Annexure 9

Engineering Servicing Report

LOT 889 RODOREDA CRESCENT, RAVENSWOOD

ENGINEERING SERVICING REPORT

PREPARED FOR THE ASPEN GROUP

Porter
Consulting Engineers

CONTENTS

APPENDIX I - WATER CONCEPT PLAN

APPENDIX J - OPEN DRAIN CONCEPT

APPENDIX K - REGIONAL OPEN SPACE INTERFACE CONCEPT

Revision	Date	Author	Issued to	Revision type
A	12/12/2024	Shane Highman	ASPEN Group	Client Review
B	16/01/2026	Shane Highman	ASPEN Group	Shire of Murray Submission
C	2/06/2026	Shane Highman	ASPEN Group	Shire of Murray Submission

1.0 INTRODUCTION

Porter Consulting Engineers has been engaged by the ASPEN Group to prepare an Engineering Servicing Report and Opinion of Probable Costs for the subdivision of Lot 889 Rodoreda Crescent in Ravenswood.

The site is approximately 33.4ha and is bounded by the Ravenswood River to the south, residential to the north and west and an undeveloped lot to the east. Refer the below for the site location.

Figure 1: The Site

2.0 BACKGROUND REPORTS

Various reports have been shared by ASPEN, it has been assumed these were prepared as part of the previous rezoning and planning phase. These documents include

- Dynamic Planning completed a Planning Assessment Report (200227 1084 in April 2019)
- Coterra Environment prepared an Environmental Management Plan (DWERAV03) in August 2019.
- Bushfire Planning and Design prepared a Bushfire Management Plan (22-011 Version C in November 2023).
- JDA Consulting Hydrologists prepared a Drainage and Nutrient Management Plan for the site and surrounding area in January 2005 (J3499e).
- Various traffic reports as prepared by KCTT.
- Various WAPC subdivision approvals (159195 and 163849)

3.0 PLANNING

Mapping shows the site is zoned Urban. There is an Outline Development Plan (ODP) for the eastern portion of Ravenswood, refer to **Appendix A** for details. The vast majority of the ODP has been subdivided with this site being the only undeveloped lot. The ODP across lot 889 shows low and medium density lots with various public open spaces and a foreshore reserve.

The Plan of Subdivision (**Appendix B**) shows the site being developed into three main zones. A foreshore reserve at the south of the site, residential lots to the west and north with land lease to the east.

The intent will be to stage the development of this site. Stage size and timing is yet to be resolved.

4.0 SITE OBSERVATIONS

As shown in Figure 2 below, the majority of the site is covered by remnant vegetation. It is expected the majority of this will cleared to enable development. Ideally, vegetation within POS areas is retained where they are of high environmental value and it is appropriate to do so.

LIDAR contours are also shown in Figure 2. A feature survey was prepared by Thompson Surveying Consultants and this is presented in **Appendix F**. The majority of the site sits at around RL 7m and it drops down to RL 2m near the foreshore.

Figure 2: Site

There are existing houses towards the southern end of the site, it is anticipated these will be demolished to enable the subdivision. There also appears to be a remanent circular track through the site. It is understood this was used for horse training.

5.0 GROUND CONDITIONS

A Geotechnical Investigation was completed by Brown Geotechnical and is presented in **Appendix G**. The ground consists of a 100-150mm layer of topsoil over the Bassendean Sand Formation. This is suitable for residential development.

As required for the adjoining developments, it is expected fill will be needed as part of the subdivision works. The extent of fill will be subject to the normal engineering considerations including:

- Site classification
- On site drainage disposal
- minimum groundwater separation
- sewer servicing levels

Avant Hydro have completed the drainage study for this site. Refer to their report for details. Advant's Figure 3 (extract below) shows their MGL and AAMGL contours. It is anticipated groundwater will be struck during the excavation for deep services.

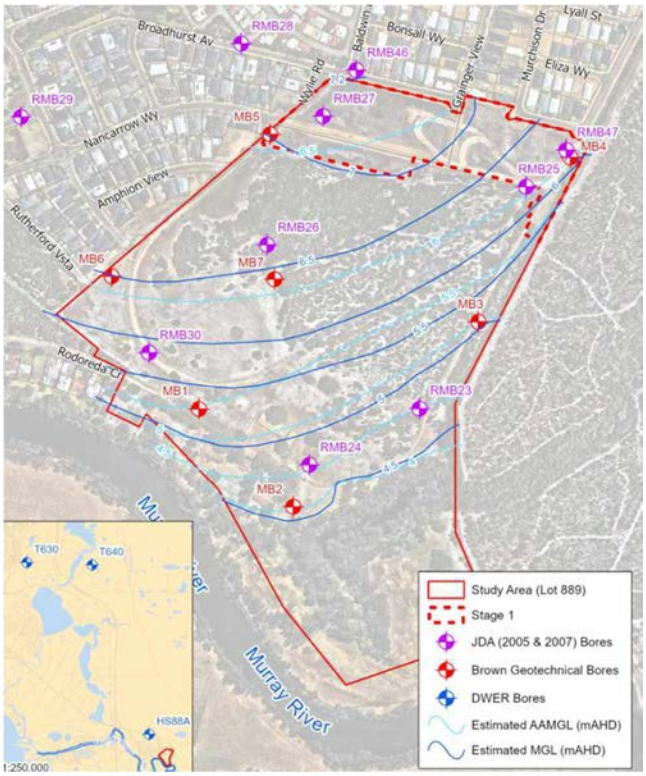


Figure 3: Advant's Groundwater Contours

The area is mapped as moderate to high risk of Acid Sulphate Soil. An Acid Sulphate Soil and Dewatering Management Plan will be required and works on site managed accordingly.

6.0 ENVIRONMENTAL AND HERITAGE

It is understood an environmental consultant is completing a high level investigation into this site. Please refer to their document for detailed environmental and heritage assessment.

Coterra Environment prepared an Environmental Management Plan, please refer to this document for further information.

Flood plain mapping is presented in Figure 4 below. This shows the bottom portion of the site will flood during extreme events. This aligns with the LIDAR contours in Figure 2. Both Appendices A and B quarantine this part of the site as Foreshore Reserve.

Figure 4: Flood Plain Mapping

The southern portion of the site fronts the Ravenswood River. It is anticipated foreshore works will be required as part of the subdivision process.

The majority of the surrounding land is vegetated. Bushfire Planning and Design prepared a Bushfire Management Plan for the site, refer to this document for bushfire requirements.

7.0 SITEWORKS, EARTHWORKS AND RETAINING

The topsoil needs to be stripped and either blended to meet structural fill requirements or spread within the POS.

The site will be earthworks including the import of fill to establish finished lot levels. Adjoining sites require significant fill to maintain minimum groundwater separation to finished lot levels. Similar is expected here. It is anticipated roads will be graded such that low points align with the various POS's. Some minor lot retaining might be required to manage level differences.

8.0 SEWER RETICULATION

Sewer Concept Plans have been approved by the Water Corporation, this shows the sewer strategy for the estate, refer **Appendix H** for details.

9.0 WATER RETICULATION

Water Concept Plans have been approved by the Water Corporation, this shows the water strategy for the estate, refer **Appendix I** for details.

It is understood the land lease will be one single green title lot. This will require a larger water meter(s) and likely a dedicated fire service, the specifics of this will be resolved at detailed design stage.

10.0 STORMWATER DRAINAGE

Avant Hydro have completed the drainage study for this site. Refer to their document for details.

Based on the developed surrounding land, it is anticipated shallow pit and pipe networks will service the road catchments. Drainage lot connections are not anticipated. It is expected water quality treatment mechanisms and detention basins will be provided in the POS's. Depending on the design outcomes, subsoil drainage maybe required. An outlet network will be provided to enable discharge into the receiving waters.

There is an existing open drain to the east of the site. This will be retrimmed as part of this subdivision works. Concepts for this are presented in **Appendix J**.

11.0 ROADS, PATHS AND FENCING

Normal 6m wide residential roads will be provided throughout the estate however it is anticipated

- Nancarrow Way will be 7m wide (match the existing) and
- Drakesbrook (eastern boundary) will be a median separated single carriageway road with on street cycle lanes to match the existing. This transitions to a 6m wide residential road south of Nancarrow Way.

A concept for the Regional Open Space frontage is presented in **Appendix K**.

As per the standard subdivision, all roads will have a footpath. A footpath network is also expected within the POS's and the regional open space.

Uniform fencing maybe required along Drakesbrook (a subdivision condition of the adjoining sites) and it is expected the POS's will have bollards.

12.0 POWER

Dial Before You Dig confirms there is an existing underground high voltage and low voltage network surrounding the site.

Time limitations associated with the preparation of this report did not permit a Western Power planning application request, however UPD have been appointed to undertake the power design for this estate and are liaising with Western Power to ensure power is available to align with the staging.

Streetlighting will be required and a point of supply maybe provided to the POS's pending the landscaping design.

13.0 COMMUNICATIONS

There is existing NBN communications network in the surrounding road reserve. It is expected connections can be made to the existing network and extensions constructed through the proposed subdivision to service each of the lots.

14.0 MOBILE COMMUNICATIONS

Mobile connectivity (4G and 5G) for new subdivisions is becoming a development consideration. A mobile service is received from local and regional antennae that are operated by various communications providers. Figure 5 below shows the location of existing mobile towers (blue and green dots) near the site (red). As of December 2024, there are 10 existing antennae within a few kilometres of the site.

Figure 5 – Existing Mobile Service Antennae

Figures 6a and 6b show Telstra's 4G and 5G network coverage (December 2024).

Figure 6a – 4G Coverage

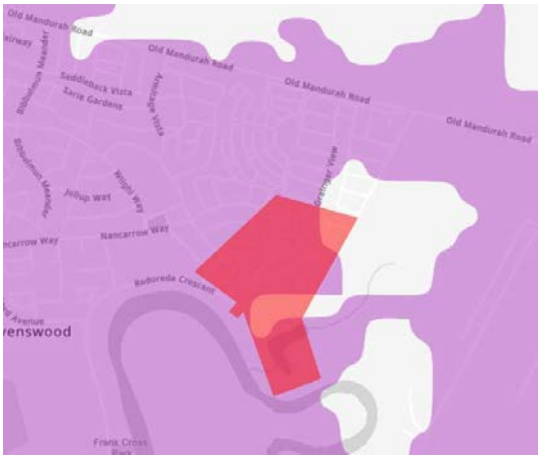


Figure 6b – 5G Coverage

Based on the above, there are mobile service antennae in close proximity and the 4G/5G coverage extends over the site. It is anticipated mobile connectivity will be available for this development.

15.0 GAS

There is no gas infrastructure in Ravenswood.

It is understood previous developers approached ATCO in 2015 regarding pioneering a service into Ravenswood. At that time, ATCO's estimate was $3,000,000 to supply gas into Ravenswood, 100% funded by the developers. This was cost prohibitive and as such, Ravenswood does not have reticulated gas.

16.0 OPINION OF PROBABLE COSTS

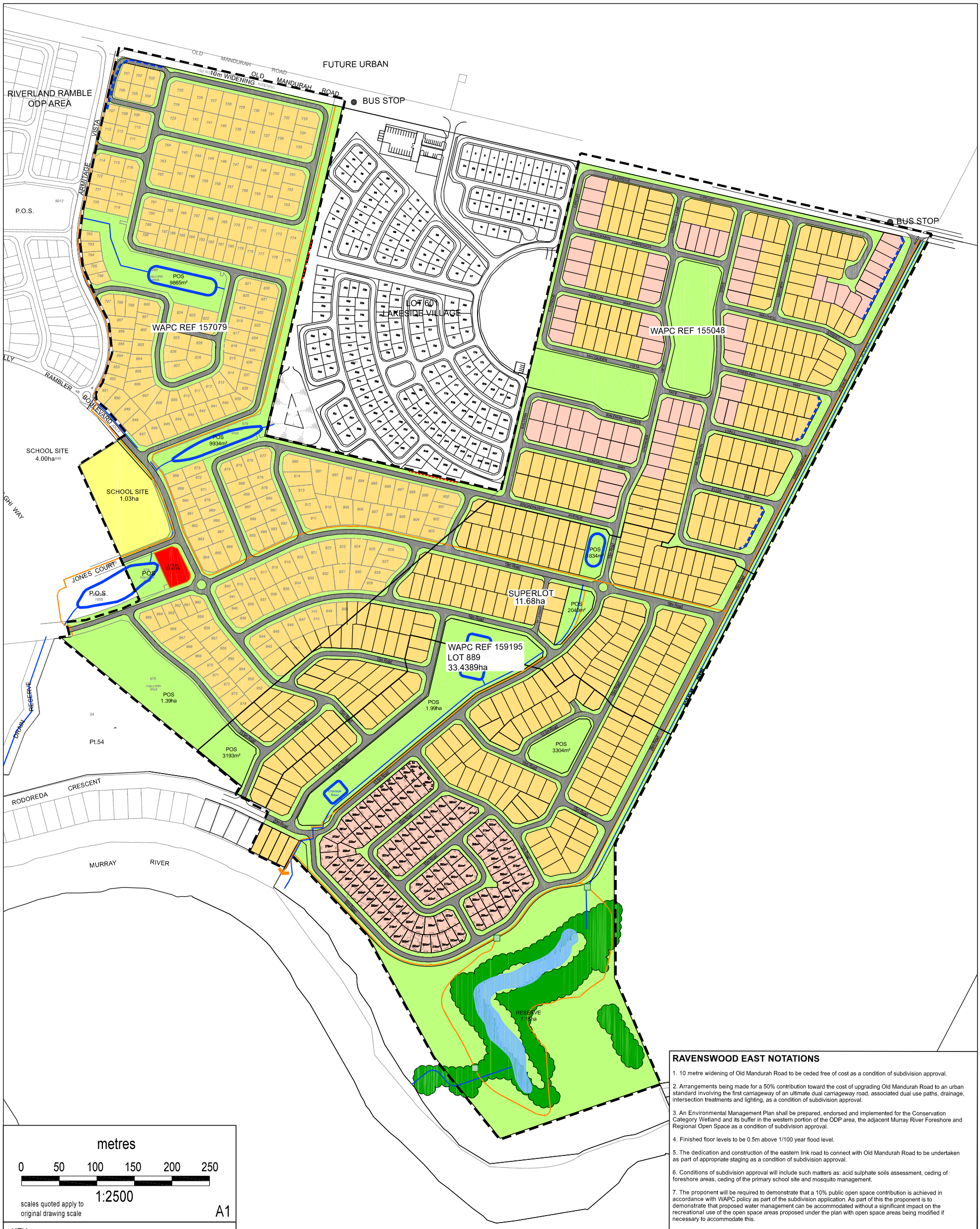
Opinion of Probable Coss were prepared as part of the December 2024 Rev A report. These have not been updated based on the current development layout, therefore Appendix C, sD and E have been left blank.

17.0 SUMMARY

The site is relatively constraint free with minimal servicing and engineering limitations that prohibit development.

It is understood an environmental consultant is completing a high level investigation into this site. The outcomes of this investigation may impact on construction methodologies and scope of works.

Based on the various consultant reports and the development requirements for neighbouring sites, fill is required to maintain minimum ground water separation to the finished lots.



THIS PLAN FOR DISCUSSION PURPOSES ONLY. SUBJECT TO APPROVALS AND SURVEY

LOT 889 (FORMERLY LOTS 619, 620 & 9010) OLD MANDURAH ROAD
RAVENSWOOD - EAST OUTLINE DEVELOPMENT PLAN (ODP)
MODIFIED PLAN TO REFLECT R30 DESIGN

Note: Yield may change with detailed design **Date: 25th October 2024**

RAVENSWOOD EAST NOTATIONS

1. 10 metre widening of Old Mandurah Road to be ceded free of cost as a condition of subdivision approval.

2. Arrangements being made for a 50% contribution toward the cost of upgrading Old Mandurah Road to an urban standard involving the first carriageway of an ultimate dual carriageway road, associated dual use paths, drainage, intersection treatments and lighting, as a condition of subdivision approval.

3. An Environmental Management Plan shall be prepared, endorsed and implemented for the Conservation Category Wetland and its buffer in the western portion of the ODP area, the adjacent Murray River Foreshore and Regional Open Space as a condition of subdivision approval.

4. Finished floor levels to be 0.5m above 1/100 year flood level.

5. The dedication and construction of the eastern link road to connect with Old Mandurah Road to be undertaken as part of appropriate staging as a condition of subdivision approval.

6. Conditions of subdivision approval will include such matters as: acid sulphate soils assessment, ceding of foreshore areas, ceding of the primary school site and mosquito management.

7. The proponent will be required to demonstrate that a 10% public open space contribution is achieved in accordance with WAPC policy as part of the subdivision application. As part of this the proponent is to demonstrate that proposed water management can be accommodated without a significant impact on the recreational use of the open space areas proposed under the plan with open space areas being modified if necessary to accommodate this.

8. All lots abutting public open space shall have visually permeable fencing and dwellings shall be designed to provide surveillance of the open space.

9. Any proposed changes to the existing fencing at the interface between the Lakeside Village on Lot 601 and the ODP are to be undertaken in consultation with the owners of the Lakeside Village and be approved by the Shire prior to construction.

10. Lots directly abutting Old Mandurah Road and those lots with dual road frontages will be subject of a Local Development Plan (LDP) to address street presentation to all street frontages through treatments including visually permeable masonry walls, landscaping and built form.

11. An Urban Water Management Plan shall be prepared, endorsed and implemented as a condition of subdivision approval.

12. No drainage infrastructure is to be constructed on the proposed school site without prior consent of the Department of Education.

13. Road reserve widths and the design of the local road network to be subject to review at the subdivision design stage.

14. An updated Traffic Management Plan shall be prepared and endorsed at the subdivision design stage which addresses both onsite traffic management issues and any offsite traffic management requirements. The plan is to be implemented to the specification of the Shire.

15. A Fire Management Plan shall be prepared and endorsed prior to subdivision approval, with relevant provisions implemented during relevant subdivision or development stages

16. The detailed location of the mature trees in the southern portion of the Structure Plan area in the vicinity of the existing buildings to be identified and where practical retained as part of the subdivision design

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CARAVAN & BOAT STORAGE
TRANSFORMER
VILLAGE CARE & MAINTENANCE TEAM WORKSHOP
CONSTRUCTION & EMERGENCY ACCESS
COMMUNITY GARDEN
POTTING SHED
ROAD REALIGNMENT SUBJECT TO ENGINEERING VERIFICATION
BPZ

LEGEND

- LANDSCAPING
- COMMUNITY FACILITY
- RECREATION FACILITY
- LAND LEASE BOUNDARY
- GATE & FENCE
- 11 STANDARD LOTS
- 39 POTENTIAL DUPLEX LOTS
- COMMUNITY ROADS
- REGIONAL / PUBLIC OPEN SPACE
- ' LIVING STREAM '

SUMMARY TABLE	
Total Site Area:	33.4389ha
Total No. of Lots:	168
Minimum Lot Area:	312m²
Maximum Lot Area:	844m²
Average Lot Area:	478m²
No. of Balance Lots:	2
Total Area:	1054m²
No. of POS Lots:	3
Total Area:	1.54ha
No. of Regional Open Space Lots:	1
Total Area:	6.77ha
No. of Group Housing Sites:	1
Total Area:	9574m²
No. of Land Lease Lots:	1
Total Area:	11.1ha
Land Lease Community Lot Sizes (avg):	12.5m x 21m
Community Open Space Area:	1.18ha
Community Open Space percentage of Land Lease Lot Area:	10.7%
No. of Land Lease Dwelling Lots:	281
	295 (incl. duplex sites)

RAVENSWOOD MASTERPLAN

FOR THE ASPEN GROUP
LOT 899 RODOREDO CRESENT

JUNE 2026
1:3000 @ A3
LAND LEASE COMMUNITY - 281 HOME SITES (14 POTENTIAL DUPLEX SITES

TOTAL LAND LEASE COMMUNITY SITE 110,885.0m²
COMMUNITY OPEN SPACE 11,886.5m² (10.7%)

0m 60m 120m 180m 240m 300m

Allerding & Associates
Town Planners, Advocates and Subdivision Designers
125 Hamersley Road, Subiaco WA 6008
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SHEET #2

SHEET #3

SHEET #6

SHEET #4

SHEET #5

Thompson surveying consultants

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Licensed Surveyors, Project Managers
& Engineering Surveyors

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Phone: (08) 9721 4000
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CLIENT:	PORTER CONSULTING ENGINEERS	Date: 30/05/2025	Drawn: DD	Surveyor: Various	CHKd: *MD*
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A.H.D. HEIGHTS DERIVED FROM :	SSM				

LOCATION SHEET

REVISION SCHEDULE — Sheet 1 of 6

No.	Date	Description
1	30/12/2024	Original Survey
2	30/05/2025	Extra Survey Added

601

146

145

144

143

142

141

140

899

900

901

904

926

9008

889

9003

9004

9005

BALDWIN DRIVE

WYLIE ROAD

BROADHURST AVENUE

NANCARROW WAY

LYGON WAY

TBM D/S
RL: 8.19m

TBM D/S
RL: 8.13m

TBM D/S
RL: 8.22m

TBM D/S
RL: 8.21m

TBM D/S
RL: 8.01m

Dense Vegetation
Approx 80 Trees
Avg.Diam 0.15m

Dense Vegetation
Approx 40 Trees
Avg.Diam 0.15m

Dense Vegetation
Approx 55 Trees
Avg.Diam 0.2m

Dense Vegetation
Approx 80 Trees
Avg.Diam 0.15m

Dense Vegetation
Approx 60 Trees
Avg.Diam 0.2m

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REVISION SCHEDULE — Sheet 2 of 6

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2	30/05/2025	Extra Survey Added

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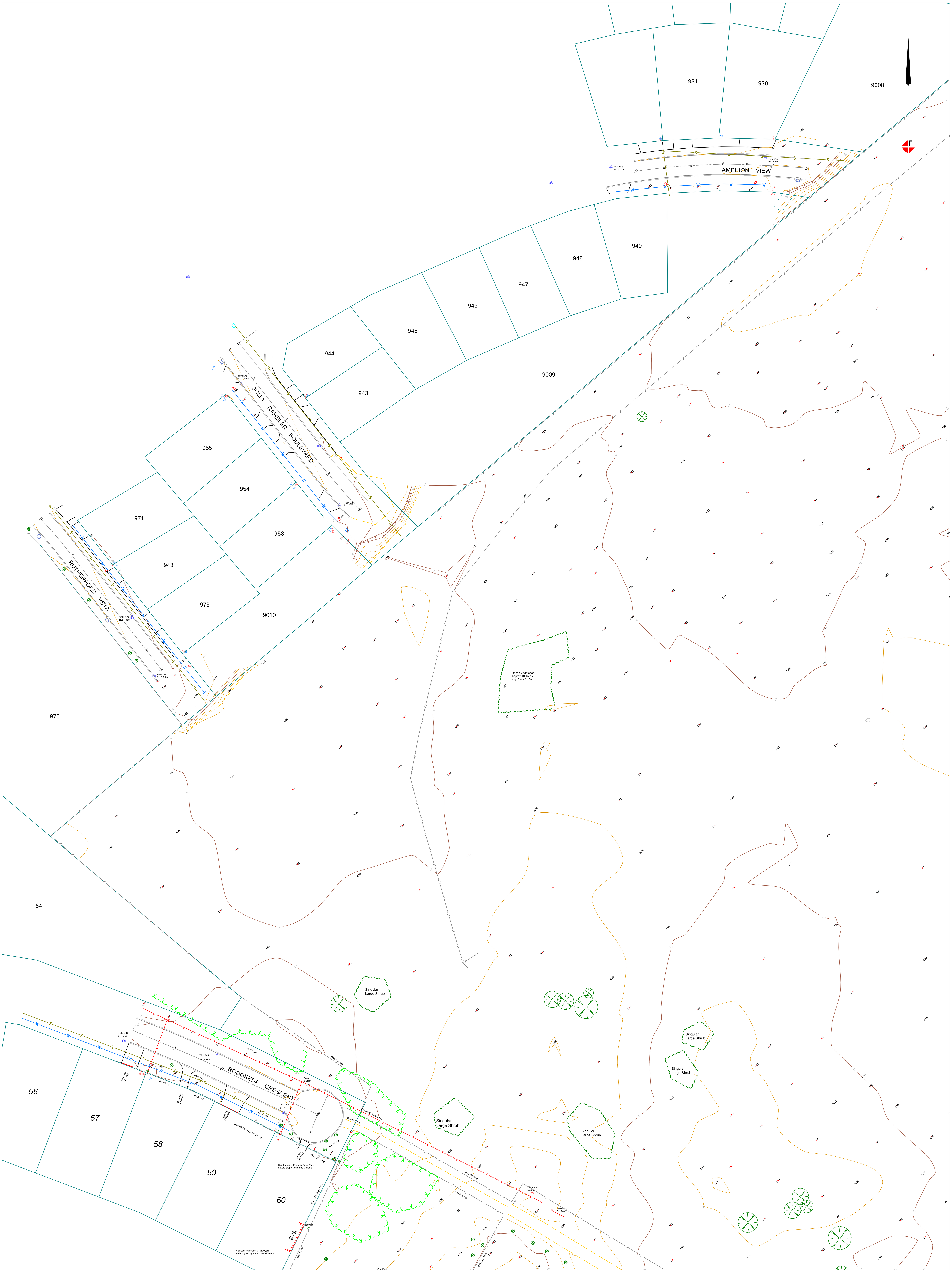

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REVISION SCHEDULE — Sheet 3 of 6

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2	30/05/2025	Extra Survey Added

