STRUCterre consulting

Geotechnical Investigation

Job No: J485600

356 Lake Pty Ltd

Proposed Residential Subdivision

Lot 101 #356 Lake Rd, Champion Lakes, WA.

Wednesday 6 August 2025

Buyer Initial: _____

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1. Project Details

1.1 Introduction

At the request of 356 Lake Pty Ltd (The Client), Structerre Consulting (Structerre) have conducted a Geotechnical Investigation at Lot 101 #356 Lake Rd, Champion Lakes, WA. The purpose of the investigation was to provide the following for a proposed residential subdivision development:

- Desktop study summarising the geology, groundwater, site history (obtained from historical photographs) and potential presence of Acid Sulphate Soils (ASS).
- Summary of encountered ground and groundwater conditions.
- Site Classification in accordance with AS2870.
- Earthquake site factor in accordance with AS1170.4.
- Wind Classification in accordance with AS4055.
- Recommendations for stormwater drainage design.
- Site preparation requirements for earthworks, including site traffic, excavation, reuse of materials and batter slopes.
- Ground bearing capacity and estimated settlements for pad and strip footings founded at 0.3m and 0.5m.
- Geotechnical design parameters for retaining structures and or deep foundations.
- Preliminary pavement design parameter, indicative California Bearing Ratio (CBR) values determined from penetrometer results and ground conditions encountered.

This report details the scope of the geotechnical investigation, presents an interpretation of ground conditions and material properties across the site, provides geotechnical design parameters for the design of the proposed infrastructure, and evaluates the suitability of materials for use in earthworks. Interpretation of site conditions is based on the subsurface lithology revealed during the investigation programme, visual assessments of the in-situ materials and the results of in situ field tests.

Terms of reference for this investigation were presented in a Structerre Consulting proposal reference Q113269 (27 May 20225), which was submitted to and accepted by The Client.

1.2 Site Description

The site is located at Lot 101 #356 Lake Rd, Champion Lakes, under the City of Armadale, WA. The site is about 2.06 ha, lies west to the Champion Drive, Lake Road roundabout and access via Lake Road. Residential properties to the southeast of the site.

The site is generally flat and level with its surrounding topography. At the time of the field investigation the site was a rural land covered with some small to medium size trees.

We understand that the site is to be used for a proposed residential subdivision development.

1.3 Field Investigation – Scope of Works

The field investigation was carried out on 4 June 2025 and 25 June 2025, comprised of:

- Eleven (11) Sample Retrieval Probes (SRP) to a depth of 2.5m over the site for material assessment and soil profiling,
- Six (6) In situ percolation tests to determine the permeability of the materials within the upper 1.0m; and
- Ten (10) Dynamic Cone Penetrometer (DCP) tests in accordance with AS 1289.6.3.2 (1997) to a depth of 1.05m for evaluation of relative densities of the upper layers.

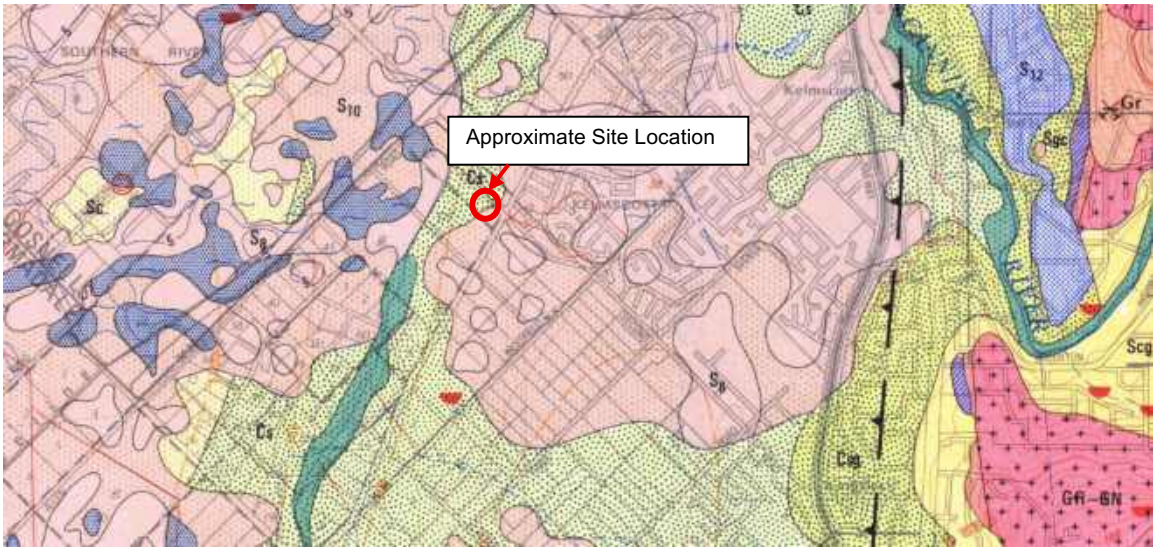
The test locations are shown on the attached site plan in Appendix A.

A geotechnical representative from Structerre supervised the fieldwork and all fieldwork, interpretation and terminology used in this report are in accordance with the guidelines presented in AS1726-2017, "Geotechnical Site Investigations".

2. Desk Study

2.1 Geological Setting

The Armadale sheet 1: 50,000 Environmental Geology Series (Part Sheets 2033 I and 2133 IV, 1986) prepared by the Geological Survey of Western Australia indicates that the following geological layers underlie the site:



SAND (S_{10}) – white to pale grey at surface, yellow at depth, fine to medium grained, moderately sorted, subangular to subrounded, minor heavy minerals of eolian origin (Thin Bassendean Sand over Guildford Formation Qpb/Qpa), underlain by

Sandy CLAY (Cs) – white-grey to brown, fine to coarse grained, subangular to rounded sand, clay of moderate plasticity, gravel, and silt layers near scarp (Guildford Formation, Qpa).

2.2 Ground Surface and Groundwater Level

Publicly available Perth Groundwater Map indicates the ground surface level at this site was approximately 24.9m Australian Height Datum (AHD).

According to the Perth Groundwater Map, groundwater is expected to be intersected with the range of 23.5m (maximum) and 22.2m (minimum) AHD. It should be noted that the groundwater levels can vary significantly due to seasonal variation and the data from the recorded range should be used only as a guide.

2.3 Acid Sulphate Soils

Information from publicly available Landgate website indicates that the site lies within a zone of moderate to low risk of ASS occurring within 3.0m of natural surface.

2.4 Site History

Historical aerial photographs dating back to 1953 are publicly available through Landgate Map Viewer were assessed and a summary is presented in Table 1.

Table 1 - Historical Site Information

Date	Description
1953	The site is bushland
1970	A house and two rows of farmhouses was built on the south corner of the site
1981	The farmhouse on the north was demolished
2025	The site remains unchanged since

2.5 Earthquake Coefficient

In accordance with AS 1170.4-2007 Structural Design Actions the site is located within an area with an earthquake acceleration coefficient of between 0.09 and 0.10.

2.6 Wind Classification

In accordance with AS 4055-2012 Wind Loads for Housing the site is in an area of with wind classification “N1 to N2”.

3. Results of the Investigation

3.1 Subsurface Soil Profile

The subsurface soil profile presented below was determined from the ground conditions encountered during the investigation and laboratory test results:

Table 2 - Subsurface Soil Profile

Depth to Base of Strata (m)	Geological Setting	Material Description
0.2	SURFICIAL	TOPSOIL
0.2 – >2.5	NATURAL	Clayey SAND: medium grained sand, with trace of gravel, medium plasticity, grey brown yellow orange, very loose to medium dense, moist (BH1, BH3, BH4, & BH10).
0.9 - >2.5	NATURAL	SAND: medium grained, poorly graded, grey brown, very loose to medium dense, moist to dry (BH2, BH5, BH6, BH7, BH8 & BH9)

The soils encountered are consistent with the expected site conditions as predicted from the Environmental Geology Map. It is important to note that there may be pockets of fill on site that are deeper than that encountered by the investigation boreholes. The subsurface soil conditions encountered are presented in the bore logs, within Appendix C.

3.2 Groundwater

Groundwater was not encountered during the investigation. However, based on the Perth Groundwater Atlas, the groundwater is expected to be encountered approximately between 1.4m to 2.7m below the existing ground level.

3.3 Percolation Testing

Percolation testing of the in-situ soils was undertaken in two locations. Results of the testing are summarised below:

Table 3 - In Situ Percolation Test Results

Test Location	Testing Depth (m)	Soil Type	Permeability (m/day)
BH1	0.25 – 0.80	SAND	2.0
BH3		Clayey SAND	0.7
BH4		SAND	2.4
BH9			11.6
BH10			1.6
BH11	0.25 – 0.90		2.0

3.4 Laboratory Test Results

Samples were tested by Structerre's in-house NATA accredited laboratory for Particle Size Distribution as per AS1289.3.6.1, Plasticity Index / Linear Shrinkage as per AS1289.3.1.2 – 3.4.1, and Organic Content as per ASTM D2974. The laboratory tests results/certificates are presented in Appendix D.

3.4.1 Particle Size Distribution

Results of the testing are summarised in the table below:

Table 4 - Particle Size Distribution Test Results

Test Hole	Depth (m)	Soil Description	Gravel Component (%)	Sand Component (%)	Clay & Silt Component (%)
BH1	0.9 - 1.4	Clayey SAND with trace gravel	4	78	28
BH3	0.4 – 1.4	Clayey SAND with gravel	24	46	30
BH10	1.4 – 2.0	Clayey SAND with trace gravel	6	62	32
Stockpile 1	-	Crushed Limestone	21	70	9
Stockpile 2	-	Crushed Limestone	25	68	7

Test results of the samples taken from the boreholes indicate that they are mainly Clayey SAND with gravel.

3.4.2 Atterberg Limits

Results of the testing are summarised in the table below:

Table 5 - Atterberg Limit Results

Sample Identification	BH1 @ 0.9m – 1.4m	BH3 @ 0.4m – 1.4m	BH10 @ 1.4m – 2.0m
Liquid Limit (%)	47	46	40
Plastic Limit (%)	15	15	14
Plasticity Index (%)	32	31	26
Linear Shrinkage (%)	12	13	10.5

Test results indicate that the natural clayey SAND has moderate shrink swell capacity or degree of expansion.

3.4.3 Organic Content Testing

Results for organic content tests of representative selected topsoil samples are summarised in the table below.

Table 6 - Organic Content Test Results

Test Hole	Depth (m)	Average Organic Content (%)
BH4	0.0 – 0.3	3.0
BH9	0.0 – 0.3	3.5
Stockpile 1	-	0.4
Stockpile 2	-	0.3

Based on the above results limited screening and blending of topsoils would be required to achieve suitable structural fill (i.e. <2% organics) for the insitu material and the stockpiled materials may be mixed (Mix ratio 1:1) and is acceptable for use as structural fill.

It should be noted that this ratio is consistent for the areas tested. For any materials where it is suspected that the organic content is not consistent with the above table, further testing should be conducted to ensure the 1:1 ratio is still suitable.

4. Geotechnical Construction Considerations

4.1 Site Classification

AS 2870-2011 Residential Slabs and Footings provides guidance on site classification for residential slabs and footing design based on the expected ground surface movement and depth of expected moisture changes.

Although the proposed development falls outside the scope of AS 2870, site classification can be used to assist in the design of foundations. The foundation design should be undertaken by a Structural Engineer, taking into consideration ground bearing capacity and the acceptable total and differential settlements of the proposed foundation system.

Based on results of this investigation the majority of the site can be classified as Class "A" provided that all unsuitable materials are removed and replaced with engineer-controlled sand fill materials in accordance with earthwork recommendations outlined in Section 4.4 in this report.

The north-eastern corner of the site (locations BH1, BH3, BH4 and BH10) in its current condition is classified as Class "S to M". Refer to Appendix A.

Footings suitable for this site should be adopted to accommodate expected ground surface movements associated with the presence of moderately reactive clayey SAND deposits within the building sites.

The site classification "S to M" could be improved to Class "A" classification with the following remediation being undertaken:

- A minimum of 1.5m sand cover is to be placed above / maintained above the reactive material to achieve a Class "A" site with ys < 3mm.

If the finished site were to be consistent with the Cossill & Webley's (CW) Plan Titled : Depth Contour Plan Sheet 1 of 1, drawing number 6483-02-205, dated 12 March 2025 and Drawing Titled : Earthworks Cross Sections Sheet 1 of 1, drawing number 6483-02-210 revision A, dated 16 June 2025, the earthworks proposed would classified the site to be Class "A', having achieved the minimum 1.5m nonreactive material cover over the reactive material on site. (Refer Appendix E). For Lot specific Site Classification, testing would need to be conducted post earthworks completion for every completed lot.

