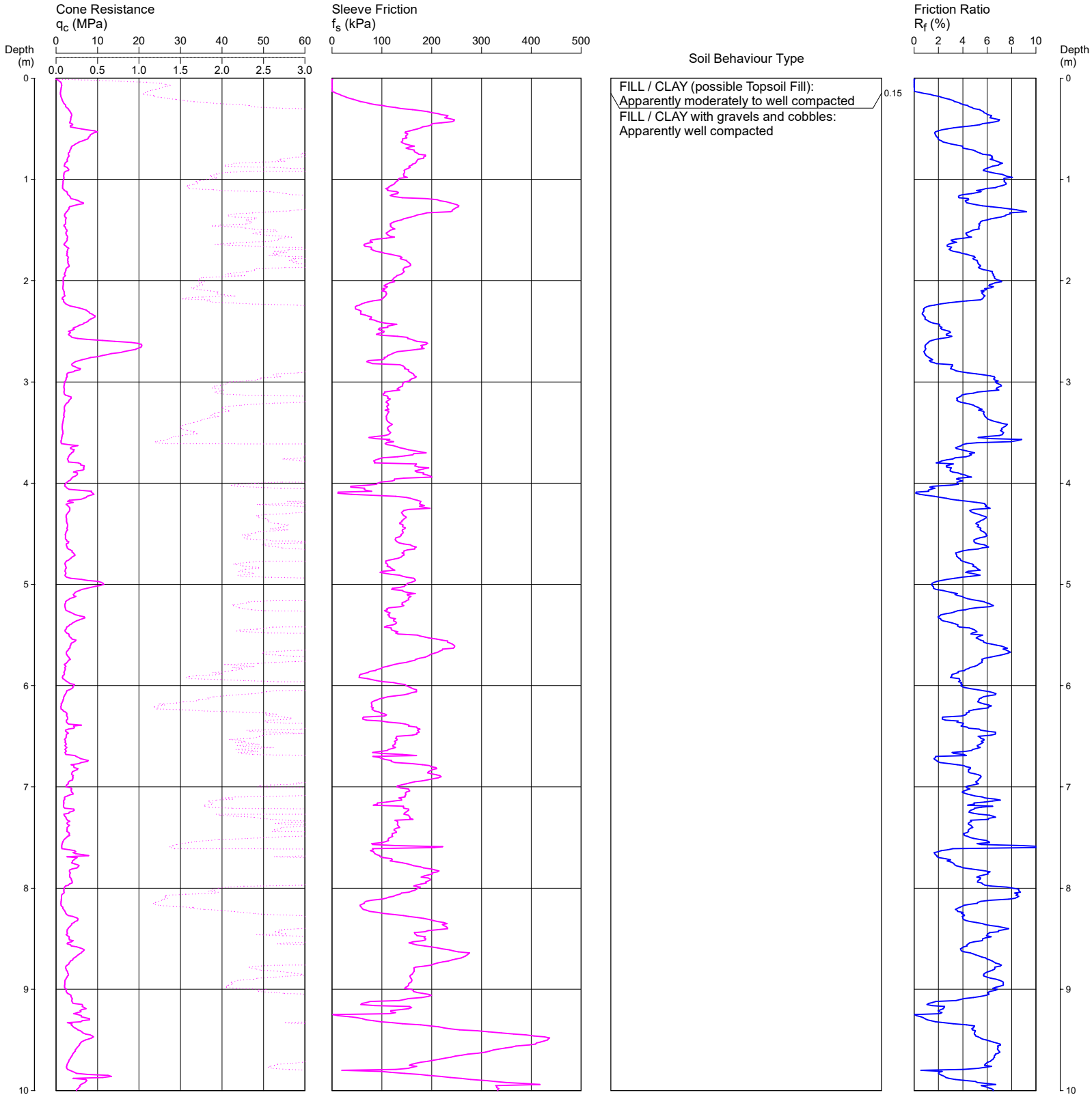
REDUCED LEVEL: 59.6

COORDINATES: 292576.7E 6246564.1N MGA2020

CPT05

DATE 2025, 6, 4

PROJECT No: 234411.00



REMARKS: TEST DISCONTINUED DUE TO REFUSAL ON (or NEAR) INFERRED WEATHERED ROCK
HOLE COLLAPSED AT 8.0M AFTER WITHDRAWAL OF RODS

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Cone ID: C22515 **Type:** C10CFIIP

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CONE PENETRATION TEST

CLIENT: GOODMAN PROPERTY SERVICES (AUST) PTY LTD

PROJECT: PROJECT MAVERICK

LOCATION: 265 MARTIN ROAD, BRADFIELD

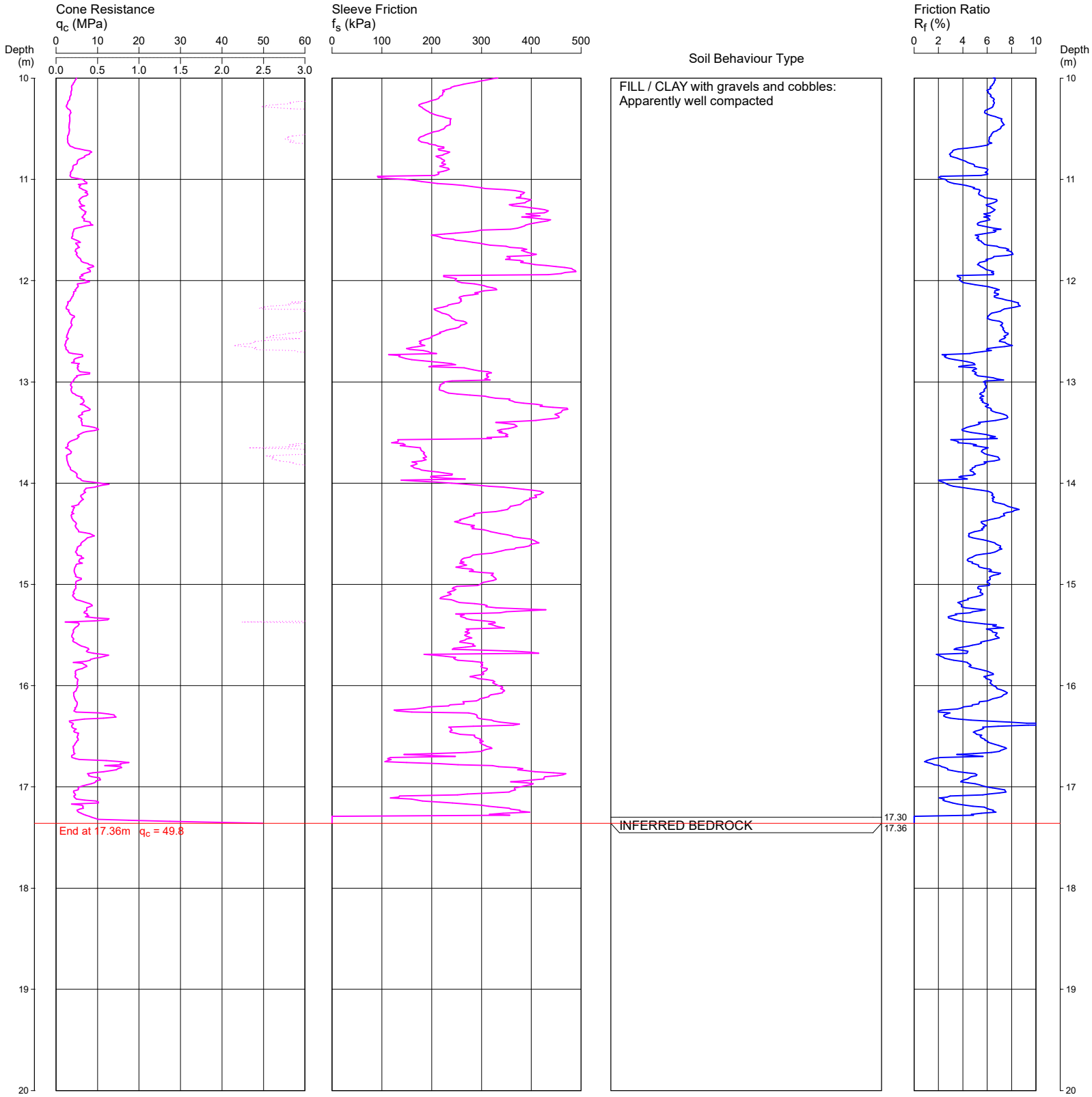
REDUCED LEVEL: 59.6

COORDINATES: 292576.7E 6246564.1N MGA2020

CPT05

DATE 2025, 6, 4

PROJECT No: 234411.00



REMARKS: TEST DISCONTINUED DUE TO REFUSAL ON (or NEAR) INFERRED WEATHERED ROCK
HOLE COLLAPSED AT 8.0M AFTER WITHDRAWAL OF RODS

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Cone ID: C22515 **Type:** C10CFIIP

ConePlot Version 5.9.2
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Geotechnics / Environment / Groundwater

Appendix E

Laboratory Test Results

Material Test Report

Douglas Partners Pty Ltd
Sydney Laboratory
96 Hermitage Road West Ryde NSW 2114
Phone: (02) 9809 0666
Email: mick.gref@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Mick Gref
Assistant Laboratory Manager
Laboratory Accreditation Number: 828

Report Number:	**234411.00-1**
Issue Number:	1
Date Issued:	11/06/2025
Client:	Goodman Property Services (Aust) Pty Ltd The Hayesbery, Rosebery NSW
Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369A
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 04/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP01 (1.5 - 1.6m)**
Material:	CLAY: pale grey and yellow-brown, with fine to coarse ironstone gravel, trace rootlets

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	**2**		
Soil Description	CLAY: pale grey and yellow-brown		
Nature of Water	Demineralised		

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Results relate only to the items tested/sampled.

Material Test Report

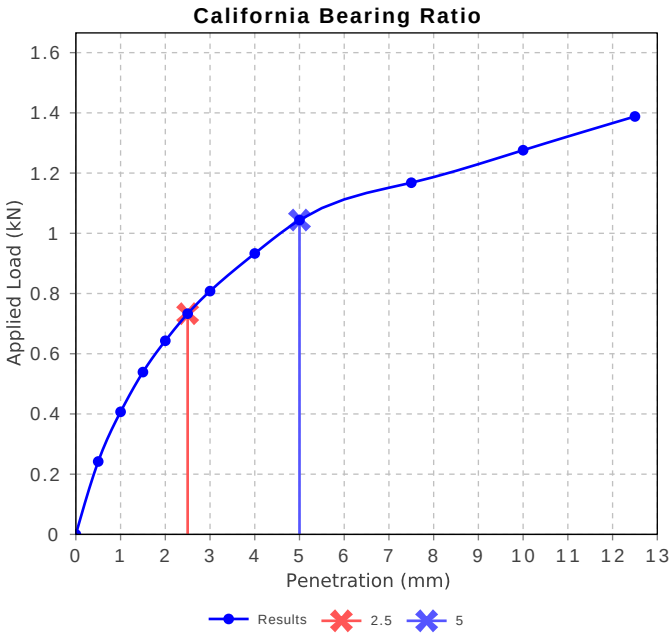
Report Number:	**234411.00-1**
Issue Number:	1
Date Issued:	11/06/2025
Client:	Goodman Property Services (Aust) Pty Ltd The Hayesbery, Rosebery NSW
Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369B
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 10/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP02 (0.5 - 1.0m)**
Material:	CLAY: red-brown, trace silt, fine to medium ironstone gravel and rootlets

Douglas Partners Pty Ltd
Sydney Laboratory
96 Hermitage Road West Ryde NSW 2114
Phone: (02) 9809 0666
Email: mick.gref@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Mick Gref
Assistant Laboratory Manager
Laboratory Accreditation Number: 828

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	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.79		
Optimum Moisture Content (%)	17.5		
Laboratory Density Ratio (%)	100.5		
Laboratory Moisture Ratio (%)	98.0		
Dry Density after Soaking (t/m^3)	1.78		
Field Moisture Content (%)	18.0		
Moisture Content at Placement (%)	17.1		
Moisture Content Top 30mm (%)	20.4		
Moisture Content Rest of Sample (%)	18.3		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	68.8		
Swell (%)	1.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		
Standard CBR moisture curing periods not applied			



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Results relate only to the items tested/sampled.

Material Test Report

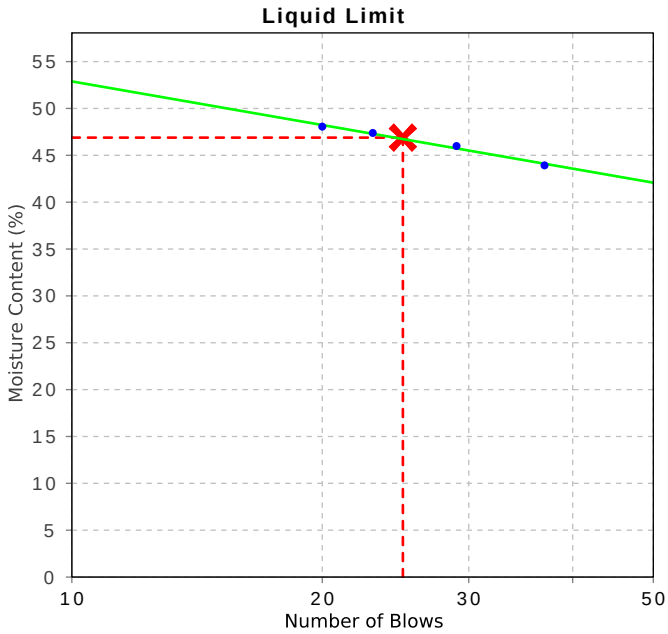
Report Number:	**234411.00-1**
Issue Number:	1
Date Issued:	11/06/2025
Client:	Goodman Property Services (Aust) Pty Ltd The Hayesbery, Rosebery NSW
Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369B
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 05/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP02 (0.5 - 1.0m)**
Material:	CLAY: red-brown, trace silt, fine to medium ironstone gravel and rootlets

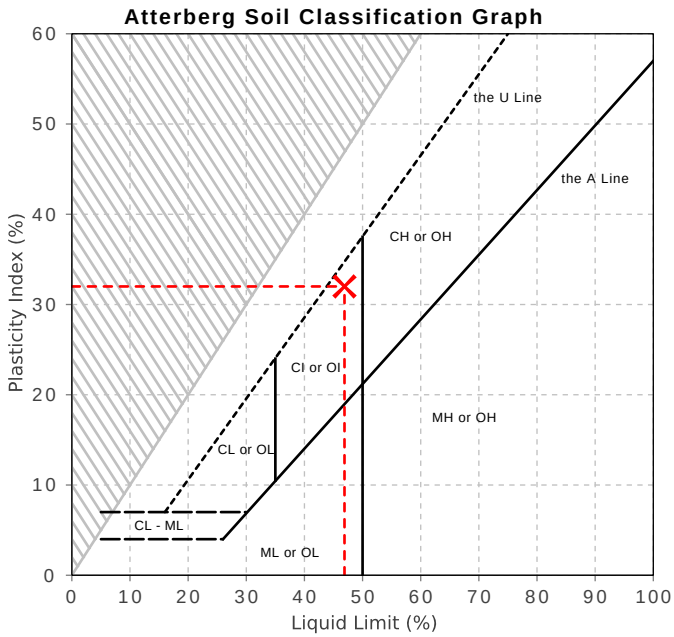
Douglas Partners Pty Ltd
Sydney Laboratory
96 Hermitage Road West Ryde NSW 2114
Phone: (02) 9809 0666
Email: mick.gref@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Mick Gref
Assistant Laboratory Manager
Laboratory Accreditation Number: 828

Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	47		
Plastic Limit (%)	15		
Plasticity Index (%)	**32**		





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Results relate only to the items tested/sampled.

Material Test Report

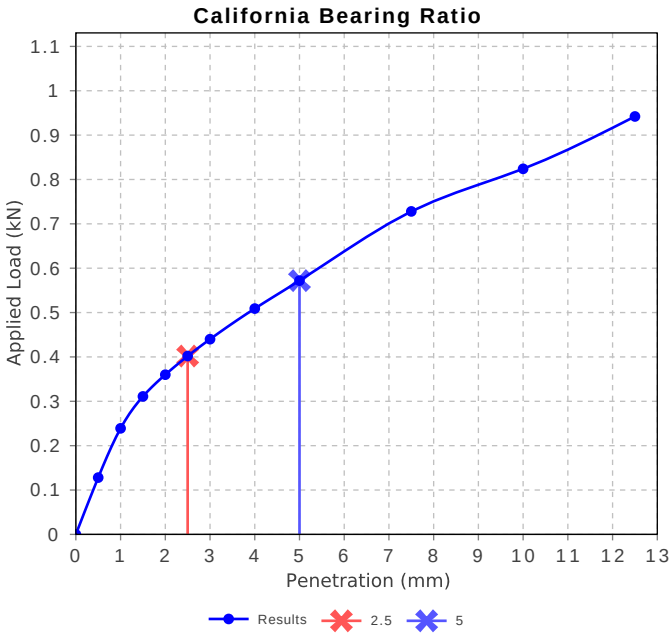
Report Number:	**234411.00-1**
Issue Number:	1
Date Issued:	11/06/2025
Client:	Goodman Property Services (Aust) Pty Ltd The Hayesbery, Rosebery NSW
Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369C
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 10/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP06 (0.5 - 1.0m)**
Material:	CLAY: red-brown and pale grey, trace fine to medium ironstone gravel and rootlets

Douglas Partners Pty Ltd
Sydney Laboratory
96 Hermitage Road West Ryde NSW 2114
Phone: (02) 9809 0666
Email: mick.gref@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Mick Gref
Assistant Laboratory Manager
Laboratory Accreditation Number: 828

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**3.0**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.65		
Optimum Moisture Content (%)	21.5		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m^3)	1.62		
Field Moisture Content (%)	23.7		
Moisture Content at Placement (%)	21.7		
Moisture Content Top 30mm (%)	28.1		
Moisture Content Rest of Sample (%)	22.4		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	44.1		
Swell (%)	2.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		
Standard CBR moisture curing periods not applied			



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Material Test Report

Report Number:	**234411.00-1**
Issue Number:	1
Date Issued:	11/06/2025
Client:	Goodman Property Services (Aust) Pty Ltd The Hayesbery, Rosebery NSW
Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369C
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 05/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP06 (0.5 - 1.0m)**
Material:	CLAY: red-brown and pale grey, trace fine to medium ironstone gravel and rootlets

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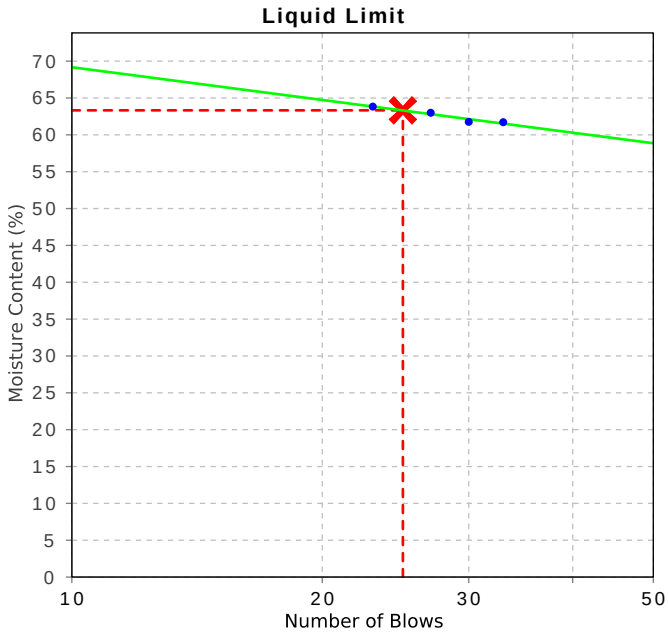
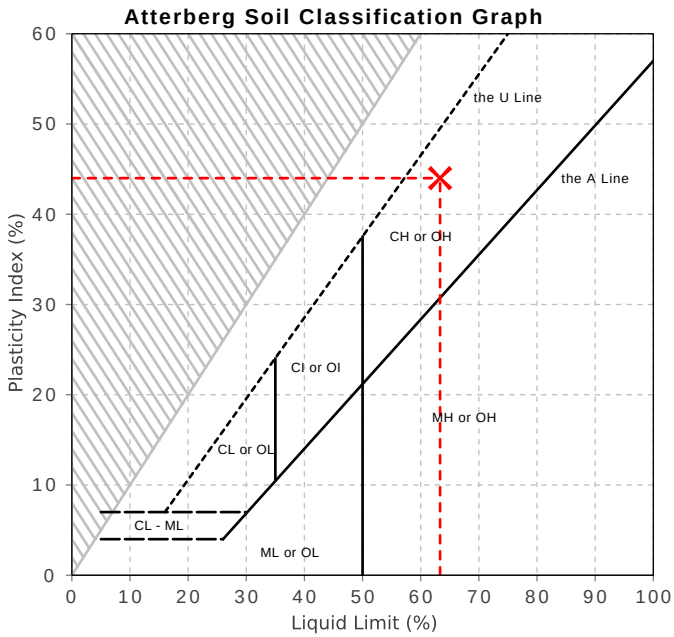
Approved Signatory: Mick Gref
Assistant Laboratory Manager
Laboratory Accreditation Number: 828

Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	63		
Plastic Limit (%)	19		
Plasticity Index (%)	**44**		





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Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369D
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 04/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP09 (1.0 - 1.1m)**
Material:	SANDSTONE: dark grey and yellow-brown, with some ironstone

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	**2**		
Soil Description	Sandy GRAVEL: dark grey and yellow-brown, trace clay		
Nature of Water	Demineralised		

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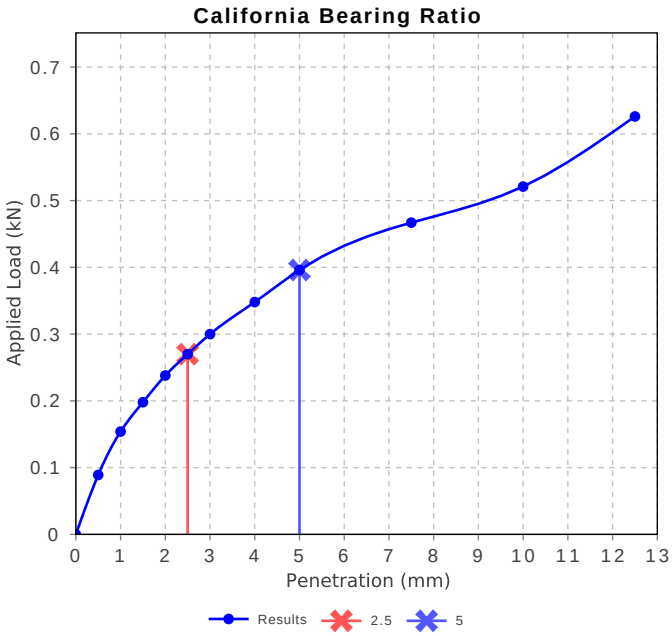
Report Number: **234411.00-1**
Issue Number: 1
Date Issued: 11/06/2025
Client: Goodman Property Services (Aust) Pty Ltd
The Hayesbery, Rosebery NSW
Contact: Lachlan O'Reilly
Project Number: 234411.00
Project Name: Project Maverick
Project Location: 265 Martin Road, Bradfield NSW
Work Request: 12369
Sample Number: SY-12369E
Date Sampled: 29/05/2025
Dates Tested: 02/06/2025 - 10/06/2025
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **TP12 (0.5 - 1.0m)**
Material: CLAY: red-brown mottled pale grey, trace fine to coarse ironstone gravel

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**2.0**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.59		
Optimum Moisture Content (%)	22.5		
Laboratory Density Ratio (%)	100.5		
Laboratory Moisture Ratio (%)	100.5		
Dry Density after Soaking (t/m^3)	1.54		
Field Moisture Content (%)	23.8		
Moisture Content at Placement (%)	22.7		
Moisture Content Top 30mm (%)	30.7		
Moisture Content Rest of Sample (%)	25.6		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	70.6		
Swell (%)	3.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		
Standard CBR moisture curing periods not applied			



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Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369E
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 05/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP12 (0.5 - 1.0m)**
Material:	CLAY: red-brown mottled pale grey, trace fine to coarse ironstone gravel

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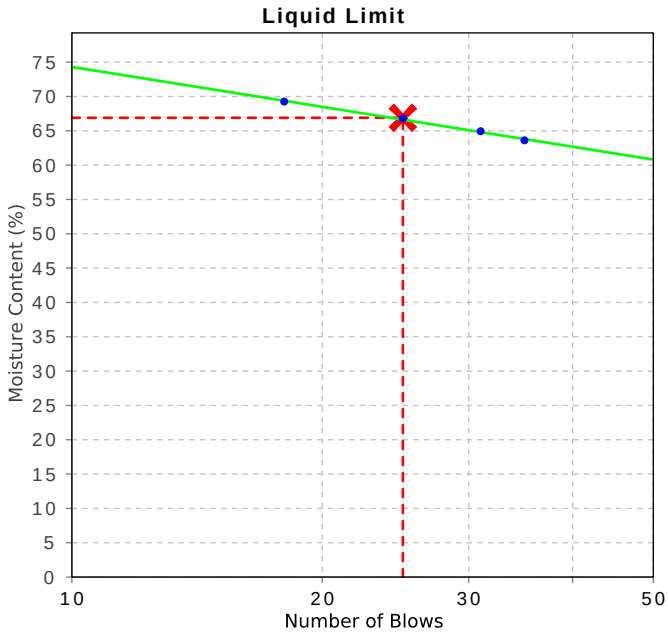
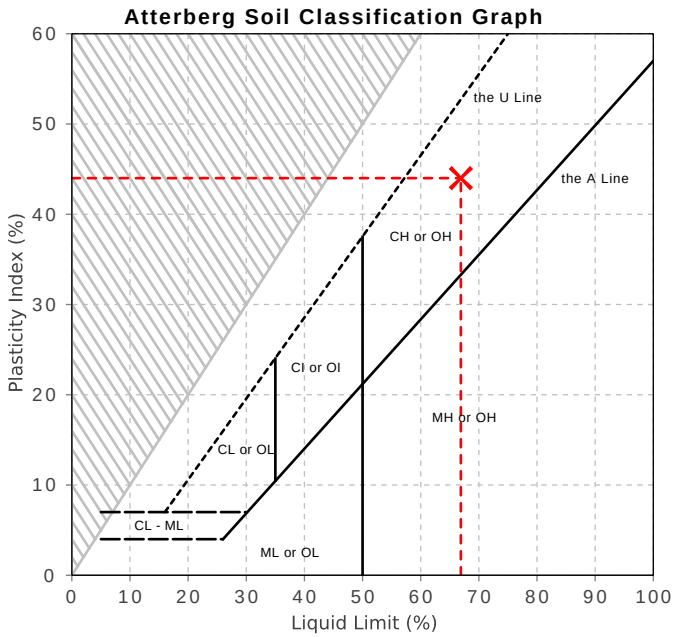
Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	67		
Plastic Limit (%)	23		
Plasticity Index (%)	**44**		





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Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369F
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 04/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP13 (0.9 - 1.0m)**
Material:	CLAY: red-brown, trace fine to coarse ironstone gravel and rootlets

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	**2**		
Soil Description	CLAY: red-brown		
Nature of Water	Demineralised		

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Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369G
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 10/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP18 (0.5 - 1.0m)**
Material:	CLAY: red-brown mottled pale grey, trace fine to medium ironstone gravel and rootlets