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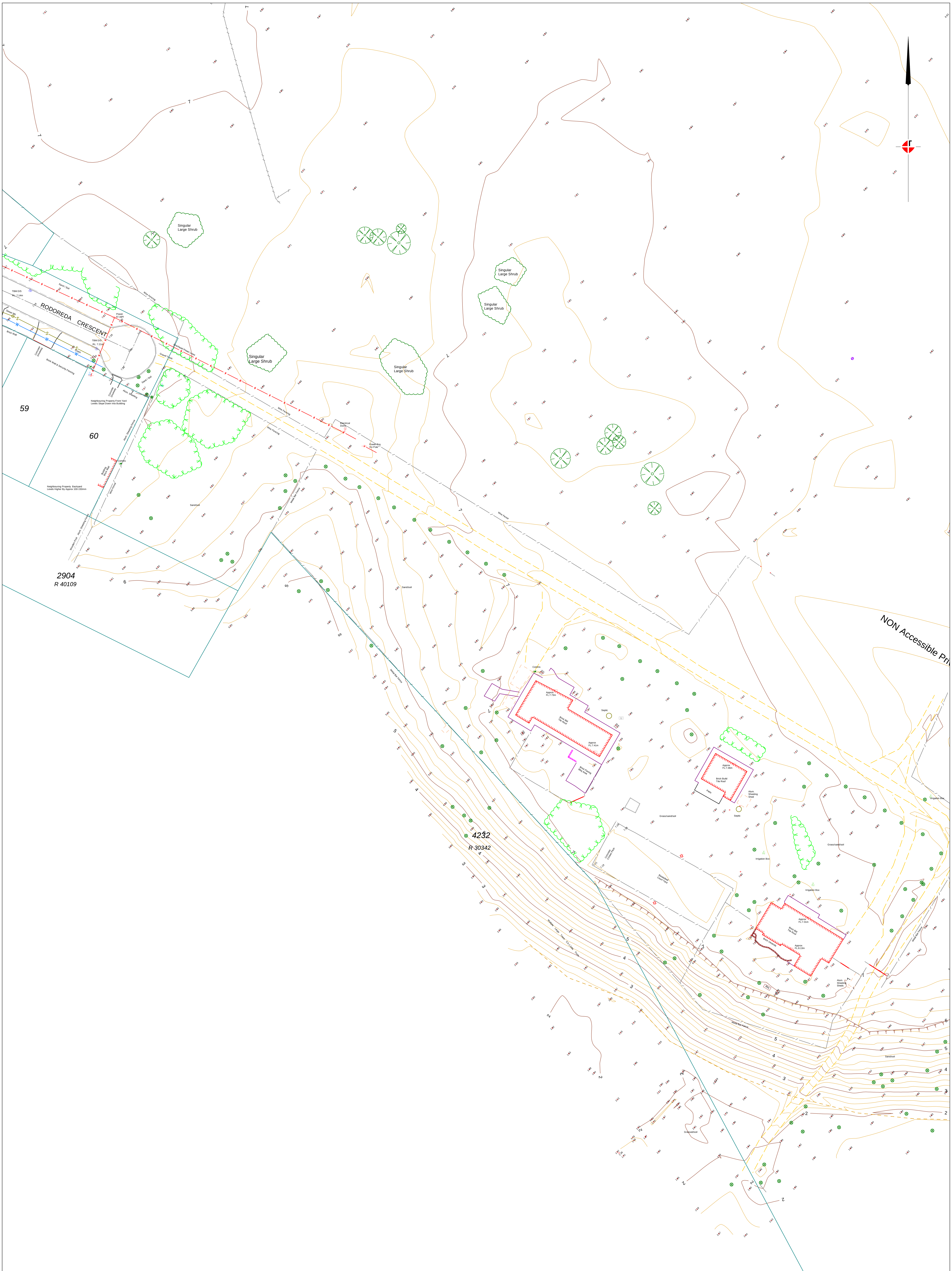

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REVISION SCHEDULE

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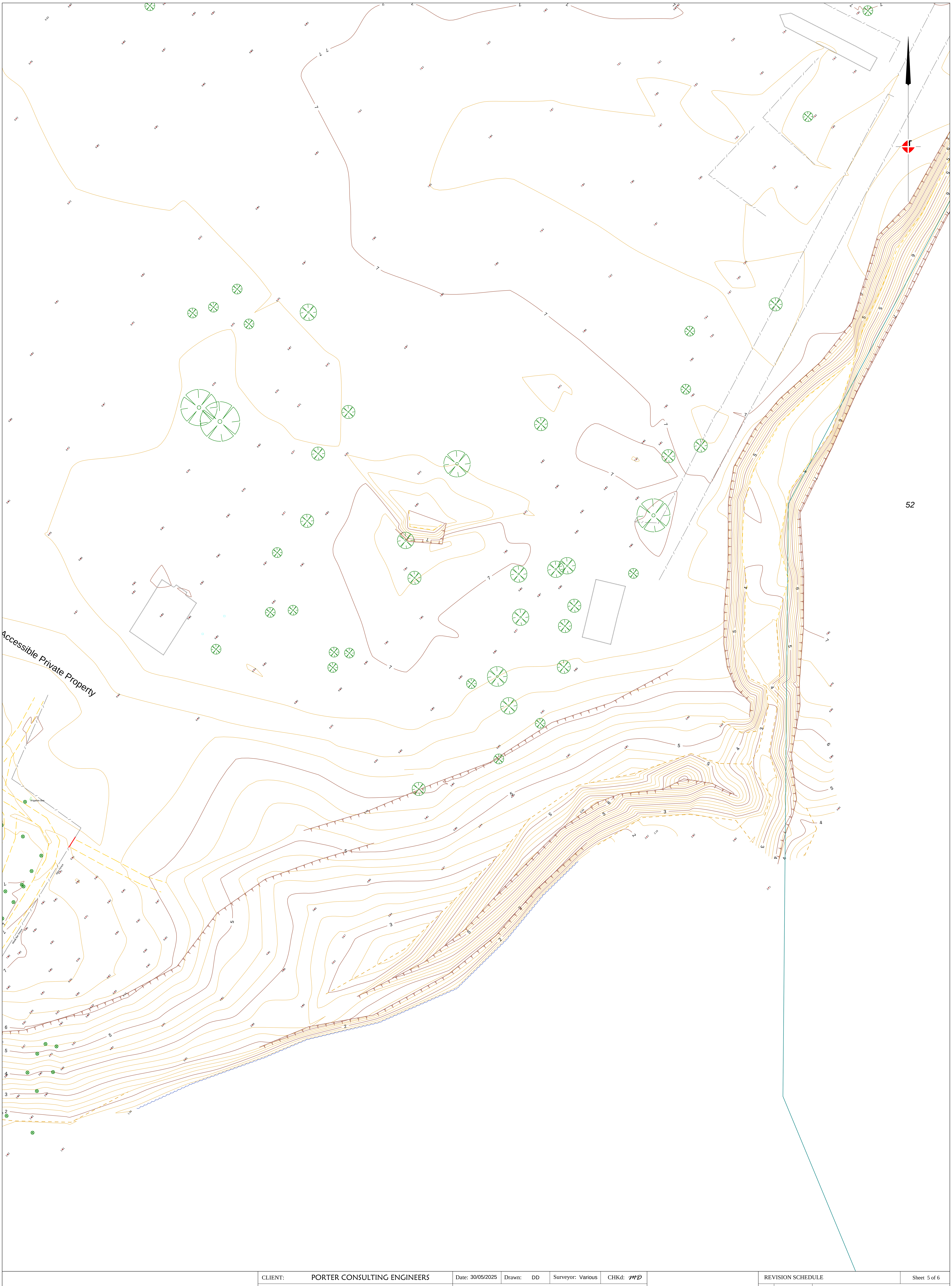
2	30/05/2025	Extra Survey Added



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2	30/05/2025	Extra Survey Added

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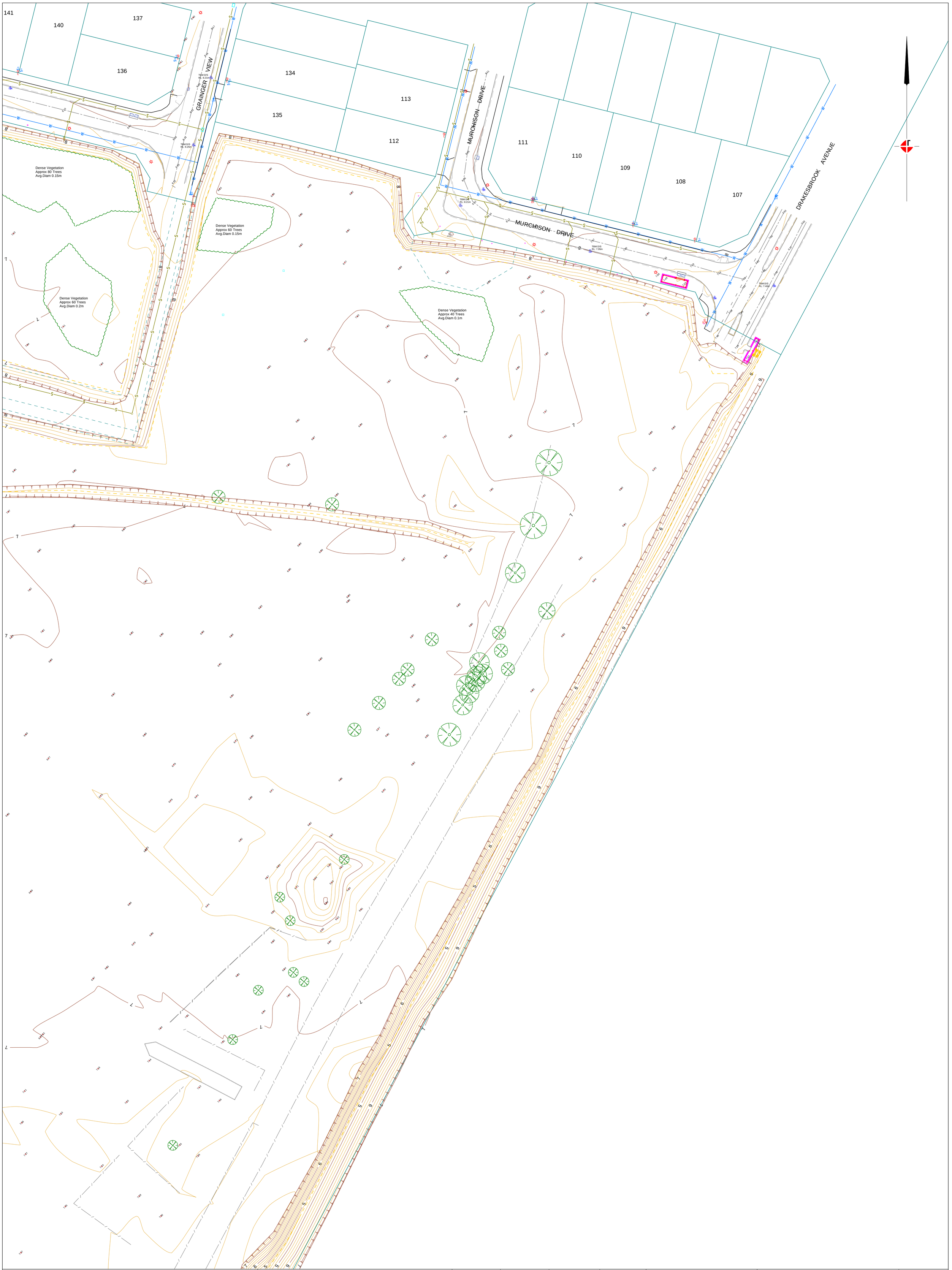

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REVISION SCHEDULE — Sheet 6 of 6

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2	30/05/2025	Extra Survey Added

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GENERAL FEATURES

- BOLLARD
- BOREHOLE
- BUSH
- BUS STOP
- COLUMN CENTRE
- CROSS ROADSIDE MEMORIAL
- DECK LEVEL
- DIEBACK AREA MARKER
- FLAGPOLE
- FLOOR LEVEL
- FUEL BOWSER
- FUEL / DIESEL TANK
- GRASS TREE
- LITTER BIN
- MAIL BOX
- NESTING TREES
- OIL MAIN MARKER
- PARKING METER
- OTHER POLE/POST
- SECURITY POST
- SPECIAL ENVIRO. AREA MARKER
- TICKET MACHINE
- TREE 0.1 - 0.3m TRUNK Ø
- TREE 0.3 - 0.5m TRUNK Ø
- TREE 0.5 - 1.0m TRUNK Ø
- TREE >1.0m TRUNK Ø

NOTE: TREE Ø 1.5M UP FROM GROUND

- TREE TRUNK / STUMP
- U/G TANK FILLER

MRWA FEATURES

- CONTROL OF ACCESS SIGN
- FINGER SIGN
- FOCAL POINT MARKER
- GUIDE POST
- ILLUMINATED ADVERTISING SIGN
- MRWA CABLE MARKER
- MRWA ELECTRIC CABLE BOX/PIT
- PEDESTRIAN SIGNAL
- POLICE TRAFFIC CAMERA
- SIGN ONE POLE
- SLK POST
- TRAFFIC CONTROLLER BOX
- TRAFFIC EARTH PIT
- TRAFFIC JUNCTION BOX
- TRAFFIC SIGNALS - 1 Direction
- TRAFFIC SIGNALS - 2 Directions
- TRAFFIC SIGNALS - 3 Directions
- TRAFFIC SIGNALS - 4 Directions
- VARIABLE SPEED SIGN

SURVEY FEATURES

- ALIGNMENT CONTROL POINT
- BENCHMARK
- CADASTRAL POST
- CONSTRUCTION CONTROL POINT
- MINING LEASE PEG
- MINOR CONTROL POINT
- MINOR VERTICAL CONTROL MARK
- PEG
- PHOTO POINT
- SPIKE
- SPRING HEAD NAIL
- STANDARD SURVEY MARK - SSM
- STAR IRON PICKET
- TEMPORARY BENCHMARK - TBM
- TRIG POINT (Legacy Code)
- VERTICAL CONTROL MARK

GROUND FEATURES

- HARD SURFACE SPOT HEIGHT
- NATURAL SURFACE
- POINT UNDER WATER (Bathymetry)

COMMUNICATION FEATURES

- ANTENNA
- COMMS ELEVATED JOINT
- COMMS MARKER
- COMMS PILLAR
- COMMS PIT / BOX
- COMMS POLE
- EMERGENCY PHONE
- TELEPHONE BOOTH

DRAINAGE FEATURES

- PIPE INVERT
- PIPE OVERT

ELECTRICAL FEATURES

- EARTH
- ELECTRIC CABLE BOX
- ELECTRIC CABLE MARKER
- ELECTRIC CABLE PILLAR
- ELECTRIC POWER DOME
- ELECTRIC SUPPLY POLE
- GROUND FLOODLIGHT
- HIGH MAST LIGHTING
- HIGH TENSION POWER POLE
- LIGHT POLE DIRECTIONLESS
- METER BOX
- POWER POLE
- SOLAR PANEL - SINGLE POLE
- STAY POLE
- STEEL WIRE ANCHOR
- TRANSFORMER POLE (SINGLE)
- UNDER BRIDGE SINGLE LIGHT

RAILWAY FEATURES

- RAIL CABLE MARKER
- RAIL CABLE PIT or BOX
- RAIL TELEPHONE BOX
- RAIL TRAFFIC CONTROL BOX
- RAIL TRAFFIC SIGNALS

RETICULATION FEATURES

- RETICULATION CONTROL VALVE
- RETICULATION SPRINKLER
- SCOUR / AIR VALVE

SEWER FEATURES

- SEWER INSPECTION SHAFT
- SEWER LINE MARKER
- SEWER VENT

WATER FEATURES

- FLOOD LEVEL
- FLOOD LEVEL INDICATOR
- FLUSHING POINT / VALVE
- HYDRANT (GROUND)
- HYDRANT (PILLAR)
- PEIZOMETER
- STANDPIPE
- STOCK TROUGH
- STOP VALVE
- TAP
- WATER BORE
- WATER LEVEL
- WATER MAIN MARKER
- WATER METER
- WELL
- WINDMILL

GAS FEATURES

- GAS MARKER
- GAS TEST VALVE
- GAS VALVE

(CLASS A) UUS FEATURES D/M

- ABANDONED NOT IN SERVICE
- AMCOM-VOCUS CABLE
- DRAINAGE PIPE - STORMWATER
- LV/HV ELECTRIC CABLE
- FUEL / OIL PIPE
- GAS LINE
- MRWA COMMS
- MRWA POWER
- NBN FIBRE
- NEXT GEN COMMS
- OPTUS COPPER
- OPTUS FIBRE OPTIC
- OTHER COMMS
- RAIL SERVICES
- RETICULATION LINE
- SERVICE UNKNOWN
- SEWER PIPE
- TELSTRA COPPER
- TELSTRA OPTIC
- WATER PIPE
- WESTERN POWER COMMS

(CLASS B) UUS FEATURES I/M

- ABANDONED NOT IN SERVICE
- AMCOM-VOCUS CABLE
- DRAINAGE PIPE - STORMWATER
- LV/HV ELECTRIC CABLE
- FUEL / OIL PIPE
- GAS LINE
- MRWA COMMS
- MRWA POWER
- NBN FIBRE
- NEXT GEN COMMS
- OPTUS COPPER
- OPTUS FIBRE OPTIC
- OTHER COMMS
- RAIL SERVICES
- RETICULATION LINE
- SERVICE UNKNOWN
- SEWER PIPE
- TELSTRA COPPER
- TELSTRA OPTIC
- WATER PIPE
- WESTERN POWER COMMS

MISCELLANEOUS FEATURES

- MARKER UNKNOWN / UNDEFINED
- UNDEFINED SERVICE PIT SMALL
- CLOTHES LINE/HOIST

LINE STYLE

DRAINAGE FEATURE LINE STYLES

- BOX CULVERT (BOTH INTERNAL EDGES)
- CULVERT (PIPE)
- DRAIN OPEN
- DRAINAGE PIPE
- EDGE OF DRAIN
- FLOODWAY
- HEADWALL
- OBVERT STRING TOP INSIDE OF D/P
- EDGE OF SUMP
- TOP OUTSIDE OF PIPE / CULVERT

GROUND FEATURE LINE STYLES

- BANK BOTTOM
- BANK TOP
- BORROW PIT
- EARTHWORKS AREA
- GROUND SUBSIDENCE
- LEVEE BOTTOM
- LEVEE TOP
- LINE of LEVELS
- RIDGE
- ROCK OUTCROP
- ROCK PITCHING

MRWA FEATURE LINE STYLES

- AERIAL SURVEILLANCE MARKER
- ARROW
- ARROW - AHEAD w LEFT & RIGHT TURN
- ARROW - AHEAD w LEFT TURN
- ARROW - AHEAD w RIGHT TURN
- ARROW - LEFT & RIGHT TURN
- ARROW - LEFT TURN
- ARROW - MERGE
- ARROW - RIGHT TURN
- ARROW - U-TURN
- BARRIER DOUBLE RAIL
- BARRIER SINGLE RAIL
- BARRIER STEEL WIRE ROPE
- BARRIER TRIPLE RAIL
- BARRIER / GUARDRAIL - THRIE BEAM
- BARRIER / GUARDRAIL W-BEAM
- BARRIER CONCRETE (BOTH FACES)
- OVERHEAD SIGN (RL LOWEST EDGE)
- PAINTED BICYCLE SIGNAL DETECTOR
- PAINTED LETTERING ON SEAL
- SIGN MULTIPLE POLES
- SURVEY EXTENTS
- TOP OF BARRIER / WALL (NON-TINABLE)
- VARIABLE MESSAGE SIGN

WATER FEATURE LINE STYLES

- CENTRE OF CHANNEL
- CREEK BOTTOM
- DAM
- EDGE OF CREEK OR RIVER
- EDGE OF WATER
- FLOOD LEVEL LINE/STRING
- SWAMP
- SWIMMING POOL
- TANK PERIMETER
- WATERWAYS CROSS SECTION
- WET AREA

LINE STYLE

GENERAL FEATURE LINE STYLES

- ABUTMENT
- AWNING
- BIKE RACK
- BRICK PAVING
- BRIDGE OUTSIDE EDGE OF DECK
- BRIDGE BARRIER (ALL OTHER TYPES)
- BRIDGE EXPANSION JOINT
- BUILDING
- BUS SHELTER
- BUSH-LINE
- CADASTRAL BOUNDARY (LANDGATE)
- CLEARING LINE - AS CLEARED
- COLUMNS
- CONVEYOR
- CROSS SECTION
- EDGE OF CONCRETE
- FENCE
- FOOTPATH
- GARDEN BED
- GAS CYLINDER / TANK
- GATE
- HANDRAIL
- HEADFRAME
- HEDGE
- KOPPA LOGGING FENCE
- LAWN
- MEMORIAL
- MINE SHAFT
- MINE WORKINGS
- MISC. LINE FEATURE WITH TEXT DESC.
- PARK BENCH / SEATING
- PEGGED CLEARING LINE
- PIERS
- PREV DISTURBED MAINTENANCE ZONE
- RAMP
- RETAINING WALL
- RUIN
- SHED
- SOFFIT STRING (LOWEST BEAM/STRUCT)
- SPECIAL ENVIRO AREA BOUNDARY
- STEPS OR STAIRS
- TREE CANOPY
- TREE-LINE - FACE OF TRUNKS
- TRUNK DIAMETER
- UNDERPASS
- VENT SHAFT
- VERANDAH
- WALL

LINE STYLE

ROAD FEATURE LINE STYLES

- CENTRE OF DRIVEWAY
- CENTRE OF ROAD
- CROSSWALK
- DOUBLE BARRIER LINES (SOLID LINES)
- EDGE OF BITUMEN (UN-KERBED)
- EDGE OF SEALED DRIVEWAY
- EDGE OF UNSEALED ROAD
- KERB BOTTOM / GULLY
- KERB TOP / BACK OF
- LANE MARKING - GIVE WAY/HOLD TURN LINES (600mm STRIPE 600mm GAP)
- LANE MARKING (3m Line With 9m Gap)
- LANE MARKING (9m Line With 3m Gap)
- LANE MARKINGS (1m Line With 1m Gap)
- LANE MARKINGS (1m Line With 3m Gap)
- LANE MARKINGS (Audible)
- LANE MARKINGS (Single Solid Line)
- LINE MARKING - FOOT/SHARED PATH GIVE WAY (200mm STRIPE 200mm GAP
- LINE MARKING - SHARED PATH GUIDE LINE (900mm STRIPE 300mm GAP)
- LIVESTOCK GRID
- LIVESTOCK GRID (PAINTED LINES)
- ON ROAD (SEALED STRING)
- OVERTAKING LANE (SOLID LINE & 3m LINE)
- PARKING BAY (REST AREA)
- PEDESTRIAN RAMP
- SHOULDER
- TRACK
- TRAFFIC DETECTOR LOOP

UTILITIES FEATURE LINE STYLES

- COMMS MANHOLE
- DRAINAGE MANHOLE
- ELECTRIC LIGHT POLE
- ELECTRIC MANHOLE
- ELECTRICAL STRUCTURE STRING
- GAS MANHOLE
- GULLY / METAL GRATE LID DRAIN
- STAY WIRE - 2D NULL HEIGHT
- STAY WIRE - TRUE HEIGHT
- HIGH TENSION POWER NULL HEIGHT
- HIGH TENSION POWER TRUE HEIGHT
- HYDRANT BOOSTER BOX
- MOBILE PHONE TOWER
- MRWA DISTRIBUTION BOARD EXTENTS
- MULTIPLE LIGHT POLE
- ON RAIL
- O/H POWER LINES - NULL HEIGHT
- O/H POWER LINES TRUE HEIGHT
- RAIL BOOM GATE
- RAIL CABLE MANHOLE
- RAIL U/G CABLE
- RAILWAY PLATFORM
- SEWER PRESSURE MAIN
- SEWERAGE MANHOLE
- SIDE ENTRY PIT
- TRANSFORMER POLE (DOUBLE)
- UNDEFINED MANHOLE
- UNDEFINED SERVICE PIT
- UNDER BRIDGE LIGHTING LINE
- WATER MANHOLE
- WATER PIPE

LINE STYLE

UUS SURFACE LOCATION (CLASS B) GROUND HEIGHT FEATURE LINE STYLES

- U/G ABANDONED NOT IN USE SERVICE
- U/G AMCOM-VOCUS CABLE
- U/G DRAINAGE PIPE - STORMWATER
- U/G ELECTRIC CABLE
- U/G FUEL OIL PIPE (GROUND STRING)
- U/G GAS LINE
- U/G MRWA COMMS
- U/G MRWA POWER
- U/G NBN FIBRE (Surface Ground Level)
- U/G NEXT GEN COMMS
- U/G OPTUS COPPER
- U/G OPTUS FIBRE OPTIC
- U/G OTHER COMMS
- U/G RAIL SERVICES
- U/G RETICULATION
- U/G SEWER PIPE
- U/G TELSTRA COPPER
- U/G TELSTRA OPTIC
- U/G WATER PIPE
- U/G WESTERN POWER COMMS
- UNKNOWN U/G SERVICE

UUS SURFACE LOCATION (CLASS C & D) (BYDA) NULL HEIGHT FEATURE LINE STYLES

- U/G ABANDONED NOT IN USE SERVICE
- U/G AMCOM-VOCUS CABLE
- U/G DRAINAGE PIPE - STORMWATER
- U/G ELECTRIC CABLE
- U/G FUEL OIL PIPE (GROUND STRING)
- U/G GAS LINE
- U/G MRWA COMMS
- U/G MRWA POWER
- U/G NBN FIBRE (Surface Ground Level)
- U/G NEXT GEN COMMS
- U/G OPTUS COPPER
- U/G OPTUS FIBRE OPTIC
- U/G OTHER COMMS
- U/G RAIL SERVICES
- U/G RETICULATION
- U/G SEWER PIPE
- U/G TELSTRA COPPER
- U/G TELSTRA OPTIC
- U/G WATER PIPE
- U/G WESTERN POWER COMMS
- UNKNOWN U/G SERVICE

UUS EXPOSED DIRECT ACCESS (CLASS Y) FEATURE LINE STYLES

- U/G ABANDONED NOT IN USE SERVICE
- U/G AMCOM-VOCUS CABLE
- U/G DRAINAGE PIPE - STORMWATER
- U/G ELECTRIC CABLE
- U/G FUEL OIL PIPE (GROUND STRING)
- U/G GAS LINE
- U/G MRWA COMMS
- U/G MRWA POWER
- U/G NBN FIBRE (Surface Ground Level)
- U/G NEXT GEN COMMS
- U/G OPTUS COPPER
- U/G OPTUS FIBRE OPTIC
- U/G OTHER COMMS
- U/G RAIL SERVICES
- U/G RETICULATION
- U/G SEWER PIPE
- U/G TELSTRA COPPER
- U/G TELSTRA OPTIC
- U/G WATER PIPE
- U/G WESTERN POWER COMMS
- UNKNOWN U/G SERVICE

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PROJECT:

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REVISION SCHEDULE | Sheet 1 of 1

No.	Date	Description

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Brown Geotechnical

Consulting Engineers – Land Development
Geotechnical/Acid Sulphate Soil/Groundwater Monitoring

Our reference: 25016.3 16 June 2025

You reference:

Aspen Group
Suite 21, 285A Crown Street
Surry Hills NSW 2010

Attention: Bailey Feltus

Geotechnical Investigation Report – Lot 889 Rodereda Crescent, Ravenswood, WA

Introduction

Brown Geotechnical was commissioned by the Aspen Group to undertake a geotechnical investigation for a proposed residential subdivision at Lot 889 Rodereda Crescent, Ravenswood in WA. This report presents the results of the investigation conducted at the site. Fieldwork commenced on 10th April 2025.