4.2 Drainage

The site is suitable for on-site disposal of stormwater runoff subject to the proposed development being improved to Class "A". For on-site disposal of stormwater runoff, soak wells of sufficient sizes are required, and should be positioned a minimum of 1.2m or the depth of soak well (whichever is greater) from any proposed or existing foundations (including those beyond the boundaries of the site) to reduce the risk of differential settlement.

To aid with the design of on-site stormwater drainage, groundwater levels and field permeability results are presented in Section 3.3 of this report. These recommendations should be confirmed via further percolation testing post earthworks.

4.3 Seismic Site Subsoil Class

The seismic subsoil site class has been assessed in accordance with AS 1170.4-2007, using the results of this investigation and published information.

Table 7 - Summary of Seismic Parameters

Hazard Factor	Site Sub-soil Class
0.09	Class Ce – shallow soil site

4.4 Earthworks

All earthworks shall be undertaken in accordance with AS 3798-2007 Guidelines on earthworks for commercial and residential developments and are to include the following:

- All unsuitable materials to be stripped and removed from the site. Unsuitable materials include vegetation, topsoils, uncontrolled filling, and any deleterious and organic materials.
- It is considered that the near surface materials require improvement. Therefore, it is proposed to excavate and stockpile the materials for reuse, provided it is dry, free from clay/silt (i.e., <5%), organic and deleterious materials. The depth of excavation may vary depending on conditions encountered (i.e. groundwater) and is subject to assessment. However, it is envisaged that an average depth of excavation would be approximately 0.2m.
- It is considered that the depth of excavation may vary depending on conditions encountered in area around BH1, BH3, BH4 and BH10 (i.e., extent of Clayey SAND) and is subject to assessment. Therefore, to upgrade to Class “A” it is recommended to chase out and excavate, stockpiling any suitable sand materials for reuse, provided it is dry, free from clay/silt (i.e., <5%), organic and deleterious materials. However, it is envisaged that an average depth of excavation would be approximately 1.5m below the final level to achieve Class “A” Lots.
- After excavation, raking and proof compaction, the exposed base is to be assessed and approved by an authorised representative from this office prior to backfilling. At this stage it can be assessed whether any further materials need to be removed or whether further compaction of the base is required.
- Proof compact the exposed base. The compaction requirements are set out in the table below, as per AS 3798-2007

Table 8 - Compaction Requirements

Item	Application	Minimum relative compaction %	
		Minimum density ratio (Standard Compaction Effort) (Cohesive soils)	Minimum density index (Cohesionless soils)
1	Residential - lot, fill, house, sites	95	70
2	Fill to support pavements General Fill Subgrade (to a depth of 0.3m)	 95 98	 70 75

- Excavations should not exceed 1.2m without adequate temporary shoring and/or safe excavation practices (e.g., benching, and / or batters), as not to undermine any surrounding structures. A 1V:2H slope should be maintained for temporary excavations. If excavation is required closer than the 1V:2H slope would allow, it is recommended that this office be contacted for retaining design.
- The ground level should be built up to design levels with any suitable stockpiled sand materials and import fill. If required, the import fill should consist of free draining sand with not more than 5% passing a 75µm sieve and be free of organic matter and other deleterious materials.
- The fill sand materials should be placed in layers not exceeding 300mm loose thickness and compacted to achieve the values stated in the table above. As a guide a minimum of 7 PSP blows over the interval 150 – 450mm, 9 PSP blows over the interval 450 – 750mm and 11 PSP blows over the interval 750 – 1050mm should be achieved, however it is recommended that this be verified with the appropriate field and laboratory testing.
- For design loadings above 100kPa additional compactive effort may be required over the base. Bearing capacities as outlined in Section 4.6 of this report can be achieved with compaction of the base of foundation to a minimum of 95% modified maximum dry density as determined by AS1289 5.2.1 and 5.4.1, to a minimum depth of 0.5m below the base of foundations.
- After remedial earthworks have been completed, the earthworks should be assessed and approved by an authorised qualified representative from this office.

It is considered that standard small to medium sized earthmoving equipment would be appropriate for the proposed earthworks. The near surface ground is competent and should not pose an issue to site traffic movements.

The material encountered on site can be deemed as 'easy' to excavate with medium sized earthwork equipment (i.e., a 20t excavator). Should excavations encounter groundwater, dewatering will be necessary.

4.5 Geotechnical Design Parameters

Based on the field investigation and test results, the interpreted geotechnical soil parameters of the encountered materials are presented in the below table.

Table 9 - Geotechnical Design Parameters

Soil Type	Depths (m)	Friction Angle Ø (^{0})	Cohesion C (kPa)	Density Y (t/m^3)	Elastic Modulus E (MPa)
Fill SAND or SAND with gravel	0 – 1.5	30	0	1.80	20
Clayey SAND	1.5 – >2.5	33	0	1.90	40
SAND with gravel	1.5 – >2.5	35	0	1.85	40

4.6 Shallow Footings – Allowable Soil Bearing Capacities

Based on the findings of the current preliminary geotechnical investigation, shallow pad and strip footings are considered appropriate for the proposed development. Allowable bearing capacities for shallow footings at the site have been calculated under the following assumptions:

- The site preparation procedures specified in Section 4.4 have been carried out.
- The specified level of compaction has been achieved below the base of each footing.
- Loads are vertical and not eccentric.
- Isolated footings (i.e., interaction of foundations has not been considered).
- The foundations are flexible.
- A factor of safety (FoS) of 3.0 against bearing capacity failure.
- Maximum allowable settlement of 20mm.

The tables below present the allowable bearing pressures for pad and strip footings of various dimensions, with embedment depths of 0.5m and 1.0m below finished surface levels.

Table 10 - Allowable Bearing Capacities for Pad Footings

Minimum Depth of Embedment (m)	Minimum Plan Dimension (m)	Allowable Bearing Capacities (kPa)	Settlement (mm)
0.3	0.5	120	< 20
	1.0	150	
	1.5	175	
	2.0	200	
0.5	0.5	150	< 20
	1.0	170	
	1.5	200	
	2.0	225	

Table 11 - Allowable Bearing Capacities for Strip Footings

Minimum Depth of Embedment (m)	Minimum Plan Dimension (m)	Allowable Bearing Capacities (kPa)	Settlement (mm)
0.3	0.5	120	< 20
	1.0	160	
	1.5	210	
0.5	0.5	120	< 20
	1.0	160	
	1.5	210	

The recommended allowable bearing capacities are dependent on the site being dry and well drained, so that the foundation material does not become saturated.

The actual allowable bearing capacity of a particular foundation will be dependent on its location, geometry and founding depth, as well as the founding horizon. Therefore, once specific foundation geometries have been determined and the earthworks completed, it is recommended that the allowable bearing capacity and associated settlements be verified.

Additionally, should undermining issue prevent the excavation of the near surface loose materials, it is recommended that the allowable bearing capacity be reviewed. However, this will likely result in lower allowable bearing capacities.

4.7 Retaining Walls

Retaining walls proposed to be installed at the site will likely support sandy soils. Where imported granular backfill is to be used in conjunction with retaining walls, the geotechnical properties will vary depending upon the nature of the granular materials imported.

For cohesion-less free draining sand, the following parameters can be used as a guide for design purposes:

Table 12 - Retaining Wall Design Parameters

Parameters	Design Values
Angle of internal friction (Ø)	32°
Coefficient of active earth pressure (Kpa)	0.307
Coefficient of passive earth pressure (Kpa)	3.255
At rest coefficient of earth pressure (K_O)	0.470
Bulk density (KN/m^3)	18

Retaining structures should be designed in accordance with AS 4678-2002 Earth Retaining Structures. Guidance on allowable footing bearing pressures is provided in Section 4.6. Where significant eccentric and /or horizontal loading is applied, further assessment will be required.

Retaining wall design should ensure adequate drainage to the rear of the wall via weepholes or proper designed drainage system. Handheld compaction equipment is utilised within 2.0m of the walls, to reduce the potential increase in lateral pressure on the retaining wall.

Experience indicates that excavation immediately in front of retaining walls may cause movement to the wall to occur. This can lead to cracking of adjoining structures and needs to be accounted for in the design and construction sequencing of the new works.

4.8 Indicative California Bearing Ratio (CBR)

The indicative California Bearing Ratio (CBR) value of the subgrade material, following earthworks can be estimated from the site investigation results and would be appropriate for preliminary design purposes. Based on a minimum of 0.5m of sand for subgrade, the indicative value is shown in the below table:

Table 13 - Indicative CBR Values

Material	Indicative CBR (%)	Compaction
SAND (In situ or Imported Fill)	12	95% of MMDD*

* Implies the maximum dry density ratio using Modified compaction in accordance with AS 1289 5.2.1-2003.

For detailed design and construction of the pavements, it is recommended that the CBR values be verified with laboratory Soaked CBR testing on the anticipated subgrade material.

5. Conclusions

A site investigation was carried out at the proposed commercial development site to assess the geotechnical conditions. Parameter and design recommendations are incorporated in the body of the report. The following conclusions have been drawn from the site investigation:

- The subsurface soil profile encountered comprised topsoil from the surface to 0.2m, underlain by loose to medium dense SAND/Clayey SAND to the investigated depth of 2.5m.
- The water table was not encountered during the investigation, however localised surface ponding and water perching on the cohesive soils may occur in the winter months of the year.
- Most of the site can be classified as Class “A” in accordance with AS 2870-2011 provided the recommended earthworks are undertaken.
- The northwestern portion of the site can be upgraded to Class “A” in accordance with AS 2870-2011 provided the recommended earthworks are undertaken and 1.5m of non-reactive (sand) cover is placed and compacted above the natural cohesive materials encountered onsite.
- It is considered that the site is suitable for on-site drainage once the site has been remediated to Class “A”.
- Recommended earthworks include stripping of fill sand and unsuitable materials, excavation of loose materials, proof compaction of the base, placement of engineered fill and compaction of final level.
- Allowable bearing capacity for pad footings ranges from 120kPa to 225kPa and from 120kPa to 210kPa for strip footings. The estimation of settlement of the footings is limited to 20mm.

6. Limitation of Field Investigations

This report has been prepared in accordance with general accepted consulting practice for The Client using information supplied at the time and for the project specific requirements as understood by Structerre. To the best of our knowledge the information contained in this report is accurate at the date of issue, however it should be emphasised that any changes to ground conditions and/or the proposed structures may invalidate the recommendations given herein.

The conclusions and recommendations in this report are based on the site conditions revealed through selective point sampling, representing the conditions of the site in total, although the area investigated represents only a small portion of the site. The actual characteristics may vary significantly between successive test locations and sample intervals other than where observations, explorations and investigations have been made.

The materials and their geotechnical properties presented in this report may not represent the full range of materials and strengths that exist on site and the recommendations should be regarded as preliminary in nature. Allowances should be made for variability in ground conditions and any consequent impact on the development. Structerre accepts no responsibility and shall not be liable for any consequence of variations in ground conditions. If ground conditions encountered during construction are different to that described in this report, this office should be notified immediately.

Should you require further information or clarification of any of the recommendations provided within this report, please contact the undersigned.

For and on behalf of Structerre Consulting.