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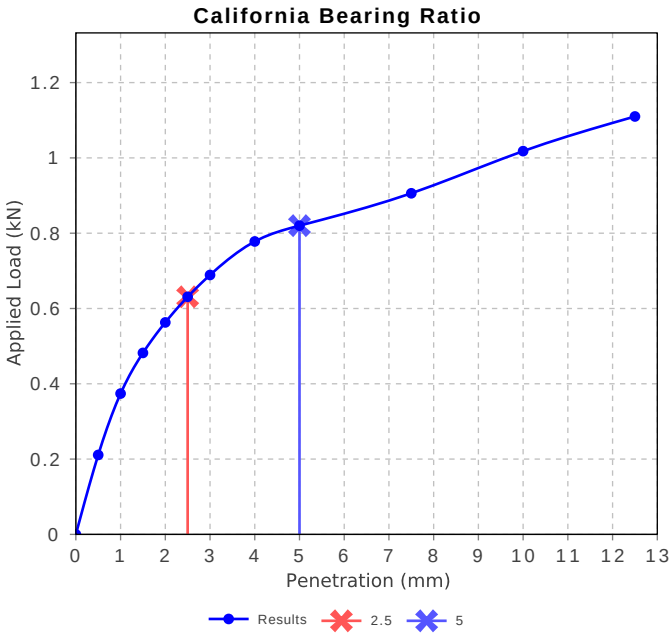
California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**5.0**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.69		
Optimum Moisture Content (%)	20.0		
Laboratory Density Ratio (%)	99.5		
Laboratory Moisture Ratio (%)	101.5		
Dry Density after Soaking (t/m^3)	1.67		
Field Moisture Content (%)	22.5		
Moisture Content at Placement (%)	20.5		
Moisture Content Top 30mm (%)	24.7		
Moisture Content Rest of Sample (%)	21.0		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	70.3		
Swell (%)	1.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		
Standard CBR moisture curing periods not applied			



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Date Issued:	11/06/2025
Client:	Goodman Property Services (Aust) Pty Ltd The Hayesbery, Rosebery NSW
Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369G
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 05/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP18 (0.5 - 1.0m)**
Material:	CLAY: red-brown mottled pale grey, trace fine to medium ironstone gravel and rootlets

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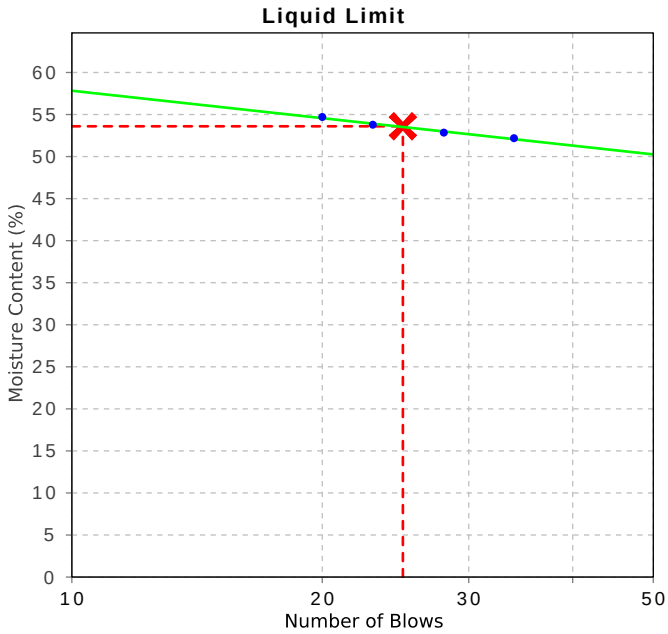
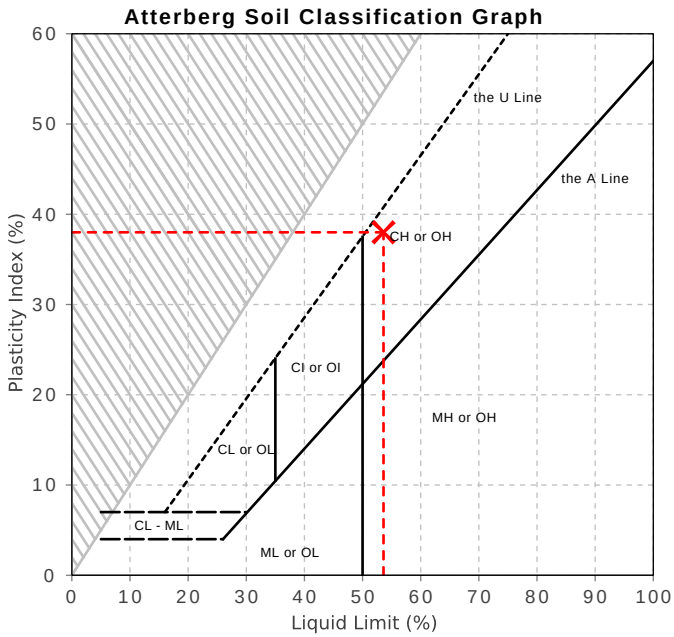
Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	54		
Plastic Limit (%)	16		
Plasticity Index (%)	**38**		





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Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369H
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 03/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP37 (0.4 - 0.85m)**
Material:	CLAY: red-brown and pale grey, trace fine ironstone gravel and rootlets

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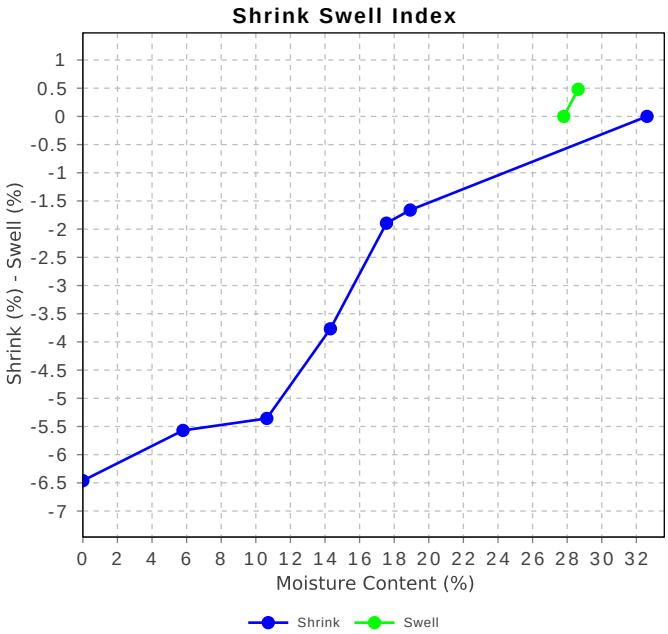
Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**3.7**
Visual Description	CLAY: red-brown and pale grey, trace gravel
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	**6.5**
Estimated % by volume of significant inert inclusions	20
Cracking	Moderately Cracked
Crumbling	No
Moisture Content (%)	32.6

Swell Test	
Initial Pocket Penetrometer (kPa)	240
Final Pocket Penetrometer (kPa)	170
Initial Moisture Content (%)	27.8
Final Moisture Content (%)	28.6
Swell (%)	**0.5**
* Accreditation does not cover the performance of pocket penetrometer readings.	



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Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369I
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 04/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP22 (1.5 - 1.6m)**
Material:	CLAY: pale grey and yellow-brown, trace fine to medium ironstone gravel and rootlets

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	**2**		
Soil Description	CLAY: pale grey and yellow-brown		
Nature of Water	Demineralised		

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Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369J
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 04/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP40 (0.9 - 1.0m)**
Material:	CLAY: red-brown, fine to medium ironstone gravel and rootlets

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	**2**		
Soil Description	CLAY: red-brown		
Nature of Water	Demineralised		

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Contact:	Lachlan O'Reilly
Project Number:	234411.00
Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369K
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 10/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP30 (2.8 - 3.2m)**
Material:	CLAY: red-brown, pale grey and yellow-brown, trace fine to medium ironstone gravel and rootlets

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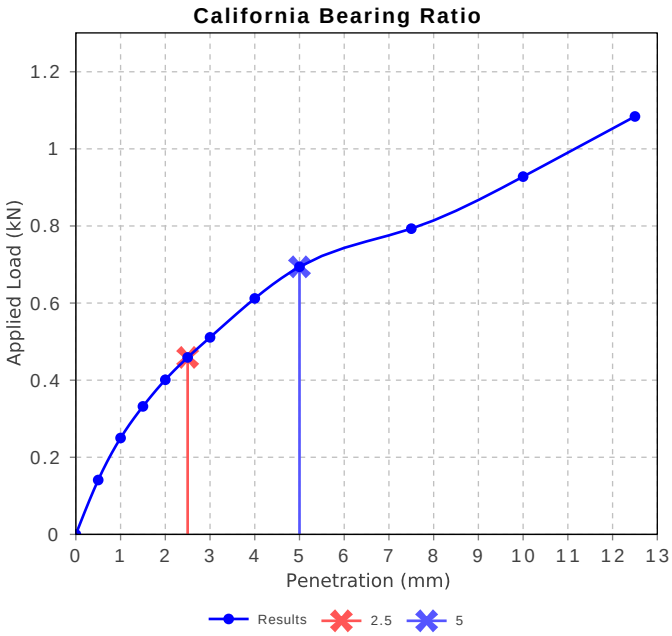
California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**3.5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.74		
Optimum Moisture Content (%)	19.0		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	100.5		
Dry Density after Soaking (t/m^3)	1.70		
Field Moisture Content (%)	20.3		
Moisture Content at Placement (%)	19.2		
Moisture Content Top 30mm (%)	25.7		
Moisture Content Rest of Sample (%)	20.0		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	70.8		
Swell (%)	2.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.6		
Standard CBR moisture curing periods not applied			



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Project Name:	Project Maverick
Project Location:	265 Martin Road, Bradfield NSW
Work Request:	12369
Sample Number:	SY-12369K
Date Sampled:	29/05/2025
Dates Tested:	02/06/2025 - 10/06/2025
Sampling Method:	Sampled by Engineering Department *The results apply to the sample as received*
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP30 (2.8 - 3.2m)**
Material:	CLAY: red-brown, pale grey and yellow-brown, trace fine to medium ironstone gravel and rootlets

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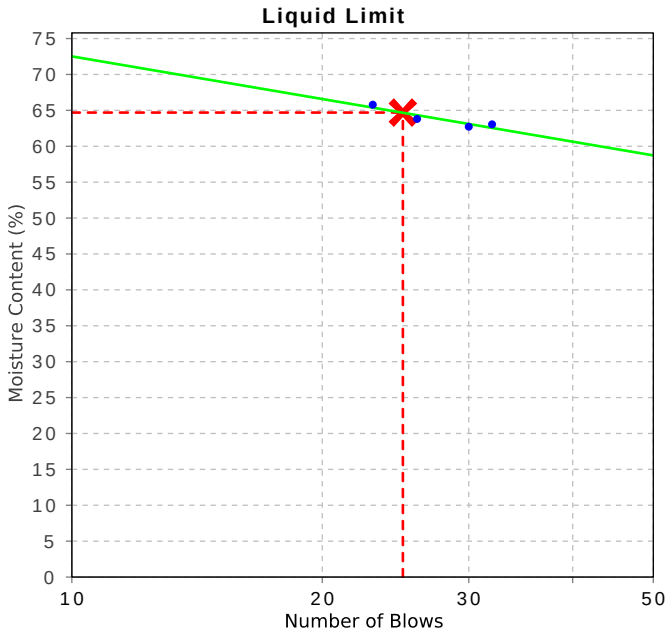
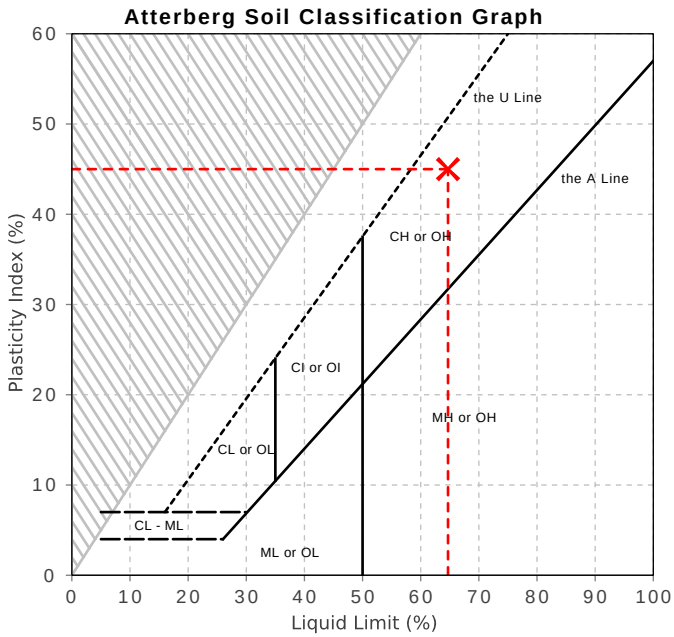
Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	**2**		
Soil Description	CLAY trace gravel: pale grey and yellow-brown		
Nature of Water	Demineralised		

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 (%)	20		
Plasticity Index (%)	**45**		





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Results relate only to the items tested/sampled.

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CERTIFICATE OF ANALYSIS 382265

Client Details

Client	Douglas Partners Pty Ltd
Attention	Ray Blinman
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**234411.00, Badgerys Creek**
Number of Samples	23 Soil
Date samples received	02/06/2025
Date completed instructions received	02/06/2025

Analysis Details

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

Samples were analysed as received from the client. Results relate specifically to the samples as received.

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

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	10/06/2025
Date of Issue	10/06/2025

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Results Approved By
Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager
Jenny He, Inorganic Team Leader

Authorised By
Nancy Zhang, Laboratory Manager

Misc Inorg - Soil						
Our Reference		382265-1	382265-2	382265-3	382265-4	382265-5
Your Reference	UNITS	TP01	TP01	TP01	TP01	TP02
Depth		0.5-0.6	0.9-1	2-2.1	2.5-2.65	0.9-1
Date Sampled		29/05/2025	29/05/2025	29/05/2025	29/05/2025	29/05/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/06/2025	02/06/2025	02/06/2025	02/06/2025	02/06/2025
Date analysed	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
pH 1:5 soil:water	pH Units	6.1	5.4	6.2	5.8	7.3
Chloride, Cl 1:5 soil:water	mg/kg	310	1,300	990	1,400	340
Sulphate, SO4 1:5 soil:water	mg/kg	210	220	220	270	160

Misc Inorg - Soil						
Our Reference		382265-6	382265-7	382265-8	382265-9	382265-10
Your Reference	UNITS	TP06	TP09	TP09	TP012	TP013
Depth		0.5-0.6	0.5-0.6	1-1.1	1-1.1	0.5-0.6
Date Sampled		29/05/2025	29/05/2025	29/05/2025	29/05/2025	29/05/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/06/2025	02/06/2025	02/06/2025	02/06/2025	02/06/2025
Date analysed	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
pH 1:5 soil:water	pH Units	6.1	8.2	9.1	6.4	5.9
Chloride, Cl 1:5 soil:water	mg/kg	160	45	250	340	27
Sulphate, SO4 1:5 soil:water	mg/kg	140	56	91	280	71

Misc Inorg - Soil						
Our Reference		382265-11	382265-12	382265-13	382265-14	382265-15
Your Reference	UNITS	TP013	TP013	TP22	TP22	TP22
Depth		0.9-1	1.5-1.6	0.9-1	2-2.1	3-3.1
Date Sampled		29/05/2025	29/05/2025	30/05/2025	30/05/2025	30/05/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/06/2025	02/06/2025	02/06/2025	02/06/2025	02/06/2025
Date analysed	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
pH 1:5 soil:water	pH Units	5.4	5.1	5.4	6.6	7.1
Chloride, Cl 1:5 soil:water	mg/kg	66	400	880	1,500	1,600
Sulphate, SO4 1:5 soil:water	mg/kg	87	330	240	100	75

Misc Inorg - Soil						
Our Reference		382265-16	382265-17	382265-18	382265-19	382265-20
Your Reference	UNITS	TP40	TP40	TP40	TP30	TP30
Depth		0.5-0.6	0.9-1	1.5-1.6	3-3.1	3.4-3.5
Date Sampled		30/05/2025	30/05/2025	30/05/2025	30/05/2025	30/05/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/06/2025	02/06/2025	02/06/2025	02/06/2025	02/06/2025
Date analysed	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
pH 1:5 soil:water	pH Units	5.6	5.7	5.2	4.5	4.8
Chloride, Cl 1:5 soil:water	mg/kg	69	82	680	760	240
Sulphate, SO4 1:5 soil:water	mg/kg	97	70	250	110	55

Misc Inorg - Soil			
Our Reference		382265-21	382265-23
Your Reference	UNITS	TP18	TP22
Depth		0.9-1	0.5-0.6
Date Sampled		30/05/2025	30/05/2025
Type of sample		Soil	Soil
Date prepared	-	02/06/2025	02/06/2025
Date analysed	-	05/06/2025	05/06/2025
pH 1:5 soil:water	pH Units	5.8	6.0
Chloride, Cl 1:5 soil:water	mg/kg	660	250
Sulphate, SO4 1:5 soil:water	mg/kg	300	62

Texture and Salinity*						
Our Reference		382265-1	382265-2	382265-3	382265-4	382265-5
Your Reference	UNITS	TP01	TP01	TP01	TP01	TP02
Depth		0.5-0.6	0.9-1	2-2.1	2.5-2.65	0.9-1
Date Sampled		29/05/2025	29/05/2025	29/05/2025	29/05/2025	29/05/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Date analysed	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Electrical Conductivity 1:5 soil:water	µS/cm	370	1,200	950	1,300	380
Texture Value	-	8.0	7.0	7.0	7.0	[NA]
Texture	-	LIGHT MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	[NA]
ECe	dS/m	3.0	8.4	6.6	8.9	[NA]
Class	-	SLIGHTLY SALINE	VERY SALINE	MODERATELY SALINE	VERY SALINE	[NA]

Texture and Salinity*						
Our Reference		382265-6	382265-7	382265-8	382265-9	382265-10
Your Reference	UNITS	TP06	TP09	TP09	TP012	TP013
Depth		0.5-0.6	0.5-0.6	1-1.1	1-1.1	0.5-0.6
Date Sampled		29/05/2025	29/05/2025	29/05/2025	29/05/2025	29/05/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Date analysed	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Electrical Conductivity 1:5 soil:water	µS/cm	230	270	400	440	79
Texture Value	-	[NA]	8.0	6.0	[NA]	7.0
Texture	-	[NA]	LIGHT MEDIUM CLAY	HEAVY CLAY	[NA]	MEDIUM CLAY
ECe	dS/m	[NA]	2.1	2.4	[NA]	<2
Class	-	[NA]	SLIGHTLY SALINE	SLIGHTLY SALINE	[NA]	NON SALINE

Texture and Salinity*						
Our Reference		382265-11	382265-12	382265-13	382265-14	382265-15
Your Reference	UNITS	TP013	TP013	TP22	TP22	TP22
Depth		0.9-1	1.5-1.6	0.9-1	2-2.1	3-3.1
Date Sampled		29/05/2025	29/05/2025	30/05/2025	30/05/2025	30/05/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Date analysed	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Electrical Conductivity 1:5 soil:water	µS/cm	270	540	830	1,300	1,300
Texture Value	-	8.0	7.0	7.0	9.0	7.0
Texture	-	LIGHT MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	CLAY LOAM	MEDIUM CLAY
ECe	dS/m	2.1	3.8	5.8	12	9.4
Class	-	SLIGHTLY SALINE	SLIGHTLY SALINE	MODERATELY SALINE	VERY SALINE	VERY SALINE

Texture and Salinity*						
Our Reference		382265-16	382265-17	382265-18	382265-19	382265-20
Your Reference	UNITS	TP40	TP40	TP40	TP30	TP30
Depth		0.5-0.6	0.9-1	1.5-1.6	3-3.1	3.4-3.5
Date Sampled		30/05/2025	30/05/2025	30/05/2025	30/05/2025	30/05/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Date analysed	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Electrical Conductivity 1:5 soil:water	µS/cm	130	120	600	710	250
Texture Value	-	8.0	8.0	7.0	7.0	7.0
Texture	-	LIGHT MEDIUM CLAY	LIGHT MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY
ECe	dS/m	<2	<2	4.2	5.0	<2
Class	-	NON SALINE	NON SALINE	MODERATELY SALINE	MODERATELY SALINE	NON SALINE

Texture and Salinity*			
Our Reference		382265-21	382265-23
Your Reference	UNITS	TP18	TP22
Depth		0.9-1	0.5-0.6
Date Sampled		30/05/2025	30/05/2025
Type of sample		Soil	Soil
Date prepared	-	04/06/2025	04/06/2025
Date analysed	-	04/06/2025	04/06/2025
Electrical Conductivity 1:5 soil:water	µS/cm	730	220
Texture Value	-	[NA]	7.0
Texture	-	[NA]	MEDIUM CLAY
ECe	dS/m	[NA]	<2
Class	-	[NA]	NON SALINE

ESP/CEC						
Our Reference		382265-1	382265-2	382265-3	382265-4	382265-7
Your Reference	UNITS	TP01	TP01	TP01	TP01	TP09
Depth		0.5-0.6	0.9-1	2-2.1	2.5-2.65	0.5-0.6
Date Sampled		29/05/2025	29/05/2025	29/05/2025	29/05/2025	29/05/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Date analysed	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Exchangeable Ca	meq/100g	2.0	0.3	<0.1	<0.1	23
Exchangeable K	meq/100g	0.1	0.2	<0.1	0.1	<0.1
Exchangeable Mg	meq/100g	10	12	4.1	12	12
Exchangeable Na	meq/100g	1.6	3.3	1.4	4.5	1.5
Cation Exchange Capacity	meq/100g	14	16	5.6	17	36
ESP	%	11	21	25	27	4

ESP/CEC						
Our Reference		382265-8	382265-10	382265-11	382265-12	382265-13
Your Reference	UNITS	TP09	TP013	TP013	TP013	TP22
Depth		1-1.1	0.5-0.6	0.9-1	1.5-1.6	0.9-1
Date Sampled		29/05/2025	29/05/2025	29/05/2025	29/05/2025	30/05/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Date analysed	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Exchangeable Ca	meq/100g	16	1.7	0.2	0.5	0.8
Exchangeable K	meq/100g	0.1	0.2	<0.1	0.2	<0.1
Exchangeable Mg	meq/100g	5.7	5.5	2.8	7.2	5.3
Exchangeable Na	meq/100g	1.4	0.4	0.8	2.7	1.7
Cation Exchange Capacity	meq/100g	24	7.8	3.9	11	7.9
ESP	%	6	5	20	25	21

ESP/CEC						
Our Reference		382265-14	382265-15	382265-16	382265-17	382265-18
Your Reference	UNITS	TP22	TP22	TP40	TP40	TP40
Depth		2-2.1	3-3.1	0.5-0.6	0.9-1	1.5-1.6
Date Sampled		30/05/2025	30/05/2025	30/05/2025	30/05/2025	30/05/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Date analysed	-	04/06/2025	04/06/2025	04/06/2025	04/06/2025	04/06/2025
Exchangeable Ca	meq/100g	1.2	1.1	1.5	1.3	0.2
Exchangeable K	meq/100g	0.2	0.2	0.2	0.1	0.2
Exchangeable Mg	meq/100g	8.3	6.4	5.6	5.3	6.4
Exchangeable Na	meq/100g	2.8	2.0	0.8	0.8	2.6
Cation Exchange Capacity	meq/100g	13	9.6	8.0	7.5	9.4
ESP	%	22	21	10	10	28

ESP/CEC				
Our Reference		382265-19	382265-20	382265-23
Your Reference	UNITS	TP30	TP30	TP22
Depth		3-3.1	3.4-3.5	0.5-0.6
Date Sampled		30/05/2025	30/05/2025	30/05/2025
Type of sample		Soil	Soil	Soil
Date prepared	-	04/06/2025	04/06/2025	04/06/2025
Date analysed	-	04/06/2025	04/06/2025	04/06/2025
Exchangeable Ca	meq/100g	<0.1	<0.1	1.3
Exchangeable K	meq/100g	0.2	0.1	<0.1
Exchangeable Mg	meq/100g	7.0	4.5	4.8
Exchangeable Na	meq/100g	1.6	1.0	0.6
Cation Exchange Capacity	meq/100g	8.8	5.7	6.8
ESP	%	18	18	8

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-123	Determined using a "Texture by Feel" method.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	382265-2
Date prepared	-			02/06/2025	1	02/06/2025	02/06/2025		02/06/2025	02/06/2025
Date analysed	-			05/06/2025	1	05/06/2025	05/06/2025		05/06/2025	05/06/2025
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	6.1	5.9	3	98	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	1	310	310	0	95	##
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	1	210	210	0	100	#

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	11	02/06/2025	02/06/2025		02/06/2025	[NT]
Date analysed	-			[NT]	11	05/06/2025	05/06/2025		05/06/2025	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	11	5.4	5.3	2	98	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	11	66	[NT]		98	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	11	87	[NT]		102	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	19	02/06/2025	02/06/2025		[NT]	[NT]
Date analysed	-			[NT]	19	05/06/2025	05/06/2025		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	19	4.5	4.5	0	[NT]	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	19	760	750	1	[NT]	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	19	110	110	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			04/06/2025	1	04/06/2025	04/06/2025		04/06/2025	[NT]
Date analysed	-			04/06/2025	1	04/06/2025	04/06/2025		04/06/2025	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	1	370	370	0	100	[NT]
Texture Value	-		INORG-123	[NT]	1	8.0	8.0	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	11	04/06/2025	04/06/2025		04/06/2025	[NT]
Date analysed	-			[NT]	11	04/06/2025	04/06/2025		04/06/2025	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	11	270	280	4	101	[NT]
Texture Value	-		INORG-123	[NT]	11	8.0	8.0	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	19	04/06/2025	04/06/2025		[NT]	[NT]
Date analysed	-			[NT]	19	04/06/2025	04/06/2025		[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	19	710	690	3	[NT]	[NT]
Texture Value	-		INORG-123	[NT]	19	7.0	7.0	0	[NT]	[NT]

QUALITY CONTROL: ESP/CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	382265-3
Date prepared	-			04/06/2025	2	04/06/2025	04/06/2025		04/06/2025	04/06/2025
Date analysed	-			04/06/2025	2	04/06/2025	04/06/2025		04/06/2025	04/06/2025
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	2	0.3	0.3	0	98	99
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	2	0.2	0.2	0	109	105
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	2	12	12	0	97	112
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	2	3.3	3.2	3	95	96
ESP	%	1	Metals-020	[NT]	2	21	20	5	[NT]	[NT]

QUALITY CONTROL: ESP/CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	12	04/06/2025	04/06/2025		[NT]	[NT]
Date analysed	-			[NT]	12	04/06/2025	04/06/2025		[NT]	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	[NT]	12	0.5	0.6	18	[NT]	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	[NT]	12	0.2	0.2	0	[NT]	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	[NT]	12	7.2	7.5	4	[NT]	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	[NT]	12	2.7	2.7	0	[NT]	[NT]
ESP	%	1	Metals-020	[NT]	12	25	25	0	[NT]	[NT]

QUALITY CONTROL: ESP/CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	23	04/06/2025	04/06/2025		[NT]	[NT]
Date analysed	-			[NT]	23	04/06/2025	04/06/2025		[NT]	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	[NT]	23	1.3	1.5	14	[NT]	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	[NT]	23	4.8	5.3	10	[NT]	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	[NT]	23	0.6	0.6	0	[NT]	[NT]
ESP	%	1	Metals-020	[NT]	23	8	8	0	[NT]	[NT]

Result Definitions

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

Quality Control Definitions

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

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

Report Comments

MISC_INORG_DRY: # Percent recovery not reported due to matrix interferences. However, an acceptable recovery was obtained for the LCS.

MISC_INORG_DRY:## Percent recovery is not applicable due to the high concentration of the analyte/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Appendix B

Appendix B - 234411.00.R.003 – Earthworks Specification

Douglas PARTNERS

GROUNDED EXPERTISE

Earthworks Specification

Project Maverick

265 Martin Road, Bradfield NSW

Prepared for Goodman Property Services (Aust) Pty Ltd

Project 234411.00

18 July 2025

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Document History

Details

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Revision 0	Adam Teoh	Ray Blinman	18 August 2025

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Revision 0	Lachlan O'Reilly, Goodman Property Services (Aust) Pty Ltd

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

Signature		Date
Author		18 August 2025
Reviewer		18 August 2025

FS604853

Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

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Earthworks Specification
Project Maverick
265 Martin Road, Bradfield NSW

1. Introduction

This specification presents the requirements of earthworks control and geotechnical management of the placement and compaction of fill for Project Maverick located at 265 Martin Road, Bradfield, NSW.