The site consists of large, grassed paddocks, with small and medium sized trees predominantly in the centre and north portions, which is original bush. Some existing residences are located along the southern boundary. The approximate area of the site is 33ha.

Scope of Work

The following scope of work was undertaken:

- An excavator and auger were used to excavate 28 test holes for soil descriptions and sampling.
- Groundwater levels were recorded in each test hole.
- Penetrometer tests were carried out to the determine relative density of soils.
- Samples were taken for laboratory testing for geotechnical parameters and soil classification.
- In-situ permeability test undertaken for drainage characteristics.

Test locations are shown on the attached site plan (Figure 1).

Brief

The report will address;

- Subsurface conditions.
- The existing site classification in accordance with AS2878-2011.
- Any earthworks required to obtain a site classification suitable for development.
- Suitability of the soils on site for use as engineering fill in the development.
- Estimated blending ratios for the re-use of screened topsoil.
- Estimated bearing capacity and settlement for typical footing.
- CBR for road pavement design.
- Retaining wall parameters.
- Site permeability.
- Drainage issues.
- Acid sulphate soil assessment based on visual observation & recommendations for any investigation.

Geotechnical Test Results

Table 1 – Geotechnical Classification Test Results

Test Hole No.	Depth (m)	Fines (%)	Sand (%)	Gravel (%)	LL (%)	LL (%)
TH1	0.5 – 1.0	3	97	0	*NP	NP
TH7	0.5 – 1.0	2	98	0	NP	NP
TH15	0.5 – 1.0	2	98	0	NP	NP
TH17	0.5 – 1.0	1	99	0	NP	NP
TH23	0.5 – 1.5	16	84	0	NP	NP

*NP: Non-plastic

Table 2 – Topsoil Test Results

Test Hole No.	Depth (m)	Fines (%)	Organic (%)	Blending Ratio (clean:screened)
TH1	0.05 – 0.15	5	8.5	4:1
TH13	0.1 – 0.15	4	3.5	2:1
TH15	0.05 – 0.15	5	5.0	3:1
TH22	0.05 – 0.15	3	1.7	None

Table 3 – Compaction and CBR Test Results

Test Hole No.	Depth (m)	Optimum Moisture Content (%)	Modified Maximum Dry Density (t / m ^{3})	California Bearing Ratio (CBR)
TH1	0.5 – 1.0	15.5	1.73	30
TH7	0.5 – 1.0	16.0	1.76	16
TH15	0.5 – 1.0	15.5	1.73	18
TH23	0.5 – 1.0	15.5	1.72	20

Permeability Tests and Site Drainage

Table 4 – Permeability Test Results

Test Location	Testing Material	In-situ Permeability Test Result (m/s)	Drainage Characteristics
P1 (0.5-1.5m)	Medium dense sand	*5x10^{-3}m/s	Good
P2 (0.5-1.5m)	Medium dense sand	*5x10^{-3}m/s	Good
P3 (0.5-1.5m)	Medium dense sand	*5x10^{-3}m/s	Good
P4 (0.5-1.5m)	Medium dense sand	*5x10^{-3}m/s	Good
P5 (0.5-1.5m)	Medium dense sand	*5x10^{-3}m/s	Good

*Estimate as water soaked away faster than could be recorded.

Groundwater Levels

Table 5 - Summary of Groundwater Levels

Location	Ground Level (mAHD)	Groundwater Depth (mBGL)	Groundwater (mAHD)
TH7	6.65	1.3	5.35
TH9	7.05	1.3	5.75
TH10	7.10	1.3	5.80
TH11	6.84	1.3	5.54
TH14	6.80	1.4	5.40

Subsoil Condition

A thin layer of grass and loose sandy topsoil with occasional tree roots covers the site to approximately 0.1m, locally to 0.2m. Samples of topsoil taken for testing show organic content to vary from 1.7% to 8.5%. Maximum fines content recorded was 5%.

Medium grained, grey sand with low fines content (>5%) was encountered in test holes to at least 2m depth. The sand is loose close to the surface, becoming medium dense at approx. 0.5m. The sands belong to the Bassendean Sand Formation.

The grading in TH23 gave a slightly higher silt content of 16%, which likely represents a more silty but non-cohesive horizon within the sand profile. This is a usual occurrence in the Bassendean Sands. The slightly higher silt content was not obvious within the test hole and was likely a thin lens, or pocket. The in-situ permeability test carried out at this location from 0.5m-1.5m did not show any reduced permeability.

Coffee rock (very dense, iron cemented sand) was encountered in TH1, TH6 and TH25-27 at approx. 1.6m, as shown on Figure 2. The material could not be excavated with the 5 tonne excavator, though tests holes often collapsed before the thickness of the layer could be determined. The coffee rock was predominantly confined to the southern boundary.

Permeability testing, using the falling head method, indicates the near surface sand to have a permeability of at least $5x10^{-3}$m/sec. The soils are free draining with good drainage characteristics.

Groundwater

No high flow groundwater was encountered in test holes, however slight seepage and moist soils were encountered at approx. 1.3m in TH7-11 and TH15 (refer Figure 2). The DoW Perth Groundwater Map does not currently cover this area, however experience working in the vicinity of the site suggests groundwater to be close to the existing ground surface during the winter rainfall period.

It is recommended that groundwater monitoring bores be installed to accurately monitor groundwater levels through the next winter period.

Site Classification

Soils below the site are medium grained, non-cohesive, with trace amounts of silt. It has been determined that the appropriate site classification for footing design is Class 'A' in accordance with AS2870-2011 (refer Table 6).

It is therefore considered that the land is suitable for development.

Table 6 - Definition of Site Classifications (Australian Standard AS2870-2011)

Class	Foundation
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites with only slight ground movement for moisture changes (y_s<20mm).
M	Moderately reactive clay or silt sites, which can experience moderate ground movement from moisture changes (y_s 20-40mm).
H1	Highly reactive clay site, which can experience moderate to high ground movement from moisture changes (y_s 40-60mm)
H2	Highly reactive clay site, which can experience high ground movement from moisture changes (y_s 60-75mm)
E	Extremely reactive sites, which can experience extreme ground movement from moisture changes (y_s>75mm)

y_s: Characteristic Surface Movement-

Suitability of Existing Soils for use in the Development

The sands on site have low fines, are medium grained, cohesionless and free draining. They will be suitable for use as engineering fill in the development.

Topsoil / Fill

Topsoil is not suitable for foundation support and should be removed. The trees across the site, unless they are to be retained, should be removed with the entire root bulb material and inspected by a geotechnical engineer. The excavations should then be backfilled and compacted with material exhibiting the same geotechnical properties as the surrounding soils.

Following screening to remove grass and root material, the topsoil may be blended with the in-situ sand or clean sand fill to decrease organic content to >2%, the minimum standard for residential development. Test results show organic content to vary from 1.7% to 8.5%. Approximate blending ratios are shown in Table 2. Further organic content tests should be carried out following screening to more accurately determine blending ratios. The maximum fines content was 5%.

No uncontrolled fill materials were identified, however uncontrolled fill materials will be associated with existing residence and should be total removed upon demolition and inspected by a geotechnical engineer.

Proof Rolling and Site Compaction

Most of the site is covered by sand to at least 2m. Prior to footing placement or placing any additional fill on site, the surface should be proof rolled to achieve at least 95% SMDD at optimum moisture content +/-2%. This approximates to at least 8 blows per 300mm using a Perth Sand Penetrometer (PSP) to a depth of 750mm. In-situ density tests should be carried out to calibrate the PSP to specific densities of the compacted material.

Imported Fill Material

Cut to fill material, and any additional sand fill imported to obtain site formation levels should be compacted in layers not more than 300mm thick to at least 95% SMDD. In-situ density tests should be carried out to calibrate the PSP to specific densities of the compacted material. Moisture conditioning (wetting) of the sand may to be required to optimise compaction. Imported sand should ideally contain less than 5% non-plastic fines to retain good drainage characteristics and should be compacted at optimum moisture content +/-2%.

Following excavation for foundations, the bases of pad and strip footings should also be compacted to achieve at least 95% SMDD.

Bearing Capacity

The following allowable bearing pressures have been based on a dense sand following proof rolling and a Young's modulus, E = 20 MPa. Potential settlements should be taken into account for design bearing pressures.

Table 7 – Pad Footing - Allowable Bearing Pressure and Estimated Settlement

Footing Depth (m)	Footing Width (m)	Allowable Bearing Pressure (kPa)	Estimated Settlement (mm)
0.5	0.5 x 0.5	100	10-12
	1.0 x 1.0	120	12-15
	1.5 x 1.5	130	15-20
	2.0 x 2.0	150	30-35

Table 8 - Strip Footing - Allowable Bearing Pressure and Estimated Settlement

Footing Depth (m)	Footing Dimension (m)	Allowable Bearing Pressure (kPa)	Estimated Settlement (mm)
0.5	0.5	90	5-10
	1.0	100	10-15
	1.5	120	30-35
	2.0	140	>45+

The bearing pressures presented in Table 7 and 8 are also based on the following:

- Ground conditions comprise dense sand at 0.5m bgl.
- No groundwater is present.
- Loading is isolated, vertical, non-eccentric, on level ground, and not influenced by any nearby cuttings or embankments.
- Factor of Safety of 3.
- It is recommended that total settlement is limited to 25mm.
- Differential Settlement to be no greater than nominally half the total.

Retaining Wall Parameters

Assuming proof rolling of the soils has been carried out as stated above, the following retaining wall parameters have been based on a dense sand soil with ϕ=40°.

γ=19 kN/m^3

Ko=0.36

Ka=0.22

Kp=4.

The parameters detailed above assume design of the retaining structure and compaction of the foundations are in accordance with AS 4678-2002, and that backfill material is composed of clean cohesionless sand.

Cut batters in sand may be constructed at a gradient of 1 Vertical to 3 Horizontal. This gradient assumes no load bearing structures or surcharge loads are within 2m of the batter crest, and that the slopes are not subject to significant vibration. Temporary batters may be cut to 1:2 but should be monitored for stability.

CBR for Pavement Design

CBR test results for the in-situ sand vary from 16 to 30% (refer Table 2). A minimum CBR of 16 should be used for road pavement design within the in-situ sand.

For imported Perth sand fill, typical CBR values can vary from 12 to 20%. Testing of additional imported fill should be carried out to determine actual values.

Permeability and Site Drainage

The drainage characteristics of the sand on site are good. Soakwells will be suitable for stormwater runoff assuming sufficient height above the maximum groundwater levels. In some areas of the site coffee rock occurs to within 1.6m of the surface (refer Figure 2). If the land surface is cut down during earthworks, the coffee rock layer may impede vertical drainage and should be broken out below soakwells to improve drainage.

Permeability and drainage conditions may be reduced during earthworks due to compaction of in-situ and imported sands. Over compaction during earthworks can seriously reduce soil permeability and drainage potential. It is recommended that further permeability testing be carried out following the completion of earthworks.

Acid Sulphate Soils Assessment

Following the fieldwork inspection, no indicators of high risk acid sulphate soils such as organic deposits, old stream beds or ponds were identified on site or in the test holes. However, the southern boundary of the site is close to the Murry River and adjacent alluvial deposits would be classed as high risk.

Generally, for sands of the Bassendean Sand Formation, an acid sulphate soil investigation will only be required if excavations are to extend >3m below the natural ground level, or if dewatering of the soil is required. If this is the case, an environmental consultant should be engaged to produce an Acid Sulphate Soil and Dewatering Management Plan.

Regards

Ken Brown

Senior Geotechnical Engineer
BROWN GEOTECHNICAL

Attachments:

Figure 1 - Site and Test Location Plan
Figure 2 – Subsoil Conditions
Test Hole Logs and Photos
PSP Plots
Laboratory Test Certificates
Conditions Relating to this Report

Lot 889 Rodereda Crescent, Ravenswood

Figure 1 - Test Location Plan

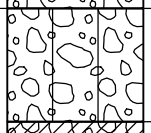
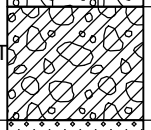
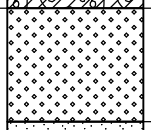
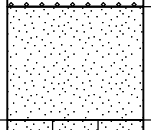
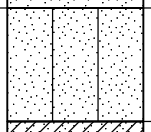
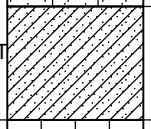
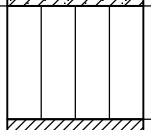
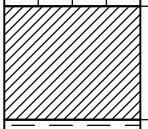
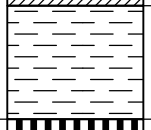
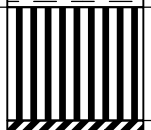
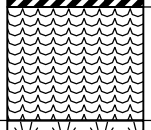
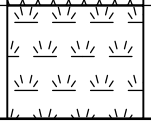
Lot 889 Rodereda Crescent, Ravenswood

Figure 2 - Subsoil Conditions

GW: Groundwater seepage (m BGL)

CR: Coffee Rock (m BGL)

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

BOREHOLE NUMBER TH01

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.90 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58620 115.84094

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry	Fines=5% Organic=8.5%	
	Not Encountered	6.5	0.5		SP	SAND: Medium dense, medium grained, grey, trace silt, dry	MC=15% DD=1.73Mg/m^3 LL=NP PL=NP Fines=3% Sand=97% Gravel=0% CBR=30	
		6.0	1.0					
		5.5	1.5			COFFEE ROCK: Very dense, Fe cemented, dark brown sand - Refusal		
		5.0	2.0			REFUSAL Borehole TH01 terminated at 1.6m		
		4.5	2.5					

BOREHOLE / TEST PIT RAVENSWOOD.GPJ GINT STD AUSTRALIA.GDT 5/6/25

TH1

BOREHOLE NUMBER TH02

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.89 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58673 115.84047

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
		6.5	0.5		SP	SAND: Medium dense, medium grained, grey, trace silt, dry Collapsing below 0.5m		
	Not Encountered	6.0	1.0					
		5.5	1.5					
		5.0	2.0					
						Borehole TH02 terminated at 2m		
		4.5	2.5					

TH2

BOREHOLE NUMBER TH03

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.86 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58585 115.84177

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
					SP	SAND: Medium dense, medium grained, grey, trace silt, dry. Occasional fine roots to 0.4m		
		6.5	0.5					
	Not Encountered	6.0	1.0			Collapsing below 0.5m		
		5.5	1.5					
		5.0	2.0			Borehole TH03 terminated at 2m		
		4.5	2.5					

TH3

BOREHOLE NUMBER TH04

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 7.25 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58498 115.84243

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
		7.0				TOPSOIL: Loose, grey, organic rich, silty sand, with organics/grass roots, dry		
					SP	SAND: Medium dense, medium grained, grey, trace silt, dry. Occasional fine roots to 0.5m		
			0.5					
		6.5						
	Not Encountered		1.0			Collapsing below 1m		
		6.0						
			1.5					
		5.5						
			2.0					
						Borehole TH04 terminated at 2m		
		5.0						
			2.5					

TH4

BOREHOLE NUMBER TH05

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 7.01 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58412 115.84298

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
					SP	SAND: Medium dense, medium grained, grey, trace silt, dry.		
	Not Encountered	6.5	0.5					
		6.0	1.0					
		5.5	1.5					
		5.0	2.0			Borehole TH05 terminated at 2m		
			2.5					

TH5

BOREHOLE NUMBER TH06

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.95 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58320 115.84345

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
	Not Encountered	6.5	0.5			TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
		6.0	1.0		SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
		5.5	1.5			COFFEE ROCK: Very dense, Fe cemented, dark brown sand - Refusal		
		5.0	2.0			REFUSAL Borehole TH06 terminated at 1.7m		
		4.5	2.5					

TH6

BOREHOLE NUMBER TH07

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.65 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58227 115.84414

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
		6.5	0.0			TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
					SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
		6.0	0.5				MC=16% DD=1.76Mg/m^3 LL=NP PL=NP Fines=2% Sand=98% Gravel=0% CBR=16	
		5.5	1.0					
	1.3m					moist/wet		Slight groundwater seepage
		5.0	1.5					
			2.0					
		4.5				Borehole TH07 terminated at 2m		
			2.5					

TH7

BOREHOLE NUMBER TH08

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 7.00 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58206 115.84300

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
					SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
	Not Encountered	6.5	0.5					
		6.0	1.0					
		5.5	1.5					
		5.0	2.0					
						Borehole TH08 terminated at 2m		
		4.5	2.5					

TH8

BOREHOLE NUMBER TH09

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 7.05 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58192 115.84225

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
		7.0				TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
					SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
			0.5					
		6.5						
						collapsing at 0.7m		
			1.0					
		6.0						
	▼ 1.3m					moist		
			1.5					
		5.5						
			2.0					
		5.0				Borehole TH09 terminated at 2m		
			2.5					

TH9

BOREHOLE NUMBER TH10

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 7.10 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58170 115.84107

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
		7.0				TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
			0.5		SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
		6.5						
			1.0					
		6.0						
	1.3m					moist		slight seepage
			1.5					
		5.5						
						collapsing at 1.8m		
			2.0					
						Borehole TH10 terminated at 2m		
		5.0						
			2.5					

TH10

BOREHOLE NUMBER TH11

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.84 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58214 115.84031

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
		6.5	0.5		SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
		6.0	1.0					
	▼ 1.3m	5.5				moist		slight seepage
			1.5			collapsing at 1.5m		
		5.0	2.0					
						Borehole TH11 terminated at 2m		
		4.5	2.5					

BOREHOLE / TEST PIT RAVENSWOOD.GPJ GINT STD AUSTRALIA.GDT 5/6/25

TH11

BOREHOLE NUMBER TH12

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 7.00 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58251 115.84112

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
	Not Encountered	6.5	0.5		SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
		6.0	1.0					
		5.5	1.5					
		5.0	2.0					
						Borehole TH12 terminated at 2m		
		4.5	2.5					

BOREHOLE / TEST PIT RAVENSWOOD.GPJ GINT STD AUSTRALIA.GDT 5/6/25

TH12

BOREHOLE NUMBER TH13

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.92 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58264 115.84234

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry	Fines=4% Organic=3.5%	
	Not Encountered	6.5	0.5		SP	SAND: Medium dense, medium grained, grey, trace silt, dry side walls collapsing		
		6.0	1.0					
		5.5	1.5					
		5.0	2.0					
						Borehole TH13 terminated at 2m		
		4.5	2.5					

BOREHOLE / TEST PIT RAVENSWOOD.GPJ GINT STD AUSTRALIA.GDT 5/6/25

TH13

BOREHOLE NUMBER TH14

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.80 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58284 115.83936

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
		6.5	0.5		SP	SAND: Medium dense, medium grained, grey, trace silt, dry side walls collapsing		
	Not Encountered	6.0	1.0					
		5.5	1.5					
		5.0	2.0			Borehole TH14 terminated at 2m		
		4.5	2.5					

TH14

BOREHOLE NUMBER TH15

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.84 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58370 115.83812

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry	Fines=5% Organic=5%	
		6.5	0.5		SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
		6.0	1.0			side walls collapsing	MC=16% DD=1.73Mg/m^3 LL=NP PL=NP Fines=2% Sand=98% Gravel=0% CBR=18	
	1.4m	5.5	1.5			moist/wet		slight seepage
		5.0	2.0			Borehole TH15 terminated at 2m		
		4.5	2.5					

BOREHOLE / TEST PIT RAVENSWOOD.GPJ GINT STD AUSTRALIA.GDT 5/6/25

TH15

BOREHOLE NUMBER TH16

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.65 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58413 115.83899

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
		6.5				TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
					SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
			0.5					
		6.0				side walls collapsing		
	Not Encountered		1.0				LL=NP PL=NP Fines=4% Sand=96% Gravel=0%	
		5.5						
			1.5					
		5.0						
			2.0					
		4.5				Borehole TH16 terminated at 2m		
			2.5					

TH16

BOREHOLE NUMBER TH17

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.67 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58371 115.84016

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
		6.5			SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
			0.5					
		6.0					LL=NP PL=NP Fines=1% Sand=99% Gravel=0% CBR=16	
	Not Encountered		1.0					
		5.5						
			1.5					
		5.0						
			2.0					
						Borehole TH17 terminated at 2m		
		4.5						
			2.5					

TH17

BOREHOLE NUMBER TH18

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.85 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58468 115.84038

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
					SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
		6.5				side walls collapsing		
			0.5					
	Not Encountered	6.0						
			1.0					
		5.5						
			1.5					
		5.0						
			2.0			Borehole TH18 terminated at 2m		
		4.5						
			2.5					

TH18

BOREHOLE NUMBER TH19

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.95 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58398 115.84150

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry, occasional tree roots		
					SP	SAND: Medium dense, medium grained, grey, trace silt, dry, occasional tree roots		
	Not Encountered	6.5	0.5					
		6.0	1.0					
		5.5	1.5					
		5.0	2.0					
						Borehole TH19 terminated at 2m		
		4.5	2.5					

TH19

BOREHOLE NUMBER TH20

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.75 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58533 115.84070

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry, occasional tree roots		
		6.5			SP	SAND: Medium dense, medium grained, grey, trace silt, dry, occasional tree roots		
						side walls collapsing		
			0.5					
		6.0						
	Not Encountered		1.0					
		5.5						
			1.5					
		5.0						
			2.0					
						Borehole TH20 terminated at 2m		
		4.5						
			2.5					

TH20

BOREHOLE NUMBER TH21

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 7.25 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58477 115.83915

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
					SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
		7.0				side walls collapsing		
			0.5					
		6.5						
	Not Encountered		1.0					
		6.0						
			1.5					
		5.5						
			2.0			Borehole TH21 terminated at 2m		
		5.0						
			2.5					

TH21

BOREHOLE NUMBER TH22

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 7.00 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58421 115.83727

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
							Fines=3% Organic=1.7%	
	Not Encountered				SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
						side walls collapsing		
		6.5	0.5					
		6.0	1.0					
		5.5	1.5					
		5.0	2.0					
						Borehole TH22 terminated at 2m		
		4.5	2.5					

TH22

BOREHOLE NUMBER TH23

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.95 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58486 115.83795

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry		
					SM	SILTY SAND: Medium dense, medium grained, grey, dry side walls collapsing		
	Not Encountered	6.5	0.5				MC=16% DD=1.72Mg/m^3 LL=NP PL=NP Fines=16% Sand=84% Gravel=0% CBR=20	
		6.0	1.0					
		5.5	1.5					
		5.0	2.0					
						Borehole TH23 terminated at 2m		
		4.5	2.5					

TH23

BOREHOLE NUMBER TH24

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.82 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58535 115.83880

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry, fine tree roots		
	Not Encountered	6.5	0.5		SP	SAND: Medium dense, medium grained, grey, trace silt, dry side walls collapsing		
		6.0	1.0					
		5.5	1.5					
		5.0	2.0					
						Borehole TH24 terminated at 2m		
		4.5	2.5					

TH24

BOREHOLE NUMBER TH25

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 7.09 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT 5 tonne Excavator **HOLE LOCATION** -32.58565 115.83844

HOLE SIZE 0.5m x 1.5m **LOGGED BY** FH **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
		7.0				TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry, fine tree roots		
	Not Encountered	6.5	0.5		SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
		6.0	1.0					
		5.5	1.5					
			2.0			COFFEE ROCK: Very dense, Fe cemented, dark brown sand - Refusal		
		5.0	2.5			Borehole TH25 terminated at 2m		

TH25

BOREHOLE NUMBER TH26

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.47 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT Auger **HOLE LOCATION** -32.58554 115.83778

HOLE SIZE 75mm dia **LOGGED BY** KB **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry, fine tree roots		
	Not Encountered	6.0	0.5		SP	SAND: Medium dense, medium grained, grey, trace silt, dry		
		5.5	1.0					
		5.0	1.5					
		4.5	2.0			COFFEE ROCK: Dense, Fe cemented, dark brown/black sand - Refusal		
		4.0	2.5			Borehole TH26 terminated at 2m		

TH26

BOREHOLE NUMBER TH27

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 6.00 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT Auger **HOLE LOCATION** -32.58601 115.83845