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6 August 2025

Job #	Revision	Authored	Checked	Authorised
J485600	0	ENG	LYG	MEC

7. References

Department of Water – Perth Groundwater Atlas

Landgate Map Viewer

The Armadale sheet 1: 50,000 Environmental Geology Series (Part Sheets 2033 I and 2133 IV, 1986) prepared by the Geological Survey of Western Australia

AS 1170.4-2007 Structural design actions – Earthquake actions in Australia

AS 1289.3.1.2-2009 Methods of testing soils for engineering purposes – Soil classification tests – Determination of the liquid limit of a soil

AS 1289.3.2.1-2009 Methods of testing soils for engineering purposes – Soil classification tests – Determination of the plastic limit of a soil

AS 1289.3.3.1-2009 Methods of testing soils for engineering purposes – Soil classification tests – Calculation of the plasticity index of a soil

AS 1289.3.4.1-2009 Methods of testing soils for engineering purposes – Soil classification tests – Determination of the linear shrinkage of a soil

AS 1289.6.3.1-2009 Soil classification tests – Determination of the particle size distribution of a soil – Standard method of analysis by sieving

AS 1289.6.3.3-1997 Methods of testing soils for engineering purposes – Soil strength and consolidation tests – Determination of the penetration resistance of a soil – Perth sand penetrometer test

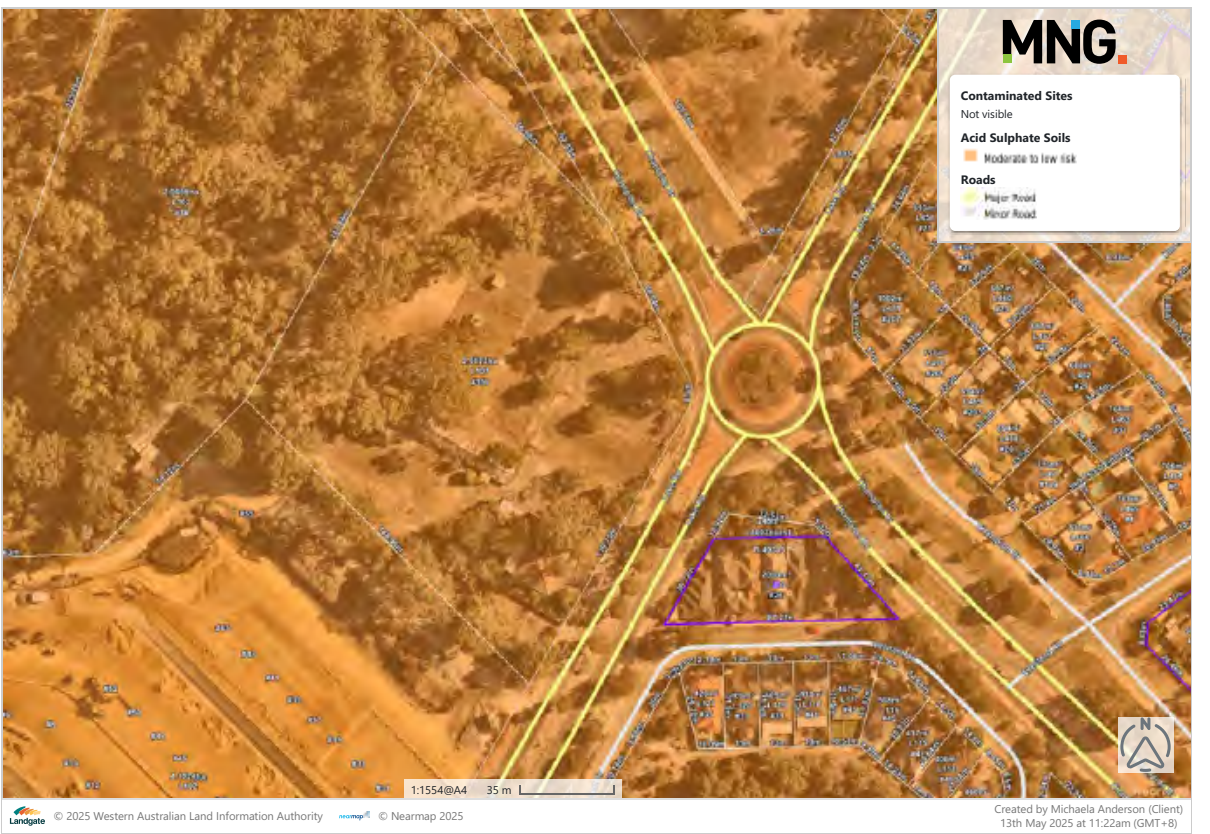
AS 1726-2017 Geotechnical Site Investigation

AS 2870-2011 Residential Slabs and Footings

AS 3798-2007 Guidelines on Earthworks for Commercial and Residential Developments

AS 4055-2012 Wind Loads for Housing

Appendix A – Site Plan



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PROJECT #:	D363603
JOB #:	J485600
CLIENT:	**356 Lake Pty Ltd**
SCALE:	NTS
TITLE:	Geotechnical - Acid Sulphate Soils
DATE:	4 Jun '25
DRAWN BY:	MM
CHECKED BY:	EN

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PROJECT:
Lot 101 #356 Lake Road, Champion Lakes

PROJECT #: D363603
JOB #: J485600
CLIENT: **356 Lake Pty Ltd**

SCALE: NTS
TITLE: Geotechnical - Bushfire Prone Areas

DATE: 4 Jun '25
DRAWN BY: MM
CHECKED BY: EN

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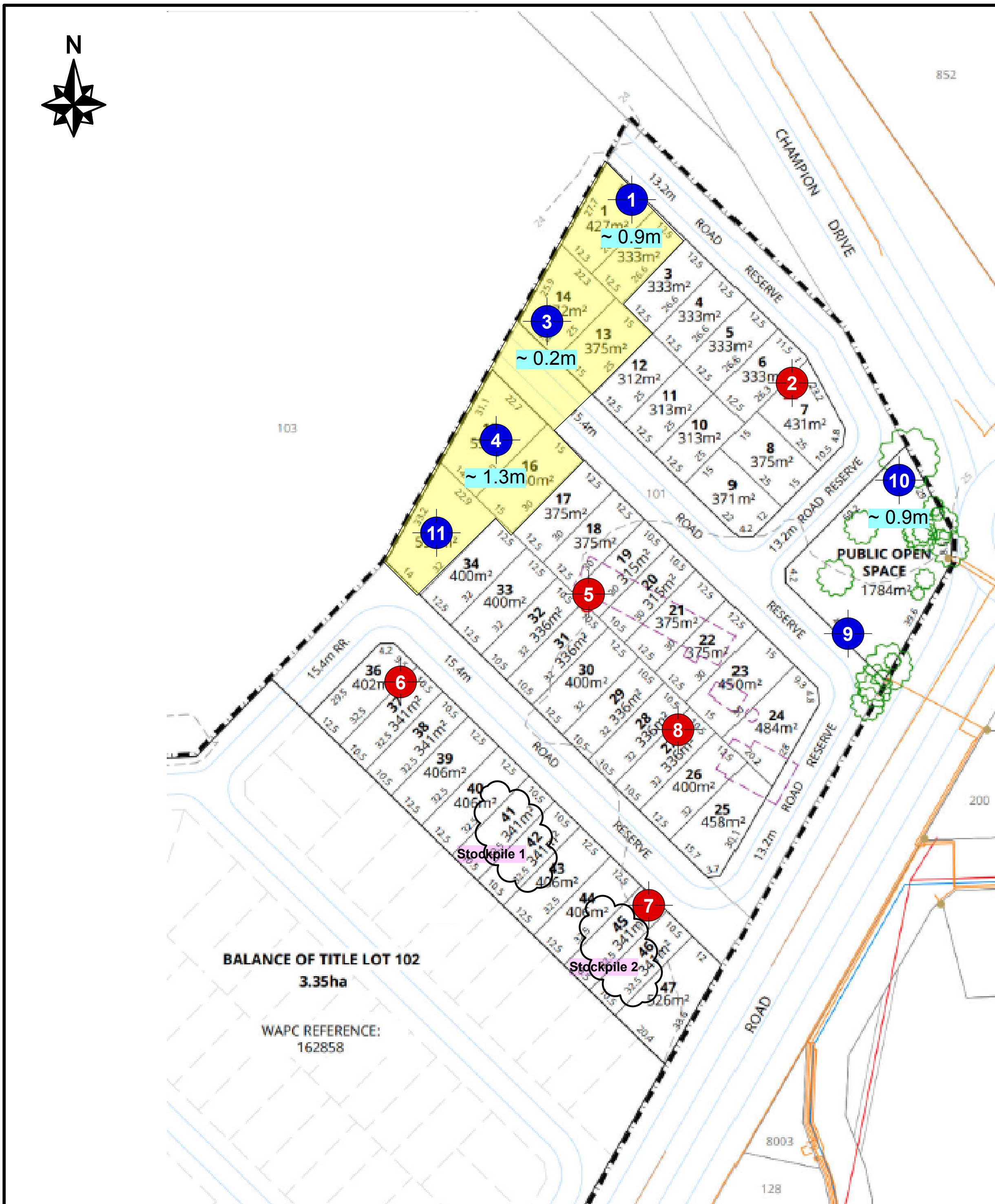

Note: Showing approximate test locations only

LEGEND

- Borehole
- Borehole and Percolation Test
- Depths to Reactive Material
- Class "S/M" - Extent of Area to be Confirmed Onsite

STRUCterre consulting	PROJECT: Lot 101 #356 Lake Road, Champion Lakes	
	PROJECT #: D363603	CLIENT: **356 Lake Pty Ltd**
	JOB #: J485600	
Buyer Initial: Zetta Pty Ltd (ABN 71 349 772 837) ATF the Young Purich and Higham Unit Trust trading as Structerre Consulting	SCALE: NTS	TITLE: Geotechnical Investigation Site Plan
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DOC: GE:3.001

Appendix B – Site Photos

PHOTO 1 - Facing south towards BH2 from BH1 location

PHOTO 2 - Facing northwest towards BH3 from BH2 location

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PROJECT:	Lot 101 #356 Lake Road, Champion Lakes
PROJECT #:	D363603
JOB #:	J485600
CLIENT:	**356 Lake Pty Ltd**
SCALE:	NTS
TITLE:	Site Photographs
DATE:	4 Jun '25
DRAWN BY:	MM
CHECKED BY:	EN

PHOTO 3 - Facing southeast towards BH8 from BH5 location

PHOTO 4 - Facing west towards BH6 location from BH8 location

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Buyer Initial: _____ Pty Ltd (ABN 71 349 772 837) ATF the Young Purich and Higham Unit Trust trading as Structerre Consulting

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TEL 9205 4500 FAX 9205 4501 EMAIL: wageotecheng@structerre.com.au

PROJECT:	Lot 101 #356 Lake Road, Champion Lakes
PROJECT #:	D363603
JOB #:	J485600
CLIENT:	**356 Lake Pty Ltd**
SCALE:	NTS
TITLE:	Site Photographs
DATE:	4 Jun '25
DRAWN BY:	MM
CHECKED BY:	EN

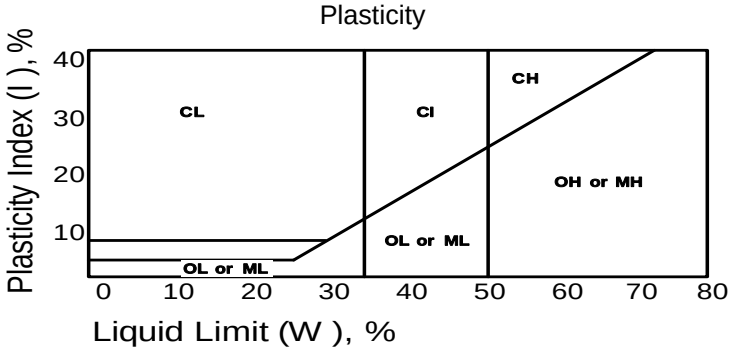
Appendix C – Borelogs & Terminology

BORELOG TERMINOLOGY

Particle Size Distribution

Major Division	Subdivision	Size
Boulders		>200mm
Cobbles		200 - 63mm
Gravel	Coarse	63 - 20mm
	Medium	20- 6mm
	Fine	6 - 2.36mm
Sand	Coarse	2.36 - 0.6mm
	Medium	0.6 - 0.2mm
	Fine	0.2 - 0.075mm

Plasticity



Consistency of Cohesive Soils

Term	Undrained Strength Su (kPa)	Field Guide
Very Soft	< 12	Exudes between the fingers when squeezed in hand
Soft	12 - 25	Can be moulded by light finger pressure
Firm	25 - 50	Can be moulded by strong finger pressure
Stiff	50 - 100	Cannot be moulded by Fingers. Can be indented by thumb.
Very Stiff	100 - 200	Can be indented by thumb nail
Hard	> 200	Can be indented with difficulty by thumb nail.
Friable	-	Crumbles or powders when scraped by thumbnail

Consistency/Density of Non-Cohesive Soils

Term	Density Index (%)	SPT "N" Value Comparison
Very Loose	< 15	0 - 4
Loose	15 - 35	4 - 10
Medium Dense	35 - 65	10 - 30
Dense	65 - 85	30 - 50
Very Dense	> 85	> 50

Moisture Content

D	Dry
M	Moist
W	Wet
S	Saturated

Minor Components

Term	Assessment Guide	Proportion of Minor Component In:
Trace	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component	Coarse grained soils: < 5 % Fine grained soils: <15%
With	Presence easily detected by feel or eye, soil properties little different to general properties of primary component	Coarse grained soils: 5 - 12 % Fine grained soils: 15 - 30%