The specification was prepared by Douglas Partners Pty Ltd (Douglas) at the request of Goodman Property Services (Aust) Pty Ltd (Goodman). It does not cover all possible scenarios. It has been based on probable site conditions and material and may be amended if circumstances require.

This specification does not cover any contamination, environmental, sedimentation or erosion issues. These potential issues are anticipated to be covered elsewhere in the project's various environmental reports and management plans. It also does not address health, safety, security or environmental management issues as these as these are the responsibility of the Contractor.

2. Project Description

For the purposes of this report, the site is referred to as 265 Martin Road, Bradfield, and is situated within the Liverpool City Council local government area, in the Parish of Bringelly, County of Cumberland.

The overall site (see Figure 1) is located at the southern end of the existing Martin Road and is formed by six individual properties legally described as:

- Lot 1 in DP1278780 – forming the north-western triangular area.
- Lot 2 in DP1278780 – forming the south-western area encompassing the three quarry pits.
- Lot 3 in DP1278780 – forming an irregular shaped central to south-eastern area south of Martin Road.
- Part Lot 54 in DP3050 – forming part of the northern elongated lot on the eastern side of the site.
- Lot 55 in DP3050 – forming the central elongated lot on the eastern side of the site.
- Lot 56 in DP3050 – forming the southern elongated lot on the eastern side of the site.

The combined site is irregularly shaped and is understood to cover an area of approximately 196 hectares and is situated within an area zoned for commercial and industrial use. It lies approximately 1 km south-east of the new Western Sydney International (Nancy-Bird Walton) Airport. The site is shown in Figure 1.

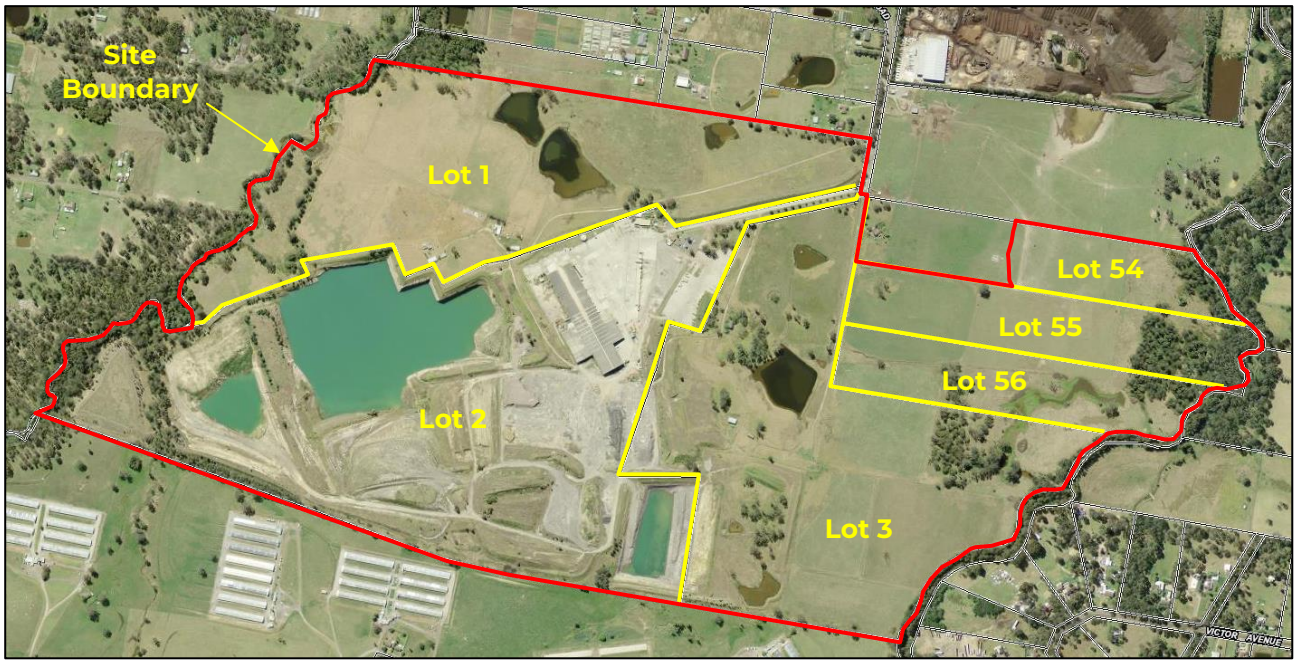

Figure 1: Site Location and Cadastral Lot Boundaries

3. General

3.1 Objectives

The aim of the specification is to ensure that all fill on the site is placed in a carefully controlled manner so that the final condition of the filled site is suitable for the proposed development.

This specification provides the requirements and procedures for controlling fill quality, placement, compaction and approval on the site.

3.2 Available Information

This specification has been prepared based on the following information:

- Douglas Report on Due Diligence Geotechnical Investigation, Project Maverick, Ref. 234411.00.R.001.Rev0 dated 19 June 2025.
- Douglas Report on Geotechnical Assessment of Supplied Documentation, Project Maverick, Ref. 234411.00.R.002.Rev0 dated 21 July 2025.
- Concept Masterplan Set Ref. MAR MP06 (A) by Design+ dated 29 May 2025.
- Collation of Borehole Data and Assessment of Uncontrolled Fill Volumes, Ref. MAP-AAP-00-MEM-XX-0001 dated 18 June 2026 by Arcadis.
- Douglas Report on Specification for Bulk Earthworks, Proposed Rehabilitation of Former Quarry Pits, 225 Martin Road, Badgerys Creek (prepared for CSR Australia). Ref 201059.00.R.003.Rev2 dated 30 September 2024.

It should be noted that the supplied documentation is currently limited, comprising only conceptual designs and information provided during the due diligence stage. As further

investigations and detailed design are undertaken, the conceptual ground model and understanding of site conditions will continue to evolve, and the list of supplied information may need to be updated accordingly.

3.3 Project Team and Responsibilities

The companies (or people) who will be part of the project team are listed in Table 1, together with their responsibilities.

Table 1: Responsibilities

Role	Company	Responsibilities
Project Owner *(the 'Principal')*	Goodman	Engages contractors and consultants to carry out the works and ensures that they comply with the project specifications and contracts.
Superintendent *(the 'Superintendent')*	TBC	Co-ordinates the earthworks contractor, the consultants, GITA and surveyor. Issues formal contractual instructions and facilitates request for information and extension of time requests etc.
Earthworks Contractor *(the 'Contractor')*	TBC	Sources and coordinates the supply of fill materials from on-site and off-site (if required) which comply with the requirements of this specification. Places and compacts fill materials in a controlled manner that complies with the project design and specification. Provides specified reports, surveys and test results to the Superintendent and Consultants for review as the project progresses.
Geotechnical Consultant	Douglas Partners	Specifies the earthworks procedures and monitors all the processes and testing involved in compaction of fill at the site.
Environmental Consultant	JBS&G	Monitors the processes affecting the quality and contamination of fill placed at the site.
Geotechnical Inspection & Testing Authority *(GITA)*	Douglas Partners	Undertakes inspections of stripped surfaces and fill compaction, observes proof rolling, samples and tests materials at the specified rates. Prepares weekly testing and inspection reports.
Surveyor	The Earthworks Contractor	Provides regular surveys of the progressive fill, showing grid control lines to allow tracking and placement of individual fill deliveries. Undertakes precise survey monitoring of settlement plates after construction is completed.

Notes: TBC = To be confirmed on upon engagement

3.4 Summary of Monitoring Procedure and Hold Points

A summary of the procedures for the overall control of the earthworks is outlined in Table 2, with Hold Points identified where information should be provided to the Superintendent and/or Geotechnical Consultant prior to continuing with the works. Details for each step listed in Table 2 are presented in the specification. All Hold Points must be released by formal written notification from the Superintendent.

Table 2: Summary of Processes and Monitoring Procedures

Step	Description	Section	Hold Point
1	Contractor is to strip the site to expose natural ground, or previously approved fill layers and remove any unsuitable material.	4.1, 4.2	
2	Contractor is to excavate level benches or steps into inclined slopes and remove any loose scree from quarry walls.	4.3	
3	Geotechnical Consultant is to review all temporary excavation faces steeper than 1H:1V and issue reports on face stability. Superintendent to issue written approval for each approved excavation face.	4.5, 4.6	Hold Point
4	Geotechnical Consultant and/or GITA is to inspect stripped surfaces and observe proof rolling for approval for fill placement. Superintendent to issue written approval for each approved area.	4.8	Hold Point
5	Contractor is to manage the movement and on-site tracking of all unsuitable materials.	5.1, 5.2	
6	Geotechnical Consultant and Environmental Consultant are to inspect / assess any excavated material for re-use or classify for disposal offsite.	6.1	
7	Environmental Consultant and Geotechnical Consultant are to inspect / assess the proposed fill materials and issue reports on material suitability.	6.1	Witness Point
8	Contractor is to only use approved fill materials for placement in layers in accordance with this specification.	6.2, 6.3	
9	Contractor is to deliver, spread and compact approved fill in layers.	7	
10	GITA is to inspect and test each layer of fill for compaction and material suitability. GITA is to issue the results of density tests each day for the preceding day's tests with notification of any non-conformances. GITA is to issue weekly reports that include a summary of the daily reports. Superintendent is to issue written approval for all fill areas and fill layers covered by the daily results and weekly report.	7.6	Hold Point
11	Steps 9 and 10 are to be repeated until design fill surface levels are achieved.	-	
12	Contractor is to over-excavate and prepare quarry batter extensions once fill levels in the quarry exceed a level equal to 2 m below top of rock in the adjoining quarry batters.	9	

Step	Description	Section	Hold Point
13	Geotechnical Consultant is to inspect the prepared batter extensions for suitability and issue reports. Superintendent to issue written approval for each approved batter area.	9	Hold Point
14	Contractor is to install settlement monitoring plates in the fill surface at locations to be advised by the Geotechnical Consultant.	10	
15	Geotechnical Consultant is to inspect the installation of settlement monitoring plates and provide an approval report. Superintendent to issue written approval for each settlement monitoring point.	10	Hold Point
16	Surveyor is to commence periodic survey of all settlement monitoring points and issue reports for review by the Geotechnical Consultant and Superintendent.	10	
17	Contractor is to grade the finished surface to design levels and grades and maintain the surface condition to protect from adverse weather effects.	7.9	

3.5 Work Instructions

All works performed on site will be directed by the Superintendent using formal written work instructions. The Superintendent will confirm the geotechnical or environmental requirements with the relevant consultant prior to issuing the work instruction. Any verbal instructions must be confirmed in writing by the Superintendent.

3.6 Site Reference Control

Prior to commencing the works, a three-dimensional grid reference system shall be developed and agreed by all parties. This reference system will act to identify the location of all inspection and test locations at the site in three dimensions. The system shall use MGA coordinates and Australian Height Datum (AHD).

3.7 Measurement and Testing

All fill volumes must be measured by accurate survey readings performed by the project's surveyor on a fortnightly basis or as otherwise instructed by the Superintendent.

All geotechnical testing must be undertaken at a laboratory that holds NATA accreditation for the test methods performed. Tests not displaying the NATA endorsement will not be accepted. An exception to this applies to testing of soils impacted by asbestos. Non-NATA endorsed test reports will be accepted for testing performed on asbestos-impacted soils.

3.8 Site Security

Prior to commencing works on the site, the Contractor must secure the site, and keep it secured, to prevent access by unauthorised parties. Controls on site security must be maintained during the entirety of the project to ensure no adverse actions are undertaken or delivery of unapproved materials occurs.

4. Site Preparation

4.1 Site Stripping

Prior to the placement of approved fill, the site should be cleared of all unsuitable material and materials not proposed for use by the project. Unsuitable materials may include but are not limited to:

- Soils with a high silt content (i.e. topsoils, sediments or similar).
- Vegetation or organic matter (i.e. plants, root affected soil, or similar).
- Existing fill (i.e. stockpiled materials, existing in situ fill, or similar).
- Any foreign objects, scattered or buried waste, or dumped materials, unless specific soil encapsulation works are proposed (if required, and subject to specific geotechnical and environmental controls).
- Contaminated soils (if present), unless specific soil encapsulation works are proposed (if required, and subject to specific geotechnical and environmental controls).
- Unsatisfactory or excessively wet soils.

Unsuitable and deleterious materials shall be assessed by the Geotechnical Consultant and Environmental Consultant and disposed of offsite or in an approved onsite encapsulation cell unless otherwise approved for re-use or on-site processing by the Superintendent.

4.2 Quarry Floors, Dams and Temporary Basins

All existing quarry floors, dams and temporary basins are to be drained, desilted and deconstructed to expose the underlying natural stiff clay or bedrock, or previously approved fill layers. The following general procedure forms the minimum requirements:

- All existing ponded waters are to be pumped out or otherwise drained to a discharge area that is located at least 50 m away from any existing waterway, or as otherwise required by Liverpool City Council.
- All vegetation and other deleterious material (such as saturated silt and clay) is to be excavated to expose the underlying stiff clay, weathered rock or unaffected underlying previously approved fill.
- All existing dam and basin walls formed in fill are to be removed.
- The exposed surfaces are to be benched to a near-horizontal surface (<10% grade) prior to fill placement.
- Exposed surfaces are to be proof rolled with six passes of a 12-tonne dead weight roller operating in static mode, with the final pass undertaken in the presence of the Geotechnical Consultant or GITA (as delegated by the Geotechnical Consultant) in order to identify areas requiring additional work.
- Saturated 'organic' soils from the dam and basin sides and base can be spread out and dried at a suitable location away from the general fill placement area. Once dried the material can be blended with other suitable granular fills (ripped rock) at a ratio of 1 in 20 (i.e. maximum 5% organic soils) and mixed into the lower fill layers. Organic soils are to be stripped of vegetation and significant roots prior to blending.

- Any saturated 'non-organic' soils can be spread out and dried. Once moisture conditioned the material can be blended with other suitable fills (clays and ripped rock) at a ratio of 1 in 5 (i.e. maximum 20% non-organic soils) and used as engineered fill below a depth of 3 m below finished bulk earthworks level (BEL).

Prior to discharging, an assessment of the water should be undertaken to confirm the suitability of the above disposal method, particularly regarding erosion. The assessment should include (as a minimum) pH and turbidity testing in accordance with Liverpool City Council's requirements.

4.3 Inclined Stripped Surfaces

Where fill is to be placed on an inclined surface with an initial grade steeper than 10H:1V, the inclined surface shall be benched flat with each bench to be cut at least 300 mm deep on its high side and to be at least 2 m wide. Where fill is to be placed on an inclined surface with an initial grade steeper than 4H:1V, the inclined surface shall be benched flat with each bench to be cut at least 600 mm deep on its high side and to be at least 2 m wide.

Benching is not required when placing fill against inclined quarry batters formed in low strength or stronger rock.

Where fill is to be placed adjacent to existing rock or clay quarry walls, the existing faces must be stripped of any loose scree material. Removal of any loose or weathered material shall continue until fill is placed and compacted over the face.

4.4 Stripped Surfaces in Approved Fill

Where new fill is to be placed on and/or immediately adjacent to existing already approved fill or ground formations, the existing faces shall be cut into steps or benches to allow lateral keying of the new fill into the existing ground. The base of each step or bench is to be flat, at least 1.2 m wide and is to be excavated at least 600 mm on its high side. The overall average and smoothed grade line of the benching is not to exceed a grade of 2H:1V.

4.5 Excavation

Following site stripping, further bulk excavation is not anticipated, although some limited areas of cutting may become evident during the works, such as the flattening of existing quarry batters, particularly those underlying future warehouses.

Material that is excavated from the site shall be geotechnically and environmentally categorised for beneficial re-use on the site, or for offsite disposal.

Any materials that are to be disposed of off-site will require classification in accordance with current *Waste Classification Guidelines* (NSW EPA 2014). Further advice is to be obtained from the project's Environmental Consultant.

4.6 Excavation Stability

Although not anticipated, if new excavations are required, then the natural soils having a stiff consistency (or better) and the underlying weathered rock would be expected to stand close to vertical in the short-term, however, unsupported near-vertical excavations or trenches may

undergo slumping, or other rapid slope failures, particularly if they become affected by water (i.e. rainfall, seepage, or similar).

Any short-term excavations that have slopes steeper than those recommended below must have appropriate exclusion zones provided on both their upper and lower sides to prevent access by personnel and plant or storage of materials. The extents of the exclusion zones should be confirmed by the Geotechnical Consultant.

Where personnel are to enter excavations, short-term excavations shall be benched or battered at grades not exceeding 1H:1V or alternatively, temporary lateral support should be provided. Short-term excavations within more competent rock may potentially be battered at steeper slopes subject to specific geotechnical review and assessment to ensure there are no unfavourable discontinuities that could lead to failure.

Long-term excavations shall be either battered at 2H:1V or flatter and protected from erosion or supported by an engineered wall. For excavations in competent rock, steeper batters may be acceptable, subject to specific geotechnical review and authorisation.

HOLD POINT	Approval of Excavations
Release by:	Superintendent

4.7 Groundwater

The regional groundwater table is unlikely to be encountered within the excavation depths on the site. However, it is the Contractor's responsibility to manage any groundwater issues, such as intermittent side wall seepage from the quarry batters, if encountered. Seepage into excavations may be encountered particularly at the soil/rock interface. Provision should be made to control and direct any seepage to temporary basins.

4.8 Preparation and Approval of Stripped Surfaces

Prior to placement of fill, the condition and suitability of all stripped areas shall be assessed by the Geotechnical Consultant. Stripped surfaces will contain one of the following soil types:

- Natural in situ clayey soils of at least a stiff consistency.
- Controlled fill previously placed and compacted in accordance with this Specification, or the existing control fill placed as part of the quarry rehabilitation for CSR Australia, if there are delays between the placement of successive fill layers.
- Natural in situ rock.

Prior notice of at least 48 hours shall be provided to the Superintendent and Geotechnical Consultant that a stripped area is ready for inspection.

At the agreed time of inspection, the Contractor shall provide a suitable smooth-drum roller of at least a 12 tonne mass for proof rolling. Proof rolling shall be undertaken in the presence of the Geotechnical Consultant or the GITA (as delegated by the Geotechnical Consultant) after the Contractor has already completed at least five passes of the roller across the prepared area (not required for stripped areas in rock). The Geotechnical Consultant shall confirm that the stripped

area has been prepared in accordance with this specification and that no adverse deflections were present during proof rolling.

If excessive deflections are recorded during proof rolling, then the Geotechnical Consultant shall provide advice to the Superintendent on appropriate rectification of the affected areas. Soft, weak, loose or yielding areas shall be excavated and replaced with suitable compacted fill. The Superintendent shall provide instructions to the Contractor to undertake the rectifications.

As part of the stripped surface assessment process, the Geotechnical Consultant shall confirm whether the stripped surface is suitable, or can be made suitable, in terms of in situ moisture content (wet or dry), including the effects of rainfall or desiccation.

HOLD POINT	Approval of Stripped Surfaces
Release by:	Superintendent

Fill shall not be placed on the stripped surface until the stripped surface has been approved by the Superintendent. The Contractor shall be responsible for maintaining the condition of the stripped surfaces during the works.

4.9 Survey

All approved stripped surfaces are to be surveyed for extent and level to provide a basis for the base level of all engineered fills placed on the site. A copy of each individual stripped surface survey is to be provided to the Geotechnical Consultant and Superintendent. A combined stripped surface survey for the whole of the site is to be provided to the Geotechnical Consultant and Superintendent. It is the Contractor's responsibility to ensure that on completion of the work all individual stripped surfaces are combined to show that no areas of the site have been missed.

5. Management of Fill Materials

5.1 Material Tracking

The Contractor is responsible for tracking the movement of all materials relocated or otherwise used during the bulk earthworks operation. Existing organic topsoils and other soils that are subject to blending shall be tracked and blending ratios measured by volume. All soils that are relocated for the purposes of the bulk earthworks shall be tracked from their source to their destination. Tracking will include reference to cut and fill areas, and with zonation within the fill. A project-specific material management system is to be developed by the Contractor to monitor and track all material movements.

5.2 Survey

All soil movement on the site, whether by cut or fill, shall be surveyed by volume as a record of the work undertaken. Surveys shall be undertaken at a minimum fortnightly frequency or as instructed by the Superintendent. Fortnightly and cumulative cut and fill volumes shall be recorded and provided to the Geotechnical Consultant and Superintendent.

5.3 Material Blending

In addition to the blending of organic and inorganic materials sourced from the desilting of quarry floors, dams and temporary basins (Section 4.2), the bulk earthworks operation will target the ongoing blending of topsoils and the various natural clay and ripped rock to form a uniform granular fill.

The upper organic part of all topsoil is to be stripped from the site and either disposed of offsite or otherwise stockpiled and adjusted to remove the organics. Removal of organics may require the use of biodegradable weed killers. After removal of the organic matter, the soil may then be blended with other suitable fills (i.e. approved stockpiled and natural clays and ripped rock) sourced from on the site at a blend ratio of 1 in 20 (i.e. maximum 5%). The underlying inorganic component of the topsoil layer is to be excavated and bended with other suitable fills (i.e. approved stockpiled and natural clays and ripped rock) sourced from on the site at a blend ratio of 1 in 10 (i.e. maximum 10%).

For the underlying natural clays and clays sourced from onsite stockpiles, further blending is required to avoid the placement of fill that comprises only clay. A minimum fill blend comprising at least one part of ripped rock for every two parts of clay shall be adopted.

6. Fill Materials

6.1 General

Fill materials are to include the dedicated sources of fill that have been identified in several stockpiles present within the Project Maverick site. In addition, fill materials could comprise site won soils, ripped rock and subject to additional geotechnical and environmental controls, imported VENM and ENM (refer below). Site materials are expected to require moisture conditioning, subject to the prevailing weather conditions and in situ moisture content prior to and during construction. Specifically, fill materials are expected to include:

- Existing Stockpiled Materials: Generally, includes ripped shale, ripped sandstone and predominantly clay-based soil. The stockpiles are undergoing progressive assessment for suitability and approved sources will be identified for use.
- Site Won Ripped Rock: Generally, all site-won ripped rock would be suitable for re-use as engineered fill following particle size breakdown and moisture conditioning.

Additional fill materials (if approved) are likely to include:

- Site-won Soils: Generally, natural soils excavated on site, excluding topsoil and soils of an unsuitably high silt content (unless stripped and blended in accordance with Section 5.3). Site-won soils may need to be blended with other granular fill materials before being deemed suitable for placement.
- Imported Materials: Classified as Virgin Excavated Natural Material (VENM) or Excavated Natural Material (ENM).
- Imported Pavement Materials: Including unbound road base (DGB20 or similar) and cement treated fine crushed rock (CTFCR) for use in pavement layers and hardstand subgrade capping.

- Imported Ripped Sandstone and DGB20: Including materials used in the reinforced zone of reinforced soil retaining walls and for retaining wall foundation improvement layers, where needed.

Environmental approval of suitable fill will occur following completion of specific contamination testing and reporting for each fill source/stockpile. Geotechnical approval of suitable fill will be based on a visual assessment prior to use, and when deemed necessary, prior testing of the fill source/stockpile for assessment of compliance with the various fill zones outlined in Section 6.3, including any requirement for blending with other materials to achieve compliance with the various fill zones.

WITNESS POINT	Approval of Fill Materials
Process to be Witnessed:	Inspection and assessment of nominated fill sources by environmental consultant and geotechnical consultant.
Submission Details:	Environmental assessment report presenting results of environmental testing and material reuse classification. Geotechnical report, when required, presenting advice for material reuse and initial blending ratios.

6.2 Unsuitable Materials

Materials considered unsuitable for use as fill include:

- Soils with vegetation including tree stumps, roots, high root fibre content or other organic or deleterious matter.
- Silts or soils with a predominant portion of silt.
- Existing on-site fill, unless otherwise approved by way of specific geotechnical and environmental assessment.
- Ripped rock comprising oversize material with particle sizes of greater than 150 mm or half of the compacted layer thickness (i.e. following compaction).

The above list is not exhaustive, and other materials may also be deemed unsuitable for use if their condition is considered adverse to, or inconsistent with, the project requirements.

6.3 Fill Materials

6.3.1 Fill Zones and Materials Requirements

The placement of fill and the selection of fill materials will be undertaken with consideration to the following fill zones:

- Upper Zone of Fill – this zone includes the upper 2 m of fill below design BEL. The minimum requirements for this zone include:
  - Maximum liquid limit of 50%.
  - Maximum particle size of 150 mm.
  - Maximum weighted plasticity index (WPI) of 1500.

  - Maximum salinity value of 4 dS/m (i.e. slightly saline or lower).
  - pH value within the range of 4.5 to 10.
- General Fill Zone – this zone includes all fill below the upper zone of fill and above the approved stripped surface. The minimum requirements for this zone include:
  - Maximum particle size of 150 mm.
  - Maximum WPI of 2000.
  - Minimum fill blend of at least one part ripped rock to two parts clay.
  - Maximum salinity value of 4 dS/m (i.e. slightly saline or lower) in the upper 2 m of this zone.
  - pH value within the range of 4.5 to 10.
- Deep Fill Zone – this zone includes that part of the general fill zone that lies below a depth of 4 m below finished BEL. This zone is identified as a location where moderately saline soils and / or blended topsoil and dried quarry base / dam / basin sediments may be placed, subject to approval by the Geotechnical Consultant and the Superintendent.

The WPI is defined as the product of the plasticity index and the percentage passing the 425 micron sieve.

$$WPI = Plasticity\ Index\ (\%) \times Percent\ Passing\ 425\ micron\ sieve$$

6.3.2 Materials Testing

The following materials tests are to be completed during the bulk earthworks operation. Testing may be conducted on fill source materials prior to fill placement, however the monitoring for compliance is to be based on samples that are collected routinely during earthworks from the completed and blended fill layers after placement and compaction.

- CBR tests on pavement and hardstand subgrades (AS 1289.6.1.1):
  - New public roads – Minimum 1 test per 80 m length of road.
  - Internal roads and hardstands – Minimum 1 test per 1,000 m^2 of pavement.
- Plasticity Index tests on fill materials (AS 1289.3.1.1, AS 1289.3.2.1 & AS 1289.3.3.1):
  - New public roads – Minimum 1 test per 160 m length of road.
  - Internal roads and hardstands – Minimum 1 test per 2000 m^2 of pavement.
  - Upper zone of fill – Minimum 1 test per 5,000 m^3 of fill.
  - General fill zone – Minimum 1 test per 10,000 m^3 of pavement.
- Particle size distribution tests on fill materials (AS 1289.3.6.1):
  - New public roads – Minimum 1 test per 160 m length of road.
  - Internal roads and hardstands – Minimum 1 test per 2000 m^2 of pavement.
  - Upper zone of fill – Minimum 1 test per 5,000 m^3 of fill.
  - General fill zone – Minimum 1 test per 10,000 m^3 of pavement.

- Salinity and pH tests on fill materials (pH, chlorides, sulphates, electrical conductivity and texture):
  - Fill materials from on-site stockpiles and cuts in natural soil – Minimum 1 test per 10,000 m^3.