HOLE SIZE 75mm dia **LOGGED BY** KB **CHECKED BY** KB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
	Not Encountered	5.5	0.5			TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry, fine tree roots		
					SP	SAND: Medium dense to dense, medium grained, grey, trace silt, dry		
		5.0	1.0					
		4.5	1.5					
						COFFEE ROCK: Dense, Fe cemented, dark brown/black sand - Refusal		
		4.0	2.0					
						Borehole TH27 terminated at 2m		
		3.5	2.5					

TH27

BOREHOLE NUMBER TH28

BG

CLIENT Aspen Group Ltd **PROJECT NAME** Lot 889 Rodereda Crescent

PROJECT NUMBER 25016 **PROJECT LOCATION** Ravenswood

DATE STARTED 10/4/25 **COMPLETED** 23/4/25 **R.L. SURFACE** 7.44 **DATUM** m AHD

DRILLING CONTRACTOR **SLOPE** 90° **BEARING** ---

EQUIPMENT Auger **HOLE LOCATION** -32.58627 115.83927

HOLE SIZE 75mm dia **LOGGED BY** KB **CHECKED BY** KB

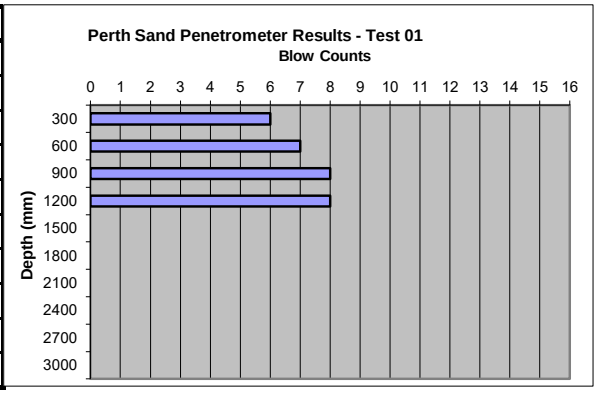
NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
		7.0	0.0			TOPSOIL: Loose, grey, silty sand, with organics/grass roots, dry, fine tree roots		
	Not Encountered		0.5		SP	SAND: Medium dense to dense, medium grained, grey, trace silt, dry		
		6.5	1.0					
		6.0	1.5					
		5.5	2.0			Borehole TH28 terminated at 2m		
		5.0	2.5					

TH28

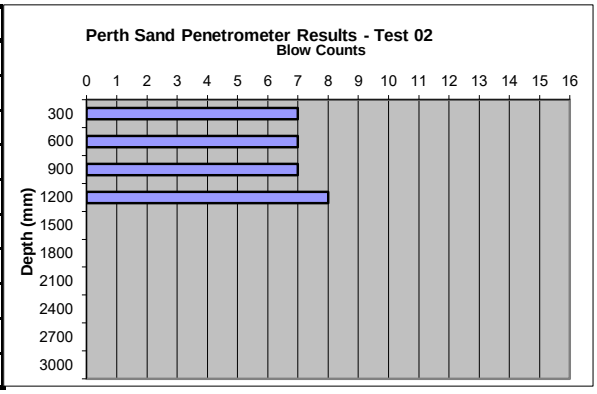
Perth Sand Penetrometer Test Plots

Depth (mm)	Blow Counts
300	6
600	7
900	8
1200	8
1500	
1800	
2100	
2400	
2700	
3000	



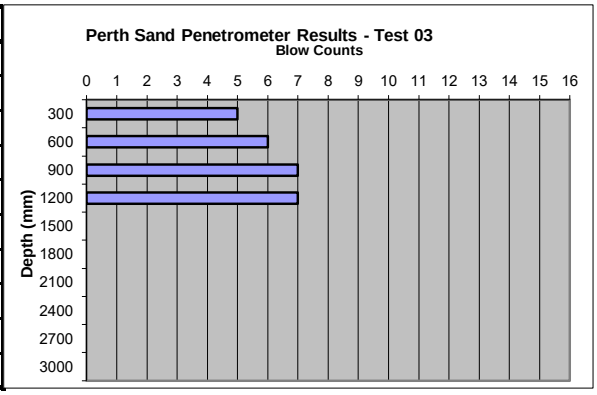
Job Name: Lot 889 Rodereda Cres Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH01

Depth (mm)	Blow Counts
300	7
600	7
900	7
1200	8
1500	
1800	
2100	
2400	
2700	
3000	



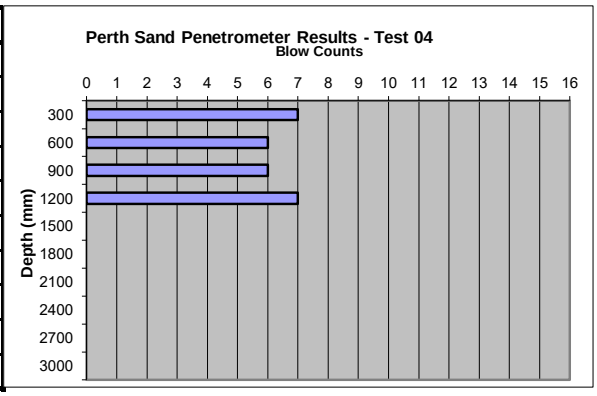
Job Name: Lot 889 Rodereda Cres Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH02

Depth (mm)	Blow Counts
300	5
600	6
900	7
1200	7
1500	
1800	
2100	
2400	
2700	
3000	



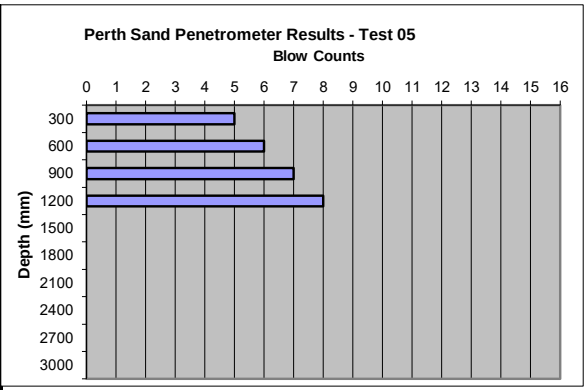
Job Name: Lot 889 Rodereda Cres Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH04

Depth (mm)	Blow Counts
300	7
600	6
900	6
1200	7
1500	
1800	
2100	
2400	
2700	
3000	



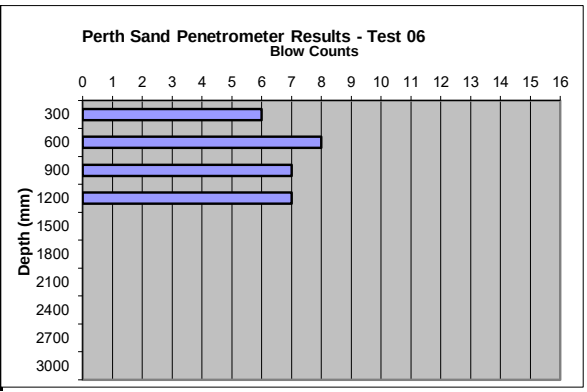
Job Name: Lot 889 Rodereda Cres Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH07

Depth (mm)	Blow Counts
300	5
600	6
900	7
1200	8
1500	
1800	
2100	
2400	
2700	
3000	



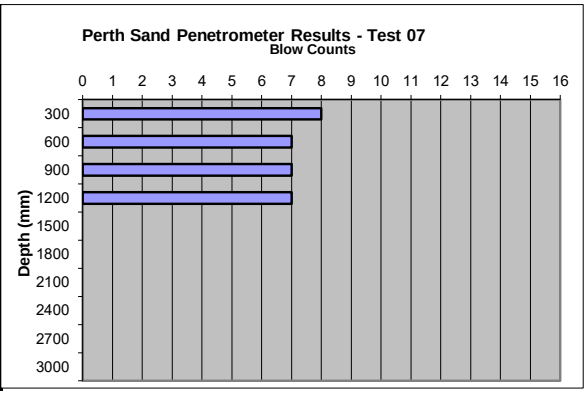
Job Name: Lot 889
Rodereda Cres
Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH09

Depth (mm)	Blow Counts
300	6
600	8
900	7
1200	7
1500	
1800	
2100	
2400	
2700	
3000	



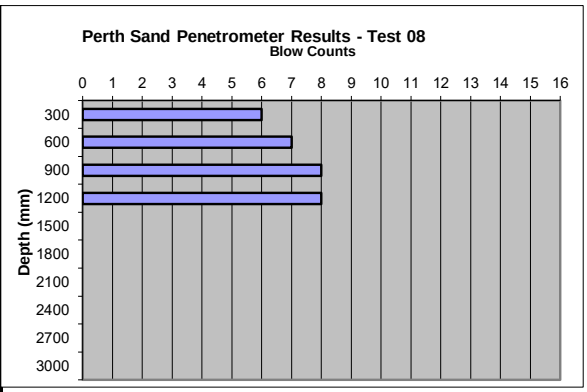
Job Name: Lot 889
Rodereda Cres
Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH11

Depth (mm)	Blow Counts
300	8
600	7
900	7
1200	7
1500	
1800	
2100	
2400	
2700	
3000	



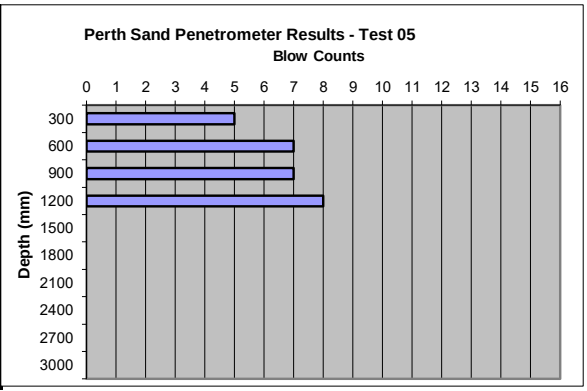
Job Name: Lot 889
Rodereda Cres
Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH13

Depth (mm)	Blow Counts
300	6
600	7
900	8
1200	8
1500	
1800	
2100	
2400	
2700	
3000	



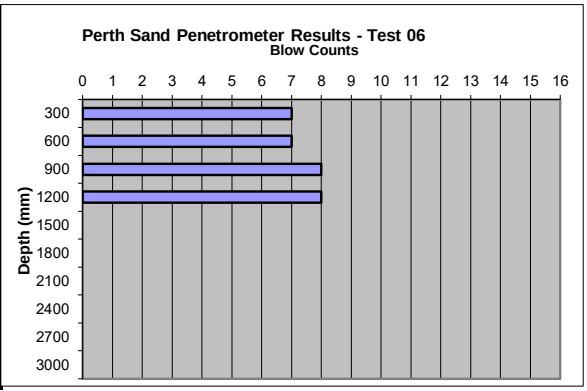
Job Name: Lot 889
Rodereda Cres
Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH14

Depth (mm)	Blow Counts
300	5
600	7
900	7
1200	8
1500	
1800	
2100	
2400	
2700	
3000	



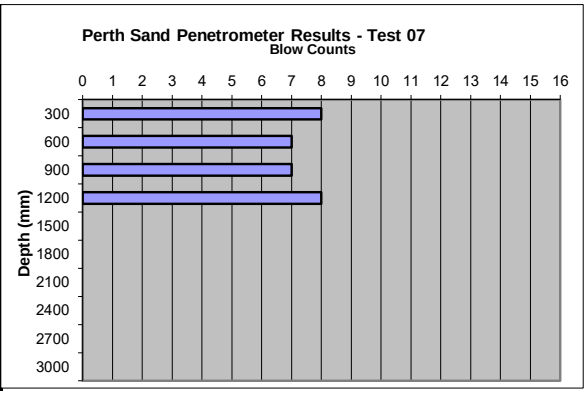
Job Name: Lot 889 Rodereda Cres Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH19

Depth (mm)	Blow Counts
300	7
600	7
900	8
1200	8
1500	
1800	
2100	
2400	
2700	
3000	



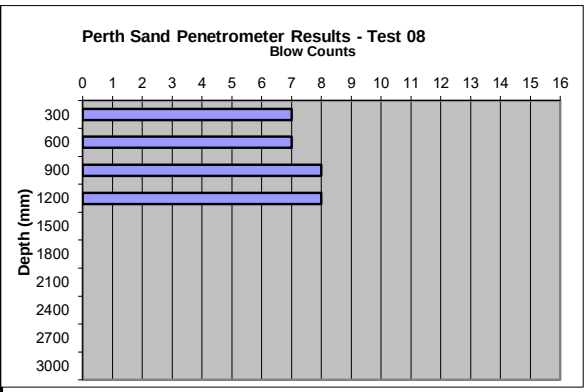
Job Name: Lot 889 Rodereda Cres Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH21

Depth (mm)	Blow Counts
300	8
600	7
900	7
1200	8
1500	
1800	
2100	
2400	
2700	
3000	



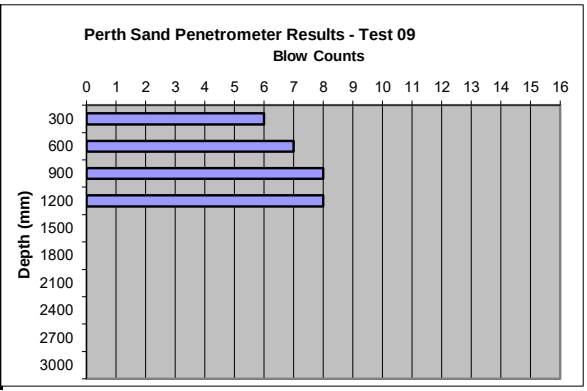
Job Name: Lot 889 Rodereda Cres Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH22

Depth (mm)	Blow Counts
300	7
600	7
900	8
1200	8
1500	
1800	
2100	
2400	
2700	
3000	



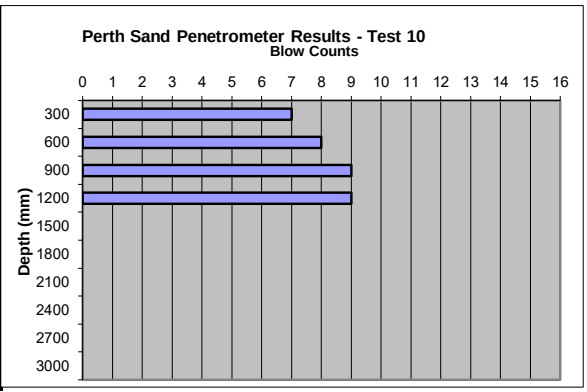
Job Name: Lot 889 Rodereda Cres Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH24

Depth (mm)	Blow Counts
300	6
600	7
900	8
1200	8
1500	
1800	
2100	
2400	
2700	
3000	



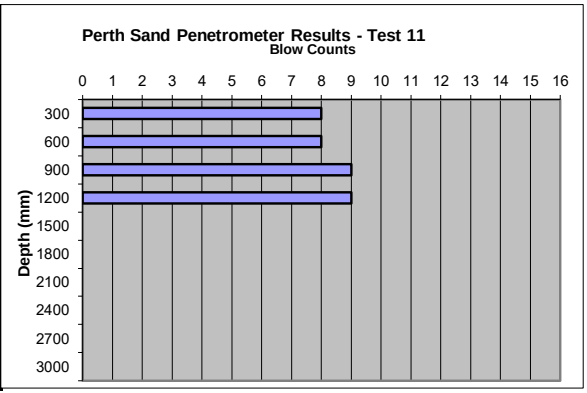
Job Name: Lot 889
Rodereda Cres
Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH26

Depth (mm)	Blow Counts
300	7
600	8
900	9
1200	9
1500	
1800	
2100	
2400	
2700	
3000	



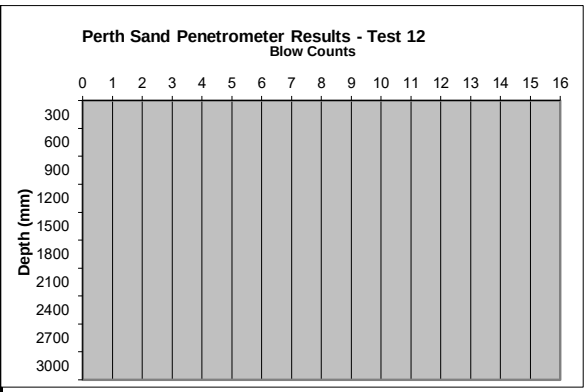
Job Name: Lot 889
Rodereda Cres
Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH27

Depth (mm)	Blow Counts
300	8
600	8
900	9
1200	9
1500	
1800	
2100	
2400	
2700	
3000	



Job Name: Lot 889
Rodereda Cres
Ravenswood
Job No: 25016
Date: 10.04.2025
Location: TH28

Depth (mm)	Blow Counts
300	
600	
900	
1200	
1500	
1800	
2100	
2400	
2700	
3000	



Job Name:
Job No:
Date:
Location:

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

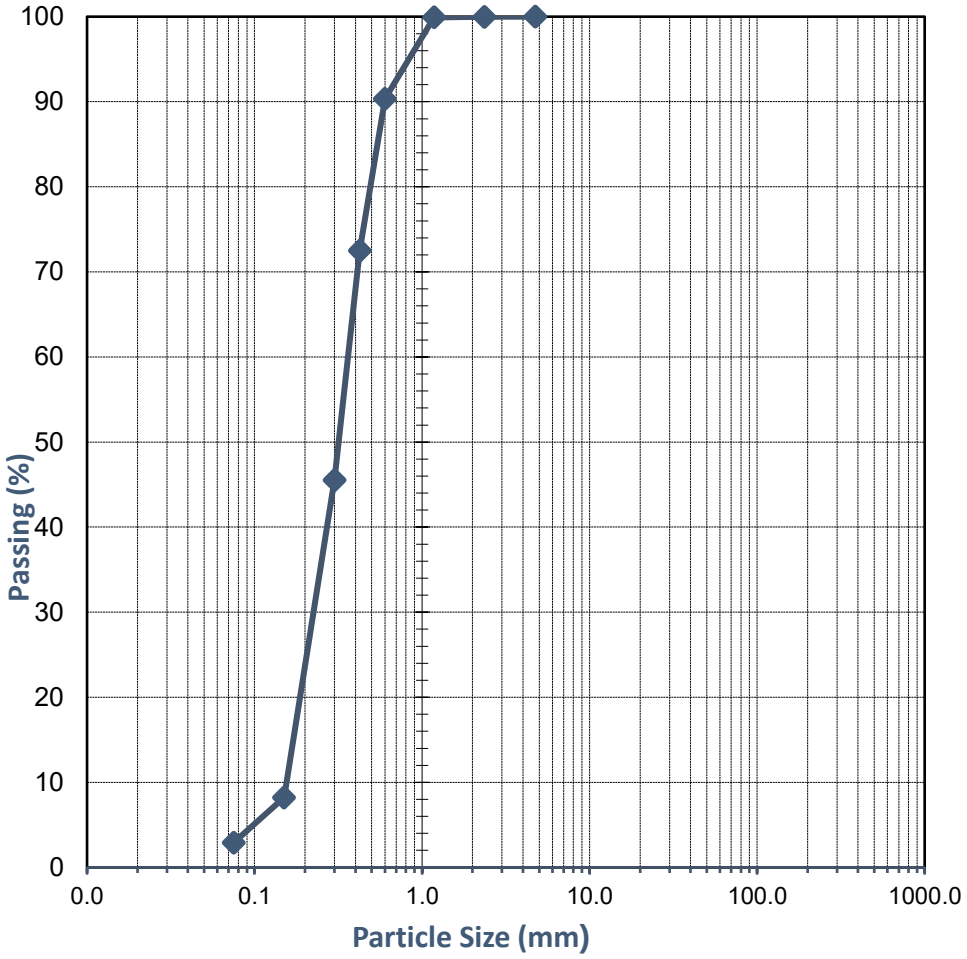
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7662_1_PSD
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7662
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH01 (x2 Large bags)	*Date Tested:*	30/04 - 01/05/2025

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	100
0.600	90
0.425	73
0.300	46
0.150	8
0.075	3



Comments:

Approved Signatory: Cody O'Neill

Name: Cody O'Neill

Date: 01/May/2025

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7662_1_PI
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7662
Location:	Ravenswood	*Date Sampled:*	16-04-2025
Sample Identification:	TH01 (x2 Large bags)	*Date Tested:*	2-05-2025

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Cody O'Neill

Date: 05-May-2025

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.5.2.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7662_1_MMDD
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7662
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH01 (x2 Large bags)	*Date Tested:*	30/04/2025

TEST RESULTS - Modified Maximum Dry Density

Sampling Method: Sampled by Client, Tested as Received

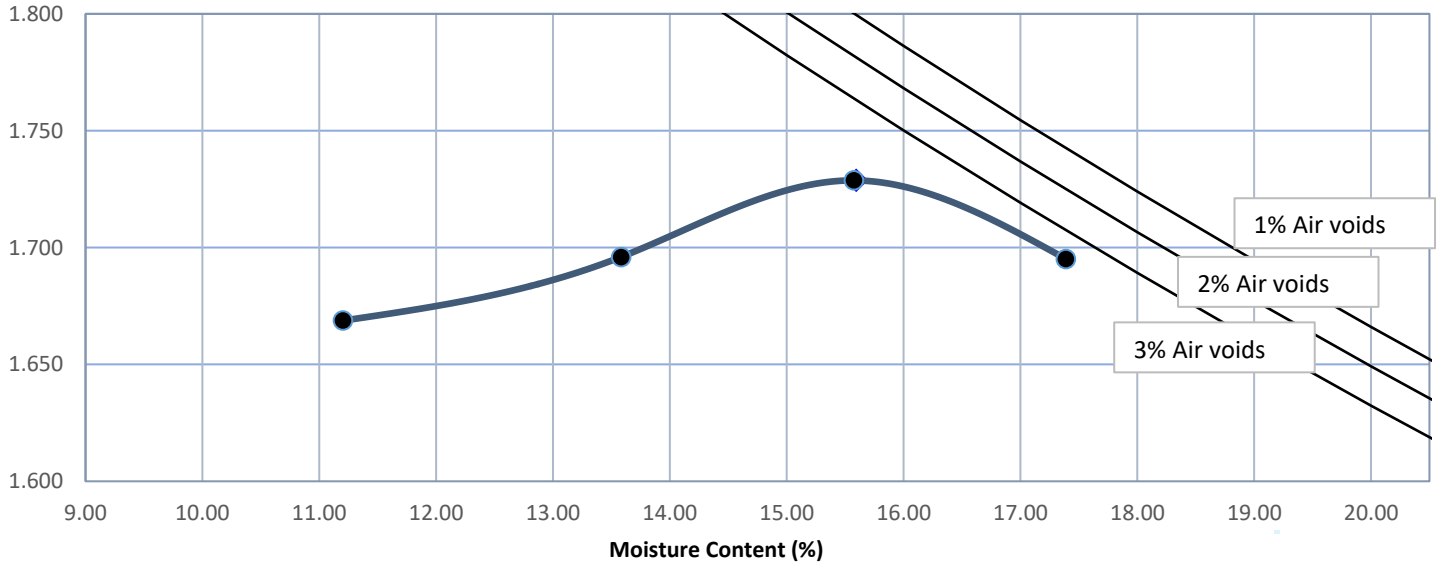
Sample Curing Time (Hours): >2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 0 **Material + 37.5mm (%)** -

Moisture Content (%)	**11.2**	**13.6**	**15.6**	**17.4**	
Dry Density (t/m³)	**1.669**	**1.696**	**1.729**	**1.695**	

Dry Density (t/m³)



Modified Maximum Dry Density (t/m³) **1.73**

Optimum Moisture Content (%) **15.5**

Comments: *The above air void lines are derived from a calculated apparent particle density of 2.537 t/m³*

Approved Signatory:

Name: Madhav Basnet

Date: 01/May/2025

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.6.1.1

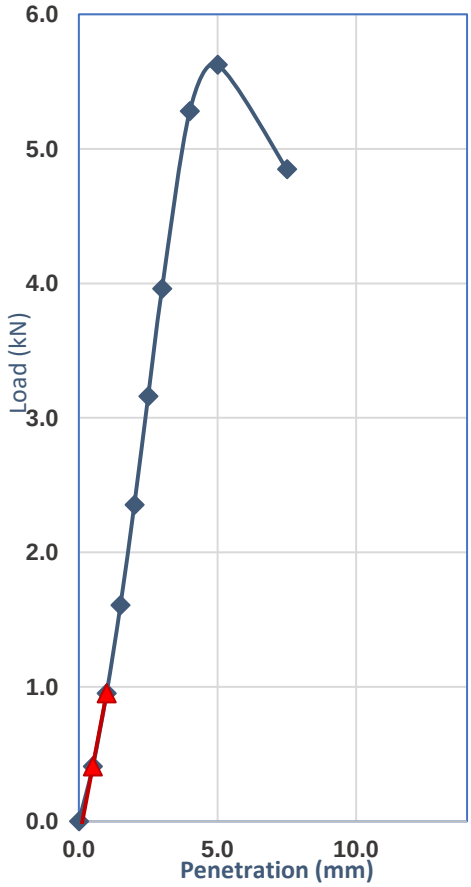
Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7662_1_SCBR
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7662
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH01 (x2 Large bags)	*Date Tested:*	30/04 - 09/05/2025

TEST RESULTS - CALIFORNIA BEARING RATIO

Sample Description: Sand

Sampling Method: Sampled by Client, Tested as Received

Load Penetration Curve



Compaction Details			
Compaction Method	AS 1289.5.2.1	Hammer Type	Modified
Plasticity Determined by	Estimated	Curing Time (Hours)	>96
% Retained 19.0mm	0	Excluded/Replaced	Excluded
Maximum Dry Density (t/m^3)	1.73	Optimum Moisture (%)	15.5
Target Dry Density Ratio (%)	96	Target Moisture Ratio (%)	100

Specimen Conditions At Compaction			
Dry Density (t/m3)	1.65	Moisture Content (%)	15.5
Density Ratio (%)	95.5	Moisture Ratio (%)	99.0