Soil Legend

FILL	CLAY	GRAVEL	CONCRETE
TOPSOIL	SILT	LIMESTONE	COMBINATIONS
PEAT	SAND	BEDROCK	eg: Clay, Silty, Sandy

USCS

GW	Well graded gravel	SC	Clayey sand	OL	Organic low plasticity silt	CL	Low plasticity clay
GP	Poorly graded gravel	SM	Silty sand	ML	Low plasticity silt	CI	Intermediate plasticity clay
SW	Well graded sand			MH	High plasticity silt	CH	High plasticity clay
SP	Poorly graded sand			OH	Organic high plasticity silt	PT	Peat

DOC:GE:3.003

WA | QLD | NSW | VIC

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ABN 71 349 772 837 Zemla Pty Ltd ACN 008 966 283 as trustee for the Young Purich and Higham Unit Trust trading as Structerre Consulting Engineers

Buyer Initial: _____

Borehole Record: BH01

Project: Proposed Residential Subdivision - Lot 101 Champion Lakes
Location: 356 Lake Rd, Champion Lakes WA 6111, Australia
Loc Comment:
Job No: D363003 J485600

Position: Easting: 379768.96
Northing: -3434370.81
Elevation: Not Surveyed
Inclination:

Date Drilled: 04/06/2025
Drill Rig SRP - 1IAY 419
Drill Supplier Example supplier
Logged/Checked: Emmanuel Normans/Tony Broadway

Water	Depth (m)	Soil Origin	Graphic Log	USCS	Material Description	Moisture	Consistency	PSP (0 5 10 15 20 25 30)	Percolation (m/day)	Samples
		Non-soil		TS	Topsoil.					
		Natural		SP	Sand (SP): medium dense, poorly graded, medium grained, pale brown, dry.	D	MD	3, 3, 7, 7, 7, 7	Percolation 1.9	
	1			SC	Clayey SAND (SC): medium dense, medium plasticity, medium grained sand, trace gravel, brown and pale grey.		F			
					BH01 Refusal at 1.4m (gravel refusal)					

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Buyer Initial: _____

Borehole Record: BH02

Project: Proposed Residential Subdivision - Lot 101 Champion Lakes
Location: 356 Lake Rd, Champion Lakes WA 6111, Australia
Loc Comment:
Job No: D363003 J485600

Position: Easting: 379768.96
Northing: -3434370.81
Elevation: Not Surveyed
Inclination:

Date Drilled: 04/06/2025
Drill Rig SRP - 1IAY 419
Drill Supplier Example supplier
Logged/Checked: Emmanuel Normans/Tony Broadway

Water	Depth (m)	Soil Origin	Graphic Log	USCS	Material Description	Moisture	Consistency	PSP	Percolation (m/day)	Samples
		Non-soil		TS	Topsoil.					
	1	Natural		SP	Sand (SP): medium dense, poorly graded, medium grained, pale grey, moist to dry.	M-D	MD			
	2				**BH02 Terminated at 2.5m (target depth)**					

PSP: 0 5 10 15 20 25 30
4
4
6
8
7
7

This report must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

Buyer Initial: _____

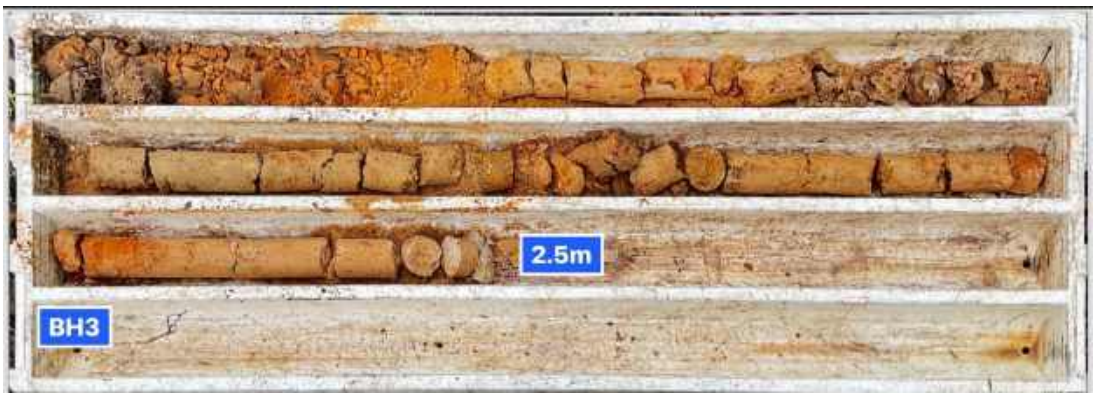
Borehole Record: BH03

Project: Proposed Residential Subdivision - Lot 101 Champion Lakes
Location: 356 Lake Rd, Champion Lakes WA 6111, Australia
Loc Comment:
Job No: D363003 J485600

Position: Easting: 379768.96
Northing: -3434370.81
Elevation: Not Surveyed
Inclination:

Date Drilled: 04/06/2025
Drill Rig SRP - 1IAY 419
Drill Supplier Example supplier
Logged/Checked: Emmanuel Normans/Tony Broadway

Water	Depth (m)	Soil Origin	Graphic Log	USCS	Material Description	Moisture	Consistency	PSP (0 5 10 15 20 25 30)	Percolation (m/day)	Samples
		Non-soil		TS	Topsoil.					
		Natural		SC	Clayey Sand (SC): medium dense, poorly graded, medium grained, low plasticity clay, yellow , orange, moist.	M	MD			
	1			SC	Clayey SAND (SC): medium dense, medium plasticity, with gravel, pale yellow mottled orange.		F		Percolation 0.7	
	2									
					BH03 Terminated at 2.5m (target depth)					



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Buyer Initial: _____

Borehole Record: BH04

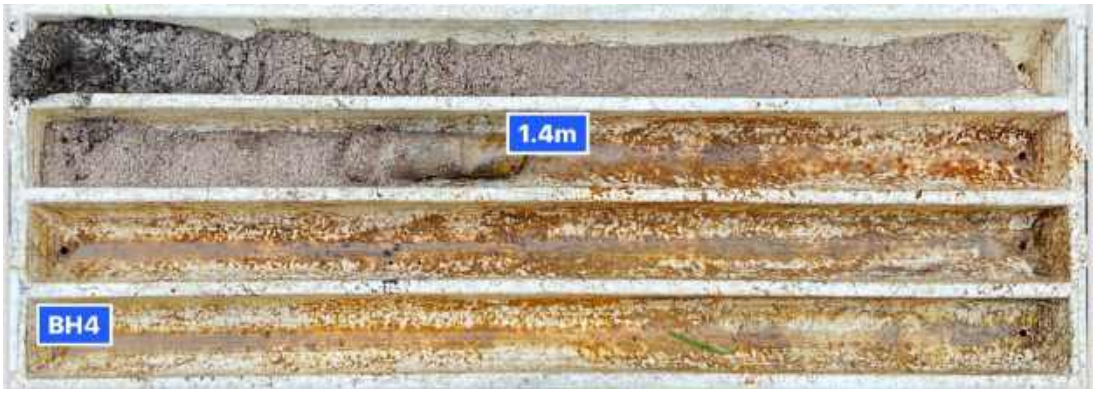
Project: Proposed Residential Subdivision - Lot 101 Champion Lakes
Location: 356 Lake Rd, Champion Lakes WA 6111, Australia
Loc Comment:
Job No: D363003 J485600

Position: Easting: 379768.96
Northing: -3434370.81
Elevation: Not Surveyed
Inclination:

Date Drilled: 04/06/2025
Drill Rig SRP - 1IAY 419
Drill Supplier Example supplier
Logged/Checked: Emmanuel Normans/Tony Broadway

Water	Depth (m)	Soil Origin	Graphic Log	USCS	Material Description	Moisture	Consistency	PSP (0 5 10 15 20 25 30)	Percolation (m/day)	Samples
		Non-soil		TS	Topsoil.			4		
		Natural		SP	Sand (SP): medium dense, poorly graded, medium grained, pale grey, moist.	M	MD	5, 6, 4, 4, 4, 5	Percolation 2.4	
	1			SC	Clayey SAND (SC): medium dense, medium plasticity, trace gravel, pale brown and yellow.		F			

BH04 Refusal at 1.4m (Clay refusal)



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Buyer Initial: _____

Borehole Record: BH05

Project: Proposed Residential Subdivision - Lot 101 Champion Lakes
Location: 356 Lake Rd, Champion Lakes WA 6111, Australia
Loc Comment:
Job No: D363003 J485600

Position: Easting: 379768.96
Northing: -3434370.81
Elevation: Not Surveyed
Inclination:

Date Drilled: 04/06/2025
Drill Rig SRP - 1IAY 419
Drill Supplier
Logged/Checked: Emmanuel Normans/Tony Broadway

Water	Depth (m)	Soil Origin	Graphic Log	USCS	Material Description	Moisture	Consistency	PSP (0 5 10 15 20 25 30)	Percolation (m/day)	Samples
		Non-soil		TS	Topsoil.					
	1	Natural		SP	Sand (SP): medium dense, poorly graded, medium grained, pale grey and pale brown, moist.	M	MD			
	2				**BH05 Terminated at 2.5m (target depth)**					

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Buyer Initial: _____

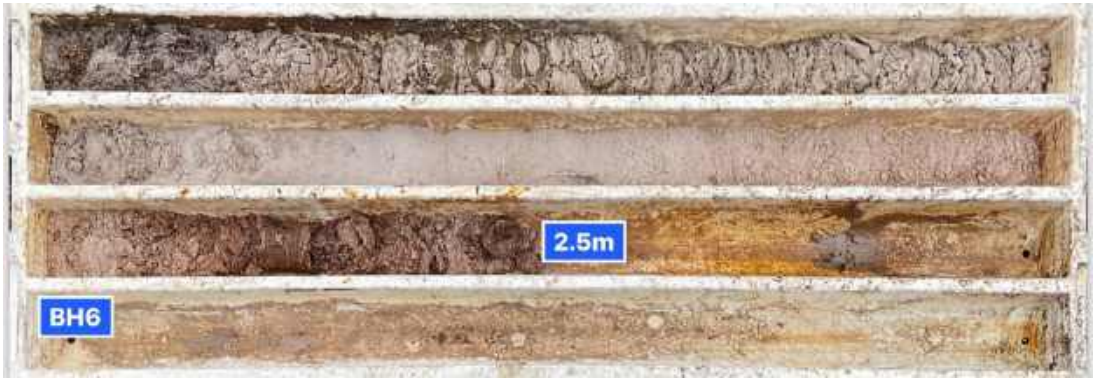
Borehole Record: BH06

Project: Proposed Residential Subdivision - Lot 101 Champion Lakes
Location: 356 Lake Rd, Champion Lakes WA 6111, Australia
Loc Comment:
Job No: D363003 J485600

Position: Easting: 379768.96
Northing: -3434370.81
Elevation: Not Surveyed
Inclination:

Date Drilled: 04/06/2025
Drill Rig SRP - 1IAY 419
Drill Supplier Example supplier
Logged/Checked: Emmanuel Normans/Tony Broadway

Water	Depth (m)	Soil Origin	Graphic Log	USCS	Material Description	Moisture	Consistency	PSP (0 5 10 15 20 25 30)	Percolation (m/day)	Samples
		Non-soil		TS	Topsoil.					
	1	Natural		SP	Sand (SP): medium dense, poorly graded, brown mottled grey.		MD	3, 3, 6, 7, 7, 9, 9		
	2			SP	Sand (SP): dense, poorly graded, fine to medium grained, brown, moist.	M	D			
					BH06 Terminated at 2.5m (target depth)					



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Buyer Initial: _____

Borehole Record: BH07

Project: Proposed Residential Subdivision - Lot 101 Champion Lakes
Location: 356 Lake Rd, Champion Lakes WA 6111, Australia
Loc Comment:
Job No: D363003 J485600

Position: Easting: 379768.96
Northing: -3434370.81
Elevation: Not Surveyed
Inclination:

Date Drilled: 04/06/2025
Drill Rig SRP - 1IAY 419
Drill Supplier Example supplier
Logged/Checked: Emmanuel Normans/Tony Broadway

Water	Depth (m)	Soil Origin	Graphic Log	USCS	Material Description	Moisture	Consistency	PSP (0 5 10 15 20 25 30)	Percolation (m/day)	Samples
		Non-soil		TS	Topsoil.					
		Natural		SP	Sand (SP): medium dense, poorly graded, medium grained, grey, moist.	M	MD	3, 4, 5, 6, 6, 7, 7		
	1			SP	Sand (SP): medium dense, poorly graded, medium grained, pale grey, moist.	M	MD			
	2				**BH07 Terminated at 2.5m (target depth)**					