6.3.3 Existing Controlled Fill – Previous Earthworks by CSR Team

For earthworks that have been completed or are ongoing under the contractual arrangements with the CSR development team, fill materials were generally defined with reference to categories termed Grade A, B, C or D. In comparing the material requirements adopted by the CSR team with those defined in this Specification, the controlled fill materials already placed as part of the quarry rehabilitation works for CSR Australia, such as at Pit 1 (ongoing) and Pit 3 (completed), outlined in Douglas Report Ref. 201059.00.R.002.Rev1 dated April 2025, the following comments are made:

- General Deep Fill (Grade A), as defined in the quarry rehabilitation specification (prepared for CSR Australia), is considered suitable for use in the Upper Zone, General Zone and Deep Fill Zone in accordance with this Specification.
- General Fill (Grade B) is considered to partially meet the requirements for the Upper Zone, General Zone and Deep Fill Zone. Prior to use, however, additional assessments for WPI, salinity, material blending and pH compliance will be required to confirm its suitability to the requirement of this Specification.
- High Plasticity Fill (Grade C) does not meet the criteria for fill, as outlined in this specification. The CSR team define this material as suitable for use in landscaping and non-developable areas. Although not directly suitable for reuse, this material may be blended with other materials to improve its properties for reuse as per the requirements outlined in this Specification.
- Capping Material (Grade D), as defined in the quarry rehabilitation specification, is considered suitable for use in the Upper Zone, General Fill and Deep Fill Zones in accordance with this Specification.

6.4 Imported Fill Materials

Importation of fill and the estimates on the required volume for importation has not been determined at this stage. If fill importation becomes necessary, then further import and approval controls will need to be implemented by the Geotechnical Consultant and Environmental Consultant. Further advice will need to be sought at the time, however, as a minimum, all imported material would need to be accompanied by suitable waste classification reports that provide sufficient site history data and chemical analysis to confirm that each source of import can be assessed to be chemically suitable for use on industrial land. Any approval for the importation of fill will first require the development of a Fill Importation Protocol (FIP) and would possibly require modifications to the Remediation Action Plan (RAP) that will govern the assessment process for all imported materials.

Imported fill materials shall not include any unsuitable material, such as described in Section 6.2. Where importation of fill is proposed, consideration should be given to placing low reactivity, non-saline to slightly saline soil or rock, and ripped shale/sandstone that complies with this specification. Granular fill should be prioritised in near-surface fill layers or pavement subgrades to assist economical construction of pavements and to benefit foundations.

Importation of pavement materials, including unbound road base (DGB20 or similar) and cement treated fine crushed rock (CTFCR) for use as subgrade capping is subject to environmental approval. When purchased from a reputable material supplier, the importation of road base and CTFCR gravels does not trigger the development of a FIP.

6.5 Importation of Material

The Superintendent shall be notified of the intent to import material and if the importation is approved by the Superintendent, they shall in turn notify the Environmental Consultant, the Geotechnical Consultant and the GITA (where relevant) at least two weeks prior to importation.

All importation shall comply with the requirements of the FIP, relevant RAP and this Specification. Environmental requirements for imported fill must be outlined in a project approved FIP and RAP prepared by the Environmental Consultant.

Any material delivered to site prior to approval being granted by the Environmental Consultant, the Geotechnical Consultant and the GITA (as relevant) shall be deemed a risk to be borne by the Contractor until the material has been suitably validated and approved. Any material that is imported to site and found to be not suitable shall be removed at the Contractor's expense. Records of the importation of any fill shall, as a minimum, include:

- The source of the material.
- The day and date of delivery.
- The location of the material on site.
- The record of the transporting company and truck registration number.
- The estimated volume of the material imported.

Such records shall be kept by the Contractor and passed on to the Superintendent, Environmental Consultant and Geotechnical Consultant. Additional records in relation to the waste classification of the imported material must also be retained, as per the requirements of the FIP and relevant RAP.

6.6 Disposal of Material

Should unsuitable material require removal from the site (including illegally dumped materials), or the quality of any imported or site-won material be deemed inadequate, the Superintendent will direct the removal of the material to an appropriate facility. The following records of disposal shall be kept as a minimum:

- Identification of the material (imported or site-won).
- The reason the material is deemed unsuitable.
- The estimated volume of the material.
- The day and date or removal from site.
- The record of the transporting Company and truck registration numbers.
- Details of the waste facility (receipt of material).

Such records shall be kept by the Contractor and passed on to the Superintendent and the Environmental Consultant.

If material is imported without approval or dumped on the site, the Contractor shall be responsible for removal (and the costs of removal) of such material together with any validation testing required for disposal and remediation of the affected areas on site.

7. Fill Placement

7.1 General Methodology

Fill should be placed and compacted in accordance with this specification and in accordance with AS 3798-2007 Guidelines on Earthworks for Commercial and Residential Structures, in conjunction with the methodology described below:

- Appropriate site preparation, proof rolling and foundation treatments as outlined in Section 4.
- Spreading of material in uniform, horizontal layers in maximum compacted thicknesses of 300 mm but appropriate for the plant used and effectiveness of the compaction achieved. Spreading shall achieve good distribution and avoid segregation or pockets of non-homogeneous material. Each layer of material shall not differ substantially from the surrounding material.
- Compaction of each layer to achieve a uniform density throughout the layer.
- Care is required to ensure that compaction is achieved over the entire fill area, particularly adjacent to any inclined or vertically excavated faces. This will require 'keying in' or 'benching' to allow compaction equipment to achieve full compaction to the edge of the fill.
- All fill should be supported by properly designed and constructed retaining walls or be battered at a maximum grade of 2H:1V (max 4 m high, or otherwise subject to geotechnical assessment) and protected from erosion by vegetation, geosynthetics or other suitable measures.
- During construction, adequate cross-fall should be provided to allow drainage, prevent ponding and to avoid scour or erosion. Contour drains and suitably placed temporary or permanent drop structures may be used to aid in the prevention of batter erosion.

7.2 Construction Control

All fill shall be placed under a programme of Level 1 inspection and testing, as defined in AS3798-2007. The following survey control shall also be conducted by the Contractor as a minimum, the extent of which should be confirmed prior to the works.

- Set out and record existing levels in areas of proposed excavations, followed by survey of stripped surface levels.
- Final earthworks levels and completed construction levels.

7.3 Compaction

7.3.1 Compaction and Other Plant

The compaction method and plant utilised will be suitable for the materials being placed, the construction sequence and location. Suitable plant may include 20-30 tonne static compactors, 12 tonne or heavier smooth drum and pad-foot rollers, together with scrapers, spreaders, water carts and dump trucks. Light-weight and handheld equipment may also be required in the vicinity of underground services or structures that may be subject to vibratory induced distress.

7.3.2 Field Density Tests

Field density testing shall be carried out in accordance with AS 1289.5.8.1 or by an alternative method approved by the Superintendent.

7.3.3 Compaction Requirements

The compaction requirements for fill are outlined in Table 3.

Table 3: Compaction Requirements

Material / Layer	Compaction Criteria (Test Method)
Stripped Surfaces and Cut Floors (only when formed in approved fill)	Minimum 95% SMDD[1] (AS 1289.5.1.1), or 95% Hilf density ratio (AS 1289.5.7.1), or 65% DI[2] (AS 1289.5.6.1)
General Fill Zone	Minimum 98% SMDD[1] (AS 1289.5.1.1), or 98% Hilf density ratio (AS 1289.5.7.1), or 70% DI[2] (AS 1289.5.6.1)
Upper Fill Zone	Minimum 98% SMDD[1] (AS 1289.5.1.1), or 98% Hilf density ratio (AS 1289.5.7.1), or 70% DI[2] (AS 1289.5.6.1)
Pavement and Hardstand Subgrades (Formed in Upper Fill Zone)	Minimum 100% SMDD[1] (AS 1289.5.1.1), or 100% Hilf density ratio (AS 1289.5.7.1), or 75% DI[2] (AS 1289.5.6.1)
Pavement and Hardstand Subgrades (Formed in unbound DGB20 or CTFCR[4])	Minimum 98% MMDD[3] (AS 1289.5.1.1)
Pavement Layers – Private Pavements (Subbase and Base Layers)	Minimum 98% MMDD[3] (AS 1289.5.1.1)
Pavement Layers – Public Pavements (Subbase and Base Layers)	In accordance with Liverpool City Council's requirements
Trench Backfill	In accordance with the asset owner or relevant authorities' requirements.

Notes: 1. SMDD: Standard Maximum Dry Density. 2. DI: Density Index. 3. MMDD: Modified Maximum Dry Density. 4. CTFCR: Materials are to be placed and compacted, with density test results available within 4 hours of delivery to site.

The maximum compaction value for fill shall not exceed 104% SMDD or 104% Hilf density ratio.

7.3.4 Moisture Control

The moisture content requirements for fill are outlined in Table 4.

Table 4: Moisture Content Requirements

Material / Layer	Moisture Content
All Fill Zones and Subgrades	±2% of SOMC[1]
Pavement Layers	±2% of MOMC[1]
Trench Backfill	±2% of SOMC[1]

Notes: 1. SOMC: Standard Optimum Moisture Content or maximum ±2% Hilf moisture variation.
2. MOMC: Modified Optimum Moisture Content.

7.3.5 Testing Frequency

The testing frequency of engineered fill shall comply with Table 5.

Table 5: Compaction Testing Frequency

Material / Layer	Compaction Test Frequency
All Fill Zones	1 test per layer per material type per 1500 m^2, or 1 test per 500 m^3 evenly distributed
Subgrades and Pavement Layers (Public Pavements)	1 test per 50 m linear metres (or part thereof), or in accordance with Liverpool City Council's requirements
Subgrades and Pavement Layers (Private Pavements)	1 test per 50 m linear metres (or part thereof), or 1 test per layer per material type per 500 m^2
Trench Backfill	Greater of, 1 test per layer per 50 linear metres, or Minimum 2 tests per layer between pits, or in accordance with the asset owner or relevant authorities' requirements.

7.3.6 Layer Thickness Control

A maximum compacted layer thickness of 300 mm applies to all fill zones. Maximum compacted layer thicknesses in pavements are to be as per the pavement thickness design but not more than 200 mm. Maximum compacted layer thicknesses in trench backfill is 300 mm, or as per the asset owner's or relevant authorities' requirements.

7.4 Reworking

All test results shall satisfy the compaction and moisture content specifications outlined above. Areas that do not satisfy the specified compaction and moisture criteria shall be reworked prior to the placement of additional fill at the Contractor's expense, or alternatively, removed and

replaced with suitable material. Following reworking or replacement, the non-conforming area shall be retested by the GITA to confirm compliance with this Specification.

Survey of the non-conforming area shall be conducted to allow retesting. Records of the locations of the original test, the reworked area and all retests shall be kept.

7.5 Hold Point

No material is to be placed on a filled area until the previously placed layer has been tested, and satisfactory results obtained, including any retests to be conducted on reworked areas of fill that previously failed. Placement of new fill on previously placed fill prior to receiving satisfactory test results is at the Contractor' risk. Earthworks operations may continue after confirmation has been received that the tests undertaken on the previous fill layers have passed. Test results are to be reported daily by the GITA with all non-conformances identified. Test results are to be included in the GITA's Weekly Report, which is to identify non-conformances and rectification works. The HOLD POINT shall be removed on a weekly basis by the Superintendent following their review of the daily test reports, the GITA's Weekly Report and their satisfaction that all non-conformances have been addressed.

HOLD POINT	Weekly Approval of Compacted Fill Layers
Release by:	Superintendent (or as delegated)

7.6 Non-Conformances

The Contractor shall develop and maintain a project quality plan to reduce or eliminate the incidence of non-conformances.

The GITA shall record all non-conformances in relation to the earthworks and the geotechnical requirements or otherwise that may affect the geotechnical design. Where the non-conformance is apparent to the GITA and can be readily rectified, the GITA shall notify the Contractor without delay and, where appropriate, report to the Superintendent.

The Contractor shall report non-conformances and following review of the reason for non-conformance corrective action shall be developed, and where required, modification of the project quality plan or Quality System should be conducted accordingly.

Details of corrective actions made should be reported by the Contractor (and GITA where appropriate), and the details shall be provided to the Superintendent within the appropriate timeframe to reduce any implications and potential future non-conformances. The Superintendent should consult the Geotechnical Consultant to determine the potential effect on the design and develop remedial measures where the non-conformance is not able to be readily rectified. Costs of rectifying any non-conformance shall be borne by the Contractor.

7.7 Site Drainage

During earthworks, all exposed stripped and filled surface areas shall be graded with a minimum 1% fall towards temporary catch drains that discharge to temporary detention basins. Should temporary drainage be disturbed during daily earthworks, rectification or reconstruction of the drainage system shall occur prior to the completion of the day's work. The temporary drainage system shall be maintained during the course of the full earthworks program.

As the sediment basins are located within the fill volume, there will be the requirement from time to time to create a new sediment basin within the placed fill to fill the old sediment basin. This is to avoid the detention basin becoming progressively deeper during the site work. All temporary basins are to be properly sized so that they adequately manage stormwater runoff volumes. All temporary basins are to be lined with compacted clay to at least 400 mm thickness across their base and sides.

When a sediment basin is decommissioned, the base of the basin will be stripped in accordance with Section 4.2. The Earthworks Contractor should anticipate a significant depth of wet material, which will require removal and treatment in accordance with Section 4.2.

7.8 Protection of Completed Fill Layers

It is the responsibility of the Earthworks Contractor to maintain the integrity of all completed fill layers following their completion and until practical completion is reached. If the surface of any approved fill layers is damaged by heavy rainfall (or similar), the Earthworks Contractor is to rework the affected area and undertake new testing to confirm the layer has been reinstated or repaired in accordance with this specification.

7.9 Plate Load Tests

When the level of the fill reaches the top of the General Fill Zone, the site is to be progressively made available to the Geotechnical Consultant to undertake plate load tests at a frequency of one test per 5,000 m^2. Plate load tests will also be undertaken at the same frequency at the midpoint of the Upper Fill Zone (1 m below BEL) and on the surface of the Upper Fill Zone (at BEL). The testing frequency can be reduced to one test per 10,000 m^2 in site areas outside of proposed building footprints if final building positions are known.

8. GITA Supervision

8.1 Scope

A full-time programme of Level 1 geotechnical inspection and testing shall be undertaken in accordance with AS 3798-2007. The works performed by the GITA shall, as a minimum, include the following:

- Daily supervision and assessment of earthworks procedures in accordance with the Specification.
- Observation, inspection and preliminary approval of excavations and stripped surface/foundation preparation.
- Compaction and density testing in accordance with the Specification, including the required frequency and methodology. Testing should be conducted by a suitably qualified and experienced NATA accredited laboratory.
- Materials testing in accordance with this Specification, including the required frequency and methodology. Testing should be conducted by a suitably qualified and experienced NATA accredited laboratory.
- Advising the Superintendent and Contractor where non-conformance occurs.

- Recording of site preparation procedures and outcomes.
- Observation and approval of proof rolling of all stripped areas and subsequent fill layers prior to placement of fill, with records kept of observations and the location and extent of areas that require treatment.
- Recording of the condition of the fill, including the suitability in accordance with the Specification and any requirements for moisture conditioning, treatment or processing.

8.2 Reporting and Record Keeping

The GITA shall prepare the following reports and documentation during and on completion of the earthworks. Where the earthworks are to be completed in stages, separate and complete reports shall be prepared for each stage. The reports should provide a summary of the works undertaken, compaction and materials testing and provide an opinion of the compliance of the works and, where applicable, non-conformance including remedial measures or actions taken.

The GITA, as a minimum, shall keep written records of the following:

- Daily Reports – summarising the work undertaken on site each day, including the source of materials being used, operational plant, weather, volume of material placed, tests completed, and any other item in accordance with AS3798. Daily photographs should be taken of the site areas worked on any given day.
- Stripped Area Approvals (unless prepared by the Geotechnical Consultant) – summarising all areas of the site progressively approved, including the tracking of areas 'yet to be approved' to ensure no areas are missed. This is to be a back-up to the records produced by the Earthworks Contractor.
- Compaction Test Reports – presenting the results of all tests undertaken during the earthworks.
- Materials Test Reports – presenting the results of all tests undertaken during the earthworks.
- Imported Source Site Approvals (unless prepared by the Geotechnical Consultant) – presenting a summary of all approved external sources of fill.
- Weekly Summary Reports (unless prepared by the Geotechnical Consultant) – presenting a summary of all activities undertaken, site observations and test results obtained during the preceding week. The report shall provide a comparison of the number of tests completed with the volume of material placed. Non-conformances are to be listed. The report shall be presented to the Geotechnical Consultant prior to 5 pm each Monday. A weekly report shall be issued for every week during which Level 1 testing was undertaken.

The Geotechnical Consultant shall review the Weekly Reports and provide written comments on compliance of the works, non-conformances and any rectification actions required prior to issuing the report to the Superintendent by 5 pm each Wednesday.

9. Over-Excavation of Quarry Batters

Where the placement of fill is undertaken within an existing quarry, the lower layers of fill are to be placed directly against the inclined quarry batters following preparation and stripping in accordance with Section 4.3. At the lower layers of fill, horizontal benching and 'keying in' of the

fill layers is restricted by the presence of higher strength in situ rock. As rock strengths reduce within the upper reaches of the quarry batters, horizontal benching is achievable, and the extent of the fill is to be extended beyond the quarry batter to step the fill / batter interface and thus provide an appropriate seal against moisture ingress from the fill surface to the quarry base.

Once the surface of the fill reaches a level equal to the top of low strength rock, the quarry batters shall be laterally over-excavated to create a level bench of a minimum 6 m width. Over-excavation will be required on all sides of all quarries, unless otherwise advised by the Geotechnical Consultant following a detailed review of final project earthworks drawings. Over-excavation is to be completed in accordance with the following methodology:

- The Earthworks Contractor is to advise the Superintendent and Geotechnical Consultant when the fill surface is nearing the top of low strength rock.
- The Geotechnical Consultant is to inspect the site and provide a report advising the appropriate benching levels and extent along the quarry perimeter.
- The Earthworks Contractor is to provide suitable plant to site and is to excavate a level bench of at least 6 m width along the required perimeter of the quarry.
- The batter faces created in rock above the bench is to be battered to a temporary grade of 1H:1V.
- The batter faces created in soil above the bench is to be excavated to a temporary grade of 2H:1V by cutting 1.2 m wide additional horizontal benches at 0.6 m height intervals (i.e. at every second fill layer) as the fill height increases.
- All excavated natural material is to be re-used as fill after approval for re-use is obtained.
- All new fill layers are to be keyed into the new batter profiles during placement and compaction.

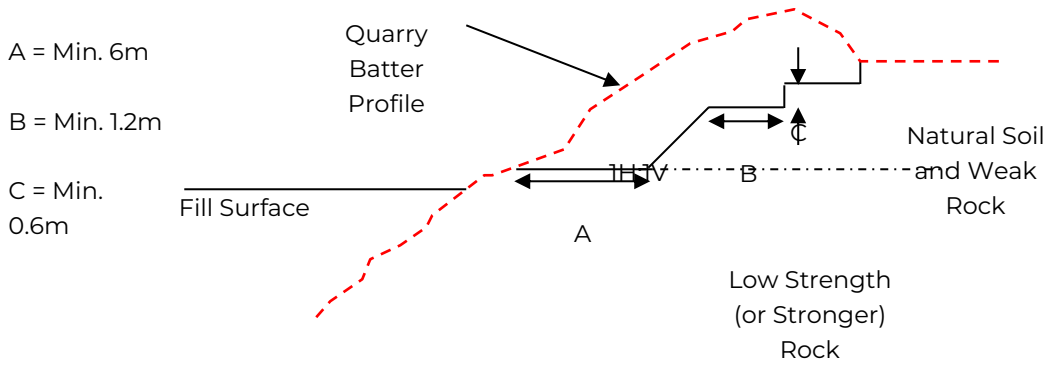

Figure 1: Over-excavation of Quarry Batter

All quarry batter over-excavation works are to be measured by survey. All batter over-excavation works are to be inspected an approved by the Geotechnical Consultant.

HOLD POINT	Approval of Over-excavation of Quarry Batters
Release by:	Superintendent (or as delegated)

10. Post-Construction Monitoring of Settlement

On completion of fill placement and in areas of more than 10 m in total fill thickness, the Earthworks Contractor is to install settlement plates and engage a registered surveyor to undertake monthly surveys to report on the total and progressive creep settlement of deep fill.

The Geotechnical Consultant is to provide details for manufacture and installation of the settlement plates and is to advise on the number of and locations for installation. Settlement plates will include vertical steel tubes welded to a horizontal steel plate that is concreted at a depth of at least 1.5 m below the completed fill surface level. The steel tubes are to extend above the ground surface.

Installation of the settlement plates is to be supervised by the Geotechnical Consultant. The Earthworks Contractor is responsible for the long-term protection of the settlement plates.

The surveyor is to undertake precise levelling (sub-millimetre) surveys at monthly intervals (fortnightly for the first three months) as is to establish sufficient fixed benchmarks nearby all settlement monitoring locations. The survey report is to be issued to the Superintendent and the Geotechnical Consultant within three days of each survey. Surveys are to be undertaken for a period of at least 24 months.

Installation of the settlement plates is to be completed as soon as practicable following completion of the fill, including staged installation, where appropriate.

HOLD POINT	Approval of Settlement Plate Installations
Release by:	Superintendent (or as delegated)

Appendix C

Appendix C - 234411.00.R.005 – Earthworks Memo

Memorandum R.005

To:	Goodman Property Services (Aust) Pty Ltd	Date:	30 January 2026
Attention:	Lachlan O'Reilly	Project No.:	234411.01
Email:	lachlan.oreilly@goodman.com	Reference:	R.005.Rev1
Subject:	Lot 12 Batter Assessment 225 – 245 Martin Road, Bradfield		

1. Introduction

This memorandum provides comments and recommendations for the earthworks associated with batter and retaining wall construction within Lot 12 of 'Project Maverick' at 225 – 245 Martin Road, Bradfield NSW.

2. Background

Based on information provided by Costin Roe (Structural Engineers), it is understood that the proposed Warehouse 12 will be designed to tolerate differential settlement grades of up to 1 in 500. Accordingly, Douglas has recommended maximum stripped surface gradients of 1(V):3(H) to limit differential settlements to within tolerable limits, where fill is placed in accordance with the project's earthworks specification (Project 234411.00.R.003.Rev1) dated 12 December 2025 (Douglas 2025).

Based on drawings and information provided by Arcadis (Civil Designers), it is understood that the footprint of Warehouse 12 traverses the extents of a previous quarry highwall, with a retaining wall to be constructed at the property boundary. It is understood that to reduce the depth of excavation required and therefore the height of the proposed retaining wall, earthworks methodology including placement of select fill (in the location of the green highlighted area in Figure 1 below) is proposed.

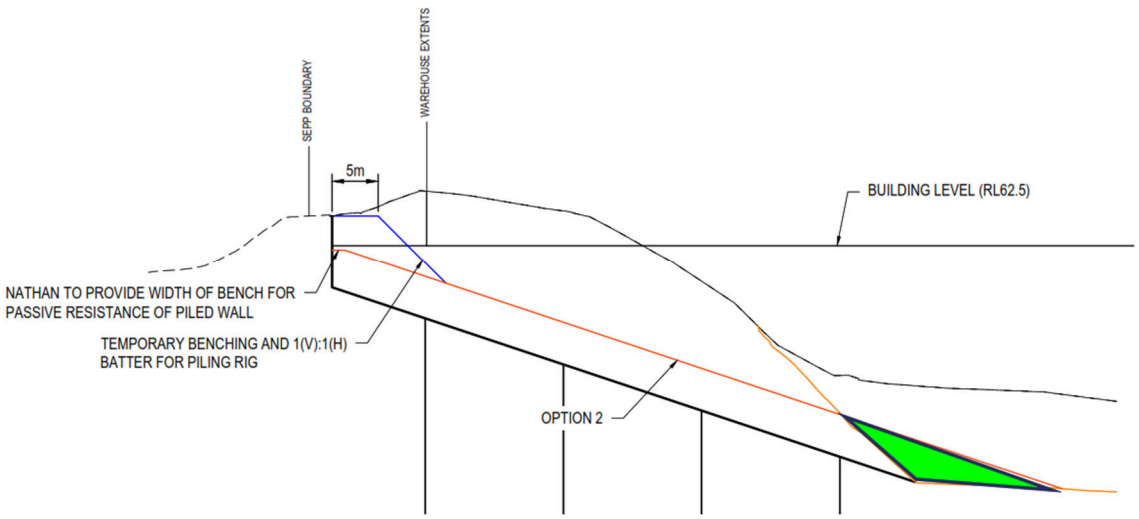

Figure 1: Proposed earthworks methodology

3. Comments

To target the maximum differential settlement grades of up to 1 in 500 below the warehouse footprint, the following comments are provided for the proposed earthworks methodology:

- To reduce the depth of excavation in accordance with the geometry presented in Figure 1, a select material which will not experience creep settlement over time must be placed onto the natural rock stripped surface.
- The select material must be placed to act as an extension of the quarry wall batter, maintaining a maximum 1(V):3(H) grade, and continuing until the batter intersects the quarry floor (i.e. as per the green area shown in Figure 1).
- The select fill must be of minimum subbase quality, which could include manufactured or recycled gravel such as DGS40, or similar. The material must be well graded, with a nominal CBR value of at least 50%.
- A bench at least four pile diameters wide must be provided for passive resistance for the retaining wall. During construction of the wall, geotechnical inspection must be undertaken to ensure that adverse joints/defects are not present which would likely require rock bolting.
- In addition to the above methodology the fill must be placed in accordance with the compaction requirements of the Douglas 2025 specification.

We trust that the above is sufficient for your present requirements. Please do not hesitate to contact the undersigned should you require further information.

Douglas Partners Pty Ltd

Nathan Godina
Associate / Geotechnical Engineer

Reviewed by

Peter Oitmaa
Principal

Attachments: About this Report

About this Report

October 2024

Introduction

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

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

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Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

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

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

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

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

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

Site Inspection

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

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Appendix D

Appendix D - C015440.00 – Ground Improvement Plan and Sections

NOTE:

GROUND IMPROVEMENT WORKS SHOWN ARE PRELIMIANRY FOR CONCEPT AND BUDGET PURPOSES ONLY.
GROUND IMPROVEMENT/ ROCK OVEREXCAVATION/ PROPOSED BATTERS ARE SUBJECT TO FINAL GEOTECHNICAL INVESTGATIONS AND ADVICE INCLUDING CALCULATED CREEP SETTLEMENTS IN DEEP FILL ZONES.

GROUND IMPROVEMENT NOTES:

- PILE TO BE Ø280 MASS CONCRETE CONTROLLED MODULUS PILES E = 10,000 MPa

SETTLEMENT CONTROL: DIFFERENTIAL TARGET - 1:500 @ 25 YEARS

TOP OF PILE LEVELS/LOCATIONS TO ACCOUNT FOR FOOTING/SLAB LOCATION AND DEPTH.