Specimen Conditions After Soak			
Soaked or Unsoaked	Soaked	Soaking Period (days)	4
Surcharges Applied (kg)	4.50	Measured Swell (%)	0.0
Dry Density (t/m³)	1.65	Dry Density Ratio (%)	95.5
Moisture Content (%)	16.5	Moisture Ratio (%)	106.0

Specimen Conditions After Test			
Top 30mm Moisture (%)	15.5	Remaining Depth (%)	17.6

Correction applied to Penetration: 0.1mm

Determined at a Penetration of: 5.0mm

California Bearing Ratio (CBR): 30%

Comments:

Approved Signatory:

Name: Connor Budimir

Date: 12/May/2025

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

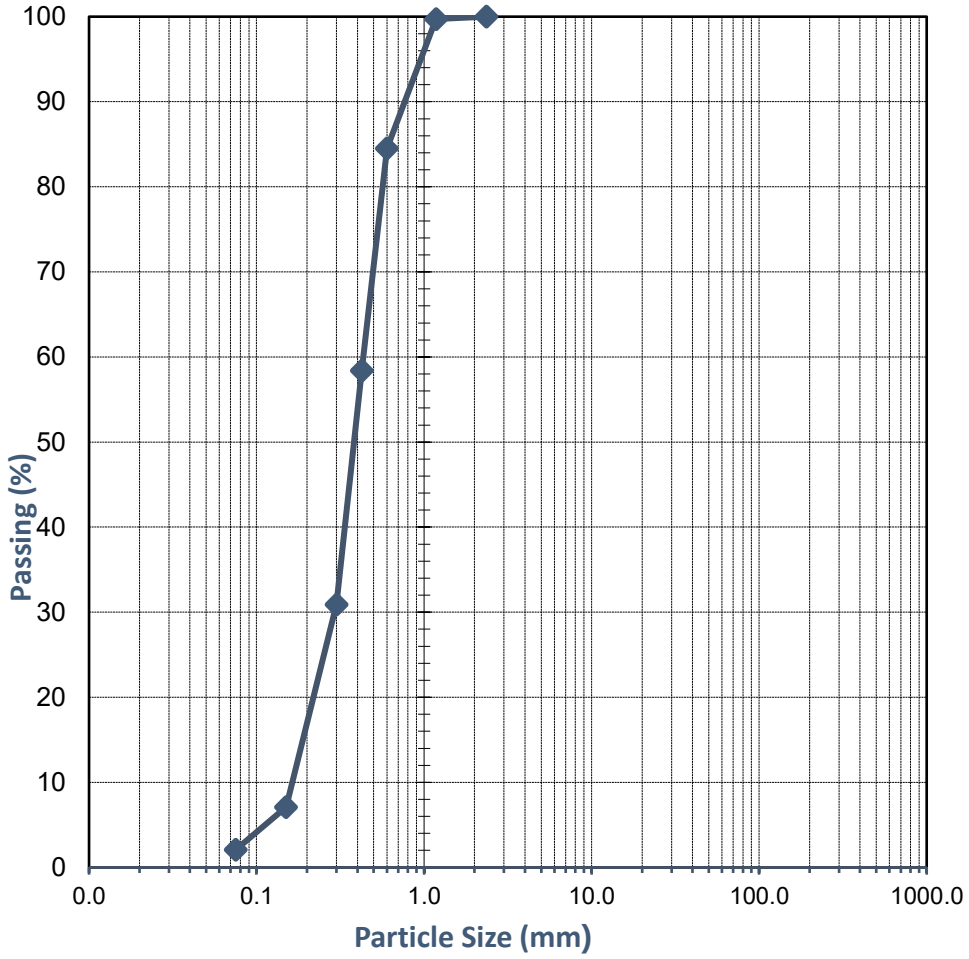
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7663_1_PSD
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7663
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH07 (x2 Large bags)	*Date Tested:*	30/04 - 01/05/2025

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	85
0.425	58
0.300	31
0.150	7
0.075	2



Comments:

Approved Signatory: Cody O'Neill

Name: Cody O'Neill

Date: 01/May/2025

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7663_1_PI
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7663
Location:	Ravenswood	*Date Sampled:*	16-04-2025
Sample Identification:	TH07 (x2 Large bags)	*Date Tested:*	2-05-2025

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Cody O'Neill

Date: 05-May-2025

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.5.2.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7663_1_MMDD
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7663
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH07 (x2 Large bags)	*Date Tested:*	30/04/2025

TEST RESULTS - Modified Maximum Dry Density

Sampling Method: Sampled by Client, Tested as Received

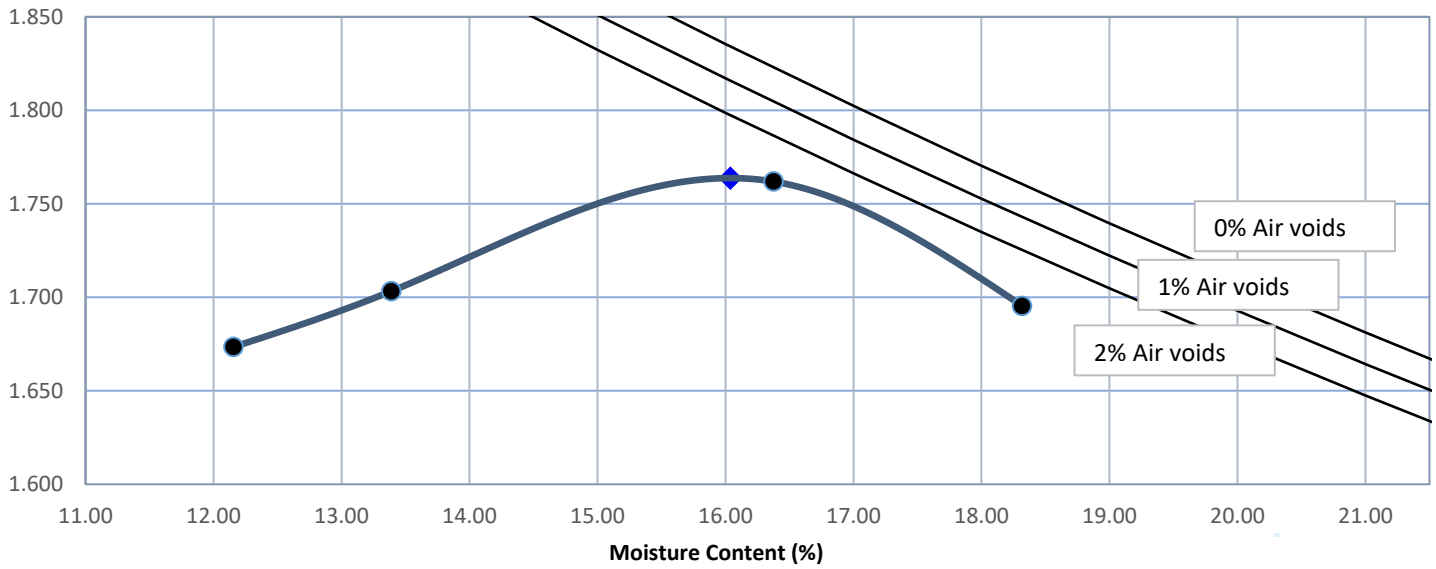
Sample Curing Time (Hours): >2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 0 **Material + 37.5mm (%)** -

Moisture Content (%)	**12.2**	**13.4**	**16.4**	**18.3**	
Dry Density (t/m³)	**1.673**	**1.703**	**1.762**	**1.695**	

Dry Density (t/m³)



Modified Maximum Dry Density (t/m³) **1.76**

Optimum Moisture Content (%) **16.0**

Comments: *The above air void lines are derived from a calculated apparent particle density of 2.599 t/m³*

Approved Signatory:

Name: Madhav Basnet

Date: 01/May/2025

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.6.1.1

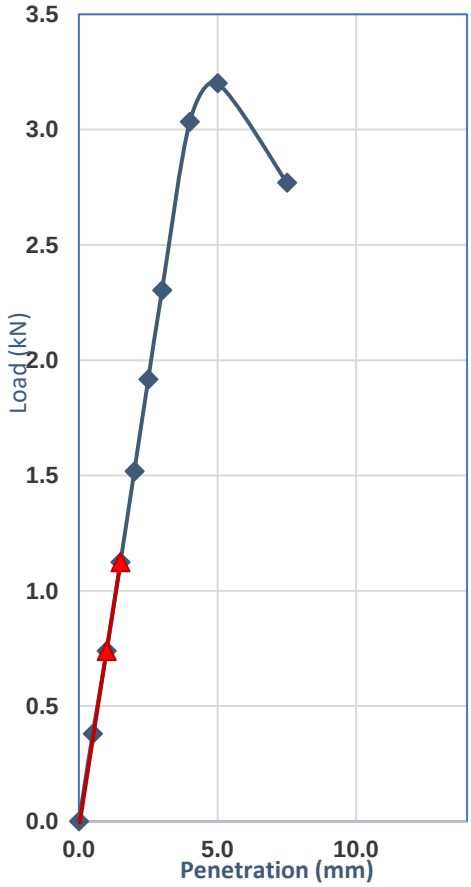
Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7663_1_SCBR
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7663
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH07 (x2 Large bags)	*Date Tested:*	30/04 - 09/05/2025

TEST RESULTS - CALIFORNIA BEARING RATIO

Sample Description: Sand

Sampling Method: Sampled by Client, Tested as Received

Load Penetration Curve



Compaction Details			
Compaction Method	AS 1289.5.2.1	Hammer Type	Modified
Plasticity Determined by	Estimated	Curing Time (Hours)	>96
% Retained 19.0mm	0	Excluded/Replaced	Excluded
Maximum Dry Density (t/m^3)	1.76	Optimum Moisture (%)	16.0
Target Dry Density Ratio (%)	96	Target Moisture Ratio (%)	100

Specimen Conditions At Compaction			
Dry Density (t/m3)	1.69	Moisture Content (%)	16.3
Density Ratio (%)	95.5	Moisture Ratio (%)	102.0

Specimen Conditions After Soak			
Soaked or Unsoaked	Soaked	Soaking Period (days)	4
Surcharges Applied (kg)	4.50	Measured Swell (%)	0.0
Dry Density (t/m³)	1.69	Dry Density Ratio (%)	95.5
Moisture Content (%)	22.6	Moisture Ratio (%)	141.5

Specimen Conditions After Test			
Top 30mm Moisture (%)	17.2	Remaining Depth (%)	20.2

Correction applied to Penetration: 0mm

Determined at a Penetration of: 5.0mm

California Bearing Ratio (CBR): 16%

Comments:

Approved Signatory:

Name: Connor Budimir

Date: 12/May/2025

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

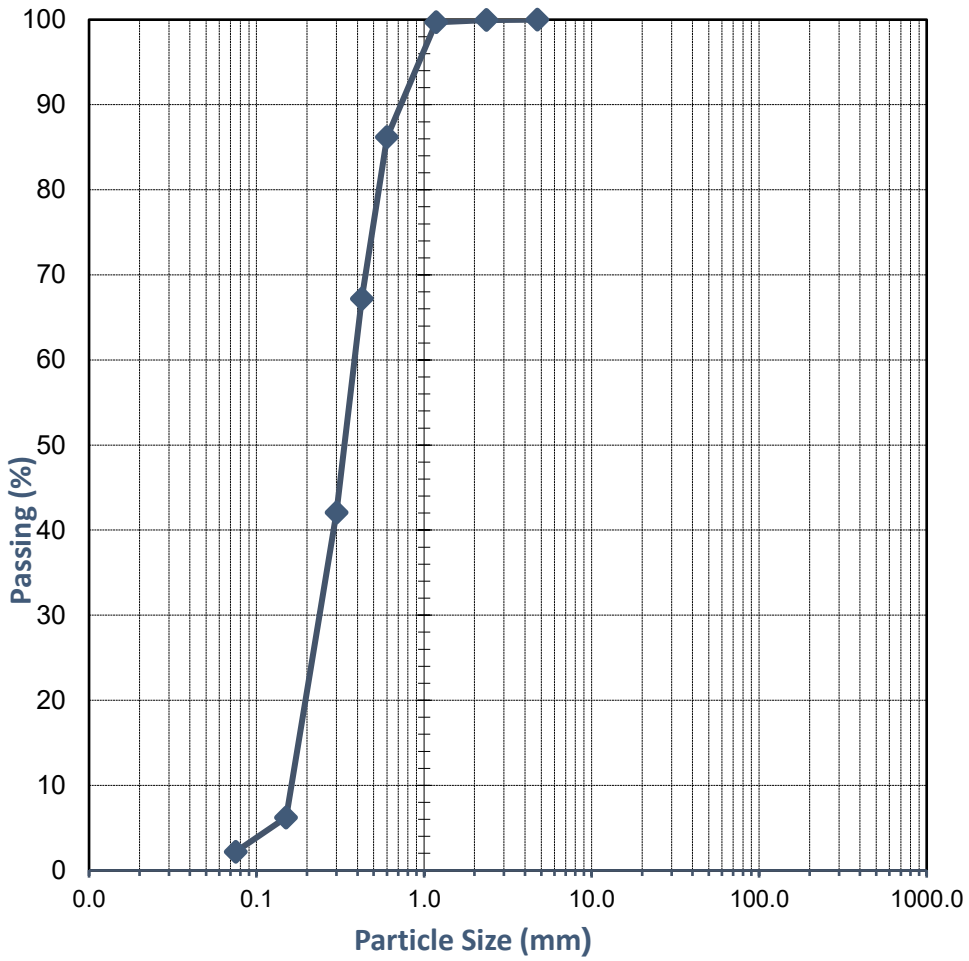
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7664_1_PSD
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7664
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH15 (x2 Large bags)	*Date Tested:*	30/04 - 01/05/2025

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	100
0.600	86
0.425	67
0.300	42
0.150	6
0.075	2



Comments:

Approved Signatory: Cody O'Neill

Name: Cody O'Neill

Date: 01/May/2025

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7664_1_PI
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7664
Location:	Ravenswood	*Date Sampled:*	16-04-2025
Sample Identification:	TH15 (x2 Large bags)	*Date Tested:*	2-05-2025

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Cody O'Neill

Date: 05-May-2025

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.5.2.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7664_1_MMDD
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7664
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH15 (x2 Large bags)	*Date Tested:*	30/04/2025

TEST RESULTS - Modified Maximum Dry Density

Sampling Method: Sampled by Client, Tested as Received

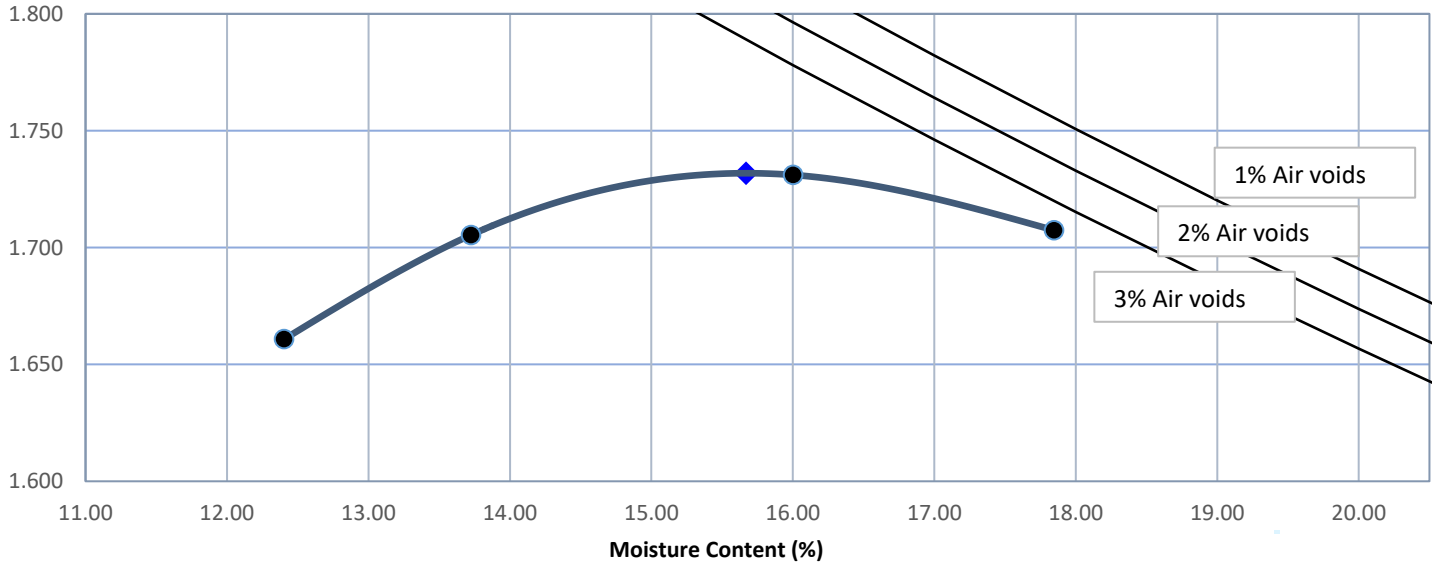
Sample Curing Time (Hours): >2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 0 **Material + 37.5mm (%)** -

Moisture Content (%)	**12.4**	**13.7**	**16.0**	**17.8**	
Dry Density (t/m³)	**1.661**	**1.705**	**1.731**	**1.707**	

Dry Density (t/m³)



Modified Maximum Dry Density (t/m³) **1.73**

Optimum Moisture Content (%) **15.5**

Comments: *The above air void lines are derived from a calculated apparent particle density of 2.594 t/m³*

Approved Signatory:

Name: Madhav Basnet

Date: 01/May/2025

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.6.1.1

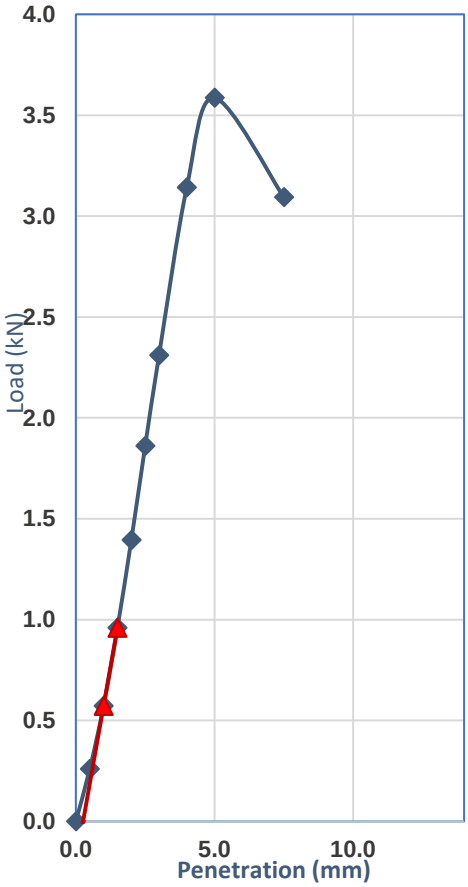
Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7664_1_SCBR
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7664
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH15 (x2 Large bags)	*Date Tested:*	30/04 - 09/05/2025

TEST RESULTS - CALIFORNIA BEARING RATIO

Sample Description: Sand

Sampling Method: Sampled by Client, Tested as Received

Load Penetration Curve



Compaction Details			
Compaction Method	AS 1289.5.2.1	Hammer Type	Modified
Plasticity Determined by	Estimated	Curing Time (Hours)	>96
% Retained 19.0mm	0	Excluded/Replaced	Excluded
Maximum Dry Density (t/m^3)	1.73	Optimum Moisture (%)	15.5
Target Dry Density Ratio (%)	96	Target Moisture Ratio (%)	100

Specimen Conditions At Compaction			
Dry Density (t/m3)	1.66	Moisture Content (%)	15.8
Density Ratio (%)	96.0	Moisture Ratio (%)	100.5

Specimen Conditions After Soak			
Soaked or Unsoaked	Soaked	Soaking Period (days)	4
Surcharges Applied (kg)	4.50	Measured Swell (%)	0.0
Dry Density (t/m³)	1.66	Dry Density Ratio (%)	96.0
Moisture Content (%)	18.0	Moisture Ratio (%)	114.5

Specimen Conditions After Test			
Top 30mm Moisture (%)	16.2	Remaining Depth (%)	16.8

Correction applied to Penetration: 0.3mm

Determined at a Penetration of: 5.0mm

California Bearing Ratio (CBR): 18%

Comments:

Approved Signatory:

Name: Connor Budimir

Date: 12/May/2025

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

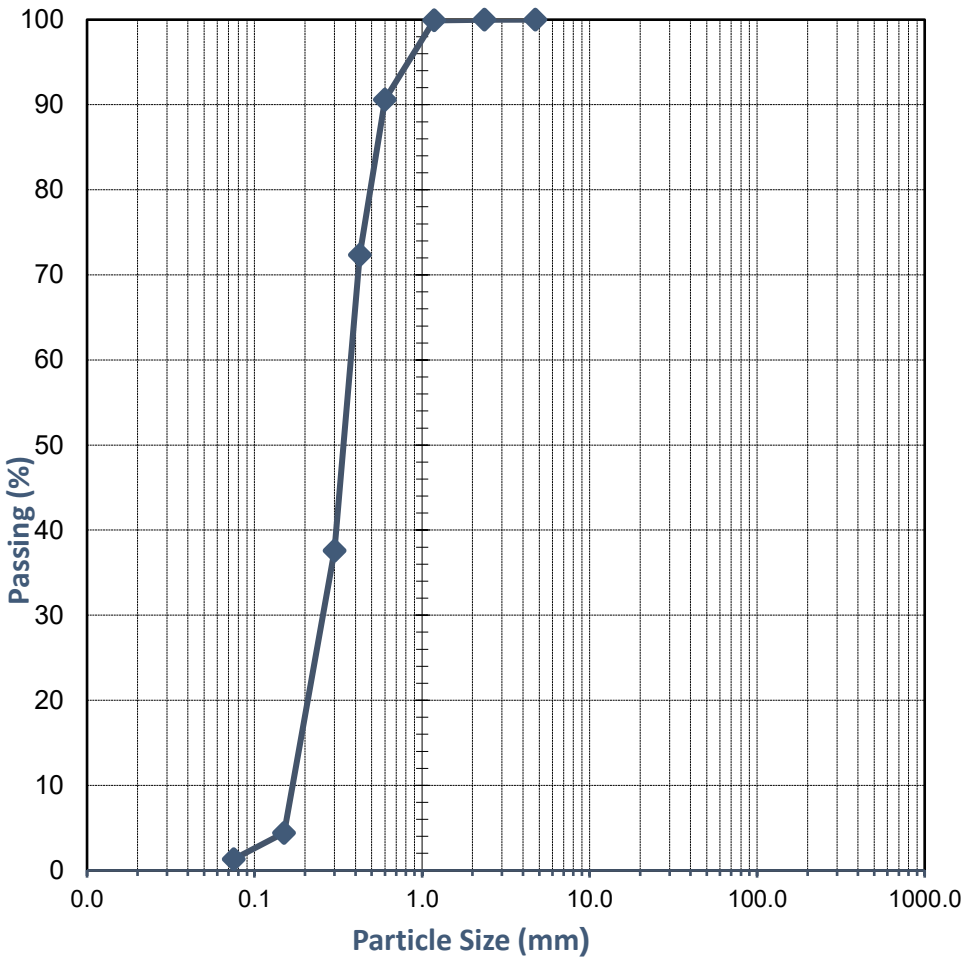
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7666_1_PSD
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7666
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH17 (x2 Large bags)	*Date Tested:*	30/04 - 01/05/2025

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	100
0.600	91
0.425	72
0.300	38
0.150	4
0.075	1



Comments:

Approved Signatory: Cody O'Neill

Name: Cody O'Neill

Date: 01/May/2025

Accreditation No. 20599
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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7666_1_PI
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7666
Location:	Ravenswood	*Date Sampled:*	16-04-2025
Sample Identification:	TH17 (x2 Large bags)	*Date Tested:*	2-05-2025

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Cody O'Neill

Date: 05-May-2025

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SOIL | AGGREGATE | CONCRETE | CRUSHING

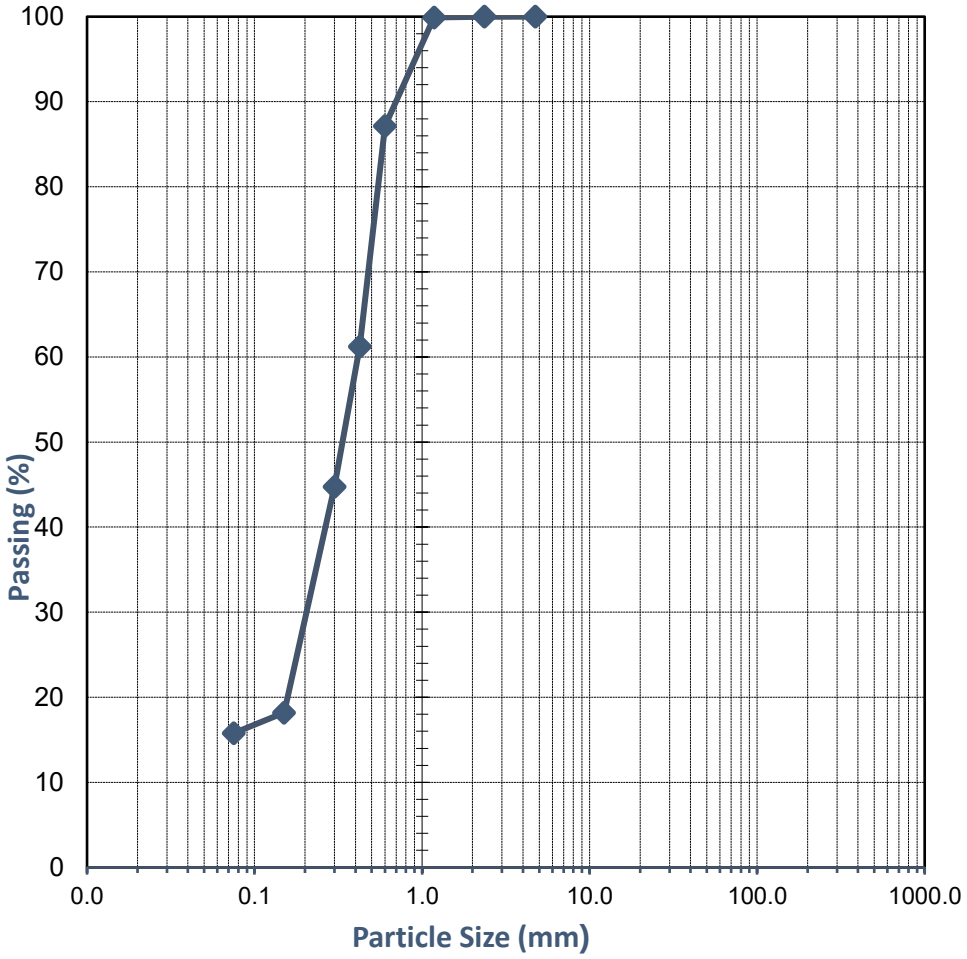
TEST REPORT - AS 1289.3.6.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7665_1_PSD
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7665
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH23 (x2 Large bags)	*Date Tested:*	30/04 - 01/05/2025