Buyer Initial: _____

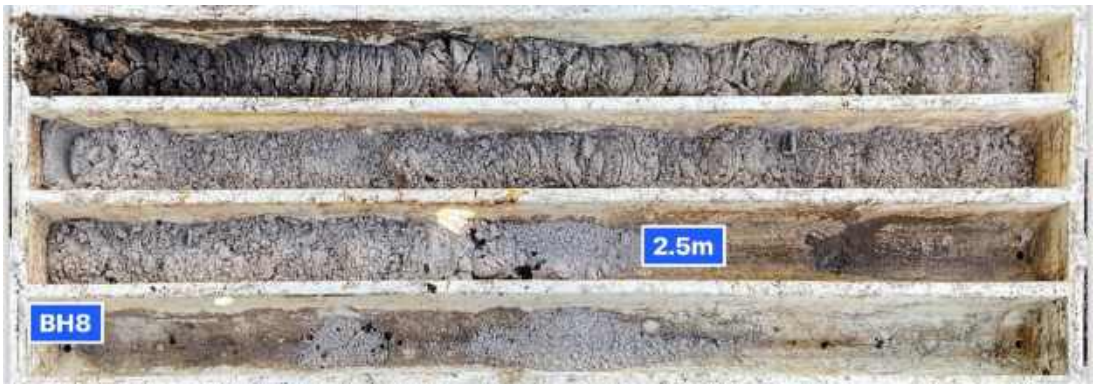
Borehole Record: BH08

Project: Proposed Residential Subdivision - Lot 101 Champion Lakes
Location: 356 Lake Rd, Champion Lakes WA 6111, Australia
Loc Comment:
Job No: D363003 J485600

Position: Easting: 379768.96
Northing: -3434370.81
Elevation: Not Surveyed
Inclination:

Date Drilled: 04/06/2025
Drill Rig SRP - 1IAY 419
Drill Supplier Example supplier
Logged/Checked: Emmanuel Normans/Tony Broadway

Water	Depth (m)	Soil Origin	Graphic Log	USCS	Material Description	Moisture	Consistency	PSP (0 5 10 15 20 25 30)	Percolation (m/day)	Samples
		Non-soil		TS	Topsoil.					
	1	Natural		SP	Sand (SP): medium dense, poorly graded, medium grained, pale grey.		MD	3, 4, 6, 7, 8, 9, 9		
	2				**BH08 Terminated at 2.5m (target depth)**					



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Buyer Initial: _____

Borehole Record: BH09

Project: Proposed Residential Subdivision - Lot 101 Champion Lakes
Location: 356 Lake Rd, Champion Lakes WA 6111, Australia
Loc Comment:
Job No: D363003 J485600

Position: Easting: 379768.96
Northing: -3434370.81
Elevation: Not Surveyed
Inclination:

Date Drilled: 04/06/2025
Drill Rig
Drill Supplier Example supplier
Logged/Checked: Emmanuel Normans/Tony Broadway

Water	Depth (m)	Soil Origin	Graphic Log	USCS	Material Description	Moisture	Consistency	PSP	Percolation (m/day)	Samples
		Non-soil		TS	Topsoil.					
		Natural		SP	Sand (SP): poorly graded, medium grained, grey, moist.	M				
	1			SP	Sand (SP): medium dense, poorly graded, medium grained, pale grey, moist.	M	MD		Percolation 11.6	
	2				**BH09 Terminated at 2.5m (target depth)**					

PSP: 0 5 10 15 20 25 30

This report must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

Buyer Initial: _____

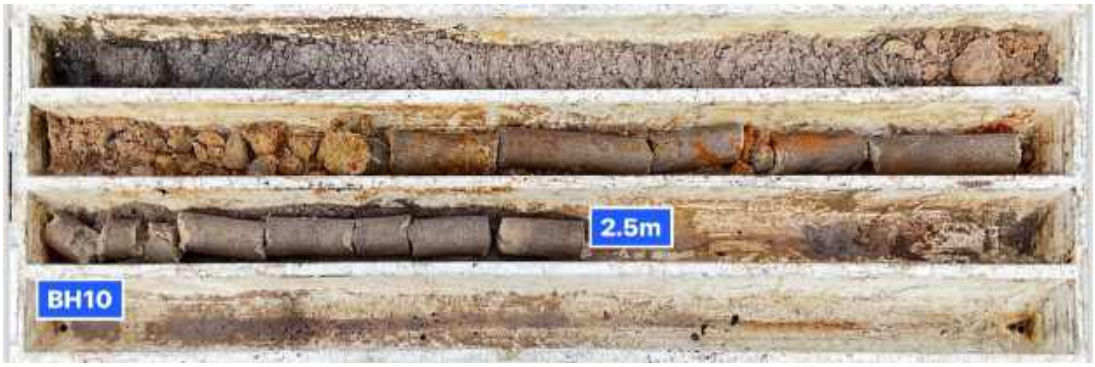
Borehole Record: BH10

Project: Proposed Residential Subdivision - Lot 101 Champion Lakes
Location: 356 Lake Rd, Champion Lakes WA 6111, Australia
Loc Comment:
Job No: D363003 J485600

Position: Easting: 379768.96
Northing: -3434370.81
Elevation: Not Surveyed
Inclination:

Date Drilled: 05/06/2025
Drill Rig SRP - 1IAY 419
Drill Supplier Example supplier
Logged/Checked: Emmanuel Normans/Tony Broadway

Water	Depth (m)	Soil Origin	Graphic Log	USCS	Material Description	Moisture	Consistency	PSP (0 5 10 15 20 25 30)	Percolation (m/day)	Samples
		Non-soil		TS	Topsoil.			2		
		Natural		SP	Sand (SP): medium dense, poorly graded, medium grained, pale grey, moist.	M	MD	2, 2, 4, 4, 7, 7	Percolation 1.6	
	1			SC	Clayey Sand (SC): medium dense, poorly graded, medium grained, pale brown, moist.	M	MD			
				SC	Clayey SAND (SC): medium dense, medium, medium grained sand, trace gravel, pale yellow and pale grey.		F			
	2				**BH10 Terminated at 2.5m (target depth)**					



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Buyer Initial: _____

Borehole Record: BH11

Project: Proposed Residential Subdivision - Lot 101 Champion Lakes
Location: 356 Lake Rd, Champion Lakes WA 6111, Australia
Loc Comment:
Job No: D363003 J485600

Position: Easting: 404527.00
Northing: 6445640.00
Elevation: 27.56(m)
Inclination:

Date Drilled: 25/06/2025
Drill Rig SRP - 1HUR 324
Drill Supplier Example supplier
Logged/Checked: Ankush Rabadia

Depth (m)	Soil Origin	Graphic Log	USCS	Material Description	Moisture	Consistency	Percolation (m/day)
0.1	Non-soil		TS	Topsoil.			
0.25	Natural		SP	Sand (SP): loose, poorly graded, medium to fine grained, pale grey, dry.	D	L	
0.50							
0.75							Percolation 2,04
				BH11 Terminated at 0.9m (BH - For Permeability Testing)			

This report must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

Buyer Initial: _____

Appendix D – Laboratory Test Results

Sample No.	**40571**	**Client**	Geotechnical
Job No.	J485600	**Project**	#356 Lake Rd, Champion Lakes

Laboratory testing carried out at Malaga Laboratory 44 Crocker Dr Malaga WA 6090

SAMPLE DETAILS

BH No. / Depth	BH1 0.9-1.4m	Sampling Method	Client
Sample History	50°C Oven Dried	Sample Preparation	AS 1289 1.1

ATTERBERG LIMITS

Description	Method	Result (%)
Liquid Limit	AS 1289.3.1.2	47
Plastic Limit	AS 1289.3.2.1	15
Plasticity Index	AS 1289.3.3.1	32
Linear Shrinkage	AS 1289.3.4.1	12
Nature of Shrinkage		Curled

PARTICLE SIZE DISTRIBUTION

Method: AS 1289.3.6.1
Description: Particle size distribution by sieve analysis

Sieve Size (mm)	% Passing
19.0	100
2.36	96
0.425	73
0.075	28

AS 1726:2017 Clause 6.1
Material Description: Clayey SAND trace gravel
AS Group Symbol: SC

NATA WORLD RECOGNISED ACCREDITATION

Accreditation Number 18742

Ben Stroop
Authorized Signatory

Senior Laboratory Technician

Date: 12-Jun-25

Buyer Initial: _____

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Phone (+618) 9205 4500 | Fax (+618) 9205 4501 | Email perth@structerre.com.au | Web www.structerre.com.au

Sample No.	**40572**	**Client**	Geotechnical
Job No.	J485600	**Project**	#356 Lake Rd, Champion Lake

Laboratory testing carried out at Malaga Laboratory 44 Crocker Dr Malaga WA 6090

SAMPLE DETAILS

BH No. / Depth	BH3 0.4-1.4m	Sampling Method	Client
Sample History	50°C Oven Dried	Sample Preparation	AS 1289 1.1

ATTERBERG LIMITS

Description	Method	Result (%)
Liquid Limit	AS 1289.3.1.2	46
Plastic Limit	AS 1289.3.2.1	15
Plasticity Index	AS 1289.3.3.1	31
Linear Shrinkage	AS 1289.3.4.1	13
Nature of Shrinkage		Curled

PARTICLE SIZE DISTRIBUTION

Method: AS 1289.3.6.1
Description: Particle size distribution by sieve analysis

Sieve Size (mm)	% Passing
19.0	100
2.36	76
0.425	60
0.075	30

AS 1726:2017 Clause 6.1
Material Description: Clayey SAND with gravel
AS Group Symbol: SC

NATA WORLD RECOGNISED ACCREDITATION

Accreditation Number 18742

Ben Stroop
Authorized Signatory

Senior Laboratory Technician

Date: 12-Jun-25

Buyer Initial: _____

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Phone (+618) 9205 4500 | Fax (+618) 9205 4501 | Email perth@structerre.com.au | Web www.structerre.com.au

Sample No.	**40578**	**Client**	Geotechnical
Job No.	J485600	**Project**	#356 Lake Rd, Champion Lake

Laboratory testing carried out at Malaga Laboratory 44 Crocker Dr Malaga WA 6090

SAMPLE DETAILS

BH No. / Depth	BH10 1.4-2.0m	Sampling Method	Client
Sample History	50°C Oven Dried	Sample Preparation	AS 1289 1.1

ATTERBERG LIMITS

Description	Method	Result (%)
Liquid Limit	AS 1289.3.1.2	40
Plastic Limit	AS 1289.3.2.1	14
Plasticity Index	AS 1289.3.3.1	26
Linear Shrinkage	AS 1289.3.4.1	10.5
Nature of Shrinkage		Flat

PARTICLE SIZE DISTRIBUTION

Method: AS 1289.3.6.1
Description: Particle size distribution by sieve analysis

Sieve Size (mm)	% Passing
19.0	100
2.36	94
0.425	75
0.075	32

AS 1726:2017 Clause 6.1
Material Description: Clayey SAND trace gravel
AS Group Symbol: SC

NATA WORLD RECOGNISED ACCREDITATION

Accreditation Number 18742

Ben Stroop
Authorized Signatory

Senior Laboratory Technician

Date: 13-Jun-25

Buyer Initial: _____

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Phone (+618) 9205 4500 | Fax (+618) 9205 4501 | Email perth@structerre.com.au | Web www.structerre.com.au

Sample No.	**40594**	**Client**	Geotechnical
Job No.	J485600	**Project**	Lot 101, #356 Lake Rd, Champion Lakes

Laboratory testing carried out at Malaga Laboratory 44 Crocker Dr Malaga WA 6090

SAMPLE DETAILS

BH No. / Depth	Stockpile 1 -	Sampling Method	Client
Sample History	50°C Oven Dried	Sample Preparation	AS 1289 1.1

ATTERBERG LIMITS

Description	Method	Result (%)
Liquid Limit	AS 1289.3.1.2	0
Plastic Limit	AS 1289.3.2.1	NP
Plasticity Index	AS 1289.3.3.1	NP
Linear Shrinkage	AS 1289.3.4.1	0
Nature of Shrinkage		Flat

PARTICLE SIZE DISTRIBUTION

Method: AS 1289.3.6.1
Description: Particle size distribution by sieve analysis

Sieve Size (mm)	% Passing
19.0	92
2.36	79
0.425	52
0.075	9

AS 1726:2017 Clause 6.1
Material Description: SAND with silt, with gravel
AS Group Symbol: SP-SM