LEGEND:

- DENOTES GROUND IMPROVEMENT ZONE 1
- DENOTES GROUND IMPROVEMENT ZONE 2
- DENOTES GROUND IMPROVEMENT ZONE 3
- DENOTES GROUND IMPROVEMENT ZONE 4

NOTES:

ZONE 1 - CONTROLLED MODULUS COLUMNS - Ø280
3m X 3m GRID (20m AVERAGE LENGTH)

ZONE 2 - CONTROLLED MODULUS COLUMNS - Ø280
3m X 3m GRID (20m AVERAGE LENGTH)

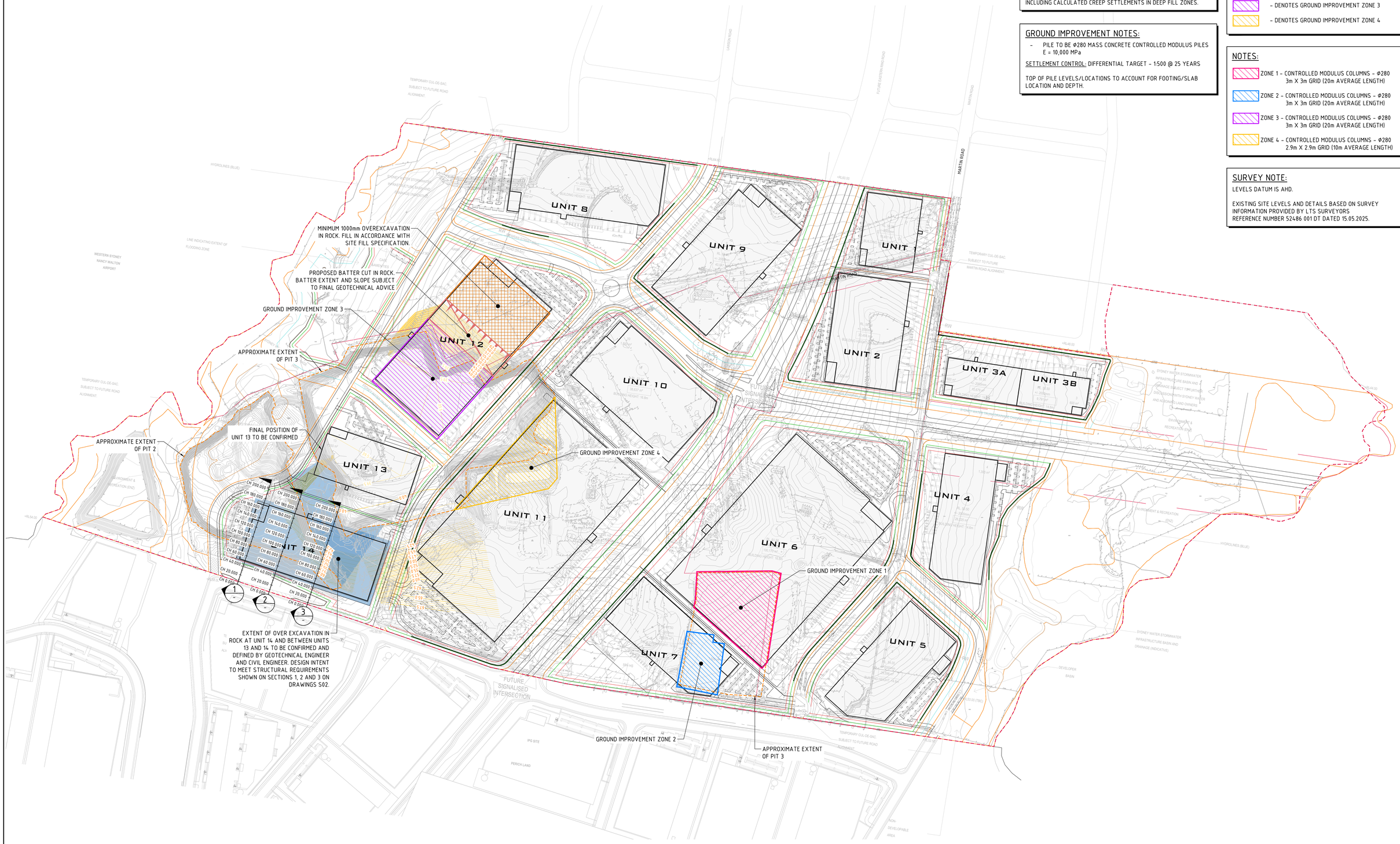
ZONE 3 - CONTROLLED MODULUS COLUMNS - Ø280
3m X 3m GRID (20m AVERAGE LENGTH)

ZONE 4 - CONTROLLED MODULUS COLUMNS - Ø280
2.9m X 2.9m GRID (10m AVERAGE LENGTH)

SURVEY NOTE:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS SURVEYORS
REFERENCE NUMBER 52486 001 DT DATED 15.05.2025.



GROUND IMPROVEMENT CONCEPT PLAN
SCALE 1:2500

20m 0 50 100 150 200 250m
SCALE 1:2500 AT A0 SIZE SHEET

PRELIMINARY ONLY

AMENDMENTS	DATE	ISSUE
ISSUED FOR PRELIMINARY ONLY - UPDATED MASTER PLAN	21.11.25	D
ISSUED FOR PRELIMINARY ONLY - UPDATED MASTER PLAN	21.10.25	C
ISSUED FOR PRELIMINARY ONLY - UPDATED MASTER PLAN	08.10.25	B
ISSUED FOR PRELIMINARY ONLY	06.06.25	A

ARCHITECT: design+

CLIENT: Goodman

PROJECT: PROJECT MAVERICK
BRADFIELD, NSW 2556

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
DN	JB	JUNE 2025		A0	AS SHOWN	C015440.00-S01

CONSULT AUSTRALIA

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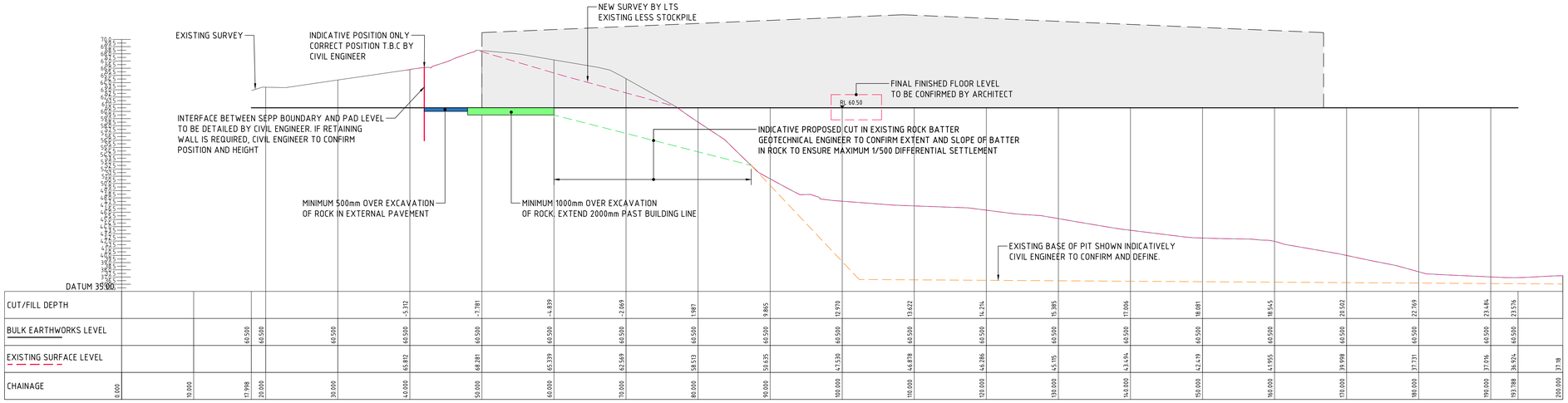
CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: GROUND IMPROVEMENT CONCEPT PLAN

DRAWING No: C015440.00-S01 ISSUE: D

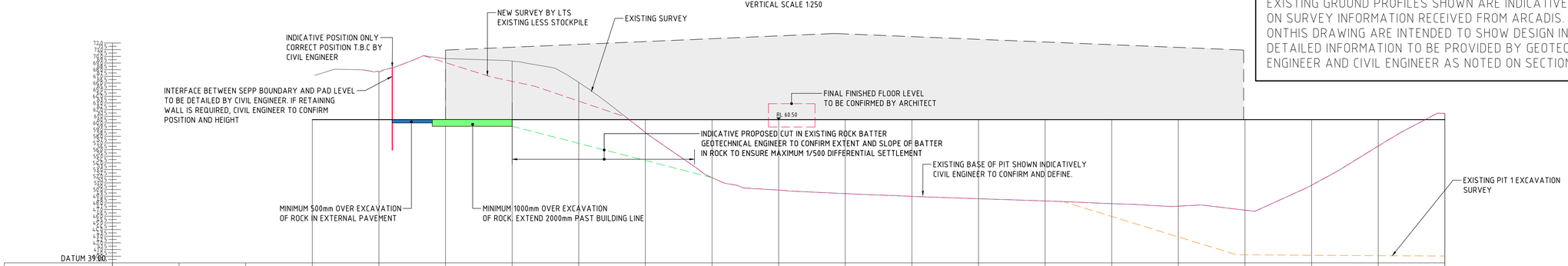


CHAINAGE	CUT/FILL DEPTH	BULK EARTHWORKS LEVEL	EXISTING SURFACE LEVEL
0.000			
10.000			
17.998		60.500	
20.000		60.500	
30.000		60.500	
40.000	-5.312	60.500	65.812
50.000	-7.781	60.500	68.281
60.000	-4.839	60.500	65.339
70.000	-2.069	60.500	62.569
80.000	1.987	60.500	58.513
90.000	9.865	60.500	50.635
100.000	12.970	60.500	47.530
110.000	13.622	60.500	46.878
120.000	14.274	60.500	46.286
130.004	15.385	60.500	45.115
140.000	17.006	60.500	43.494
150.000	18.081	60.500	42.419
160.000	18.545	60.500	41.955
170.000	20.502	60.500	39.998
180.000	22.769	60.500	37.731
190.000	23.484	60.500	37.016
193.788	23.576	60.500	36.924
200.000			37.18

SECTION 1

HORIZONTAL SCALE 1:250
VERTICAL SCALE 1:250

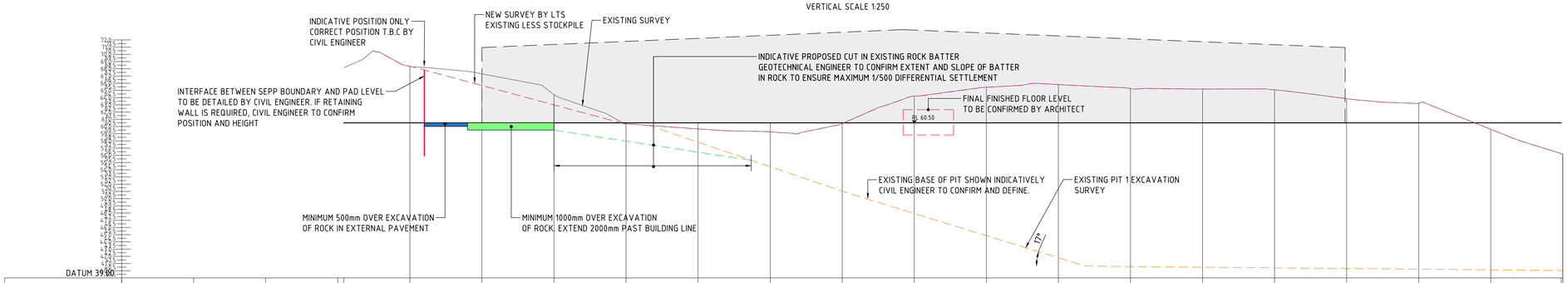
NOTE:
EXISTING GROUND PROFILES SHOWN ARE INDICATIVE ONLY BASED ON SURVEY INFORMATION RECEIVED FROM ARCADIS. SECTIONS SHOWN ONTHIS DRAWING ARE INTENDED TO SHOW DESIGN INTENT ONLY. DETAILED INFORMATION TO BE PROVIDED BY GEOTECHNICAL ENGINEER AND CIVIL ENGINEER AS NOTED ON SECTIONS.



CHAINAGE	CUT/FILL DEPTH	BULK EARTHWORKS LEVEL	EXISTING SURFACE LEVEL	EXISTING SURFACE LEVEL
0.000				
10.000				
20.000				
30.000		60.500		
40.000	-7.178	60.500	67.678	
50.000	-8.560	60.500	69.060	
60.000	-5.745	60.500	66.245	
70.000	-2.780	60.500	63.280	
80.000	1.910	60.500	58.590	
90.000	8.703	60.500	51.797	
100.000	10.574	60.500	49.926	
110.000	11.108	60.500	49.392	
120.000	11.595	60.500	48.905	
130.000	11.872	60.500	48.628	
140.000	12.204	60.500	48.296	
150.000	12.615	60.500	47.885	45.967
160.000	12.992	60.500	47.508	42.896
170.000	13.590	60.500	46.910	43.218
180.000	9.850	60.500	50.650	43.137
190.000	3.974	60.500	56.526	43.074
200.000	-0.942	60.500	61.442	43.027

SECTION 2

HORIZONTAL SCALE 1:250
VERTICAL SCALE 1:250



CHAINAGE	CUT/FILL DEPTH	BULK EARTHWORKS LEVEL	EXISTING SURFACE LEVEL	EXISTING SURFACE LEVEL
0.000				
10.000				
20.000				
30.000		60.500		
39.828				
40.000	-7.846	60.500	68.346	
50.000	-5.187	60.500	65.687	
60.000	-2.491	60.500	62.991	
70.000	0.144	60.500	60.356	
80.000	0.841	60.500	59.659	
90.000	1.232	60.500	59.268	
100.000	0.092	60.500	60.408	
110.000	-3.719	60.500	64.219	
120.000	-4.951	60.500	65.451	
130.000	-5.317	60.500	65.817	
140.000	-4.765	60.500	65.265	
150.000	-4.690	60.500	65.190	
160.000	-4.584	60.500	65.084	
170.000	-3.355	60.500	63.855	
180.000	-2.737	60.500	63.237	
190.000	0.880	60.500	59.620	
195.106	4.259	60.500	56.241	
200.000			54.836	43.836

SECTION 3

HORIZONTAL SCALE 1:250
VERTICAL SCALE 1:250

PRELIMINARY ONLY

2m 0 5 10 15 20 25m
SCALE 1:250 AT A0 SIZE SHEET

AMENDMENTS	DATE	ISSUE
ISSUED FOR PRELIMINARY ONLY	21.11.25	A

ARCHITECT: design+

CLIENT: Goodman

PROJECT: PROJECT MAVERICK
BRADFIELD, NSW 2556

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
DN	JB	JUNE 2025		A0	AS SHOWN	C015440.00-S02

CONSULT AUSTRALIA
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CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: GROUND IMPROVEMENT CONCEPT SECTIONS

DRAWING No: C015440.00-S02 ISSUE: A

Appendix E

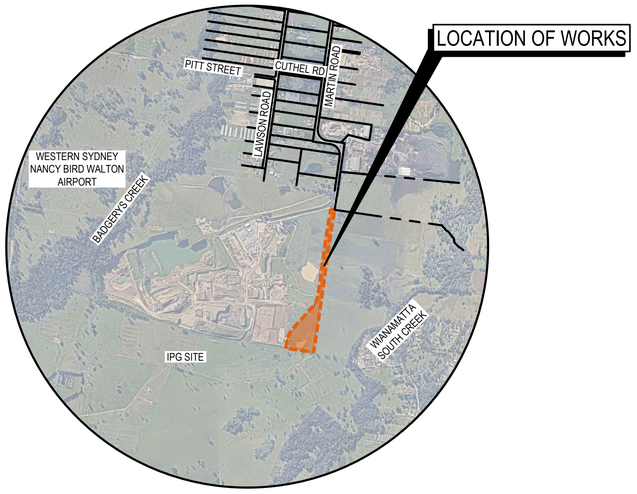
Appendix E - Proposed Gas Layout Plan

225-245 MARTIN ROAD, BRADFIELD

BULK EARTHWORKS, REHABILITATION AND QUARRYING - GAS MAIN RELOCATION
STATE SIGNIFICANT DEVELOPMENT APPLICATION - SSD-97711727

DRAWING SCHEDULE

DRAWING NUMBER	DESCRIPTION
UTILITIES	
MAR-AAP-DA-R02-DRG-UT-0001	GAS MAIN RELOCATION COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE
MAR-AAP-DA-R02-DRG-UT-0062	GAS MAIN RELOCATION KEY PLAN
MAR-AAP-DA-R02-DRG-UT-0501	GAS MAIN RELOCATION PLAN SHEET 1
MAR-AAP-DA-R02-DRG-UT-0502	GAS MAIN RELOCATION PLAN SHEET 2
MAR-AAP-DA-R02-DRG-UT-0503	GAS MAIN RELOCATION PLAN SHEET 3
MAR-AAP-DA-R02-DRG-UT-0504	GAS MAIN RELOCATION PLAN SHEET 4
MAR-AAP-DA-R02-DRG-UT-0505	GAS MAIN RELOCATION PLAN SHEET 5
MAR-AAP-DA-R02-DRG-UT-0506	GAS MAIN RELOCATION PLAN SHEET 6
MAR-AAP-DA-R02-DRG-UT-0507	GAS MAIN RELOCATION PLAN SHEET 7
MAR-AAP-DA-R02-DRG-UT-0508	GAS MAIN RELOCATION PLAN SHEET 8
MAR-AAP-DA-R02-DRG-UT-0521	GAS MAIN RELOCATION TYPICAL VERGE SECTIONS
MAR-AAP-DA-R02-DRG-UT-0531	GAS MAIN RELOCATION CROSS SECTIONS SHEET 1
MAR-AAP-DA-R02-DRG-UT-0532	GAS MAIN RELOCATION CROSS SECTIONS SHEET 2



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OPTION 1

Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

Scales

0 500 1000 1500 2000m

1 : 20000

Surveyor

Client

Status
PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project
225-245 MARTIN ROAD, BRADFIELD
BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title
GAS MAIN RELOCATION COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE

Arcadis Australia Pacific Pty Limited
Level 15, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289
Tel No: +61 2 8907 9000
www.arcadis.com/au

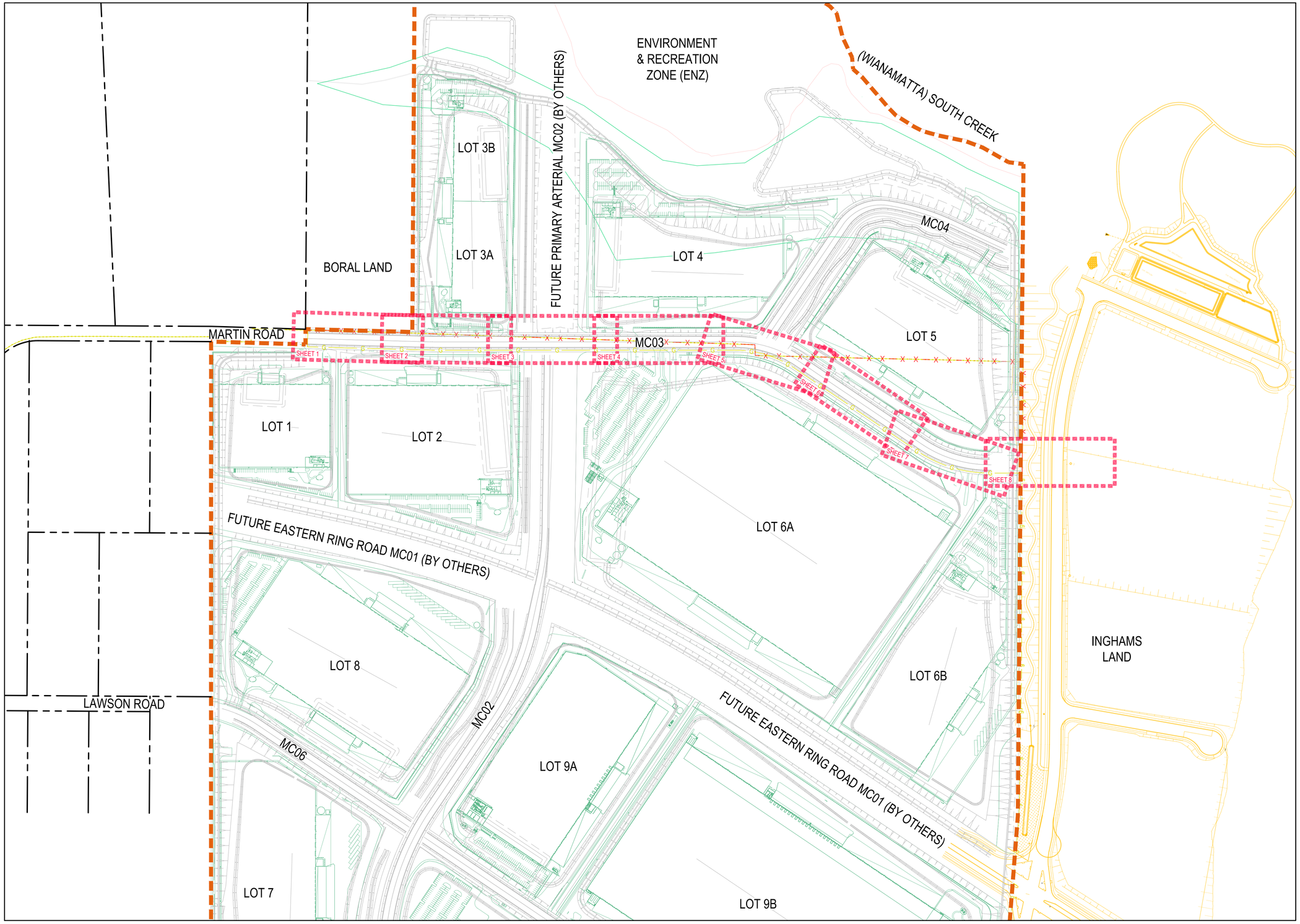
Project Number: 30281481

Drawing No.: MAR-AAP-DA-R02-DRG-UT-0001

Issue: B

100mm on Original

Date Plotted: 10 Jun 2026 - 05:06PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0001-GasMainRelocationCoverSheetLocalityPlanAndDrawingSchedule.dwg



LEGEND

- SITE BOUNDARY
- EXISTING BOUNDARY
- PROPOSED ADJACENT WORKS
- PROPOSED ADJACENT WORKS (BY OTHERS)
- PROPOSED INTERNAL WORKS ARCHITECTURAL (SSD-97688711)

NOTES

1. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0501 TO MAR-AAP-DA-R02-DRG-UT-0508 FOR GAS MAIN RELOCATION PLANS AND LONGITUDINAL SECTIONS.
2. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0521 FOR TYPICAL VERGE CROSS SECTION.
3. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0531 AND MAR-AAP-DA-R02-DRG-UT-0532 FOR DETAILED VERGE CROSS SECTIONS.
4. THE FUTURE INTERNAL WORKS - ESTATE AND INTERNAL WORKS - LOTS ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGES OF WORKS, PREPARED BY ARCADIS, UNDER SSD-97688711.
5. ADJACENT WORKS (BY OTHERS) ARE SHOWN INDICATIVELY ONLY AND REPRESENT A WORK IN PROGRESS. AS SUCH THESE ADJACENT PACKAGE WORKS ARE SUBJECT TO CHANGE.
6. THE GAS MAIN ALIGNMENT IS SHOWN FOR INFORMATION ONLY, WITH DETAILED DESIGN TO BE UNDERTAKEN BY JEMENA/ZINFRA
7. JEMENA/ZINFRA TO PROVIDE FINAL SPECIFICATION FOR ALL PROPOSED ITEMS

Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

100mm on Original

Scales

0 50 100 150 200 250m

1 : 2500

Surveyor

LTS

Client

Goodman

Status

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project

225-245 MARTIN ROAD, BRADFIELD
BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title

GAS MAIN RELOCATION
KEY PLAN

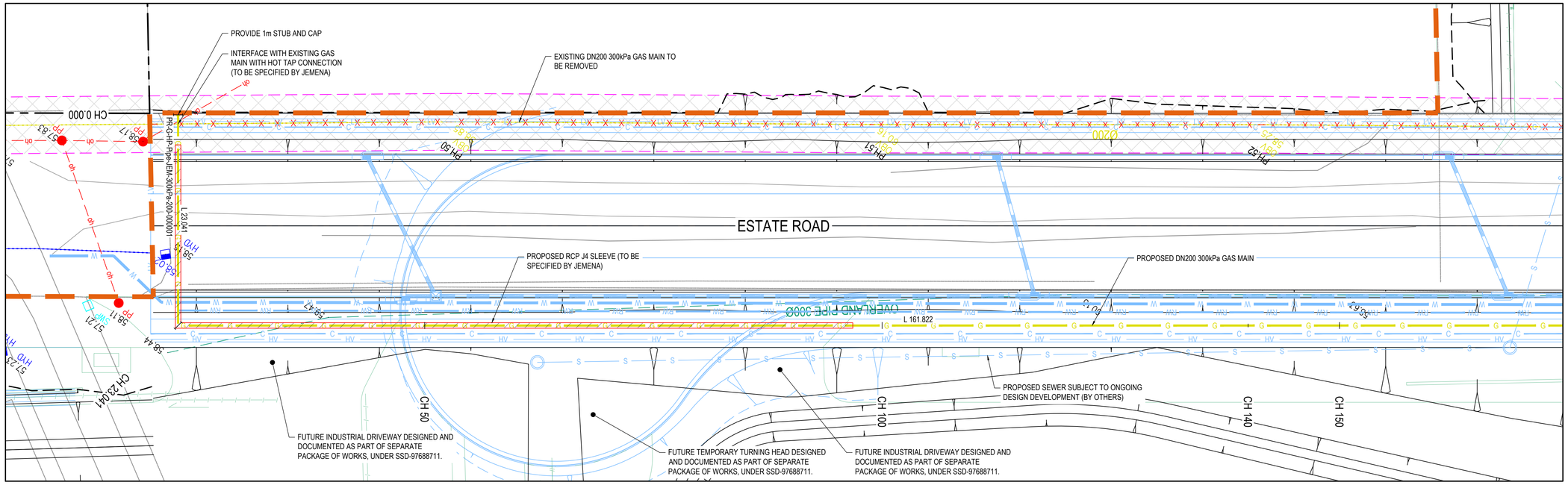
ARCADIS
Arcadis Australia Pacific Pty Limited
Level 15, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289
Tel No: +61 2 8907 9000
www.arcadis.com/au

Project Number: 30281481

Drawing No.: MAR-AAP-DA-R02-DRG-UT-0062

Issue: B

Date Plotted: 10 Jun 2026 - 05:07PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0062-GasMainRelocationKeyPlan.dwg



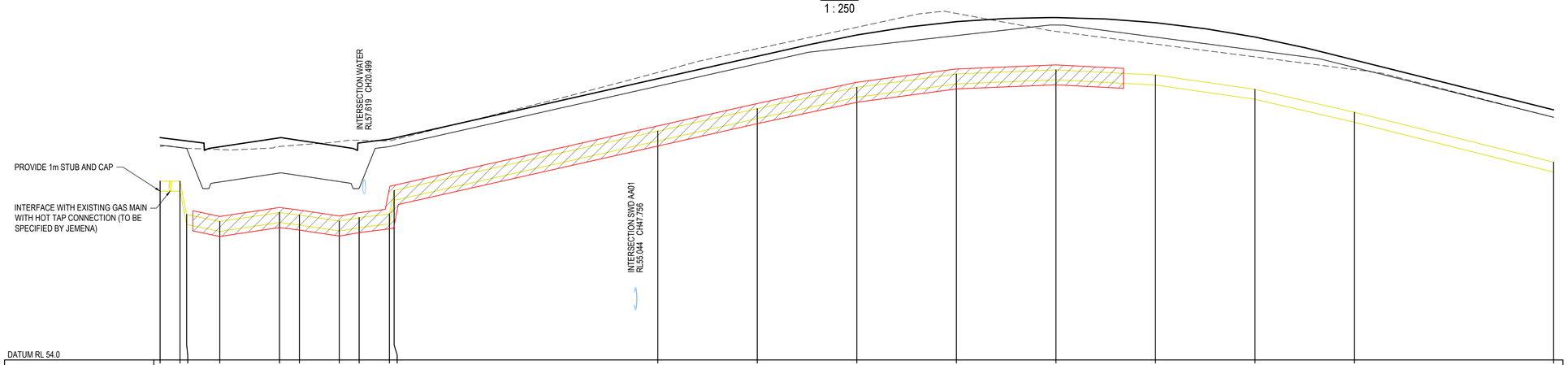
PLAN
1 : 250

LEGEND

- EXTENT OF WORKS
- EXISTING BOUNDARY
- EXISTING GAS EXCLUSION ZONE
- PROPOSED ADJACENT WORKS
- PROPOSED ADJACENT WORKS (BY OTHERS)
- PROPOSED INTERNAL WORKS ARCHITECTURAL (SSD-97688711)
- g — EXISTING GAS
- w — EXISTING WATER
- oh — EXISTING ELECTRICAL OVERHEAD
- swd — EXISTING STORMWATER
- s — EXISTING SEWER
- c — EXISTING TELECOMMUNICATIONS
- G — PROPOSED DN200 300kPa GAS MAIN
- PROPOSED RCP J4 SLEEVE (TO BE SPECIFIED BY JEMENA)
- PROPOSED STORMWATER CULVERT
- PROPOSED STORMWATER PIPE
- FUTURE STORMWATER PIPE
- FUTURE KERB INLET PIT
- FUTURE JUNCTION PIT
- FUTURE HEADWALL
- HV — FUTURE HV ELECTRICAL (BY OTHERS)
- LV — FUTURE LV ELECTRICAL (BY OTHERS)
- C — FUTURE TELECOMMUNICATIONS (BY OTHERS)
- W — FUTURE POTABLE WATER (BY OTHERS)
- RW — FUTURE RECYCLED WATER (BY OTHERS)
- WH — FUTURE WATER HARVESTING (BY OTHERS)
- S — FUTURE SEWER MAIN (BY OTHERS)