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	100
0.600	87
0.425	61
0.300	45
0.150	18
0.075	16



Comments:

Approved Signatory: Cody O'Neill

Name: Cody O'Neill

Date: 01/May/2025

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7665_1_PI
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7665
Location:	Ravenswood	*Date Sampled:*	16-04-2025
Sample Identification:	TH23 (x2 Large bags)	*Date Tested:*	2-05-2025

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Cody O'Neill

Date: 05-May-2025

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.5.2.1

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7665_1_MMDD
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7665
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH23 (x2 Large bags)	*Date Tested:*	30/04/2025

TEST RESULTS - Modified Maximum Dry Density

Sampling Method: Sampled by Client, Tested as Received

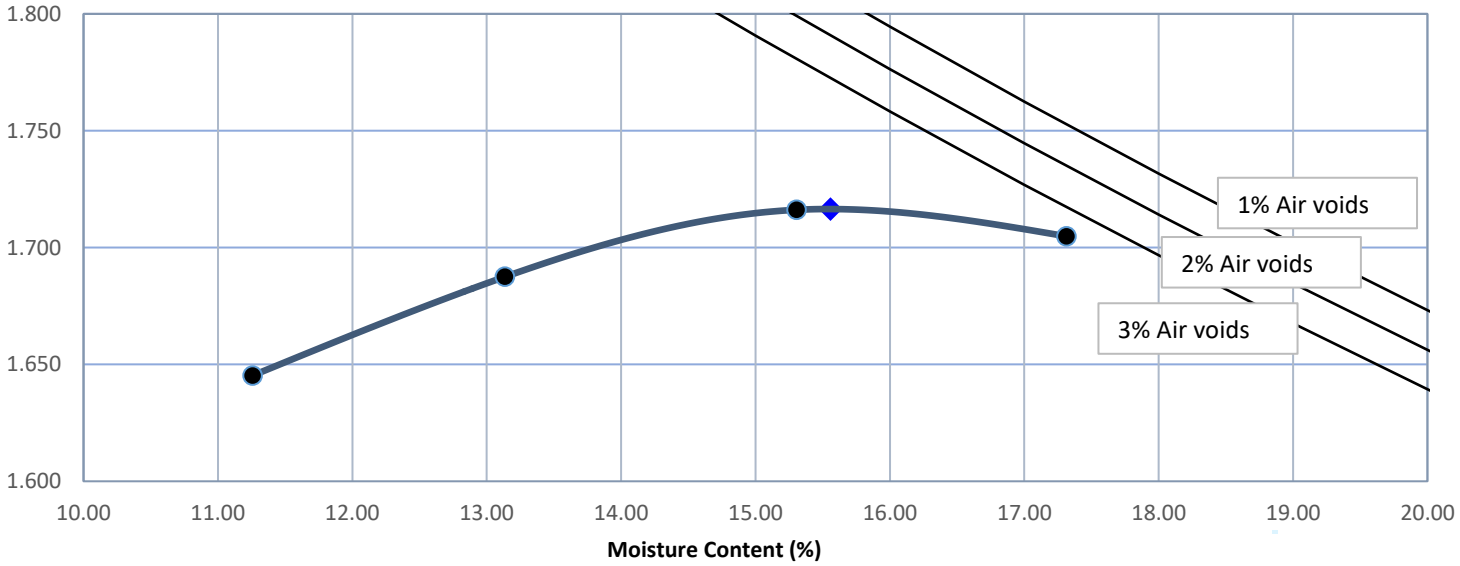
Sample Curing Time (Hours): 2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 0 **Material + 37.5mm (%)** -

Moisture Content (%)	**11.3**	**13.1**	**15.3**	**17.3**	
Dry Density (t/m³)	**1.645**	**1.688**	**1.716**	**1.705**	

Dry Density (t/m³)



Modified Maximum Dry Density (t/m³) **1.72**

Optimum Moisture Content (%) **15.5**

Comments: *The above air void lines are derived from a calculated apparent particle density of 2.553 t/m³*

Approved Signatory:

Name: Matthew Varady

Date: 01/May/2025

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.6.1.1

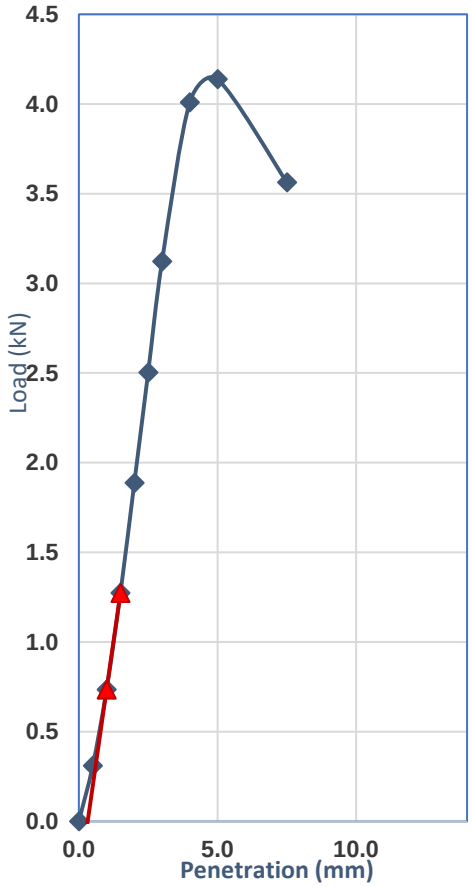
Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7665_1_SCBR
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7665
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH23 (x2 Large bags)	*Date Tested:*	30/04 - 09/05/2025

TEST RESULTS - CALIFORNIA BEARING RATIO

Sample Description: Sand

Sampling Method: Sampled by Client, Tested as Received

Load Penetration Curve



Compaction Details			
Compaction Method	AS 1289.5.2.1	Hammer Type	Modified
Plasticity Determined by	Estimated	Curing Time (Hours)	>96
% Retained 19.0mm	0	Excluded/Replaced	Excluded
Maximum Dry Density (t/m^3)	1.72	Optimum Moisture (%)	15.5
Target Dry Density Ratio (%)	96	Target Moisture Ratio (%)	100

Specimen Conditions At Compaction			
Dry Density (t/m3)	1.64	Moisture Content (%)	15.6
Density Ratio (%)	95.5	Moisture Ratio (%)	100.0

Specimen Conditions After Soak			
Soaked or Unsoaked	Soaked	Soaking Period (days)	4
Surcharges Applied (kg)	4.50	Measured Swell (%)	0.0
Dry Density (t/m³)	1.64	Dry Density Ratio (%)	95.5
Moisture Content (%)	17.2	Moisture Ratio (%)	110.5

Specimen Conditions After Test			
Top 30mm Moisture (%)	16.8	Remaining Depth (%)	18.0

Correction applied to Penetration: 0.3mm

Determined at a Penetration of: 2.5mm

California Bearing Ratio (CBR): 20%

Comments:

Approved Signatory:

Name: Connor Budimir

Date: 12/May/2025

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599

Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - ASTM D2974-20 (Test Method A)

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7658-7661_1_ORG
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7658-7661
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	Various - see below	*Date Tested:*	29/04 - 30/04/2025

TEST RESULTS - Organic Content

Sampling Method: Sampled by Client, Tested as Received

Testing Completed By: WGLS-SH

Furnace Temperature (°C): 440

Sample Number	Sample Identification	Ash Content (%)	Organic Content (%)
WG25.7658	TH01 (small bag)	91.5	8.5
WG25.7659	TH13 (small bag)	96.5	3.5
WG25.7660	TH15 (small bag)	95.0	5.0
WG25.7661	TH22 (small bag)	98.3	1.7

Comments:

Approved Signatory: Cody O'Neill

Name: Cody O'Neill

Date: 01/May/2025

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599

Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

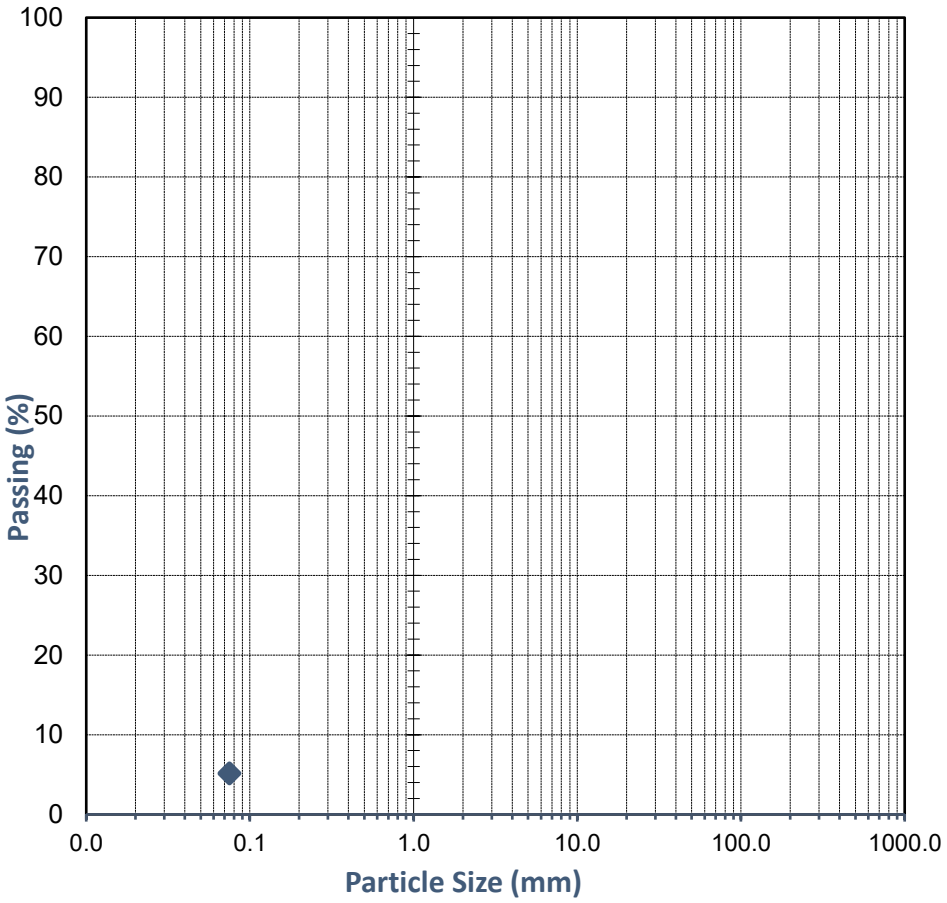
TEST REPORT - AS 1289.3.6.1 (% Fines)

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7658_1_%FINES
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7658
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH01 (small bag)	*Date Tested:*	30/04 - 01/05/2025

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	
1.18	
0.600	
0.425	
0.300	
0.150	
0.075	5



Comments: Clients request for the % Fines of Material passing 0.075mm only.

Approved Signatory:

Name: Cody O'Neill

Date: 01/May/2025

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

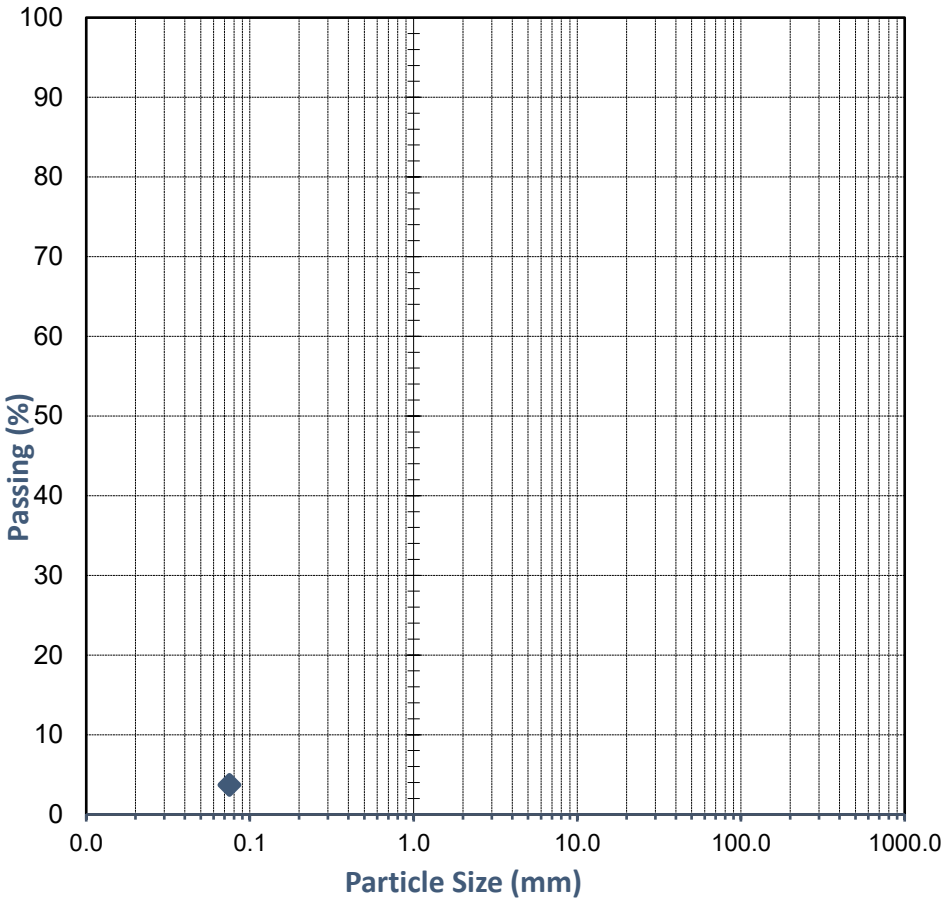
TEST REPORT - AS 1289.3.6.1 (% Fines)

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7659_1_%FINES
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7659
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH13 (small bag)	*Date Tested:*	30/04 - 01/05/2025

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	
1.18	
0.600	
0.425	
0.300	
0.150	
0.075	4



Comments: Clients request for the % Fines of Material passing 0.075mm only.

Approved Signatory:

Name: Cody O'Neill

Date: 01/May/2025

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

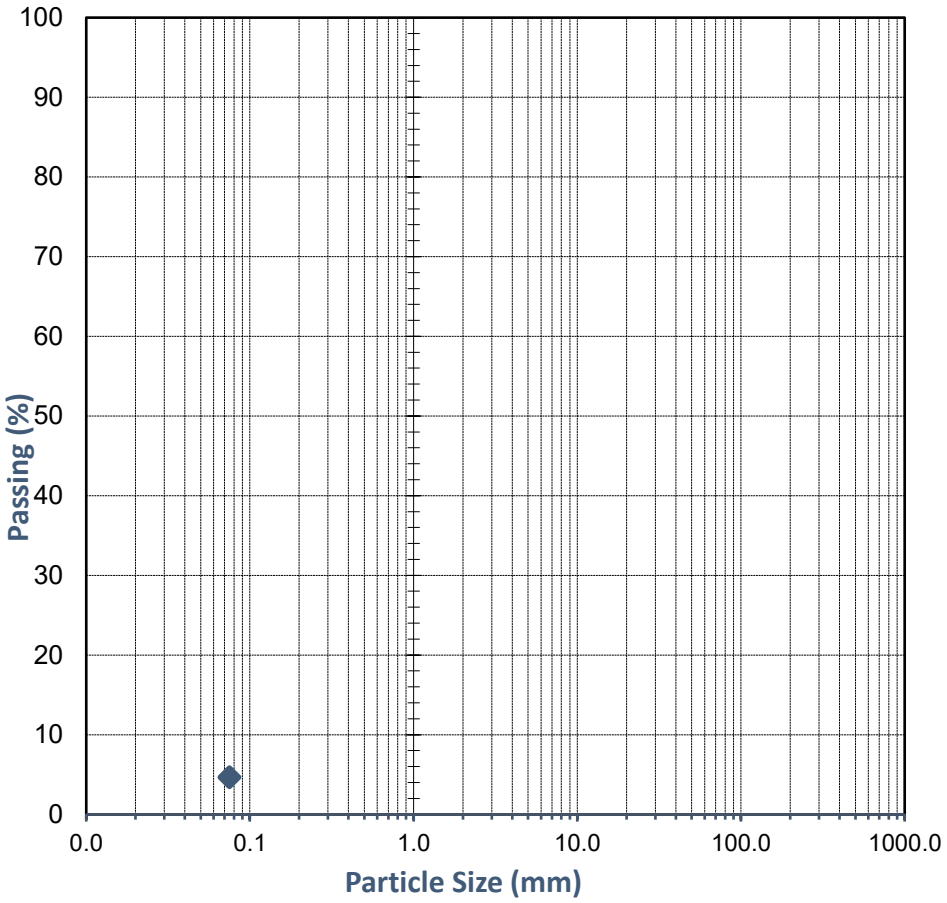
TEST REPORT - AS 1289.3.6.1 (% Fines)

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7660_1_%FINES
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7660
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH15 (small bag)	*Date Tested:*	30/04 - 01/05/2025

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	
1.18	
0.600	
0.425	
0.300	
0.150	
0.075	5



Comments: Clients request for the % Fines of Material passing 0.075mm only.

Approved Signatory:

Name: Cody O'Neill

Date: 01/May/2025

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

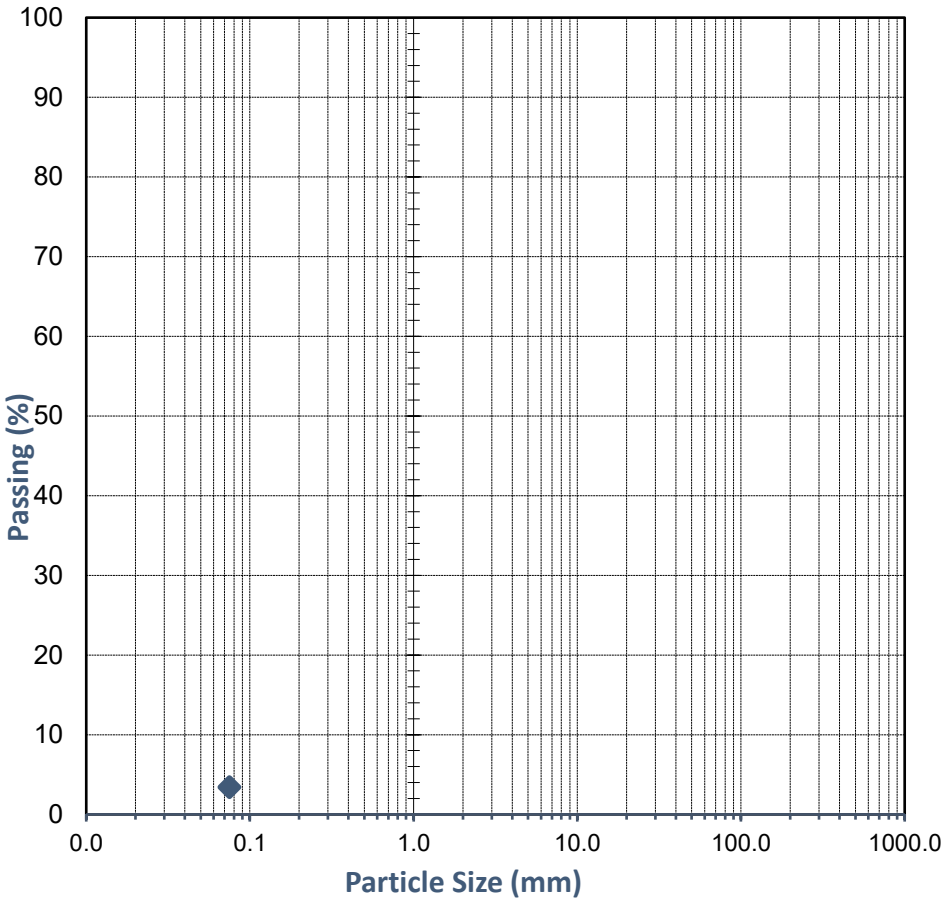
TEST REPORT - AS 1289.3.6.1 (% Fines)

Client:	Brown Geotechnical	*Ticket No.*	S17089
Client Address:	PO Box 278, Como WA 6952	*Report No.*	WG25.7661_1_%FINES
Project:	Lot 889 Rodereda Crescent	*Sample No.*	WG25.7661
Location:	Ravenswood	*Date Sampled:*	16/04/2025
Sample Identification:	TH22 (small bag)	*Date Tested:*	30/04 - 01/05/2025

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	
1.18	
0.600	
0.425	
0.300	
0.150	
0.075	3



Comments: Clients request for the % Fines of Material passing 0.075mm only.

Approved Signatory:

Name: Cody O'Neill

Date: 01/May/2025

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

CONDITIONS RELATING TO THIS REPORT

1. This report has been prepared for the sole use of the client. It has been issued in accordance with the agreed terms and scope detailed in the proposal for the investigation. No responsibility or liability to any third party is accepted for any damages arising out of the use of this report.

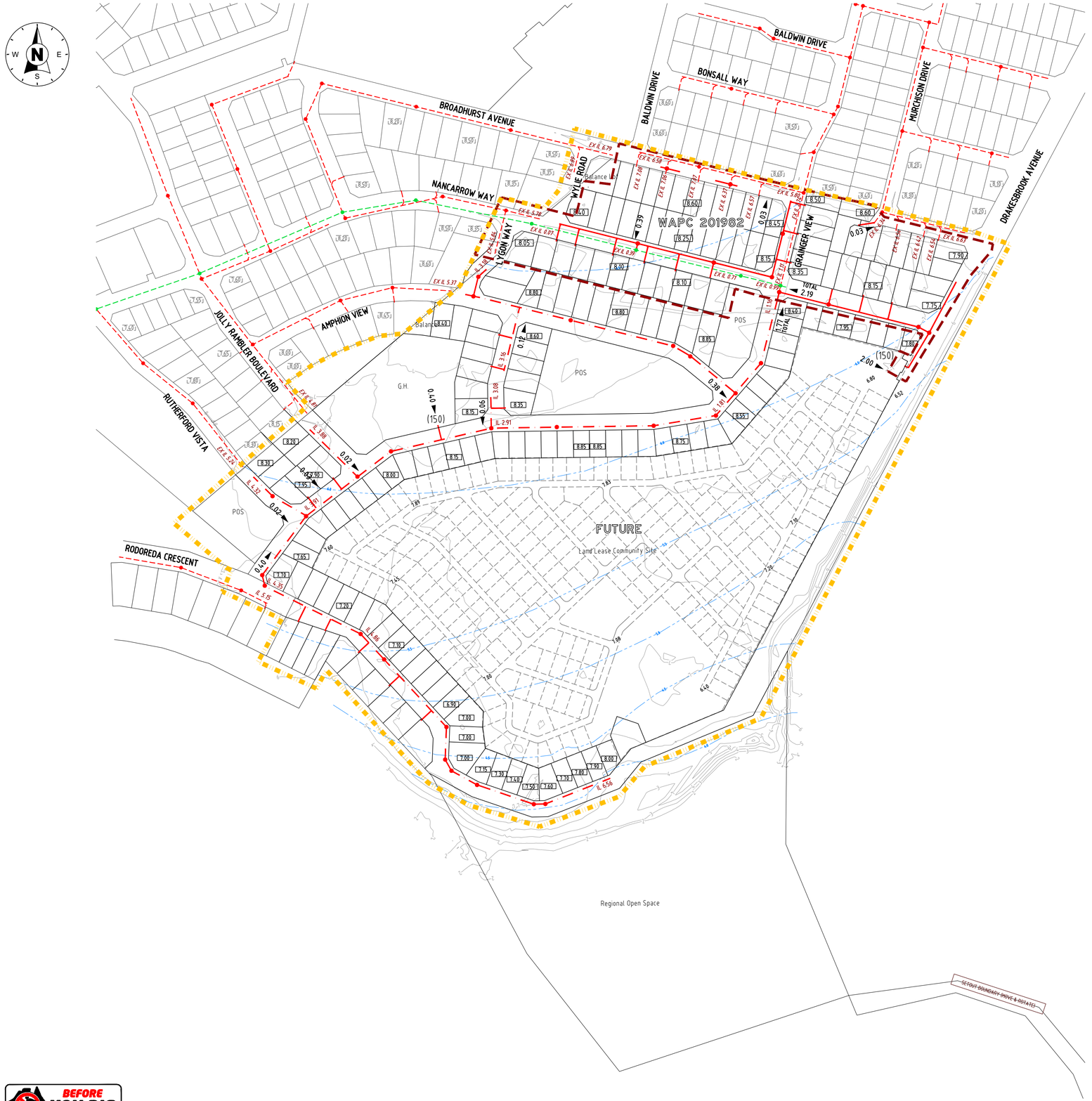
2. This report has been prepared by suitably qualified and experienced personnel for the purposes stated herein. Every care is taken with the report as it relates to interpretation of sub-surface conditions, discussion of findings and recommendations given. No responsibility for the consequences of extrapolation by others is accepted by the company.