Ben Stroop
Authorized Signatory Senior Laboratory Technician

Date: 18-Jun-25

Accreditation Number 18742

WA | QLD | NSW | VIC
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Phone (+618) 9205 4500 | Fax (+618) 9205 4501 | Email perth@structerre.com.au | Web www.structerre.com.au
ABN 71 349 772 857 Zemla Pty Ltd ACN 008 966 283 as trustee for the Young Purich and Higham Unit Trust trading as Structerre Consulting Engineers

Buyer Initial: _____

Sample No.	**40595**	**Client**	Geotechnical
Job No.	J485600	**Project**	Lot 101, #356 Lake Rd, Champion Lakes

Laboratory testing carried out at Malaga Laboratory 44 Crocker Dr Malaga WA 6090

SAMPLE DETAILS

BH No. / Depth	Stockpile 2 -	Sampling Method	Client
Sample History	50°C Oven Dried	Sample Preparation	AS 1289 1.1

ATTERBERG LIMITS

Description	Method	Result (%)
Liquid Limit	AS 1289.3.1.2	0
Plastic Limit	AS 1289.3.2.1	NP
Plasticity Index	AS 1289.3.3.1	NP
Linear Shrinkage	AS 1289.3.4.1	0
Nature of Shrinkage		Flat

PARTICLE SIZE DISTRIBUTION

Method: AS 1289.3.6.1
Description: Particle size distribution by sieve analysis

Sieve Size (mm)	% Passing
19.0	93
2.36	75
0.425	47
0.075	7

AS 1726:2017 Clause 6.1
Material Description: SAND with silt, with gravel
AS Group Symbol: SP-SM

NATA WORLD RECOGNISED ACCREDITATION

Accreditation Number 18742

Ben Stroop
Authorized Signatory

Senior Laboratory Technician

Date: 18-Jun-25

Buyer Initial: _____

WA | QLD | NSW | VIC
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Ph : (08) 9205 4500
Email: wageotechlab@structerre.com.au
Website: www.structerre.com.au
ABN: 71 349 772 837 / ACN: 008 966 283

Report Number: ASM:W25-03015
Date of Issue26/06/2025
Issue Number: 2
This report replaces all previous issues of report no 'ASM:W25-03015'.

Material Test Report

Client:	356 Lake Pty Ltd
Client Address:	Po Box 9054 Subiaco WA 6008
Project:	Lot 101 #356 LAKE RD CHAMPION LAKES
Project No:	D363603

Approved Signatory: Pethreux Simon Cabral

Accredited for compliance with ISO/IEC 17025

Material Details

Test Location	Material Assessment	**TRN**	-
Soil Description	Sand	**Proposed Use**	Insitu
Specification	N/A	**Sampling Method**	TESTED AS RECEIVED
Depth of Test	0-200	**Depth of Layer**	

Sample Details

Sample ID	25S-07400	25S-07401
Field Sample ID	BH4	BH9
Date Sampled	06/06/2025	06/06/2025

Other Test Results

Description	Method	Results		Limits
Ash Content (%)	ASTM D 2974	97.0	96.5	
Organic Content (%)		3.0	3.5	
Furnace Temperature (°C)		440	440	
Moisture Content (%)		0	0	
Moisture contents are proportioned by		oven-dried mass	oven-dried mass	
Moisture Content Method (A or B)		A	A	
Ash Content Method (C or D)		C	C	
Date Tested		10/06/2025	10/06/2025	

Comments

Reissued to amend Sample Details.

Buyer Initial: _____

Malaga Laboratory
44 Crocker Drive, Malaga, WA 6090
Post: PO Box 792, Balcatta WA 6914
Ph : (08) 9205 4500
Email: wageotechlab@structerre.com.au
Website: www.structerre.com.au
ABN: 71 349 772 837 / ACN: 008 966 283

Material Test Report

Report Number: ASM:W25-03087
Date of Issue26/06/2025
Issue Number: 2
This report replaces all previous issues of report no 'ASM:W25-03087'.

Client:	356 Lake Pty Ltd
Client Address:	Po Box 9054 Subiaco WA 6008
Project:	Lot 101 #356 LAKE RD CHAMPION LAKES
Project No:	D363603

Approved Signatory: Pethreux Simon Cabral

Accredited for compliance with ISO/IEC 17025

Material Details

Test Location	Organic Content - Lot 101 #356 Lake Road	**TRN**	-
Soil Description	Limestone	**Proposed Use**	Fill
Specification	N/A	**Sampling Method**	Sample submitted by client
Depth of Test	-	**Depth of Layer**	

Sample Details

Sample ID	25S-07585	25S-07586
Field Sample ID	Stockpile 1	Stockpile 2
Date Sampled	10/06/2025	10/06/2025

Other Test Results

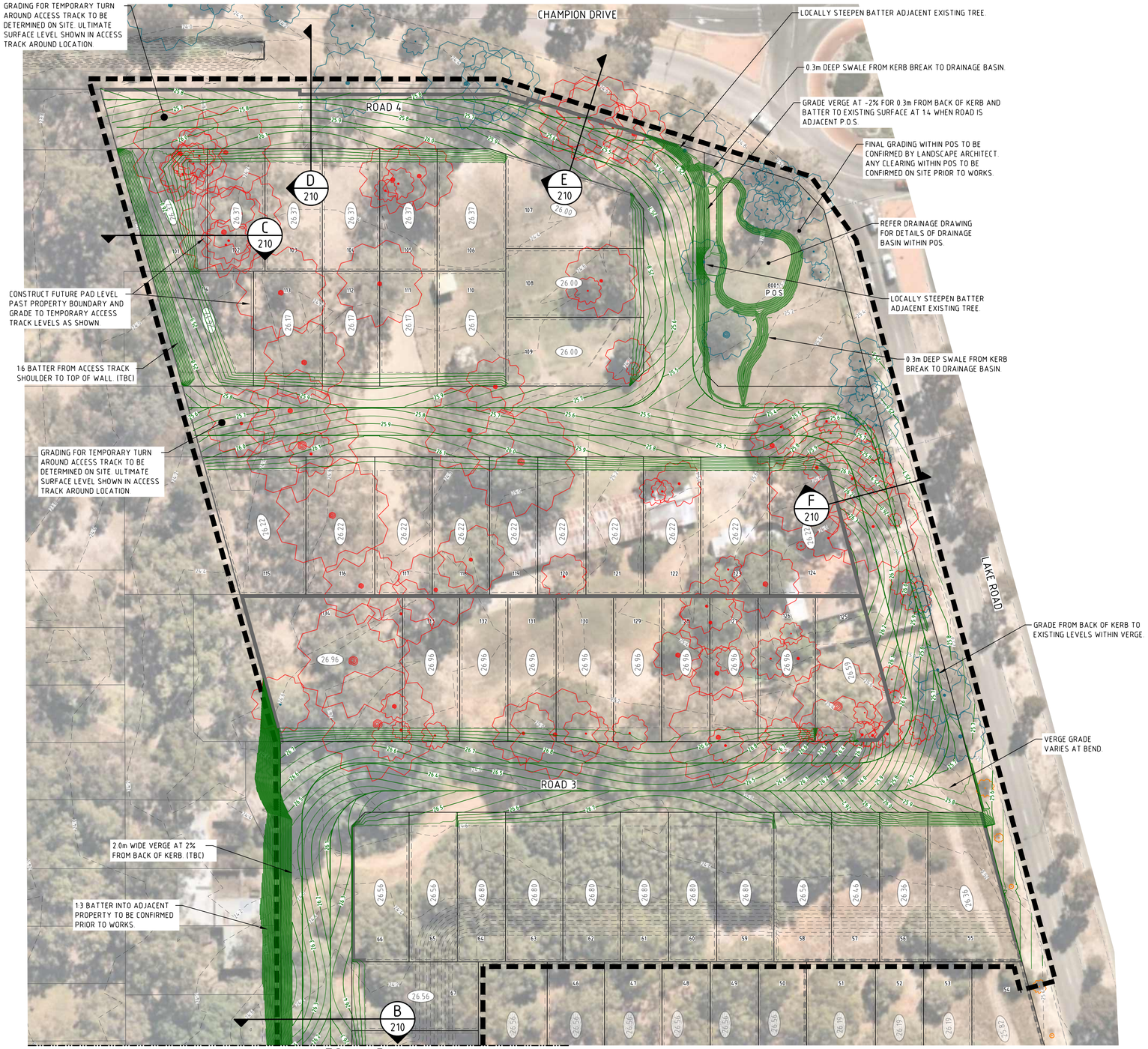
Description	Method	Results		Limits
Ash Content (%)	ASTM D 2974	99.6	99.7	
Organic Content (%)		0.4	0.3	
Furnace Temperature (°C)		440	440	
Moisture Content (%)		0	0	
Moisture contents are proportioned by		as-received mass	as-received mass	
Moisture Content Method (A or B)		A	A	
Ash Content Method (C or D)		C	C	
Date Tested		12/06/2025	12/06/2025	

Comments

ASTM D 2974 Not covered under scope of accreditation.
Reissued to amend Sample Details.

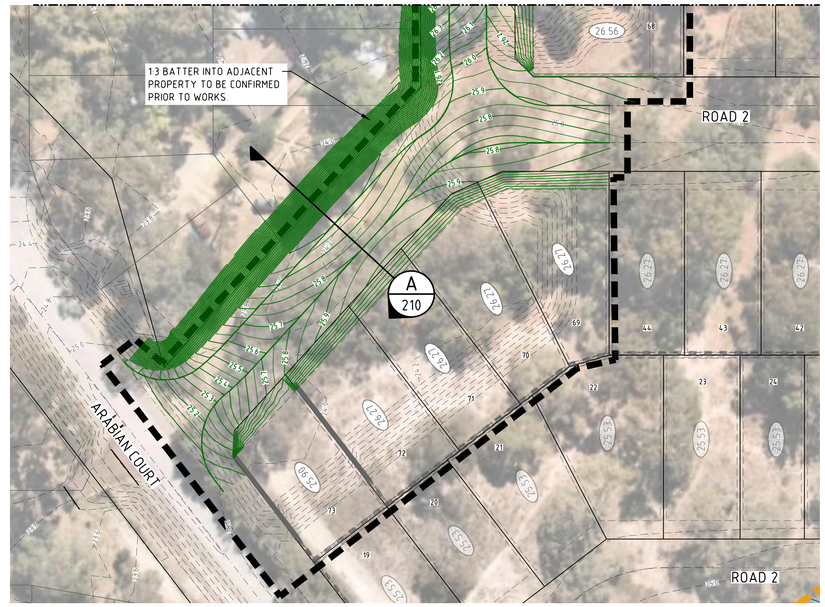
Buyer Initial: _____

Appendix E – Earthworks Levels Construction Plans from CW



MATCH LINE A - A

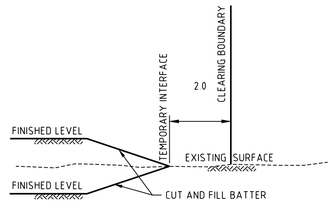
MATCH LINE A - A



NOTICE TO CONTRACTOR

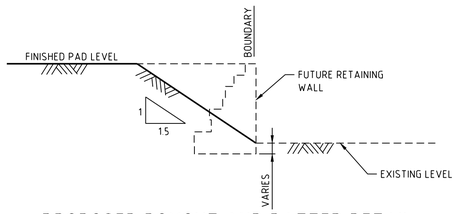
IT IS THE CONTRACTOR'S RESPONSIBILITY TO INVESTIGATE THE NATURE AND LOCATION OF ALL SERVICES WHICH MAY BE ENCOUNTERED AND TO CONSULT WITH THE RELEVANT SERVICE AUTHORITIES PRIOR TO COMMENCEMENT OF EXCAVATIONS. FAILURE TO DO SO OR TO TAKE DUE CARE SHALL NOT LIMIT THE CONTRACTOR'S LIABILITY FOR REPAIR OF ALL SERVICES DAMAGED BY HIM DURING CONSTRUCTION WORKS THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY FOR THE PROTECTION OF ALL EXISTING SERVICES.