NOTES

1. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0521 FOR TYPICAL VERGE CROSS SECTION.
2. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0531 AND MAR-AAP-DA-R02-DRG-UT-0532 FOR DETAILED VERGE CROSS SECTIONS.
3. THE FUTURE UTILITIES (BY OTHERS) ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGE OF WORKS, UNDER SSD-97688711. THESE WORKS ARE SUBJECT TO DESIGN DEVELOPMENT.
4. THE FUTURE INTERNAL WORKS - ESTATE AND INTERNAL WORKS - LOTS ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGES OF WORKS, PREPARED BY ARCADIS, UNDER SSD-97688711. THESE WORKS ARE SUBJECT TO DESIGN DEVELOPMENT.
5. ADJACENT WORKS (BY OTHERS) ARE SHOWN INDICATIVELY ONLY AND REPRESENT A WORK IN PROGRESS. AS SUCH THESE ADJACENT PACKAGE WORKS ARE SUBJECT TO CHANGE.
6. THE GAS MAIN ALIGNMENT HAS BEEN DESIGNED IN ACCORDANCE WITH JEMENA'S GUIDELINE TO DESIGN, CONSTRUCTION AND OPERATING AROUND THE EXISTING AS4645 NATURAL GAS NETWORK (GAS-9899-GL-CV-001)
7. THE GAS MAIN ALIGNMENT IS SHOWN FOR INFORMATION ONLY, WITH DETAILED DESIGN TO BE UNDERTAKEN BY JEMENA/ZINFRA
8. JEMENA/ZINFRA TO PROVIDE FINAL SPECIFICATION FOR ALL PROPOSED ITEMS
9. REMOVAL OF EXISTING GAS MAIN IS SUBJECT TO DESIGN DEVELOPMENT AND CONSTRUCTION STAGING



DATUM RL 54.0

CONTROL STRING LEVEL	57.589	57.589 58.919	56.780	56.960	56.908	56.788	56.857	56.933 57.404	58.596	59.046	59.474	59.741	59.823	59.720	59.432	58.971	57.971
REHABILITATION LEVEL	58.314	58.264 59.247	57.573	57.753	57.701	57.581	57.444	58.283 58.304	59.496	59.946	60.286	60.511	60.723	60.480	60.218	59.871	58.871
REHABILITATION LEVEL COVER TO GAS MAIN	0.725	0.675 1.327	0.793	0.793	0.793	0.793	0.587	1.350 0.900	0.900	0.900	0.813	0.770	0.900	0.760	0.786	0.900	0.900
DESIGN LEVEL	58.464	58.414 59.397	58.280	58.460	58.408	58.288	58.357	58.433 58.454	59.646	60.096	60.524	60.791	60.873	60.770	60.482	60.021	59.021
DESIGN LEVEL COVER TO GAS MAIN	0.875	0.825 1.477	1.500	1.500	1.500	1.500	1.500	1.500 1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050
EXISTING LEVEL	58.29	58.27 59.25	58.22	58.28	58.32	58.38	58.41	58.40 58.42	59.77	60.25	60.68	60.96	60.60	60.34	60.08	59.83	58.87
CHAINAGE	0.000	2.000 2.870	6.000	12.000	14.000	18.000	20.000	23.041 23.512	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	140.000

PR-G-HP-Pipe-JEM-300kPa-200-000001 LONGITUDINAL SECTION
SCALE 1:250 HORI.
1:50 VERT.

Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

Scales
0 5 10 15 20 25m
1 : 250
0 0.5 1 2 3 4 5m
1 : 50

Surveyor: LTS

Client: Goodman

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project: 225-245 MARTIN ROAD, BRADFIELD BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title: GAS MAIN RELOCATION PLAN SHEET 1

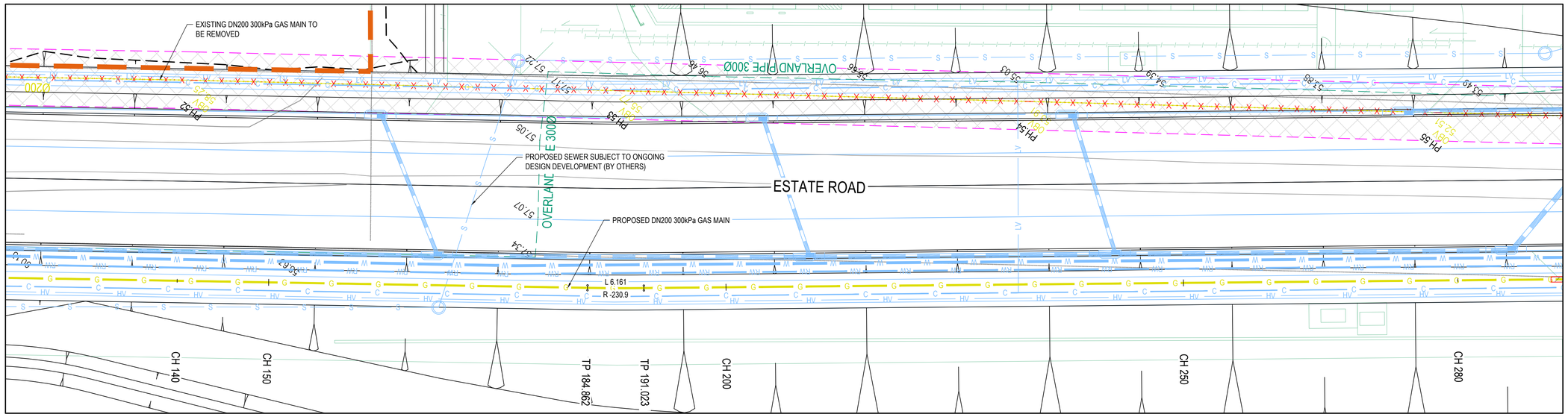
ARCADIS
Arcadis Australia Pacific Pty Limited
Level 15, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289
Tel No: +61 2 8907 9000
www.arcadis.com/au

Project Number: 30281481

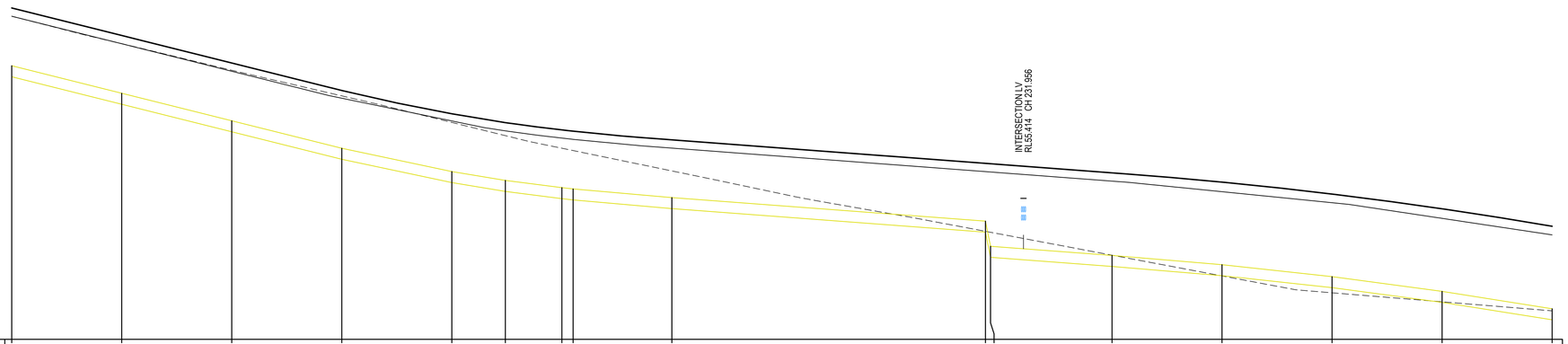
Drawing No.: MAR-AAP-DA-R02-DRG-UT-0501
Issue: B

100mm on Original

Date Plotted: 10 Jun 2026 - 05:07PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0501-GasMainRelocationPlan.dwg



PLAN
1 : 250



DATUM RL 53.0

CONTROL STRING LEVEL	57.971	57.471	56.971	56.472	56.048	55.887	55.756	55.733	55.575	55.147	54.690	54.525	54.356	54.139	53.872	53.554
REHABILITATION LEVEL	58.871	58.371	57.871	57.381	56.968	56.788	56.657	56.633	56.475	56.047	56.040	55.875	55.682	55.482	55.198	54.898
REHABILITATION LEVEL COVER TO GAS MAIN	0.900	0.900	0.900	0.909	0.920	0.900	0.901	0.900	0.900	0.900	1.350	1.350	1.326	1.343	1.326	1.343
DESIGN LEVEL	59.021	58.521	58.021	57.522	57.098	56.937	56.806	56.783	56.625	56.197	56.190	56.025	55.856	55.639	55.372	55.054
DESIGN LEVEL COVER TO GAS MAIN	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.500	1.500	1.500	1.500	1.500	1.500
EXISTING LEVEL	58.87	58.37	57.89	57.42	56.94	56.70	56.47	56.43	56.06	54.96	54.95	54.53	54.15	53.85	53.68	53.52
CHAINAGE	140.000	150.000	160.000	170.000	180.000	184.862	190.000	191.023	200.000	228.499	228.956	240.000	250.000	260.000	270.000	280.000

PR-G-HP-Pipe-JEM-300kPa-200-000001 LONGITUDINAL SECTION
SCALE 1:250 HORI.
1:50 VERT.

LEGEND

- EXTENT OF WORKS
- EXISTING BOUNDARY
- EXISTING GAS EXCLUSION ZONE
- PROPOSED ADJACENT WORKS
- PROPOSED ADJACENT WORKS (BY OTHERS)
- PROPOSED INTERNAL WORKS ARCHITECTURAL (SSD-97688711)
- g — EXISTING GAS
- w — EXISTING WATER
- oh — EXISTING ELECTRICAL OVERHEAD
- swd — EXISTING STORMWATER
- s — EXISTING SEWER
- c — EXISTING TELECOMMUNICATIONS
- G — PROPOSED DN200 300kPa GAS MAIN
- PROPOSED RCP J4 SLEEVE (TO BE SPECIFIED BY JEMENA)
- PROPOSED STORMWATER CULVERT
- PROPOSED STORMWATER PIPE
- FUTURE STORMWATER PIPE
- FUTURE KERB INLET PIT
- FUTURE JUNCTION PIT
- FUTURE HEADWALL
- HV — FUTURE HV ELECTRICAL (BY OTHERS)
- LV — FUTURE LV ELECTRICAL (BY OTHERS)
- C — FUTURE TELECOMMUNICATIONS (BY OTHERS)
- W — FUTURE POTABLE WATER (BY OTHERS)
- RW — FUTURE RECYCLED WATER (BY OTHERS)
- WH — FUTURE WATER HARVESTING (BY OTHERS)
- S — FUTURE SEWER MAIN (BY OTHERS)

NOTES

1. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0521 FOR TYPICAL VERGE CROSS SECTION.
2. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0531 AND MAR-AAP-DA-R02-DRG-UT-0532 FOR DETAILED VERGE CROSS SECTIONS.
3. THE FUTURE UTILITIES (BY OTHERS) ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGE OF WORKS, UNDER SSD-97688711. THESE WORKS ARE SUBJECT TO DESIGN DEVELOPMENT.
4. THE FUTURE INTERNAL WORKS - ESTATE AND INTERNAL WORKS - LOTS ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGES OF WORKS, PREPARED BY ARCADIS, UNDER SSD-97688711. THESE WORKS ARE SUBJECT TO DESIGN DEVELOPMENT.
5. ADJACENT WORKS (BY OTHERS) ARE SHOWN INDICATIVELY ONLY AND REPRESENT A WORK IN PROGRESS. AS SUCH THESE ADJACENT PACKAGE WORKS ARE SUBJECT TO CHANGE.
6. THE GAS MAIN ALIGNMENT HAS BEEN DESIGNED IN ACCORDANCE WITH JEMENA'S GUIDELINE TO DESIGN, CONSTRUCTION AND OPERATING AROUND THE EXISTING AS4645 NATURAL GAS NETWORK (GAS-9899-GL-CV-001)
7. THE GAS MAIN ALIGNMENT IS SHOWN FOR INFORMATION ONLY, WITH DETAILED DESIGN TO BE UNDERTAKEN BY JEMENA/ZINFRA
8. JEMENA/ZINFRA TO PROVIDE FINAL SPECIFICATION FOR ALL PROPOSED ITEMS
9. REMOVAL OF EXISTING GAS MAIN IS SUBJECT TO DESIGN DEVELOPMENT AND CONSTRUCTION STAGING

Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

100mm on Original

Scales

0 5 10 15 20 25m
1 : 250

0 0.5 1 2 3 4 5m
1 : 50

Surveyor: LTS

Client: Goodman

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project: 225-245 MARTIN ROAD, BRADFIELD BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title: GAS MAIN RELOCATION PLAN SHEET 2

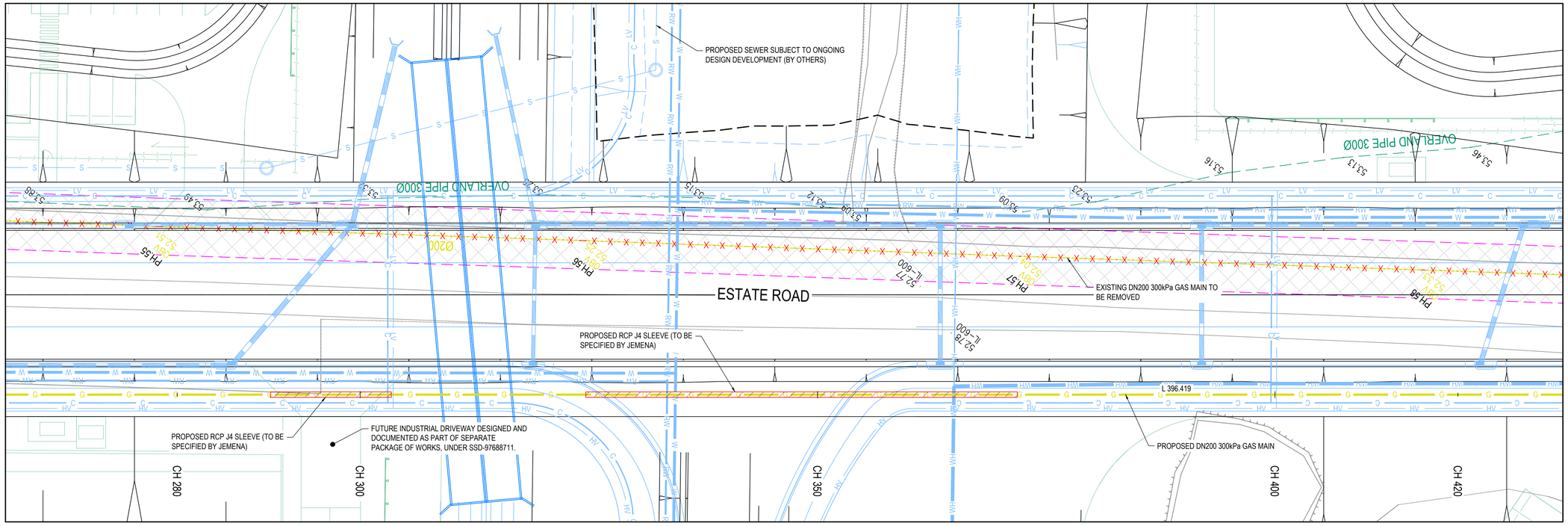
ARCADIS
Arcadis Australia Pacific Pty Limited
Level 15, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289
Tel No: +61 2 8907 9000
www.arcadis.com/au

Project Number: 30281481

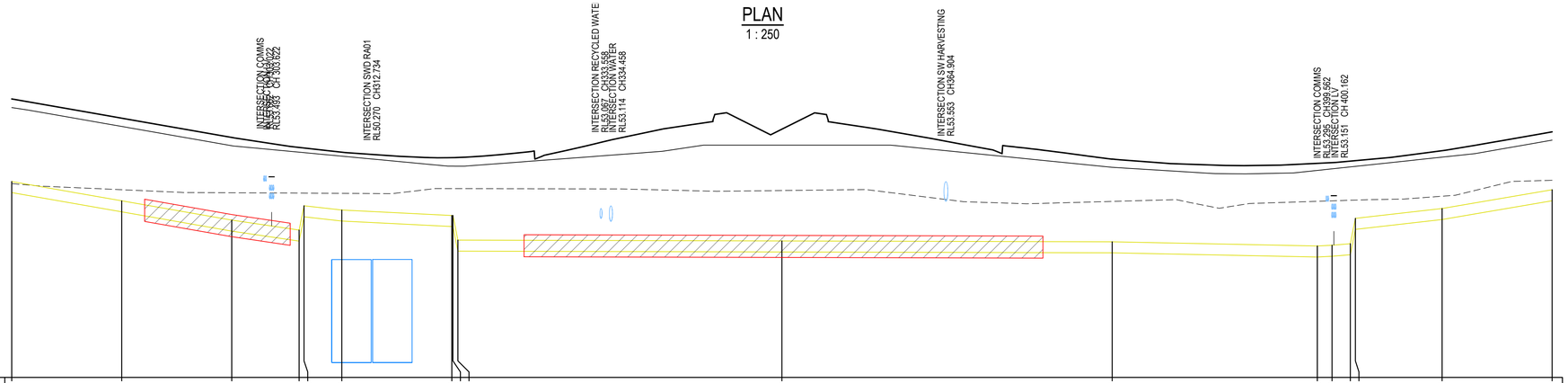
Drawing No.: MAR-AAP-DA-R02-DRG-UT-0502

Issue: B

Date Plotted: 10 Jun 2026 - 05:07PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0501-GasMainRelocationPlan.dwg



PLAN
1 : 250



DATUM RL 50.0

CONTROL STRING LEVEL	53.554	53.205	52.855	52.674 53.115	53.038	52.839 52.840 52.482	52.477	52.462	52.386 52.399	52.426 52.887	53.066	53.407
REHABILITATION LEVEL	54.898	54.555	54.205	54.089 54.080	54.016	53.835 53.835 53.834	54.216	53.814	53.757 53.786	53.821 53.831	53.998	54.307
REHABILITATION LEVEL COVER TO GAS MAIN	1.343	1.350	1.350	1.415 0.965	0.978	0.896 0.895 0.952	1.739	1.352	1.371 1.387	1.395 0.944	0.932	0.900
DESIGN LEVEL	55.054	54.705	54.355	54.174 54.164	54.088	53.989 53.990 53.992	54.507	53.862	53.886 53.899	53.926 53.935	54.116	54.457
DESIGN LEVEL COVER TO GAS MAIN	1.500	1.500	1.500	1.500 1.049	1.050	1.050 1.050 1.050	2.029	1.500	1.500 1.500	1.500 1.048	1.050	1.050
EXISTING LEVEL	53.52	53.41	53.35	53.35 53.34	53.34	53.43 53.43 53.43	53.39	53.19	53.20 53.20	53.22 53.22	53.29	53.58
CHAINAGE	280.000	290.000	300.000	306.122 306.564	310.000	320.000 320.103 320.550	350.000	380.016	398.662 400.000	401.662 402.123	410.000	420.000

PR-G-HP-Pipe-JEM-300kPa-200-000001 LONGITUDINAL SECTION
SCALE 1:250 HORI.
1:50 VERT.

LEGEND

- EXTENT OF WORKS
- EXISTING BOUNDARY
- EXISTING GAS EXCLUSION ZONE
- PROPOSED ADJACENT WORKS
- PROPOSED ADJACENT WORKS (BY OTHERS)
- PROPOSED INTERNAL WORKS ARCHITECTURAL (SSD-97688711)
- EXISTING GAS
- EXISTING WATER
- EXISTING ELECTRICAL OVERHEAD
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING TELECOMMUNICATIONS
- PROPOSED DN200 300kPa GAS MAIN
- PROPOSED RCP J4 SLEEVE (TO BE SPECIFIED BY JEMENA)
- PROPOSED STORMWATER CULVERT
- PROPOSED STORMWATER PIPE
- FUTURE STORMWATER PIPE
- FUTURE KERB INLET PIT
- FUTURE JUNCTION PIT
- FUTURE HEADWALL
- FUTURE HV ELECTRICAL (BY OTHERS)
- FUTURE LV ELECTRICAL (BY OTHERS)
- FUTURE TELECOMMUNICATIONS (BY OTHERS)
- FUTURE POTABLE WATER (BY OTHERS)
- FUTURE RECYCLED WATER (BY OTHERS)
- FUTURE WATER HARVESTING (BY OTHERS)
- FUTURE SEWER MAIN (BY OTHERS)

NOTES

1. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0521 FOR TYPICAL VERGE CROSS SECTION.
2. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0531 AND MAR-AAP-DA-R02-DRG-UT-0532 FOR DETAILED VERGE CROSS SECTIONS.
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Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

Scales: 1 : 250 (0 5 10 15 20 25m); 1 : 50 (0 0.5 1 2 3 4 5m)

Surveyor: LTS

Client: Goodman

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project: 225-245 MARTIN ROAD, BRADFIELD BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title: GAS MAIN RELOCATION PLAN SHEET 3

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 15, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289
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www.arcadis.com/au

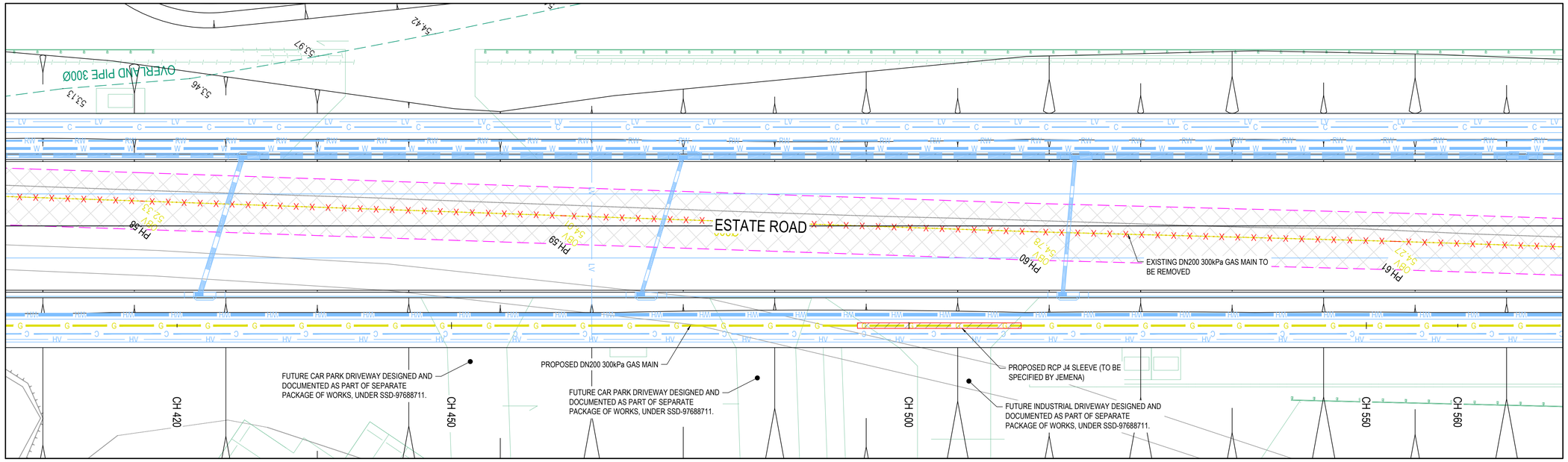
Project Number: 30281481

Drawing No.: MAR-AAP-DA-R02-DRG-UT-0503

Issue: B

100mm on Original

Date Plotted: 10 Jun 2026 - 05:08PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0501-GasMainRelocationPlan.dwg



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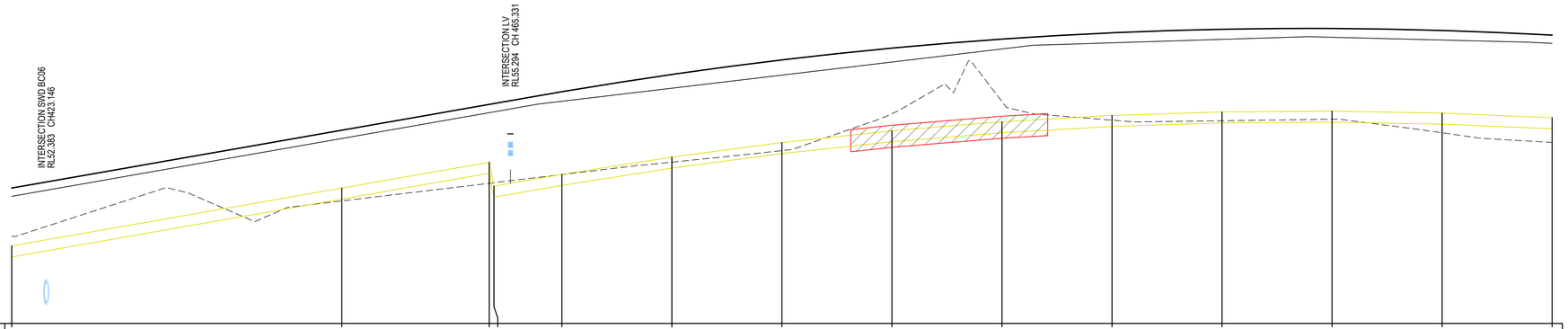

DATUM RL 52.0

CONTROL STRING LEVEL	53.407	54.457	54.926 54.491	54.706	55.020	55.284	55.498	55.662	55.776	55.840	55.854	55.818	55.734
REHABILITATION LEVEL	54.307	55.357	55.826 55.841	56.033	56.270	56.508	56.745	56.983	57.094	57.157	57.195	57.145	57.084
REHABILITATION LEVEL COVER TO GAS MAIN	0.900	0.900	0.900 1.350	1.327	1.250	1.224	1.247	1.321	1.318	1.317	1.340	1.327	1.350
DESIGN LEVEL	54.457	55.507	55.976 55.991	56.206	56.520	56.784	56.998	57.162	57.276	57.340	57.354	57.318	57.234
DESIGN LEVEL COVER TO GAS MAIN	1.050	1.050	1.050 1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500
EXISTING LEVEL	53.58	54.22	54.54 54.55	54.70	54.93	55.14	55.81	56.03	55.69	55.68	55.71	55.46	55.29
CHAINAGE	420.000	450.000	463.397 463.831	470.000	480.000	490.000	500.000	510.000	520.000	530.000	540.000	550.000	560.000

PR-G-HP-Pipe-JEM-300kPa-200-000001 LONGITUDINAL SECTION
SCALE 1:250 HORI.
1:50 VERT.