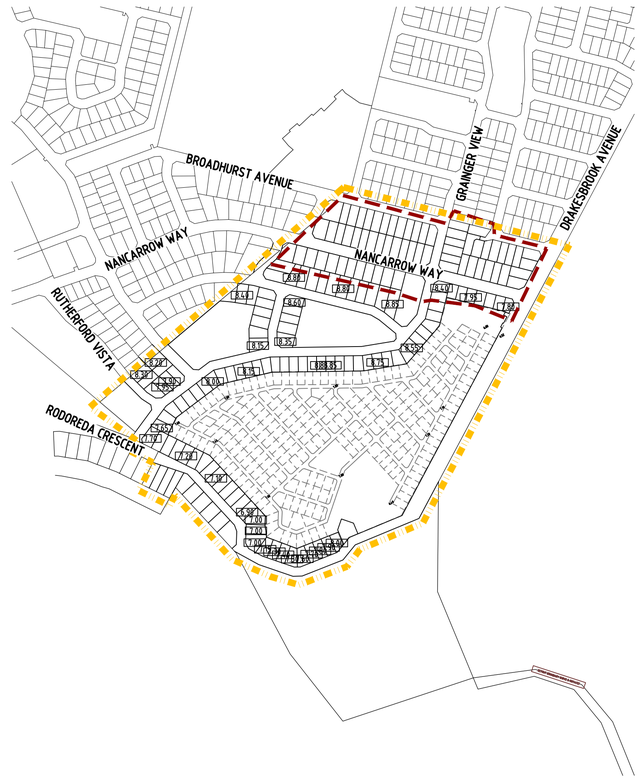
3. Findings and conclusions produced in the report are based on the investigation of the sub-surface through isolated locations. Conditions between investigated sites are based on extrapolation, interpretation and professional estimates. Unexpected variations in ground conditions often occur which cannot always be anticipated. The conclusions and recommendations in the report were considered accurate at the time of issue and based on certain assumptions at the time. Conditions and assumptions change with time and may affect the accuracy of the report.

4. Certain content within this report is based on information provided by the client and/or other parties and the accuracy of this information cannot be guaranteed.

5. These conditions must be read as part of the report and must be reproduced with all future copies.

6. The recommendations of this report should be considered a starting point. Recommendations should be continuously reviewed during the earthworks stage as sub-surface information and results from monitoring become available. It is strongly recommended that the Brown Geotechnical be retained to provide consultancy and/or inspections during the earthwork stages.





LOCALITY PLAN
SCALE 1:5000

NOTE

ALL COORDINATES SHOWN ON THIS DRAWING SHALL BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER IMMEDIATELY.

NOTE

NUMBER OF LOTS SERVED:

WAPC 201982 STAGE 1 = 61

FUTURE STAGES = 114

FUTURE LEND LEASE SITE = 258

LEGEND

- EXISTING GROUND CONTOUR
- EXISTING ANNUAL AVERAGE MAXIMUM GROUNDWATER LEVEL CONTOUR (AAMGL)
- WORKS AGREEMENT BOUNDARY
- EXISTING GRAVITY SEWER MAIN
- PROPOSED GRAVITY SEWER MAIN
- PROPOSED GRAVITY SEWER MAIN
- FUTURE GRAVITY SEWER MAIN
- STAGE BOUNDARY
- FLOW IN L/s
- FINISHED LOT LEVEL
- EXISTING FINISHED LOT LEVEL
- SEWER DEPTH OVER 5m
- CONTROL LINE

SIZING LEGEND

- DN300 OR ABOVE
- DN225
- DN150

1:2000 0m 40 80 120m

1:5000 0m 100 200 300m

W.A.P.C. No 201982

LOCAL AUTHORITY SHIRE OF MURRAY

THIS PLAN IS ACCEPTED AS COMPLYING WITH OVERALL SCHEME PLANNING. COMPLIANCE WITH THE WATER CORPORATION DESIGN STANDARDS OR STATUTORY REQUIREMENTS HAS NOT BEEN CHECKED AND REMAINS THE RESPONSIBILITY OF THE CONSULTING ENGINEER.

Michael Hoglin Feb 02, 2026
Name Date ..... DATE .....

MANAGER DEVELOPMENT SERVICES

EXISTING MAINS TO BE SURVEYED FOR LOCATION AND LEVEL BEFORE CONSTRUCTION COMMENCES

OZ12-200-001-01A

FILE No. 206233827 RETICULATION AREA

BEFORE YOU DIG www.byda.com.au

PROJECT:
LOT 889 RODOREDA CRESCENT RAVENSWOOD

No.	DATE	REVISION	BY
B	20-1-2026	UPDATED AS PER WCWA AND UPDATED MASTERPLAN	MEG
A	2-1-2025	ISSUED FOR APPROVAL	TN

Porter Consulting Engineers
Level 2 Kishorn Court
58 Kishorn Road
Mt Pleasant 6153 WA
PO Box 1036
Canning Bridge 6153 WA
Tel (08) 9315 9955
Email. office@porterenq.com.au
www.porterenq.com.au
TUSMO Pty Ltd ACN 070 097 548 as trustee for the Consulting Engineering Unit Trust trading as Porter Consulting Engineers ABN 78 636 396 385

CLIENT:
REALISE RESIDENTIAL WA 2 PTY LTD

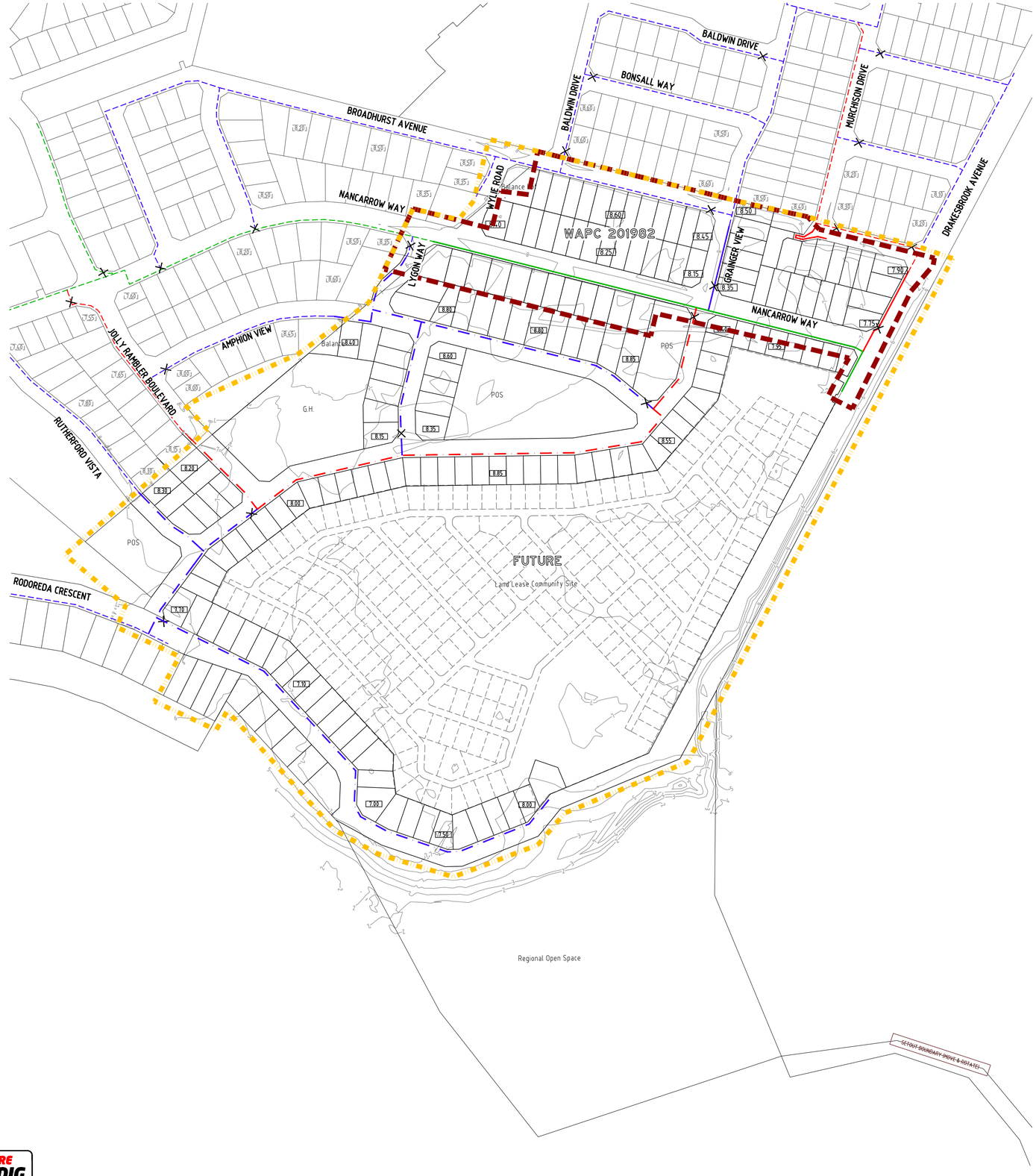
DRAWING:
SEWER RETICULATION CONCEPT PLAN

STATUS: **FOR APPROVAL**

SCALE	1:2000
DATE	Jan-26
DESIGN	SCH
DRAWN	MEG
CHECK	
APP'D	

DRAWING No. 24-12-163/0/200 | REV No. B | ORIGINAL DRAWING SIZE A1

FILE NAME ...63\ACAD\STAGE 0\24-12163-0-200.dwg



LOCALITY PLAN

SCALE 1:5000

GENERAL NOTES

1. ALL PIPES AND FITTINGS SHALL BE LAID ON AN ALIGNMENT OF 2.1m FROM THE CENTRE OF THE PIPE TO THE ROAD RESERVE BOUNDARY, UNLESS OTHERWISE SHOWN ON THIS DRAWING

LEGEND

- EXISTING GROUND CONTOUR
- WORKS AGREEMENT BOUNDARY
- STAGE BOUNDARY
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- FUTURE WATER MAIN
- VALVE
- EXISTING SURFACE CONTOURS - 1.0m CONTOURS

NOTE

NUMBER OF LOTS SERVED:

WAPC 201982 STAGE 1 = 61

FUTURE STAGES = 114

FUTURE LEND LEASE SITE = 258

SIZING LEGEND

- DN200
- DN150
- DN100

NOTE
LAND USE IS SINGLE RESIDENTIAL.

NOTE
LIMIT OF SUPPLY 18m AHD (GROUND LEVEL).

WATER RETICULATION DETAILS

WAPC No	:	201982
FILE	:	206233827
PLAN	:	OZ12-100-001-01A

THIS PLAN IS ACCEPTED AS COMPLYING WITH OVERALL SCHEME PLANNING. COMPLIANCE WITH THE WATER CORPORATION DESIGN STANDARDS OR STATUTORY REQUIREMENTS HAS NOT BEEN CHECKED AND REMAINS THE RESPONSIBILITY OF THE CONSULTING ENGINEER.

Michael Hoglin — Feb 02, 2026
Name — Date

..... FOR MANAGER LAND SERVICING

1:2000 0m 40 80 120m

1:5000 0m 100 200 300m

BEFORE YOU DIG www.byda.com.au

PROJECT:
LOT 889 RODOREDA CRESCENT RAVENSWOOD

No	DATE	REVISION	BY
B	20-1-2026	UPDATED AS PER WCWA AND UPDATED MASTERPLAN	MEG
A	2-1-2025	ISSUED FOR APPROVAL	TN

Porter Consulting Engineers
Level 2 Kishorn Court
58 Kishorn Road
Mt Pleasant 6153 WA
PO Box 1036
Canning Bridge 6153 WA
Tel (08) 9315 9955
Email office@portereng.com.au
www.portereng.com.au
TUSMO Pty Ltd ACN 070 097 148 as trustee for the Consulting Engineering Unit Trust trading as Porter Consulting Engineers ABN 78 636 396 385

CLIENT:
REALISE RESIDENTIAL WA 2 PTY LTD

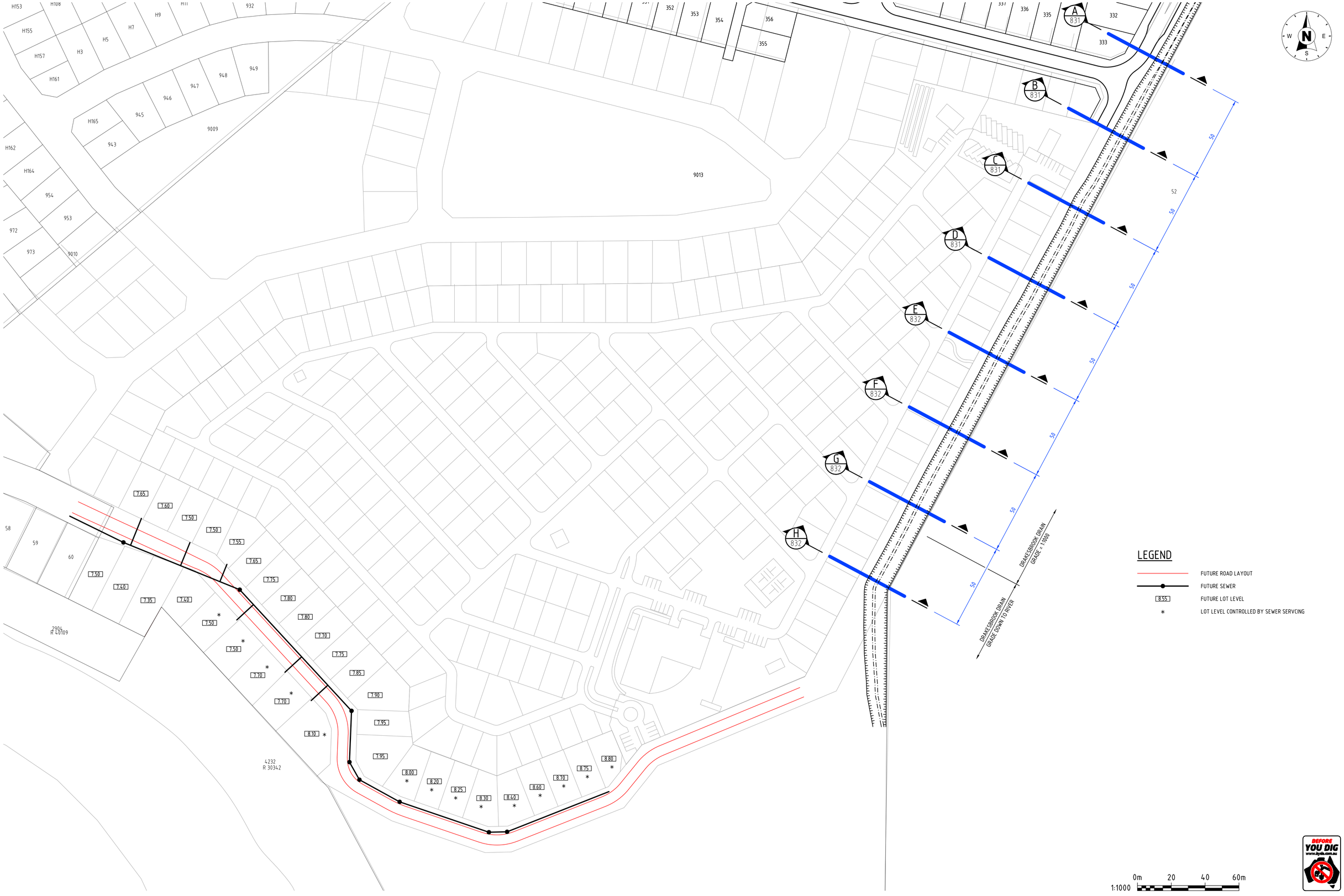
DRAWING:
WATER RETICULATION CONCEPT PLAN

STATUS: **FOR APPROVAL**

SCALE	1:2000
DATE	Jan-26
DESIGN	SCH
DRAWN	MEG
CHECK	
APP'D	

DRAWING No. 24-12-163/0/300 | REV No. B | ORIGINAL DRAWING SIZE A1

FILE NAME ..63\ACAD\STAGE 01\241263-0-300.dwg



PROJECT:

LOT 889 RODOREDA CRESCENT RAVENSWOOD

No.	DATE	REVISION	BY
A	16-10-2025	ISSUED FOR INFORMATION	DLC

Porter Consulting Engineers

Level 2 Kishorn Court
58 Kishorn Road
Mt Pleasant 6153 WA

PO Box 1036
Canning Bridge 6153 WA

Tel (08) 9315 9955
Email office@porterenq.com.au
www.porterenq.com.au

TUSMO Pty Ltd ACN 070 097 948 as trustee for the Consulting Engineering Unit Trust trading as Porter Consulting Engineers ABN 78 636 396 385

CLIENT:

REALISE RESIDENTIAL WA 2 PTY LTD

DRAWING:

DRAKESBROOK INTERFACE CROSS SECTIONS REFERENCE PLAN

STATUS: **FOR INFORMATION**

SCALE	1:1000
DATE	Oct-25
DESIGN	DLC
DRAWN	DLC
CHECK	
APP'D	

DRAWING No. **24-12-163/0/800**

REV No. **A**

ORIGINAL DRAWING SIZE **A1**

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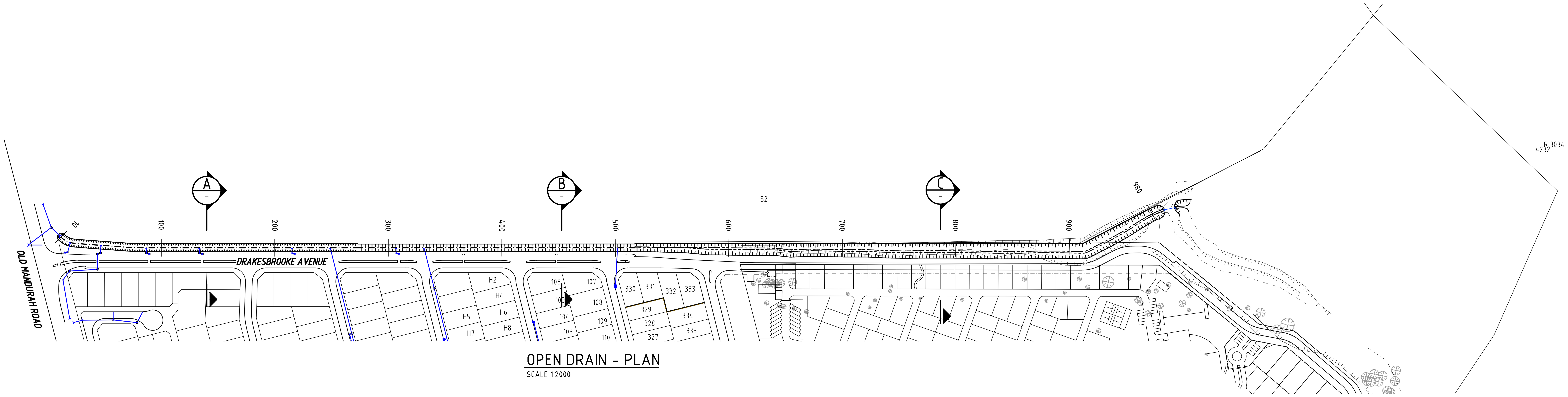
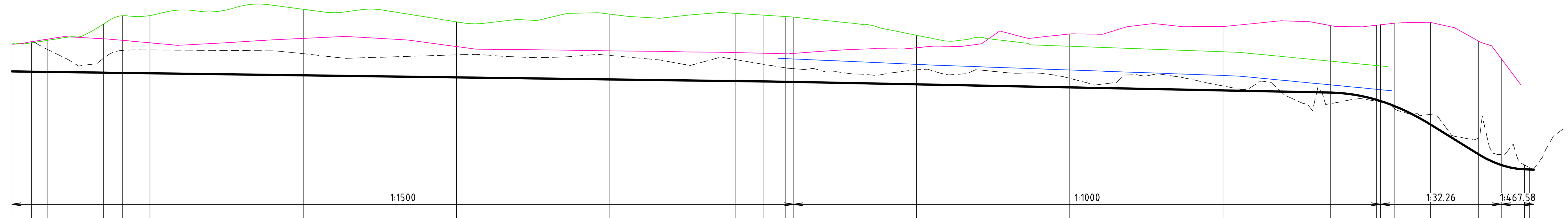


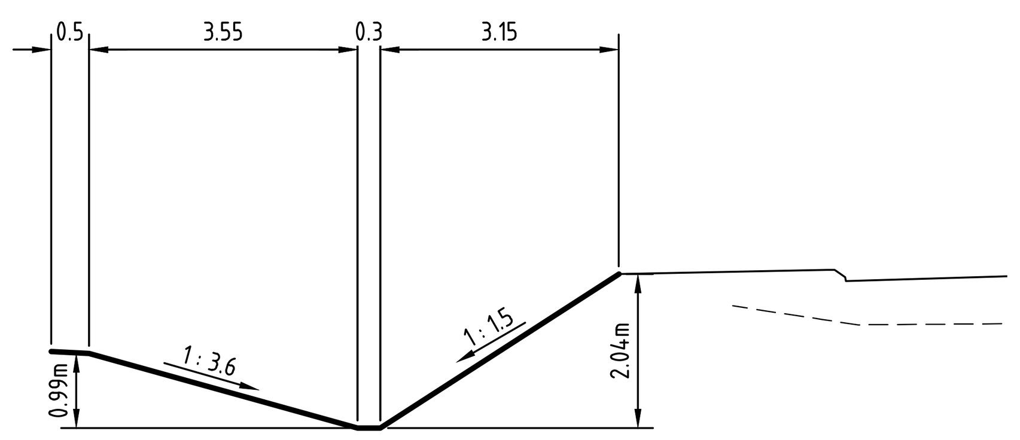
OPEN DRAIN - PLAN
SCALE 1:2000



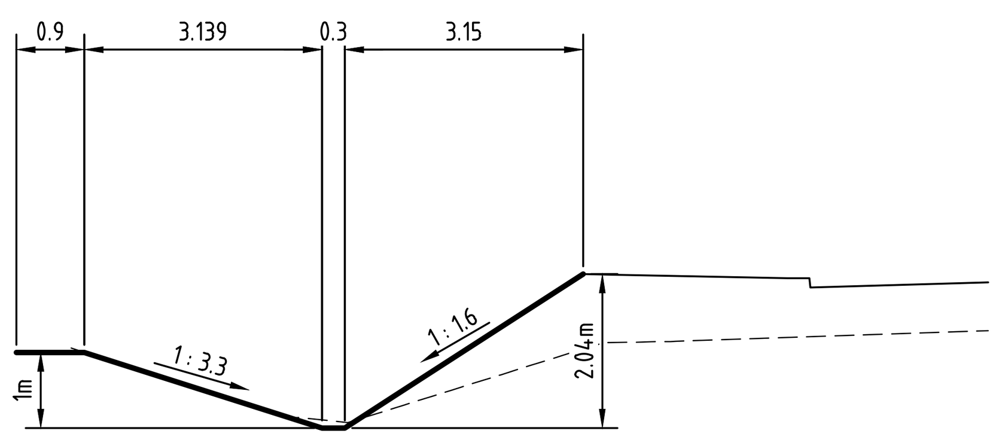
PEGGED CL CHAINAGE	1% AEP HGL	DEPTH OF OPEN DRAIN	LHS TOP OF OPEN DRAIN	RHS TOP OF OPEN DRAIN	OPEN DRAIN INVERT
-10.000					
0.000					
10.000		0.890	6.480	6.480	5.590
22.836		0.944	6.562	6.526	5.582
32.996		1.029	6.643	6.604	5.575
69.787		1.107	6.658	7.142	5.550
82.264		1.064	6.606	7.412	5.542
100.000		0.995	6.525	7.416	5.530
200.000		1.206	6.670	7.621	5.464
300.000		1.007	6.403	7.210	5.397
400.000		0.933	6.263	7.462	5.330
481.712		0.931	6.206	7.488	5.276
500.000	6.02	0.922	6.186	7.430	5.264
514.376		0.915	6.169	7.384	5.254
520.000		0.931	6.181	7.364	5.250
600.000	5.80	1.194	xxxx	6.772	5.170
700.000	5.62	1.343	6.831	6.413	5.070
800.000	5.44	1.263	7.056	6.233	4.970
870.216		1.026	7.086	5.926	4.900
900.000	4.96	1.181	7.100	5.783	4.665
902.716		1.146	7.115	5.770	4.624
912.045			7.168		4.454
914.064			7.168		4.412
935.216			7.194		3.860
966.487			6.586		2.890
981.487			6.008		2.534
996.487					2.393
1000.000					2.386