PRELIMINARY



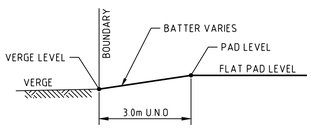
TEMPORARY EARTHWORKS INTERFACE

SCALE: N.T.S



PROPOSED BOXOUT AND BATTER DETAIL FOR FUTURE RETAINING WALLS

SCALE: N.T.S



TYPICAL BATTER TO FRONT OF TRADITIONAL LOTS

SCALE: N.T.S

LEGEND

DESCRIPTION	SYMBOL
LIMIT OF CLEARING BOUNDARY	
NO CLEARING ZONE	
FINISHED SURFACE CONTOUR	22.50
EXISTING SURFACE CONTOUR	22.50
FINISHED LOT PAD LEVEL	25.00
PROPOSED RETAINING WALL	
EXISTING RETAINING WALL	
FUTURE RETAINING WALL	
EXTENTS OF FLAT LOT PAD	
TREE TO BE RETAINED	
TREE TO BE REMOVED	
TREE TO BE REMOVED AND RE-PLANTED AFTER EARTHWORKS. TBC BY COUNCIL.	
TREE PROTECTION ZONE (TPZ)	

NOTES

1. ALL LEVELS IN METRES TO AHD. SURVEY BY MNG.
2. BATTERS TO EXISTING SURFACE AT 1:3 (CUT) 1:4 (FILL) UNLESS NOTED OTHERWISE.
3. BATTER POSITION FOR FUTURE WALLS TO ENSURE CUT TO FILL EARTHWORKS BALANCE.
4. ALL UNSUITABLE MATERIAL TO BE REMOVED BY THE CONTRACTOR TO APPROVED TIPPING SITE PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL FEES TO BE PAID BY CONTRACTOR.
5. EXTENT OF CLEARING AND EARTHWORKS TO BE LIMITED TO THE STAGE CLEARING BOUNDARY UNLESS AGREED WITH THE SUPERINTENDENT.
6. ALL CLEARED MATERIAL TO BE MULCHED AND STOCKPILED ON SITE AS DIRECTED BY THE SUPERINTENDENT.
7. CONTRACTOR TO LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS ON SITE.
8. CONTRACTOR TO GRADE EVENLY BETWEEN DESIGN CONTOURS AND MATCH INTO EXISTING SURFACE AT LIMIT OF EARTHWORKS. BOUNDARY WHERE APPROPRIATE.
9. EXCESS CUT FROM EARTHWORKS SHALL BE PLACED ON SITE AS DIRECTED BY THE SUPERINTENDENT.
10. WHERE LIMESTONE IS WITHIN 600mm OF THE FINAL SURFACE LEVEL THE CONTRACTOR SHALL TREAT THE SITE IN ACCORDANCE WITH THE SPECIFICATION.
11. DESIGN LEVELS SHOWN SHALL BE ON THE FINISHED SURFACE INCLUDING TOPSOIL WHERE SPECIFIED.
12. THE CONTRACTOR SHALL LIMIT THE MOVEMENT OF EQUIPMENT AND MANPOWER TO THE MINIMUM AREA NECESSARY AND PROTECT ALL VEGETATION AND EXISTING SERVICES ON SITE.
13. ADJACENT RESIDENTS TO BE NOTIFIED OF THE WORKS AT LEAST TWO WEEKS IN ADVANCE. CONTRACTOR TO PROVIDE MOBILE NUMBER FOR SUPERVISOR AS PART OF NOTIFICATION.

REV.	DATE	DRN	CKD	APP	AMENDMENT
A	16.06.25	AC	-	-	ISSUED FOR APPROVAL

BEFORE YOU DIG www.byda.com.au

1:1000 0m 20 40 60m

Cossill & Webley CONSULTING ENGINEERS
Mailing Address: PO Box 680, Subiaco WA 6904
Street Address: B12 (Level 2) 431 Roberts Road, Subiaco WA 6008
T (08) 9422 5800 F (08) 9422 5801 E admin@cosweb.com.au

CLIENT: CELSIUS PROPERTY GROUP PTY LTD

APPROVED: PRELIMINARY

DESIGNED: AC

SCALE: 1:1000

PROJECT: LAKE ROAD, CHAMPION LAKES - STAGE 02

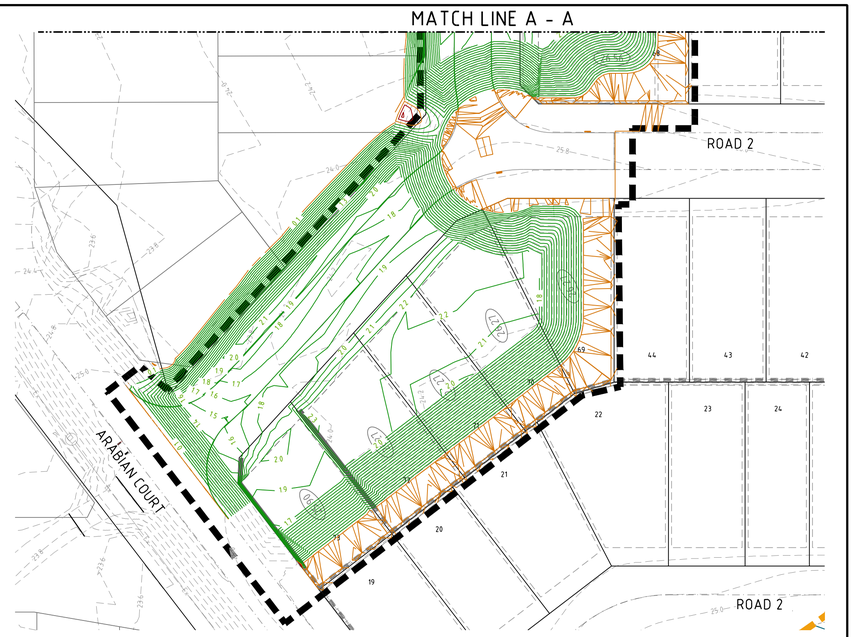
TITLE: CLEARING & EARTHWORKS PLAN SHEET 1 OF 1

WAPC No. 162858

DRAWING No. 6483-02-200

REVISION A

ORIGINAL SIZE A1



LEGEND

DESCRIPTION	SYMBOL
LIMIT OF CLEARING BOUNDARY	
EXISTING SURFACE CONTOUR	
FINISHED LOT PAD LEVEL	25.00
FILL CONTOURS	0.6
CUT CONTOURS	0.1
ZERO CONTOURS	
EXISTING TREE	

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REV.	DATE	DRN	CKD	APP	AMENDMENT
A	12.03.25	AC	-	-	ISSUED FOR APPROVAL

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0m 10 20 30
1:500

Cossill & Webley CONSULTING ENGINEERS
Mailing Address PO Box 680 Subiaco WA 6904
Street Address B12 (Level 2) 431 Roberts Road Subiaco WA 6008
T (08) 9422 5800 F (08) 9422 5801 E admin@cosweb.com.au