LEGEND

- EXTENT OF WORKS
- EXISTING BOUNDARY
- EXISTING GAS EXCLUSION ZONE
- PROPOSED ADJACENT WORKS
- PROPOSED ADJACENT WORKS (BY OTHERS)
- PROPOSED INTERNAL WORKS ARCHITECTURAL (SSD-97688711)
- g — EXISTING GAS
- w — EXISTING WATER
- oh — EXISTING ELECTRICAL OVERHEAD
- swd — EXISTING STORMWATER
- s — EXISTING SEWER
- c — EXISTING TELECOMMUNICATIONS
- G — PROPOSED DN200 300kPa GAS MAIN
- PROPOSED RCP J4 SLEEVE (TO BE SPECIFIED BY JEMENA)
- PROPOSED STORMWATER CULVERT
- PROPOSED STORMWATER PIPE
- FUTURE STORMWATER PIPE
- FUTURE KERB INLET PIT
- FUTURE JUNCTION PIT
- FUTURE HEADWALL
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- LV — FUTURE LV ELECTRICAL (BY OTHERS)
- C — FUTURE TELECOMMUNICATIONS (BY OTHERS)
- W — FUTURE POTABLE WATER (BY OTHERS)
- RW — FUTURE RECYCLED WATER (BY OTHERS)
- WH — FUTURE WATER HARVESTING (BY OTHERS)
- S — FUTURE SEWER MAIN (BY OTHERS)

NOTES

1. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0521 FOR TYPICAL VERGE CROSS SECTION.
2. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0531 AND MAR-AAP-DA-R02-DRG-UT-0532 FOR DETAILED VERGE CROSS SECTIONS.
3. THE FUTURE UTILITIES (BY OTHERS) ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGE OF WORKS, UNDER SSD-97688711. THESE WORKS ARE SUBJECT TO DESIGN DEVELOPMENT.
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Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

Scales
0 5 10 15 20 25m
1 : 250
0 0.5 1 2 3 4 5m
1 : 50

Surveyor: LTS

Client: Goodman

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project: 225-245 MARTIN ROAD, BRADFIELD BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title: GAS MAIN RELOCATION PLAN SHEET 4

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 15, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289
Tel No: +61 2 8907 9000
www.arcadis.com/au

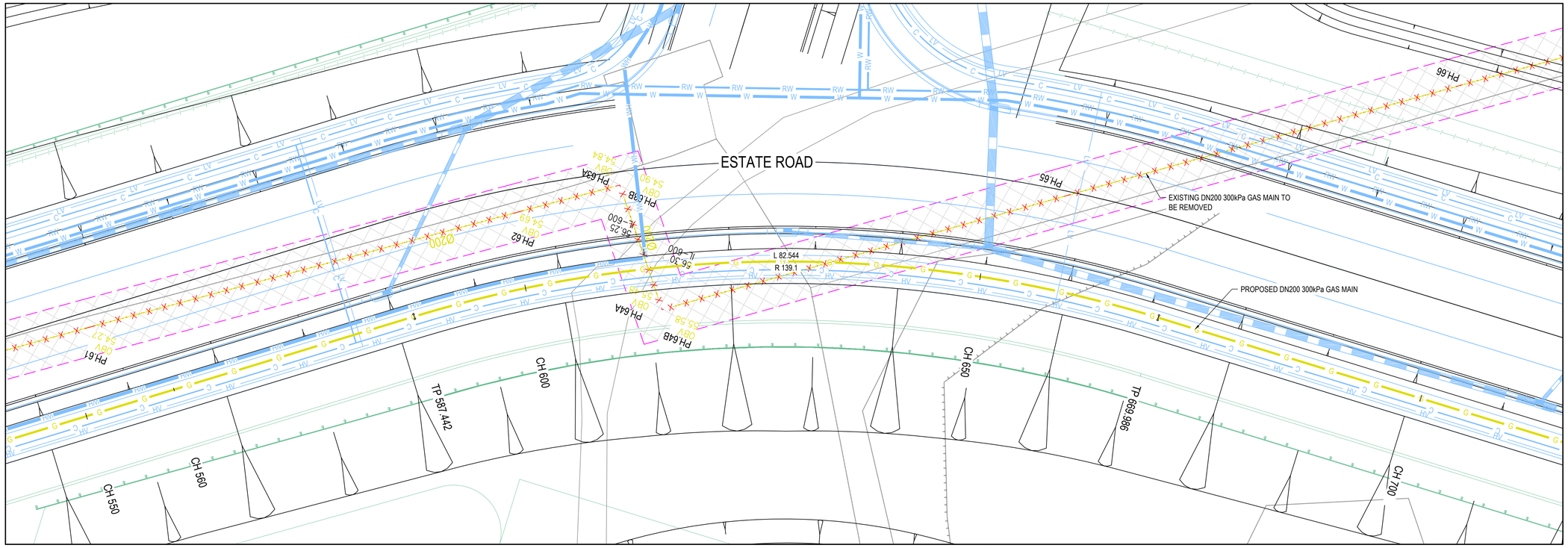
Project Number: 30281481

Drawing No.: MAR-AAP-DA-R02-DRG-UT-0504

Issue: B

100mm on Original

Date Plotted: 10 Jun 2026 - 05:08PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0501-GasMainRelocationPlan.dwg



PLAN
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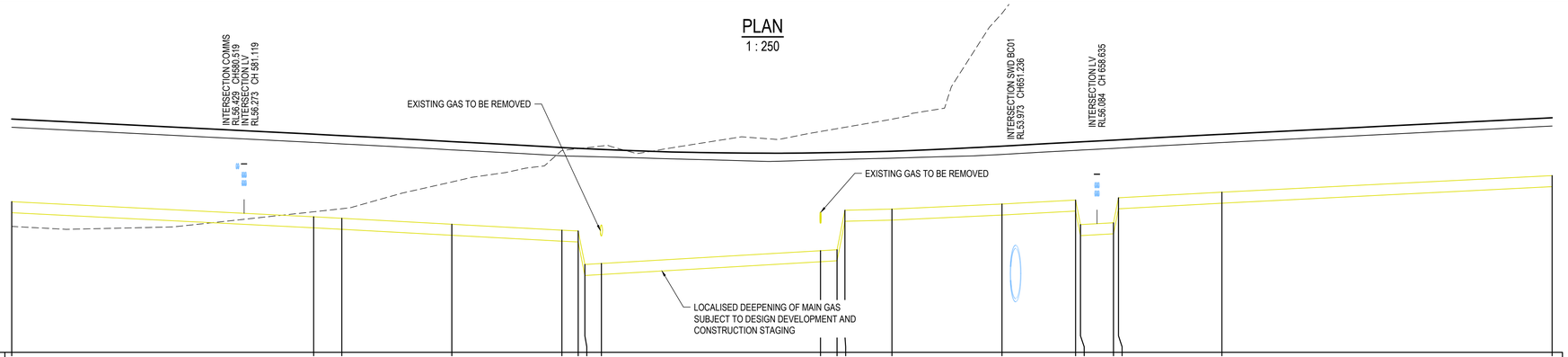

DATUM RL 53.0

CONTROL STRING LEVEL	55.734	55.459	55.432	55.324	55.216	55.202	54.594	54.612	54.844	54.862	55.576	55.599	55.691	55.763	55.318	55.340	55.805	55.906	56.207
REHABILITATION LEVEL	57.084	56.809	56.782	56.674	56.566	56.556	56.553	56.545	56.488	56.486	56.500	56.523	56.591	56.663	56.668	56.700	56.705	56.807	57.107
REHABILITATION LEVEL COVER TO GAS MAIN	1.350	1.350	1.350	1.350	1.350	1.354	1.959	1.933	1.644	1.634	0.922	0.924	0.900	0.900	1.350	1.350	0.900	0.900	0.900
DESIGN LEVEL	57.234	56.959	56.932	56.824	56.716	56.701	56.695	56.681	56.619	56.624	56.627	56.649	56.741	56.813	56.818	56.850	56.855	56.956	57.257
DESIGN LEVEL COVER TO GAS MAIN	1.500	1.500	1.500	1.500	1.500	1.499	2.100	2.069	1.775	1.762	1.049	1.050	1.050	1.050	1.500	1.500	1.050	1.050	1.050
EXISTING LEVEL	55.29	55.55	55.61	56.09	56.66	56.70	56.71	56.74	57.01	57.06	57.08	57.23	59.15	60.86	61.00	61.97	62.06	61.36	59.51
CHAINAGE	560.000	587.442	590.000	600.000	610.000	611.485	612.093	613.593	633.509	635.009	635.725	640.000	650.000	656.690	657.135	660.135	660.590	669.986	700.000

PR-G-HP-Pipe-JEM-300kPa-200-000001 LONGITUDINAL SECTION
SCALE 1:250 HORI.
1:50 VERT.

LEGEND

- EXTENT OF WORKS
- EXISTING BOUNDARY
- EXISTING GAS EXCLUSION ZONE
- PROPOSED ADJACENT WORKS
- PROPOSED ADJACENT WORKS (BY OTHERS)
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- FUTURE STORMWATER PIPE
- FUTURE KERB INLET PIT
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- HV — FUTURE HV ELECTRICAL (BY OTHERS)
- LV — FUTURE LV ELECTRICAL (BY OTHERS)
- C — FUTURE TELECOMMUNICATIONS (BY OTHERS)
- W — FUTURE POTABLE WATER (BY OTHERS)
- RW — FUTURE RECYCLED WATER (BY OTHERS)
- WH — FUTURE WATER HARVESTING (BY OTHERS)
- S — FUTURE SEWER MAIN (BY OTHERS)

NOTES

1. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0521 FOR TYPICAL VERGE CROSS SECTION.
2. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0531 AND MAR-AAP-DA-R02-DRG-UT-0532 FOR DETAILED VERGE CROSS SECTIONS.
3. THE FUTURE UTILITIES (BY OTHERS) ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGE OF WORKS, UNDER SSD-97688711. THESE WORKS ARE SUBJECT TO DESIGN DEVELOPMENT.
4. THE FUTURE INTERNAL WORKS - ESTATE AND INTERNAL WORKS - LOTS ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGES OF WORKS, PREPARED BY ARCADIS, UNDER SSD-97688711. THESE WORKS ARE SUBJECT TO DESIGN DEVELOPMENT.
5. ADJACENT WORKS (BY OTHERS) ARE SHOWN INDICATIVELY ONLY AND REPRESENT A WORK IN PROGRESS. AS SUCH THESE ADJACENT PACKAGE WORKS ARE SUBJECT TO CHANGE.
6. THE GAS MAIN ALIGNMENT HAS BEEN DESIGNED IN ACCORDANCE WITH JEMENA'S GUIDELINE TO DESIGN, CONSTRUCTION AND OPERATING AROUND THE EXISTING AS4645 NATURAL GAS NETWORK (GAS-9899-GL-CV-001)
7. THE GAS MAIN ALIGNMENT IS SHOWN FOR INFORMATION ONLY, WITH DETAILED DESIGN TO BE UNDERTAKEN BY JEMENA/ZINFRA
8. JEMENA/ZINFRA TO PROVIDE FINAL SPECIFICATION FOR ALL PROPOSED ITEMS
9. REMOVAL OF EXISTING GAS MAIN IS SUBJECT TO DESIGN DEVELOPMENT AND CONSTRUCTION STAGING

Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

Scales
1 : 250
1 : 50

Surveyor: LTS

Client: Goodman

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project: 225-245 MARTIN ROAD, BRADFIELD BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title: GAS MAIN RELOCATION PLAN SHEET 5

ARCADIS
Arcadis Australia Pacific Pty Limited
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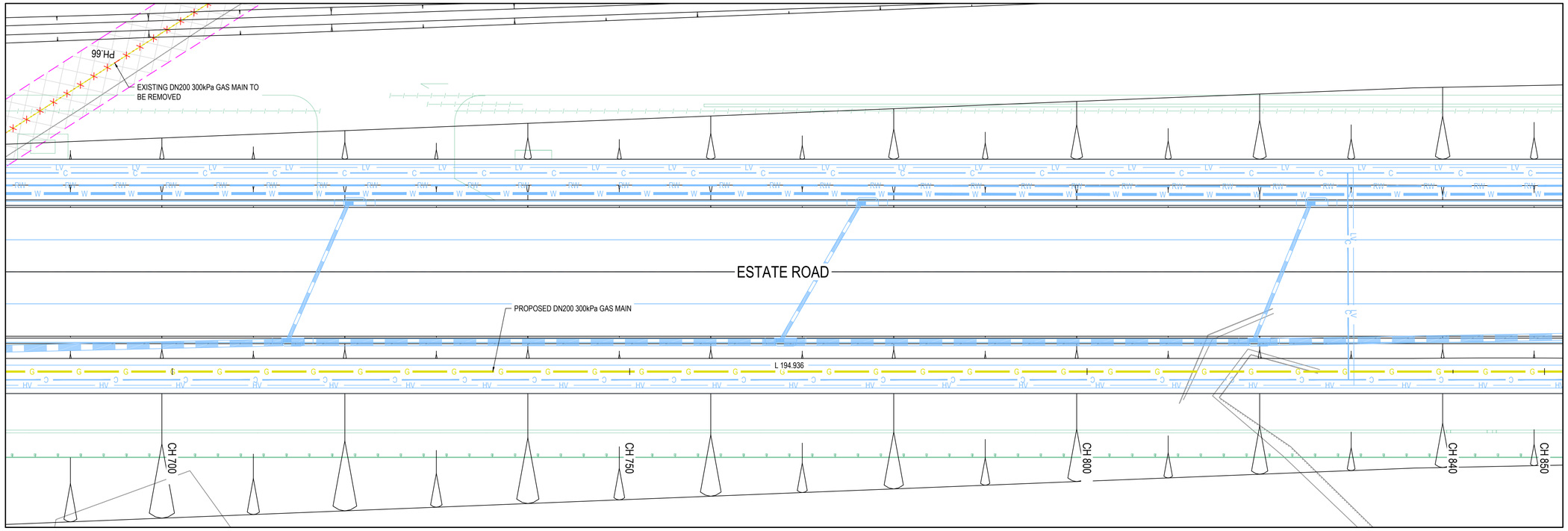
Project Number: 30281481

Drawing No.: MAR-AAP-DA-R02-DRG-UT-0505

Issue: B

100mm on Original

Date Plotted: 10 Jun 2026 - 05:08PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0501-GasMainRelocationPlan.dwg



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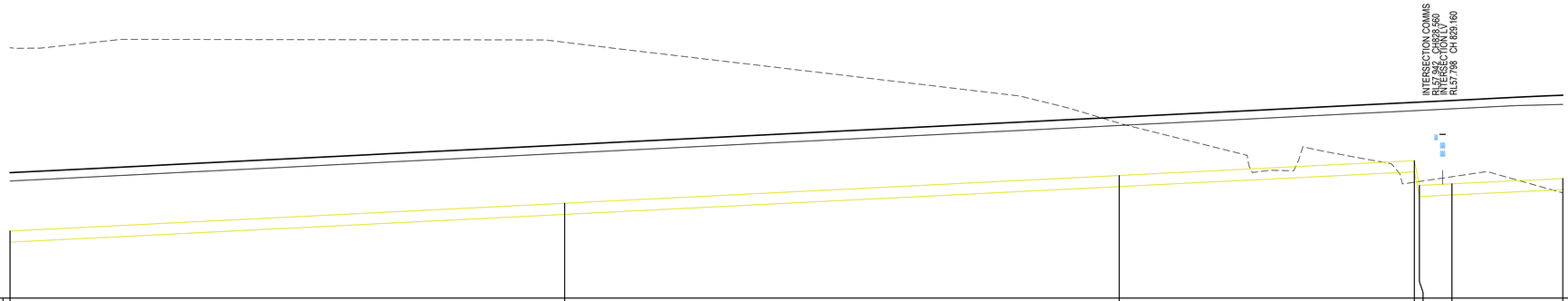

DATUM RL 55.0

CONTROL STRING LEVEL	56.207	56.707	57.207	57.473 57.027	57.057	57.151
REHABILITATION LEVEL	57.107	57.607	58.107	58.373 58.377	58.407	58.485
REHABILITATION LEVEL COVER TO GAS MAIN	0.900	0.900	0.900	0.900 1.350	1.350	1.334
DESIGN LEVEL	57.257	57.757	58.257	58.523 58.327	58.557	58.651
DESIGN LEVEL COVER TO GAS MAIN	1.050	1.050	1.050	1.050 1.500	1.500	1.500
EXISTING LEVEL	59.51	59.60	58.15	57.08 57.10	57.18	56.89
CHAINAGE	700.000	750.000	800.000	826.615 827.060	830.000	840.000

PR-G-HP-Pipe-JEM-300kPa-200-000001 LONGITUDINAL SECTION
SCALE 1:250 HORI.
1:50 VERT.

LEGEND

- EXTENT OF WORKS
- EXISTING BOUNDARY
- EXISTING GAS EXCLUSION ZONE
- PROPOSED ADJACENT WORKS
- PROPOSED ADJACENT WORKS (BY OTHERS)
- PROPOSED INTERNAL WORKS ARCHITECTURAL (SSD-97688711)
- EXISTING GAS
- EXISTING WATER
- EXISTING ELECTRICAL OVERHEAD
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING TELECOMMUNICATIONS
- PROPOSED DN200 300kPa GAS MAIN
- PROPOSED RCP J4 SLEEVE (TO BE SPECIFIED BY JEMENA)
- PROPOSED STORMWATER CULVERT
- PROPOSED STORMWATER PIPE
- FUTURE STORMWATER PIPE
- FUTURE KERB INLET PIT
- FUTURE JUNCTION PIT
- FUTURE HEADWALL
- FUTURE HV ELECTRICAL (BY OTHERS)
- FUTURE LV ELECTRICAL (BY OTHERS)
- FUTURE TELECOMMUNICATIONS (BY OTHERS)
- FUTURE POTABLE WATER (BY OTHERS)
- FUTURE RECYCLED WATER (BY OTHERS)
- FUTURE WATER HARVESTING (BY OTHERS)
- FUTURE SEWER MAIN (BY OTHERS)

NOTES

1. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0521 FOR TYPICAL VERGE CROSS SECTION.
2. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0531 AND MAR-AAP-DA-R02-DRG-UT-0532 FOR DETAILED VERGE CROSS SECTIONS.
3. THE FUTURE UTILITIES (BY OTHERS) ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGE OF WORKS, UNDER SSD-97688711. THESE WORKS ARE SUBJECT TO DESIGN DEVELOPMENT.
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7. THE GAS MAIN ALIGNMENT IS SHOWN FOR INFORMATION ONLY, WITH DETAILED DESIGN TO BE UNDERTAKEN BY JEMENA/ZINFRA
8. JEMENA/ZINFRA TO PROVIDE FINAL SPECIFICATION FOR ALL PROPOSED ITEMS.
9. REMOVAL OF EXISTING GAS MAIN IS SUBJECT TO DESIGN DEVELOPMENT AND CONSTRUCTION STAGING

Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

Scales
1 : 250
1 : 50

Surveyor: LTS

Client: Goodman

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project: 225-245 MARTIN ROAD, BRADFIELD BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title: GAS MAIN RELOCATION PLAN SHEET 6

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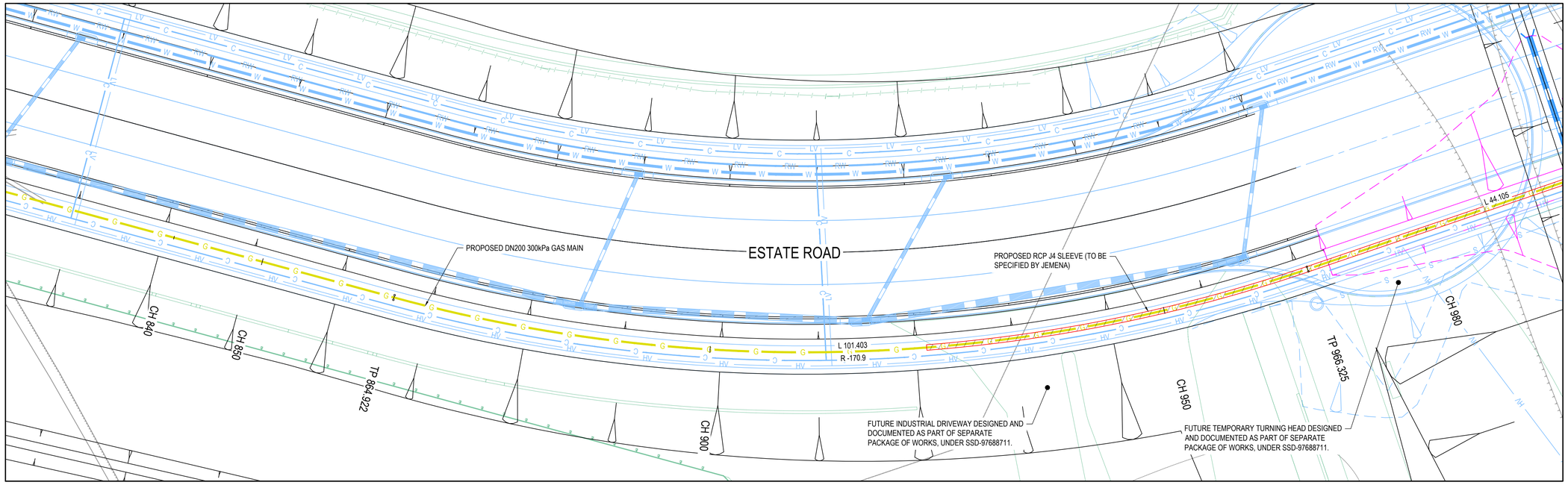
Project Number: 30281481

Drawing No.: MAR-AAP-DA-R02-DRG-UT-0506

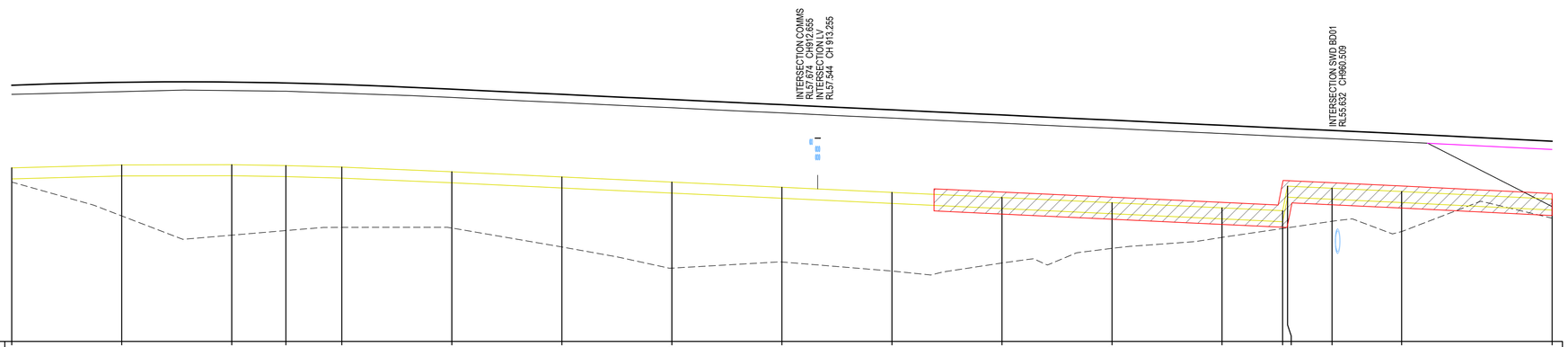
Issue: B

100mm on Original

Date Plotted: 10 Jun 2026 - 05:09PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0501-GasMainRelocationPlan.dwg



PLAN
1 : 250



DATUM RL 54.0

CONTROL STRING LEVEL	57.151	57.204	57.208	57.192	57.164	57.080	56.966	56.893	56.799	56.705	56.612	56.518	56.425	56.373 56.819	56.781	56.722	56.585
REHABILITATION LEVEL	58.485	58.535	58.553	58.542	58.507	58.430	58.336	58.243	58.149	58.055	57.962	57.868	57.775	57.723 57.719	57.681	57.622	56.448
REHABILITATION LEVEL COVER TO GAS MAIN	1.334	1.331	1.346	1.350	1.343	1.350	1.350	1.350	1.350	1.350	1.350	1.350	1.350	1.350 0.900	0.900	0.900	-0.137
DESIGN LEVEL	58.651	58.704	58.708	58.692	58.664	58.580	58.486	58.393	58.299	58.205	58.112	58.018	57.925	57.873 57.869	57.831	57.772	57.635
DESIGN LEVEL COVER TO GAS MAIN	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500 1.050	1.050	1.050	1.050
EXISTING LEVEL	56.89	56.28	55.93	56.01	56.07	56.06	55.72	55.33	55.44	55.28	55.42	55.69	55.89	56.05 56.07	56.18	55.99	56.24
CHAINAGE	840.000	850.000	860.000	864.922	870.000	880.000	890.000	900.000	910.000	920.000	930.000	940.000	950.000	955.509 955.954	960.000	966.325	980.000

PR-G-HP-Pipe-JEM-300kPa-200-000001 LONGITUDINAL SECTION
SCALE 1:250 HORI.
1:50 VERT.