LEGEND

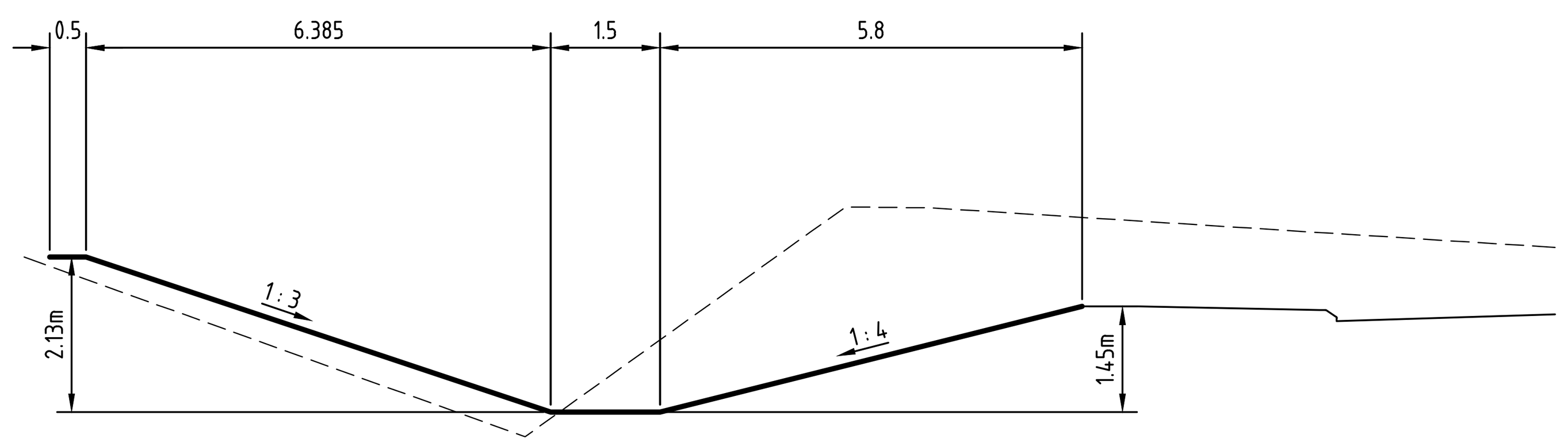
- OPEN DRAIN LAYOUT
- DESIGN SURFACE
- EXISTING SURFACE
- EXISTING DRAINAGE
- 4.00 FUTURE ROAD LEVEL
- 4.00 EXISTING LEVEL
- EXISTING EMBANKMENT
- EXISTING TREE



SECTION - A
HORIZONTAL SCALE 1:100
VERTICAL SCALE 1:100



SECTION - B
HORIZONTAL SCALE 1:100
VERTICAL SCALE 1:100



SECTION - C
HORIZONTAL SCALE 1:100
VERTICAL SCALE 1:100

1:100 — 0m 2.0 4.0 6.0m
1:2000 — 0m 40 80 120m

BEFORE YOU DIG www.byda.com.au

PROJECT:
LOT 889 RODOREDA CRESCENT RAVENSWOOD

No.	DATE	REVISION	BY
B	28-11-2025	DRAIN LONGSECTION UPDATED	DLC
A	30-10-2025	ISSUED FOR INFORMATION	TN

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TUSNO Pty Ltd ACN 070 097 148 as trustee for the Consulting Engineering Unit Trust trading as Porter Consulting Engineers ABN 78 636 396 385

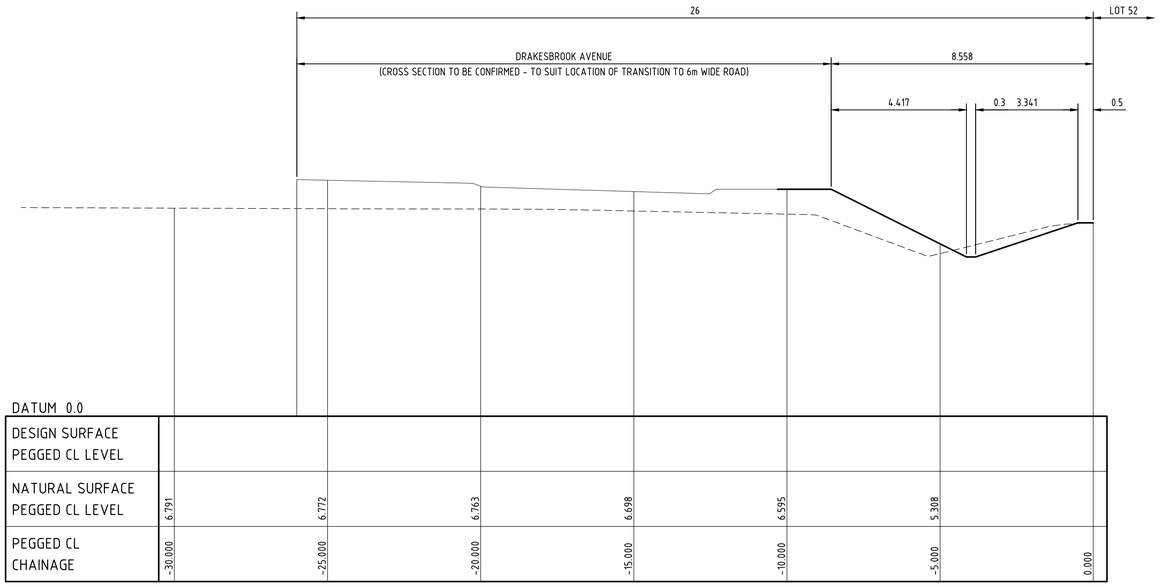
CLIENT:
REALISE RESIDENTIAL WA 2 PTY LTD

DRAWING:
CONCEPT OPEN DRAIN PLAN

STATUS: **FOR INFORMATION**

SCALE	AS SHOWN
DATE	Nov-25
DESIGN	DLC
DRAWN	TN
CHECK	
DRAWING No.	24-12-163/0/803
REV No.	B
ORIGINAL DRAWING SIZE	A1
FILE NAME	..63\ACAD\STAGE 0\2412163-0-803.dwg
APP'D	

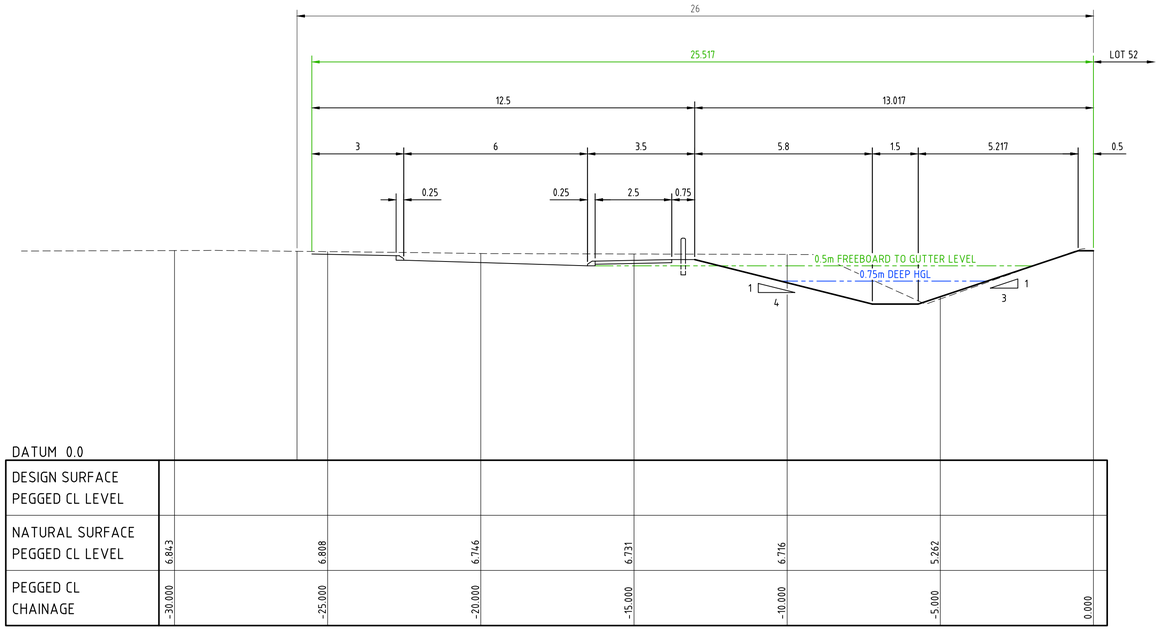
CONSULT AUSTRALIA



DATUM 0.0

DESIGN SURFACE PEGGED CL LEVEL							
NATURAL SURFACE PEGGED CL LEVEL	6.791	6.772	6.763	6.698	6.595	5.308	
PEGGED CL CHAINAGE	-30.000	-25.000	-20.000	-15.000	-10.000	-5.000	0.000

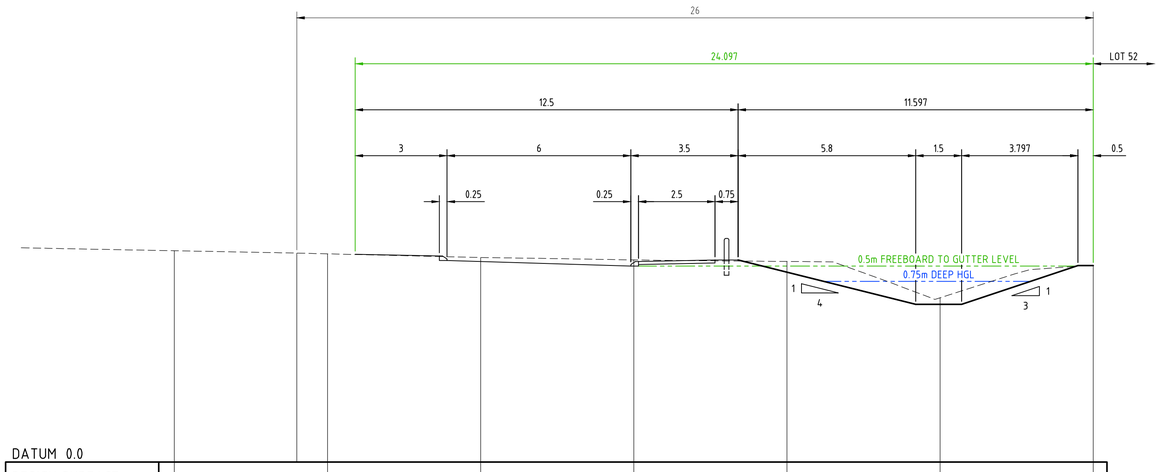
Section A
HORIZONTAL SCALE 1:100
VERTICAL SCALE 1:100



DATUM 0.0

DESIGN SURFACE PEGGED CL LEVEL							
NATURAL SURFACE PEGGED CL LEVEL	6.843	6.808	6.746	6.731	6.716	5.262	
PEGGED CL CHAINAGE	-30.000	-25.000	-20.000	-15.000	-10.000	-5.000	0.000

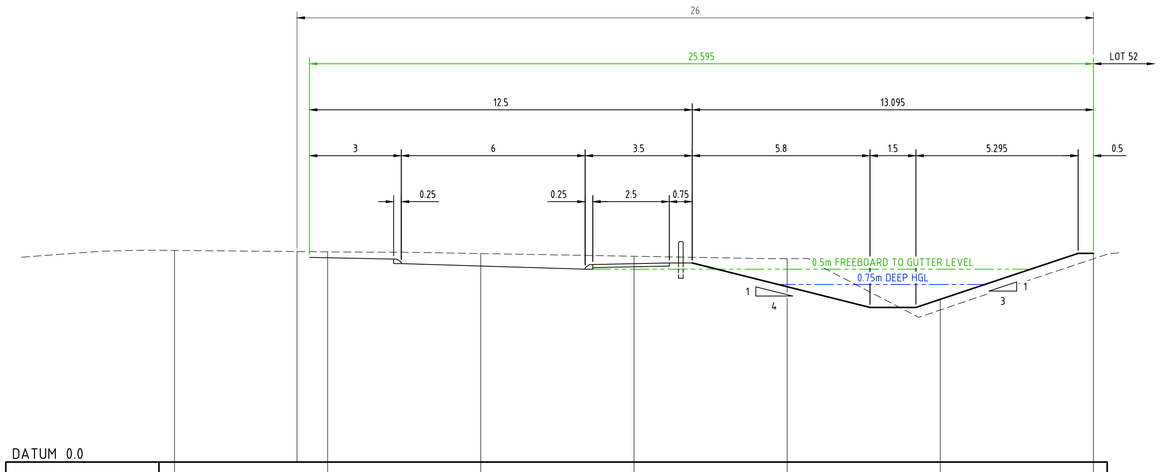
Section C
HORIZONTAL SCALE 1:100
VERTICAL SCALE 1:100



DATUM 0.0

DESIGN SURFACE PEGGED CL LEVEL							
NATURAL SURFACE PEGGED CL LEVEL	6.898	6.797	6.678	6.599	6.548	5.365	
PEGGED CL CHAINAGE	-30.000	-25.000	-20.000	-15.000	-10.000	-5.000	0.000

Section B
HORIZONTAL SCALE 1:100
VERTICAL SCALE 1:100



DATUM 0.0

DESIGN SURFACE PEGGED CL LEVEL							
NATURAL SURFACE PEGGED CL LEVEL	6.908	6.862	6.806	6.718	6.638	4.964	6.634
PEGGED CL CHAINAGE	-30.000	-25.000	-20.000	-15.000	-10.000	-5.000	0.000

Section D
HORIZONTAL SCALE 1:100
VERTICAL SCALE 1:100

0m 2 4 6m
1:100

PROJECT:
LOT 889 RODOREDA CRESCENT RAVENSWOOD

No.	DATE	REVISION	BY
A	16-10-2025	ISSUED FOR INFORMATION	DLC

Porter Consulting Engineers

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TUSMO Pty Ltd ACN 070 097 948 as Trustee for The Consulting Engineering Unit Trust trading as Porter Consulting Engineers ABN 78 636 396 385

CLIENT:
REALISE RESIDENTIAL WA 2 PTY LTD

DRAWING:
DRAKESBROOK INTERFACE CROSS SECTIONS SHEET 1

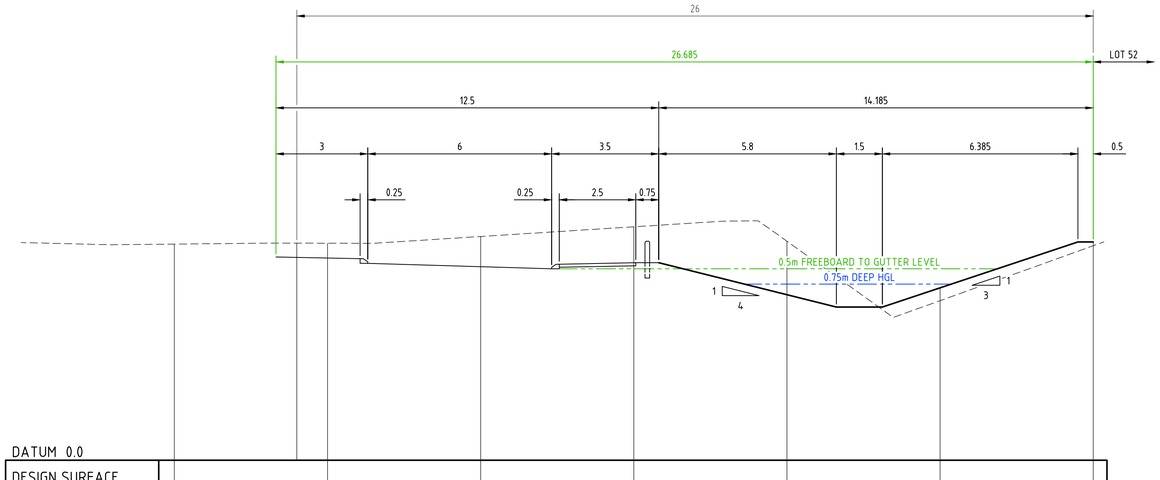
STATUS: **FOR INFORMATION**

SCALE	1:100
DATE	Oct-25
DESIGN	DLC
DRAWN	DLC
CHECK	

DRAWING No. 24-12-163/0/831 | REV No. A | ORIGINAL DRAWING SIZE A1

FILE NAME .63\ACAD\STAGE 01\24121163-0-831-832.dwg

APP'D

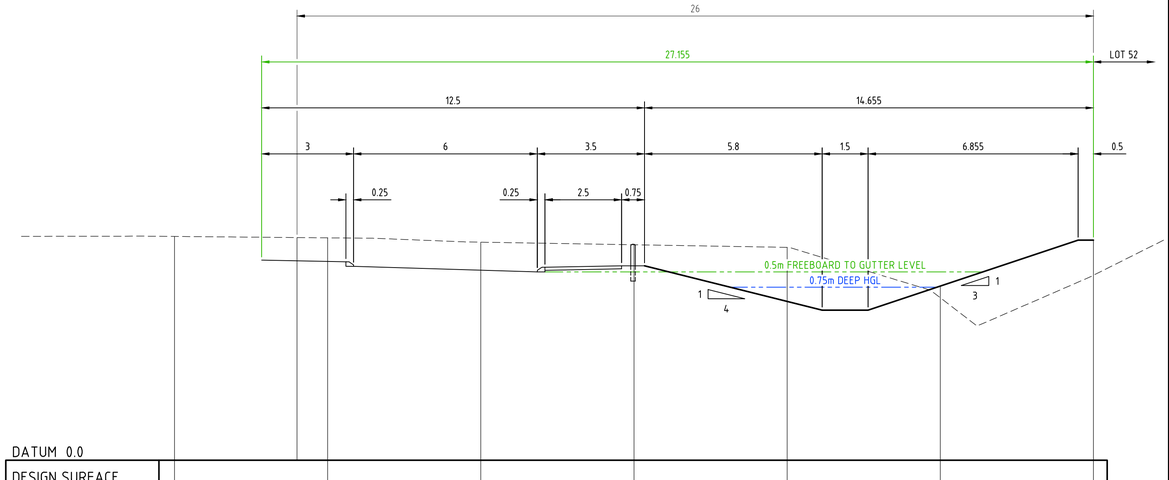


DATUM 0.0

DESIGN SURFACE PEGGED CL LEVEL							
NATURAL SURFACE PEGGED CL LEVEL	7.054	7.083	7.302	7.619	7.147	5.207	7.000
PEGGED CL CHAINAGE	-30.000	-25.000	-20.000	-15.000	-10.000	-5.000	0.000

Section E

HORIZONTAL SCALE 1:100
VERTICAL SCALE 1:100

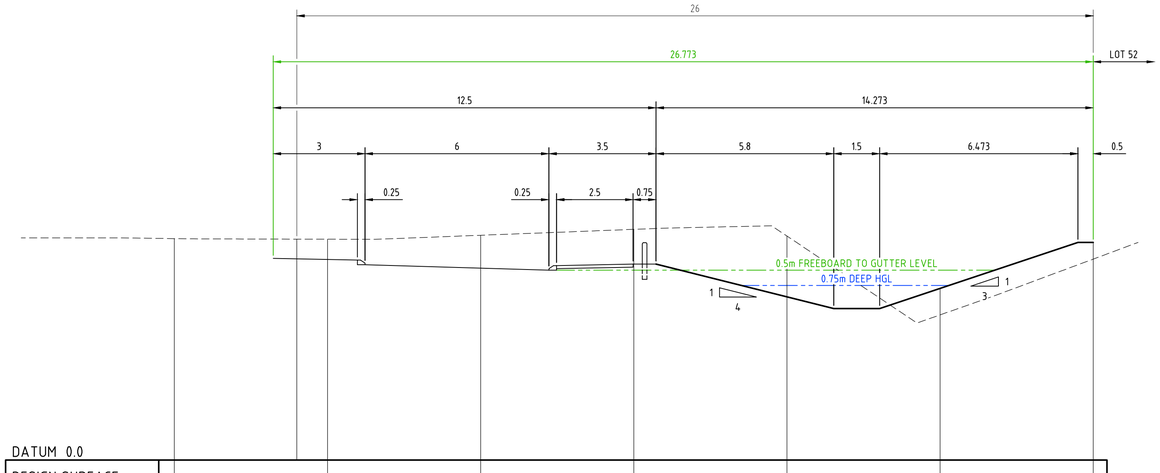


DATUM 0.0

DESIGN SURFACE PEGGED CL LEVEL							
NATURAL SURFACE PEGGED CL LEVEL	7.394	7.259	7.118	7.032	6.947	5.305	6.036
PEGGED CL CHAINAGE	-30.000	-25.000	-20.000	-15.000	-10.000	-5.000	0.000

Section G

HORIZONTAL SCALE 1:100
VERTICAL SCALE 1:100

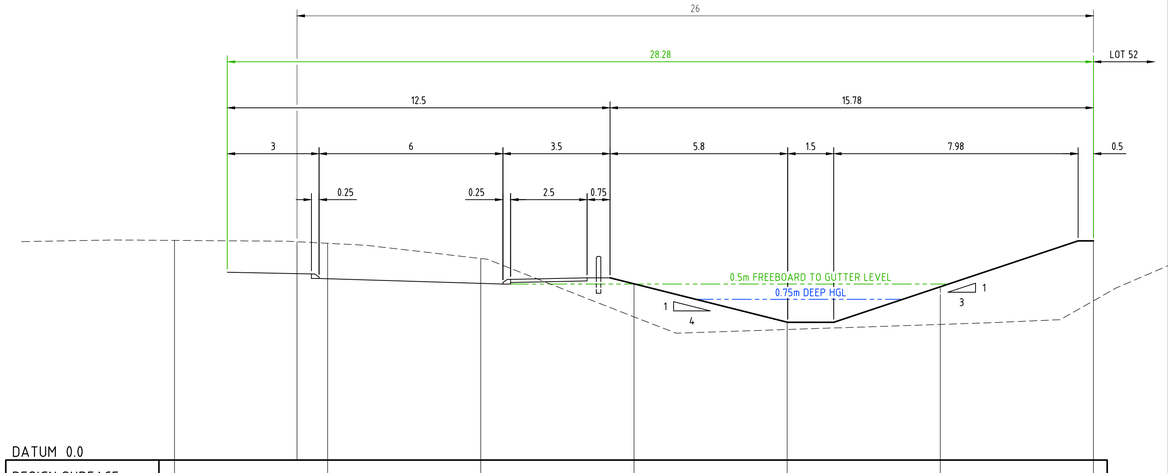


DATUM 0.0

DESIGN SURFACE PEGGED CL LEVEL							
NATURAL SURFACE PEGGED CL LEVEL	7.229	7.209	7.338	7.531	7.313	4.739	6.561
PEGGED CL CHAINAGE	-30.000	-25.000	-20.000	-15.000	-10.000	-5.000	0.000

Section F

HORIZONTAL SCALE 1:100
VERTICAL SCALE 1:100



DATUM 0.0

DESIGN SURFACE PEGGED CL LEVEL							
NATURAL SURFACE PEGGED CL LEVEL	7.170	7.076	6.579	4.675	4.261	4.428	5.197
PEGGED CL CHAINAGE	-30.000	-25.000	-20.000	-15.000	-10.000	-5.000	0.000

Section H

HORIZONTAL SCALE 1:100
VERTICAL SCALE 1:100

0m 2 4 6m
1:100

PROJECT:

LOT 889 RODOREDA CRESCENT RAVENSWOOD

No.	DATE	REVISION	BY
A	16-10-2025	ISSUED FOR INFORMATION	DLC

Porter Consulting Engineers

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TUSMO Pty Ltd ACN 070 097 948 as trustee for the Consulting Engineering Unit Trust trading as Porter Consulting Engineers ABN 78 636 396 385

CLIENT:

REALISE RESIDENTIAL WA 2 PTY LTD

DRAWING:

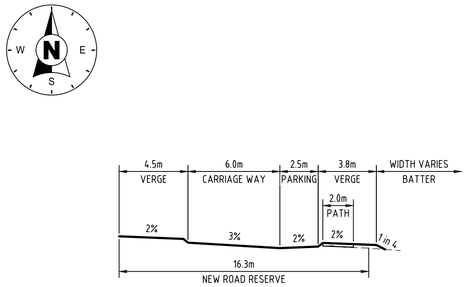
DRAKESBROOK INTERFACE CROSS SECTIONS SHEET 2

STATUS: **FOR INFORMATION**

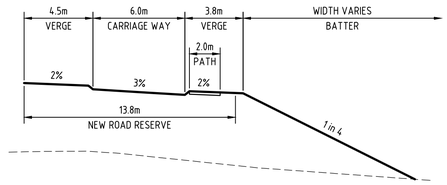
SCALE	1:100
DATE	Oct-25
DESIGN	DLC
DRAWN	DLC
CHECK	
APP'D	

DRAWING No. **24-12-163/0/832** | REV No. **A** | ORIGINAL DRAWING SIZE **A1**

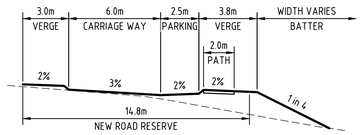
FILE NAME .63\ACAD\STAGE 01\24121163-0-831-832.dwg



A SECTION
HOR. SCALE 1:200
VER. SCALE 1:100



B SECTION
HOR. SCALE 1:200
VER. SCALE 1:100



C SECTION
HOR. SCALE 1:200
VER. SCALE 1:100

LEGEND

- OPEN DRAIN
- FUTURE ROAD LAYOUT
- FUTURE PATH LAYOUT
- BOTTOM OF BATTER
- NEW CADASTRAL BOUNDARY
- PROPOSED RETAINING WALL
- 8.55 FUTURE LOT LEVEL
- FUTURE GROUND CONTOUR
- EXISTING GROUND CONTOUR (0.25m INTERVAL)
- 15.22 EXISTING LEVEL
- EXISTING TREE
- EXISTING EMBANKMENT
- #1 SURVEY MARKS
- D PROPOSED CULVERT HEADWALL AND PIPE

1:100 0m 2.0 4.0 6.0m
1:200 0m 4.0 8.0 12.0m
1:500 0m 10.0 20.0 30.0m

BEFORE YOU DIG www.byda.com.au

PROJECT:
LOT 889 RODOREDA CRESCENT RAVENSWOOD

No.	DATE	REVISION	BY
B	5-11-2025	DETAILS ADDED	TN
A	24-10-2025	ISSUED FOR INFORMATION	TN

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TVSMD Pty Ltd ACN 070 997 168 as trustee for the Consulting Engineering Unit Trust trading as Porter Consulting Engineers ABN 78 636 396 385

CLIENT:
REALISE RESIDENTIAL WA 2 PTY LTD

DRAWING:
CONCEPT REGIONAL OPEN SPACE INTERFACE PLAN

STATUS: **FOR INFORMATION**

SCALE	1:500
DATE	Nov-25
DESIGN	DLC
DRAWN	TN
CHECK	
APP'D	

DRAWING No. 24-12-163/0/802
REV No. B
ORIGINAL DRAWING SIZE A1
FILE NAME .63\ACAD\STAGE 01\24163-0-802.dwg

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