CLIENT: CELSIUS PROPERTY GROUP PTY LTD

APPROVED: CHECK PRINT

DESIGNED: AC

SCALE: 1:500

PROJECT: LAKE ROAD, CHAMPION LAKES - STAGE 02

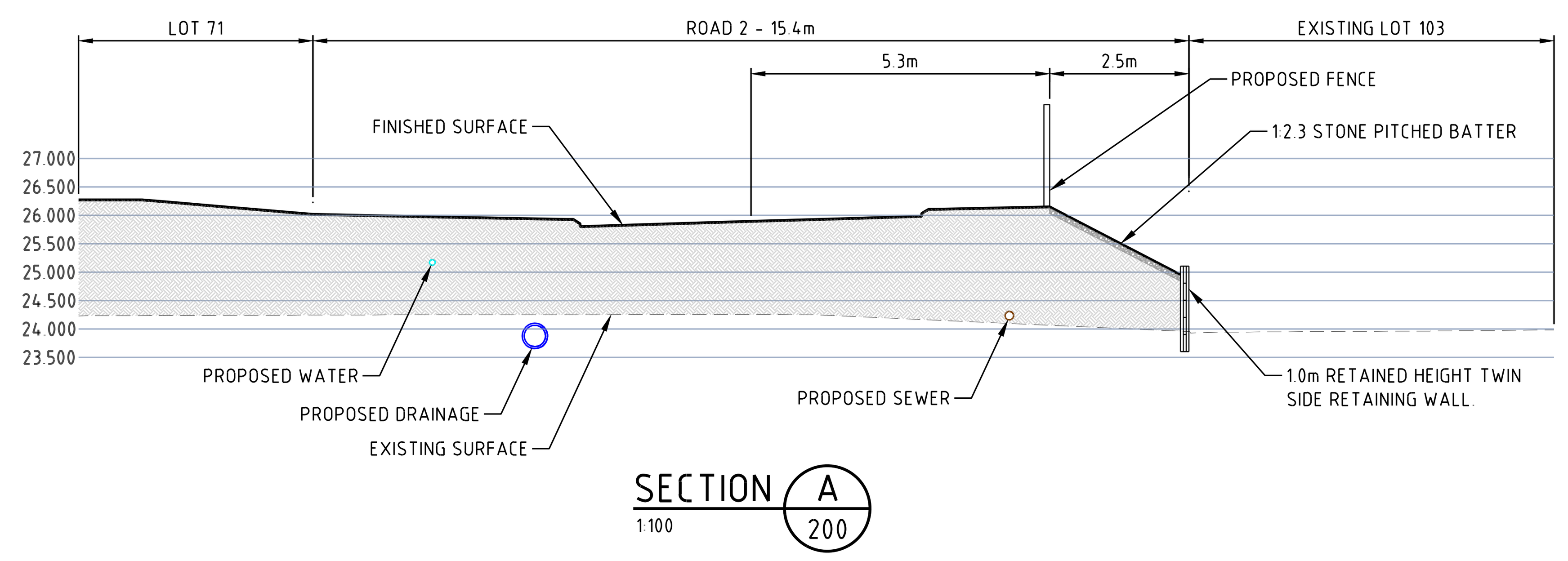
TITLE: DEPTH CONTOUR PLAN SHEET 1 OF 1

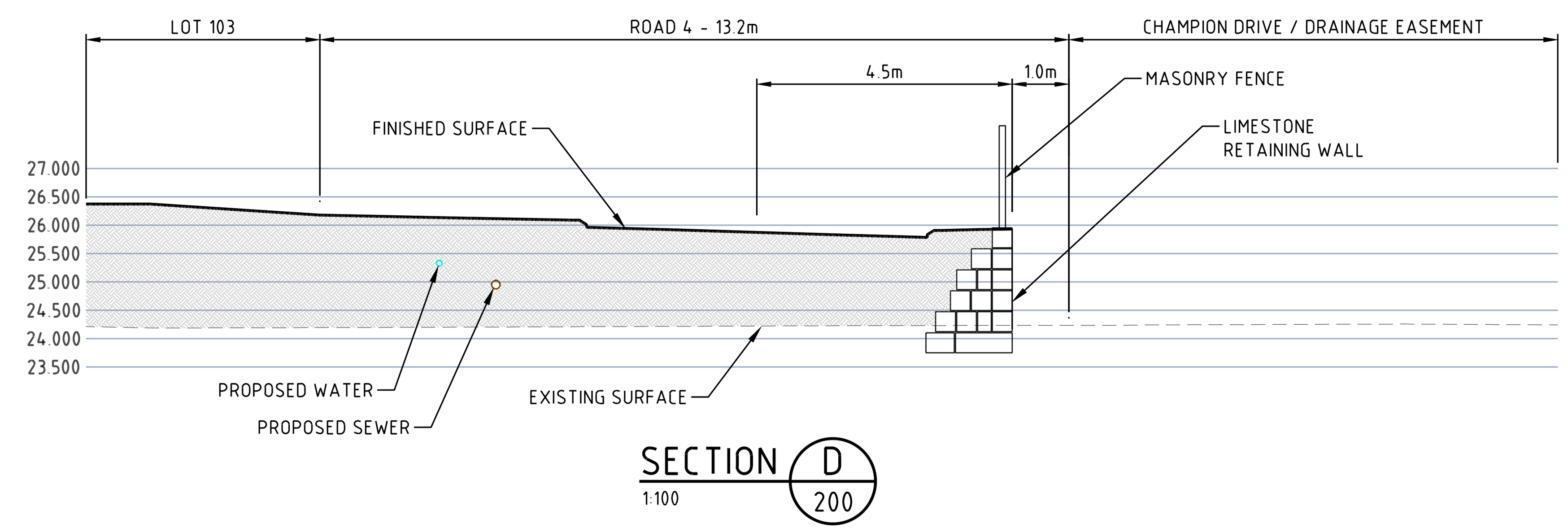
WAPC No. 162858

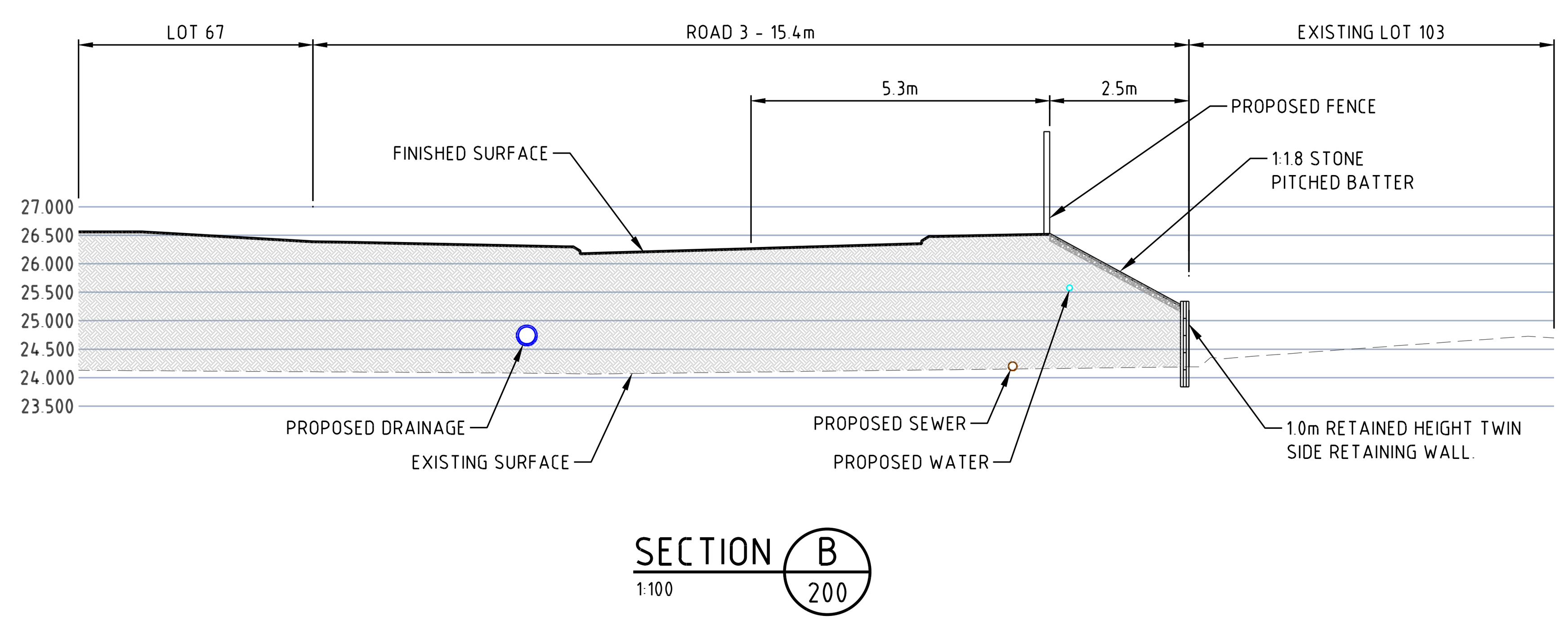
DRAWING No. 6483-02-205

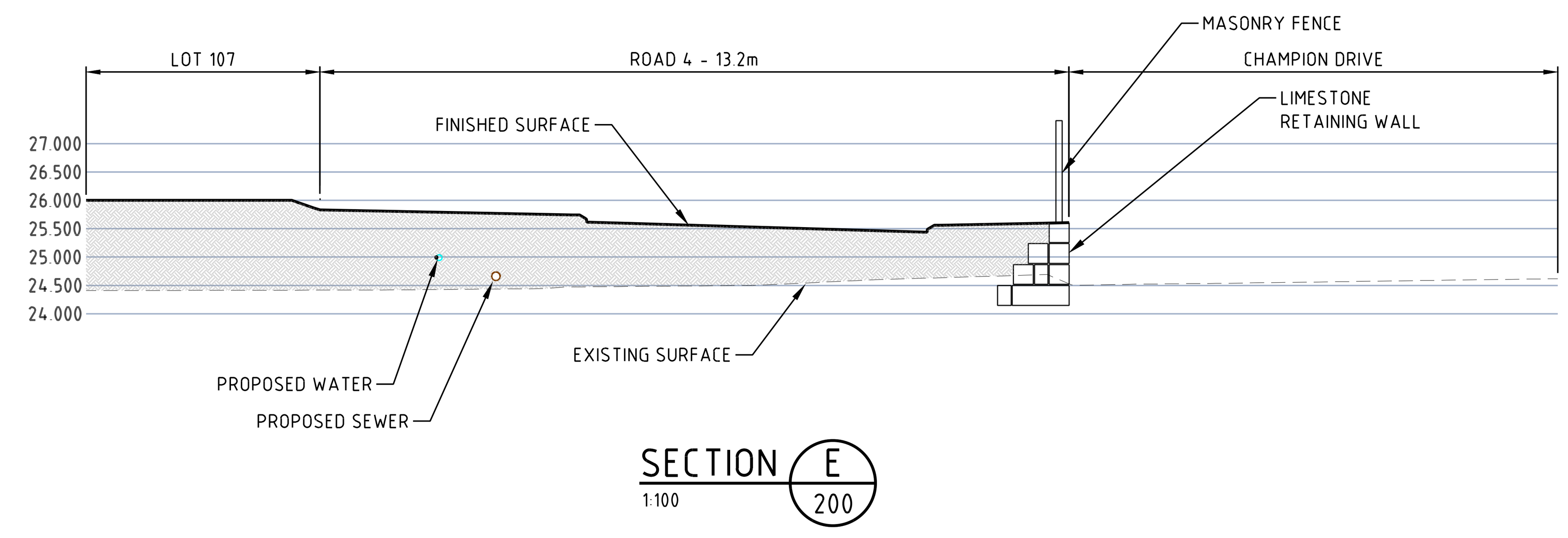
REVISION A

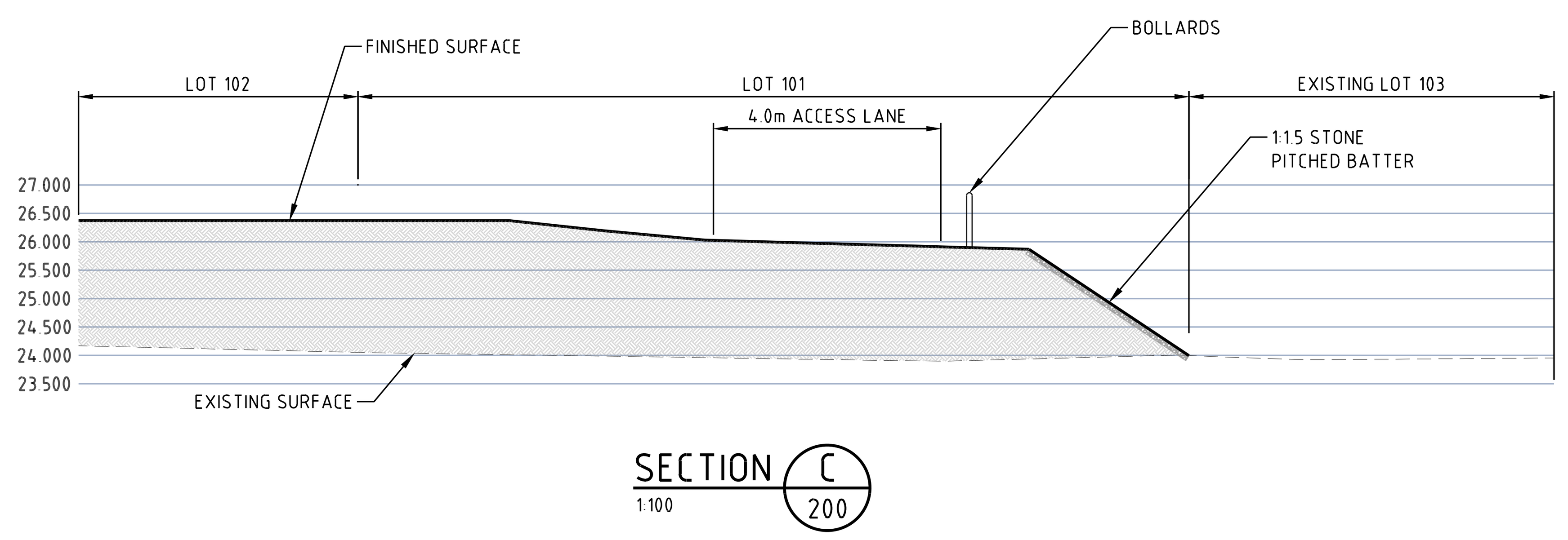
ORIGINAL SIZE A1

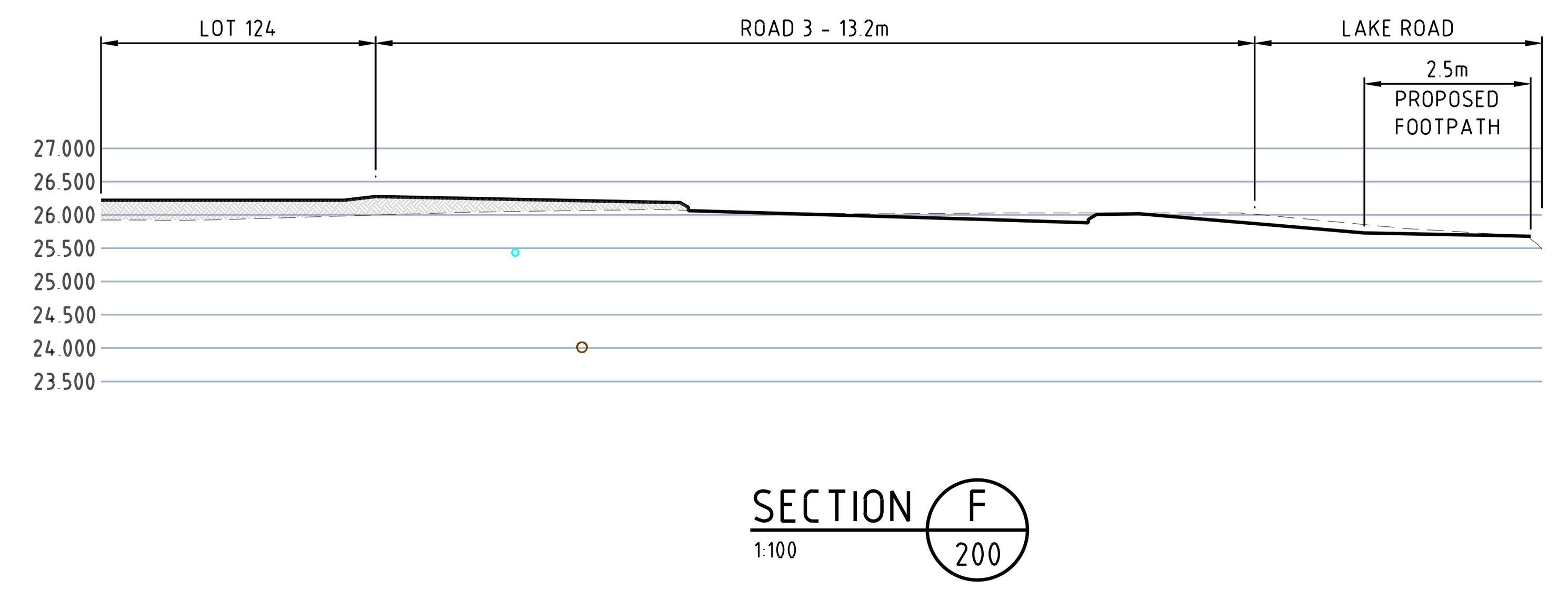












PRELIMINARY

REV	DATE	DRN	CKD	APP	AMENDMENT
A	16.06.25	AC	-	-	ISSUED FOR APPROVAL

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0m 2 4 6
1:100

Cossill & Webley
CONSULTING ENGINEERS
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Street Address
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Subiaco WA 6008
T (08) 9422 5800 F (08) 9422 5801 E admin@cosweb.com.au

CLIENT	CELSIUS PROPERTY GROUP PTY LTD
APPROVED	PRELIMINARY
DESIGNED	AC
SCALE	1:100
PROJECT	LAKE ROAD, CHAMPION LAKES - STAGE 02
TITLE	EARTHWORKS CROSS SECTIONS SHEET 1 OF 1
WAPC No.	162858
DRAWING No.	6483-02-210
REVISION	A
ORIGINAL SIZE	A1

Buyers Plot
P:\6483 Arabian Court Champion Lakes\6483-02\Acad\6483-02-210.dwg, 16/06/2025 9:53:36 AM, anthonyc, Digital Signing PDF.pc3, 1:1, - CW Reference