LEGEND

- EXTENT OF WORKS
- EXISTING BOUNDARY
- EXISTING GAS EXCLUSION ZONE
- PROPOSED ADJACENT WORKS
- PROPOSED ADJACENT WORKS (BY OTHERS)
- PROPOSED INTERNAL WORKS ARCHITECTURAL (SSD-97688711)
- g — EXISTING GAS
- w — EXISTING WATER
- oh — EXISTING ELECTRICAL OVERHEAD
- swd — EXISTING STORMWATER
- s — EXISTING SEWER
- c — EXISTING TELECOMMUNICATIONS
- G — PROPOSED DN200 300kPa GAS MAIN
- PROPOSED RCP J4 SLEEVE (TO BE SPECIFIED BY JEMENA)
- PROPOSED STORMWATER CULVERT
- PROPOSED STORMWATER PIPE
- FUTURE STORMWATER PIPE
- FUTURE KERB INLET PIT
- FUTURE JUNCTION PIT
- FUTURE HEADWALL
- HV — FUTURE HV ELECTRICAL (BY OTHERS)
- LV — FUTURE LV ELECTRICAL (BY OTHERS)
- C — FUTURE TELECOMMUNICATIONS (BY OTHERS)
- W — FUTURE POTABLE WATER (BY OTHERS)
- RW — FUTURE RECYCLED WATER (BY OTHERS)
- WH — FUTURE WATER HARVESTING (BY OTHERS)
- S — FUTURE SEWER MAIN (BY OTHERS)

NOTES

1. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0521 FOR TYPICAL VERGE CROSS SECTION.
2. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0531 AND MAR-AAP-DA-R02-DRG-UT-0532 FOR DETAILED VERGE CROSS SECTIONS.
3. THE FUTURE UTILITIES (BY OTHERS) ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGE OF WORKS, UNDER SSD-97688711. THESE WORKS ARE SUBJECT TO DESIGN DEVELOPMENT.
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8. JEMENA/ZINFRA TO PROVIDE FINAL SPECIFICATION FOR ALL PROPOSED ITEMS
9. REMOVAL OF EXISTING GAS MAIN IS SUBJECT TO DESIGN DEVELOPMENT AND CONSTRUCTION STAGING

Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

Scales
0 5 10 15 20 25m
1 : 250
0 0.5 1 2 3 4 5m
1 : 50

Surveyor: LTS

Client: Goodman

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project: 225-245 MARTIN ROAD, BRADFIELD BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title: GAS MAIN RELOCATION PLAN SHEET 7

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Level 15, 580 George Street
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www.arcadis.com/au

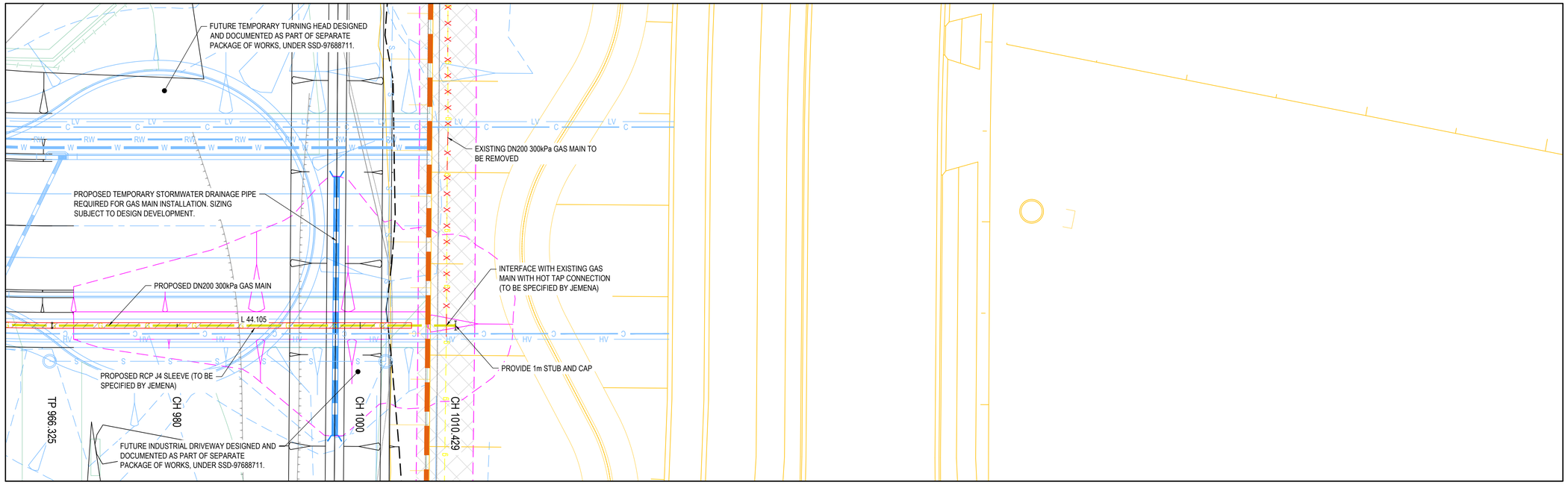
Project Number: 30281481

Drawing No.: MAR-AAP-DA-R02-DRG-UT-0507

Issue: B

100mm on Original

Date Plotted: 10 Jun 2026 - 05:09PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0501-GasMainRelocationPlan.dwg



PLAN
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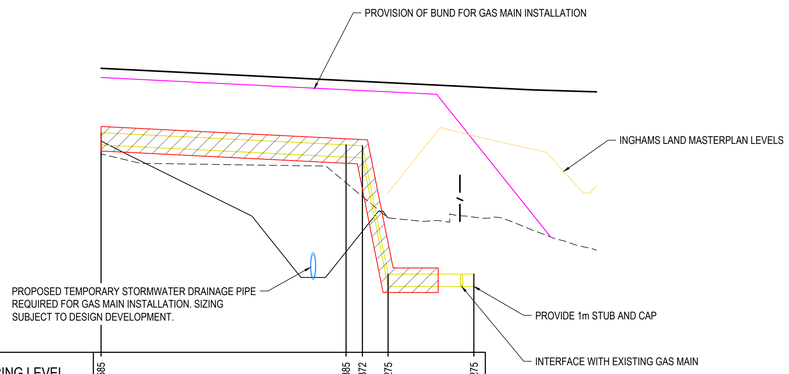

DATUM RL 53.0

CONTROL STRING LEVEL	56.585	56.385	56.372	54.275	54.275		
REHABILITATION LEVEL	56.448	54.642	54.975				
REHABILITATION LEVEL COVER TO GAS MAIN	-0.137	-1.743	-1.397				
DESIGN LEVEL	57.635	57.435	57.422	57.401	57.331		
DESIGN LEVEL COVER TO GAS MAIN	1.050	1.050	1.050	3.125	3.055		
EXISTING LEVEL	56.24	55.77	55.56	55.26	55.21		
CHAINAGE	980.000	1000.000	1001.333	1003.429	1010.429		

PR-G-HP-Pipe-JEM-300kPa-200-000001 LONGITUDINAL SECTION
SCALE 1:250 HORI.
1:50 VERT.

LEGEND

- EXTENT OF WORKS
- EXISTING BOUNDARY
- EXISTING GAS EXCLUSION ZONE
- PROPOSED ADJACENT WORKS
- PROPOSED ADJACENT WORKS (BY OTHERS)
- PROPOSED INTERNAL WORKS ARCHITECTURAL (SSD-97688711)
- g — EXISTING GAS
- w — EXISTING WATER
- oh — EXISTING ELECTRICAL OVERHEAD
- swd — EXISTING STORMWATER
- s — EXISTING SEWER
- c — EXISTING TELECOMMUNICATIONS
- G — PROPOSED DN200 300kPa GAS MAIN
- PROPOSED RCP J4 SLEEVE (TO BE SPECIFIED BY JEMENA)
- PROPOSED STORMWATER CULVERT
- PROPOSED STORMWATER PIPE
- FUTURE STORMWATER PIPE
- FUTURE KERB INLET PIT
- FUTURE JUNCTION PIT
- FUTURE HEADWALL
- HV — FUTURE HV ELECTRICAL (BY OTHERS)
- LV — FUTURE LV ELECTRICAL (BY OTHERS)
- C — FUTURE TELECOMMUNICATIONS (BY OTHERS)
- W — FUTURE POTABLE WATER (BY OTHERS)
- RW — FUTURE RECYCLED WATER (BY OTHERS)
- WH — FUTURE WATER HARVESTING (BY OTHERS)
- S — FUTURE SEWER MAIN (BY OTHERS)

NOTES

1. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0521 FOR TYPICAL VERGE CROSS SECTION.
2. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0531 AND MAR-AAP-DA-R02-DRG-UT-0532 FOR DETAILED VERGE CROSS SECTIONS.
3. THE FUTURE UTILITIES (BY OTHERS) ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGE OF WORKS, UNDER SSD-97688711. THESE WORKS ARE SUBJECT TO DESIGN DEVELOPMENT.
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6. THE GAS MAIN ALIGNMENT HAS BEEN DESIGNED IN ACCORDANCE WITH JEMENA'S GUIDELINE TO DESIGN, CONSTRUCTION AND OPERATING AROUND THE EXISTING AS4645 NATURAL GAS NETWORK (GAS-9899-GL-CV-001)
7. THE GAS MAIN ALIGNMENT IS SHOWN FOR INFORMATION ONLY, WITH DETAILED DESIGN TO BE UNDERTAKEN BY JEMENA/ZINFRA
8. JEMENA/ZINFRA TO PROVIDE FINAL SPECIFICATION FOR ALL PROPOSED ITEMS
9. REMOVAL OF EXISTING GAS MAIN IS SUBJECT TO DESIGN DEVELOPMENT AND CONSTRUCTION STAGING

Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

100mm on Original

Scales
0 5 10 15 20 25m
1 : 250
0 0.5 1 2 3 4 5m
1 : 50

Surveyor: LTS

Client: Goodman

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project: 225-245 MARTIN ROAD, BRADFIELD BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title: GAS MAIN RELOCATION PLAN SHEET 8

ARCADIS
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Level 15, 580 George Street
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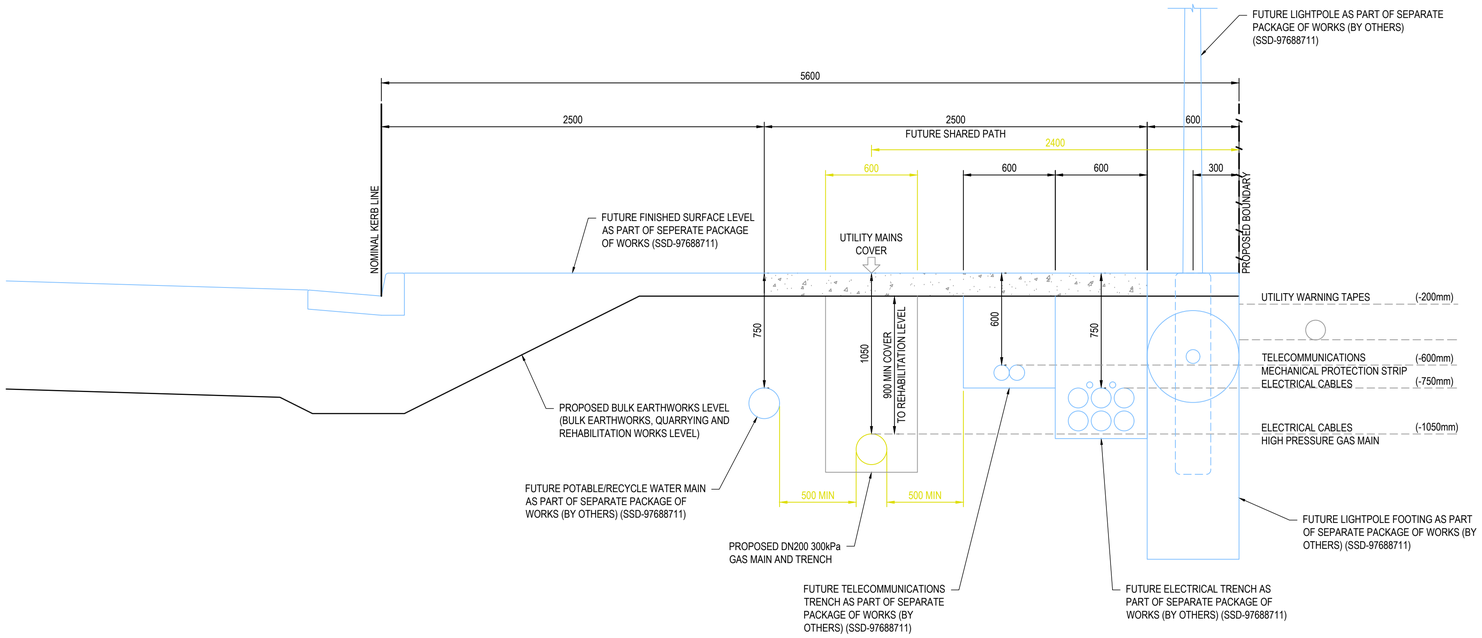
www.arcadis.com/au

Project Number: 30281481

Drawing No.: MAR-AAP-DA-R02-DRG-UT-0508
Issue: B

Date Plotted: 10 Jun 2026 - 05:09PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0501-GasMainRelocationPlan.dwg



TYPICAL GAS MAIN TRENCH DETAIL

1 : 20

Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

Scales

0 0.5 1 1.5 2m

1 : 20

Surveyor

LTS

Client

Goodman

Status

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project

225-245 MARTIN ROAD, BRADFIELD
BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title

GAS MAIN RELOCATION
TYPICAL VERGE SECTIONS

ARCADIS
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www.arcadis.com/au

Project Number 30281481

Drawing No. MAR-AAP-DA-R02-DRG-UT-0521

Issue B

100mm on Original

Date Plotted: 10 Jun 2026 - 05:10PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0521-GasMainRelocationTypicalVergeSections.dwg

LEGEND

- EXISTING SURFACE LEVEL
- BULK SURFACE LEVEL
- FINISHED EARTHWORKS LEVEL (SSD-97688711)
- PROPOSED DN200 300kPa GAS MAIN
- FUTURE STORMWATER DRAINAGE
- FUTURE HV/LV ELECTRICAL (BY OTHERS)
- FUTURE TELECOMMUNICATIONS (BY OTHERS)
- FUTURE POTABLE WATER (BY OTHERS)
- FUTURE STORMWATER HARVESTING (BY OTHERS)
- FUTURE RECYCLED WATER (BY OTHERS)
- EXISTING GAS

NOTES

1. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0501 TO MAR-AAP-DA-R02-DRG-UT-0508 FOR GAS MAIN RELOCATION PLANS AND LONGITUDINAL SECTIONS.
2. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0521 FOR TYPICAL VERGE CROSS SECTION.
3. THE FUTURE INTERNAL WORKS - ESTATE AND INTERNAL WORKS - LOTS ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGES OF WORKS, PREPARED BY ARCADIS, UNDER SSD-97688711.
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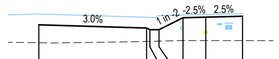
7. JEMENA/ZINFRA TO PROVIDE FINAL SPECIFICATION FOR ALL PROPOSED ITEMS

DATUM RL 57.25

REHABILITATION SURFACE LEVEL	60.095	59.884	59.777	59.777	60.437	60.480	60.540
FINISHED SURFACE LEVEL	60.80	60.59	60.58	60.49	60.73	60.77	60.83
EXISTING SURFACE LEVEL	60.81	60.44	60.44	60.42	60.39	60.34	60.28
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.730	0.000	2.400

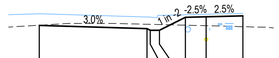
CH 100.000



DATUM RL 51.75

REHABILITATION SURFACE LEVEL	55.181	54.970	54.863	54.853	55.645	55.682	55.742
FINISHED SURFACE LEVEL	55.89	55.68	55.67	55.62	55.82	55.86	55.92
EXISTING SURFACE LEVEL	54.01	54.09	54.10	54.12	54.15	54.15	54.15
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.486	0.000	2.400

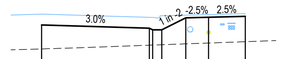
CH 250.000



DATUM RL 50.00

REHABILITATION SURFACE LEVEL	53.222	53.011	52.905	52.905	53.752	53.786	53.846
FINISHED SURFACE LEVEL	53.98	53.77	53.76	53.87	53.92	53.95	54.01
EXISTING SURFACE LEVEL	53.23	53.30	53.29	53.28	53.24	53.20	53.14
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.355	0.000	2.400

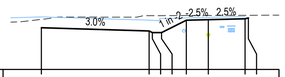
CH 400.000



DATUM RL 52.00

REHABILITATION SURFACE LEVEL	56.643	56.432	56.325	56.325	57.108	57.145	57.205
FINISHED SURFACE LEVEL	57.35	57.14	57.13	57.24	57.28	57.32	57.38
EXISTING SURFACE LEVEL	55.07	55.32	55.33	55.35	55.41	55.46	55.55
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.485	0.000	2.400

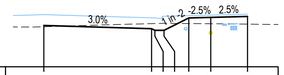
CH 550.000



DATUM RL 56.25

REHABILITATION SURFACE LEVEL	58.970	58.759	58.653	58.653	59.460	59.496	59.556
FINISHED SURFACE LEVEL	59.68	59.47	59.46	59.57	59.61	59.65	59.71
EXISTING SURFACE LEVEL	59.51	59.76	59.76	59.76	59.77	59.77	59.78
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

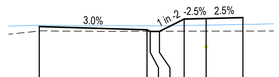
CH 50.000



DATUM RL 53.25

REHABILITATION SURFACE LEVEL	55.949	55.738	55.631	55.631	56.439	56.475	56.535
FINISHED SURFACE LEVEL	56.66	56.44	56.45	56.55	56.59	56.62	56.68
EXISTING SURFACE LEVEL	55.87	56.07	56.07	56.09	56.07	56.06	56.03
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

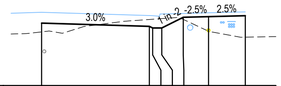
CH 200.000



DATUM RL 50.00

REHABILITATION SURFACE LEVEL	53.691	53.479	53.373	53.373	54.181	54.216	54.276
FINISHED SURFACE LEVEL	53.78	53.74	53.74	53.74	53.76	53.79	53.83
EXISTING SURFACE LEVEL	53.40	53.38	53.38	53.38	53.39	53.39	53.40
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

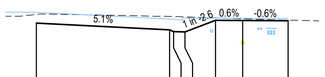
CH 350.000



DATUM RL 52.25

REHABILITATION SURFACE LEVEL	56.322	56.111	56.005	56.005	56.704	56.745	56.805
FINISHED SURFACE LEVEL	57.03	56.82	56.81	56.92	56.96	57.00	57.06
EXISTING SURFACE LEVEL	55.75	56.56	56.58	56.62	56.57	55.81	55.41
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.652	0.000	2.400

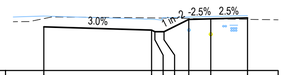
CH 500.000



DATUM RL 54.50

REHABILITATION SURFACE LEVEL	58.113	57.672	57.552	57.539	58.294	58.283	58.264
FINISHED SURFACE LEVEL	58.82	58.38	58.37	58.46	58.44	58.43	58.41
EXISTING SURFACE LEVEL	58.68	58.55	58.55	58.52	58.45	58.40	58.31
OFFSET	-13.473	-4.775	-4.512	-3.770	-1.774	0.000	2.967

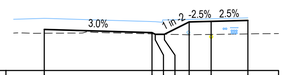
CH 23.041



DATUM RL 55.00

REHABILITATION SURFACE LEVEL	57.845	57.634	57.528	57.528	58.335	58.371	58.431
FINISHED SURFACE LEVEL	58.55	58.34	58.33	58.44	58.48	58.52	58.58
EXISTING SURFACE LEVEL	58.38	58.43	58.43	58.42	58.39	58.37	58.34
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

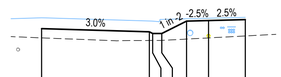
CH 150.000



DATUM RL 51.00

REHABILITATION SURFACE LEVEL	53.680	53.468	53.382	53.362	54.170	54.205	54.265
FINISHED SURFACE LEVEL	54.40	54.19	54.18	54.29	54.34	54.37	54.43
EXISTING SURFACE LEVEL	53.43	53.39	53.38	53.37	53.33	53.35	53.39
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

CH 300.000



DATUM RL 51.25

REHABILITATION SURFACE LEVEL	54.831	54.620	54.514	54.514	55.321	55.357	55.417
FINISHED SURFACE LEVEL	55.54	55.33	55.32	55.43	55.47	55.51	55.57
EXISTING SURFACE LEVEL	54.23	54.06	54.06	54.06	54.15	54.22	54.35
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

CH 450.000

Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

100mm on Original

Scales

0 5 10 15 20m

1 : 200

Surveyor

LTS

Client

Goodman

Status

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project

225-245 MARTIN ROAD, BRADFIELD
BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title

GAS MAIN RELOCATION CROSS SECTIONS SHEET 1

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 15, 580 George Street
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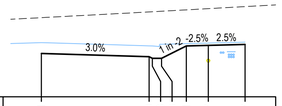
ABN 76 104 485 289
Tel No: +61 2 8907 9000
www.arcadis.com/au

Project Number: 30281481

Drawing No.: MAR-AAP-DA-R02-DRG-UT-0531

Issue: B

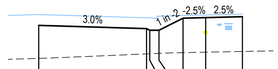
Date Plotted: 10 Jun 2026 - 05:10PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0531-GasMainRelocationCrossSections.dwg



DATUM RL 53.75

REHABILITATION SURFACE LEVEL	56.581	58.370	58.263	58.263	57.071	57.107	57.167
FINISHED SURFACE LEVEL	57.29	57.08	57.07	57.19	57.22	57.26	57.32
EXISTING SURFACE LEVEL	58.92	59.29	59.30	59.34	59.43	59.51	59.64
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

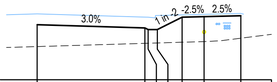
CH 700.000



DATUM RL 53.75

REHABILITATION SURFACE LEVEL	58.030	57.818	57.712	57.712	58.498	58.535	58.595
FINISHED SURFACE LEVEL	58.74	58.52	58.52	58.63	58.67	58.70	58.76
EXISTING SURFACE LEVEL	55.87	56.17	56.17	56.20	56.25	56.28	56.33
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.478	0.000	2.400

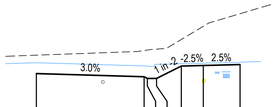
CH 850.000



DATUM RL 53.50

REHABILITATION SURFACE LEVEL	57.096	56.865	56.778	56.778	57.586	57.622	57.682
FINISHED SURFACE LEVEL	57.80	57.59	57.59	57.70	57.74	57.77	57.83
EXISTING SURFACE LEVEL	55.67	55.88	55.89	55.90	55.95	55.99	56.22
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

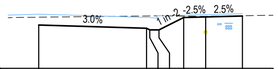
CH 966.325



DATUM RL 53.25

REHABILITATION SURFACE LEVEL	56.065	55.854	55.748	55.748	56.555	56.591	56.651
FINISHED SURFACE LEVEL	56.77	56.56	56.55	56.65	56.71	56.74	56.80
EXISTING SURFACE LEVEL	57.26	57.57	57.60	57.66	58.29	59.15	59.97
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

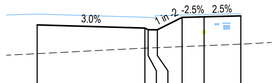
CH 650.000



DATUM RL 54.75

REHABILITATION SURFACE LEVEL	57.561	57.370	57.263	57.263	58.071	58.107	58.167
FINISHED SURFACE LEVEL	58.29	58.08	58.07	58.18	58.22	58.26	58.32
EXISTING SURFACE LEVEL	58.09	58.17	58.17	58.18	58.16	58.15	58.19
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

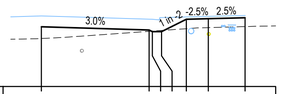
CH 800.000



DATUM RL 53.25

REHABILITATION SURFACE LEVEL	57.249	57.038	56.931	56.931	57.739	57.774	57.834
FINISHED SURFACE LEVEL	57.96	57.74	57.74	57.85	57.89	57.92	
EXISTING SURFACE LEVEL	55.37	55.73	55.74	55.76	55.83	55.89	55.99
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

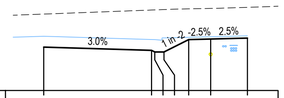
CH 950.000



DATUM RL 52.25

REHABILITATION SURFACE LEVEL	56.148	55.937	55.831	55.831	56.638	56.674	56.734
FINISHED SURFACE LEVEL	56.86	56.64	56.54	56.75	56.79	56.82	56.88
EXISTING SURFACE LEVEL	55.38	55.85	55.86	55.91	56.02	56.09	56.16
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

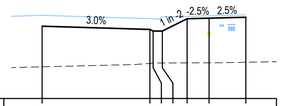
CH 600.000



DATUM RL 54.25

REHABILITATION SURFACE LEVEL	57.081	56.870	56.763	56.763	57.571	57.607	57.667
FINISHED SURFACE LEVEL	57.79	57.58	57.57	57.68	57.72	57.76	57.82
EXISTING SURFACE LEVEL	59.24	59.50	59.51	59.53	59.58	59.60	59.68
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

CH 750.000



DATUM RL 53.00

REHABILITATION SURFACE LEVEL	57.717	57.506	57.399	57.399	58.207	58.243	58.303
FINISHED SURFACE LEVEL	58.42	58.21	58.21	58.32	58.36	58.39	
EXISTING SURFACE LEVEL	55.07	55.29	55.30	55.31	55.32	55.33	55.36
OFFSET	-10.900	-3.863	-3.650	-3.050	-1.435	0.000	2.400

CH 900.000

LEGEND

- EXISTING SURFACE LEVEL
- BULK SURFACE LEVEL
- FINISHED EARTHWORKS LEVEL (SSD-97688711)
- PROPOSED DN200 300kPa GAS MAIN
- FUTURE STORMWATER DRAINAGE
- FUTURE HV/LV ELECTRICAL (BY OTHERS)
- FUTURE TELECOMMUNICATIONS (BY OTHERS)
- FUTURE POTABLE WATER (BY OTHERS)
- FUTURE STORMWATER HARVESTING (BY OTHERS)
- FUTURE RECYCLED WATER (BY OTHERS)
- EXISTING GAS

NOTES

1. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0501 TO MAR-AAP-DA-R02-DRG-UT-0508 FOR GAS MAIN RELOCATION PLANS AND LONGITUDINAL SECTIONS.
2. REFER TO DRAWING MAR-AAP-DA-R02-DRG-UT-0521 FOR TYPICAL VERGE CROSS SECTION.
3. THE FUTURE INTERNAL WORKS - ESTATE AND INTERNAL WORKS - LOTS ARE DESIGNED AND DOCUMENTED AS PART OF SEPARATE PACKAGES OF WORKS, PREPARED BY ARCADIS, UNDER SSD-97688711.
4. ADJACENT WORKS (BY OTHERS) ARE SHOWN INDICATIVELY ONLY AND REPRESENT A WORK IN PROGRESS. AS SUCH THESE ADJACENT PACKAGE WORKS ARE SUBJECT TO CHANGE.
5. THE GAS MAIN ALIGNMENT HAS BEEN DESIGNED IN ACCORDANCE WITH JEMENA'S GUIDELINE TO DESIGN, CONSTRUCTION AND OPERATING AROUND THE EXISTING AS4645 NATURAL GAS NETWORK (GAS-9899-GL-CV-001)
6. THE GAS MAIN ALIGNMENT IS SHOWN FOR INFORMATION ONLY, WITH DETAILED DESIGN TO BE UNDERTAKEN BY JEMENA/ZINFRA
7. JEMENA/ZINFRA TO PROVIDE FINAL SPECIFICATION FOR ALL PROPOSED ITEMS

Issue	Description	DR	CH	VE	Date
B	ISSUED FOR INFORMATION	RS	IS	JH	10.06.26
A	ISSUED FOR INFORMATION	RS	IS	JH	15.05.26

Scales

0 5 10 15 20m

1 : 200

Surveyor

LTS

Client

Goodman

Status

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Issue Signatures			
Drawn	R. SANTOS	Original Size	A1
Designed	I. SUMMERS	Height Datum	AHD
Project Manager	K. MCAREAVEY	Grid	MGA/20-56
Verified	J. HEYDON		

Project

225-245 MARTIN ROAD, BRADFIELD
BULK EARTHWORKS, REHABILITATION AND QUARRYING

Title

GAS MAIN RELOCATION CROSS SECTIONS SHEET 2

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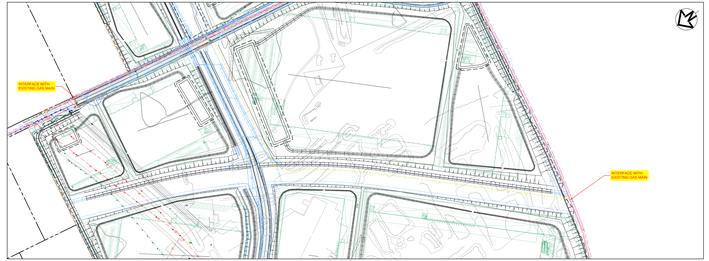
Project Number: 30281481

Drawing No.: MAR-AAP-DA-R02-DRG-UT-0532

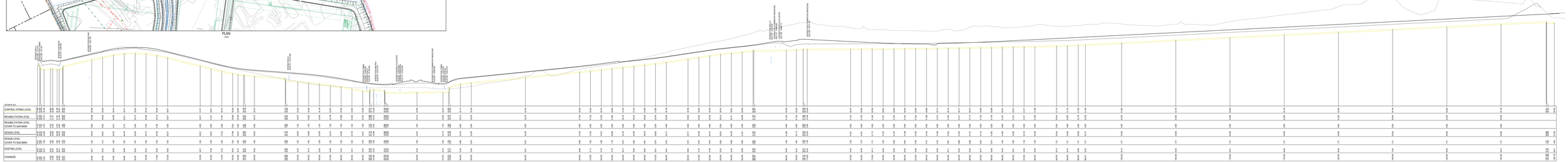
Issue: B

100mm on Original

Date Plotted: 10 Jun 2026 - 05:10PM File Name: C:\Users\isaz4360\DC\ACCDocs\Arcadis ACC AU\AAU-30281481-265 Martin Road Project Maverick\Project Files\10_WIP\10_AAP_Civil\R02\DRG\MAR-AAP-DA-R02-DRG-UT-0531-GasMainRelocationCrossSections.dwg



PLAN
1:500



225-245 MARTIN ROAD, BRADFIELD
GAS MAIN RELOCATION PLAN AND LONGITUDINAL SECTION - OPTION 2

PR-GHP-Pipe-JEM-300kPa-200-000004 LONGITUDINAL SECTION
SCALE 1:500(H)
1:50 (V)

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