



PUBLIC NOTICE DETAILS

PLANNING APPLICATION DETAILS

Application Number:	DA 2026/20
Application Type:	Discretionary Development Application
Property Location:	473 Rockmount Road, Ellendale
Proposal:	Outbuilding
Advertising Commencement Date:	18 March 2026
Representation Period Closing Date:	01 April 2026
Responsible Officer:	Louisa Brown, Senior Planning Officer

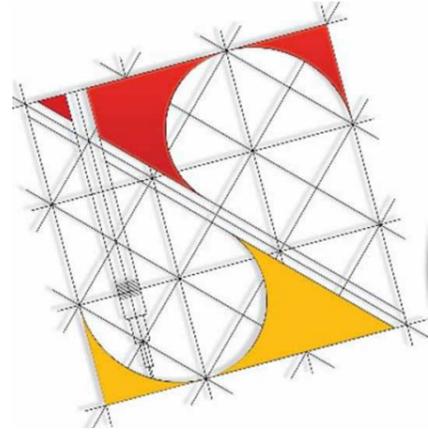
The relevant documents may be viewed at Council's website www.centralhighlands.tas.gov.au or at Council's Offices 19 Alexander Street, Bothwell & 6 Tarleton Street, Hamilton during normal business hours.

Enquiries regarding this Application can be made by contacting Central Highlands Council on (03) 6259 5503 or by emailing development@centralhighlands.tas.gov.au. Please quote the "Application Number" when making your enquiry.

Representations on this application may be made to the General Manager in writing either by:

Post: 19 Alexander Street, Bothwell TAS 7030
Email: development@centralhighlands.tas.gov.au

All representations must include the authors full name, contact number and postal address and be received by 5.00pm on the representation period closing date.



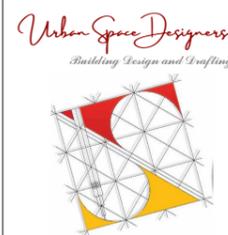
Urban Space Designers
Building Design and Drafting

**PROPOSED COLORBOND SHED
 (20m x 10m)**

AT

**473 ROCKMOUNT RD,
 ELLENDALE, TAS - 7140**

SHEET	REVISION	SHEET NAME
A01		COVER SHEET
A02		KEY DATA/ SITE PLAN
A03		FLOOR PLAN
A04		ELEVATIONS



Phone:
0402438170

Email:
info@urbanspacedesigners.com.au

Website:
www.urbanspacedesigners.com.au

Accreditation:
TAS - 381246362
VIC - DP-AD 72846

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IF IN DOUBT ASK.

The completion of the issued details checked and authorized section below is confirmation of the status of the drawing. The drawing shall not be used for the construction unless endorsed "for construction" and authorized for issue. Read these drawings in conjunction with drawings prepared by USD. Refer any discrepancies with the architect before proceeding with any building works. The drawing is prepared as built and strict instructions to builders to have a physical measurement before referring this drawing and inform USD if there are any gaps in dimensions.

Client:
Cahill Aherne

Project:
Proposed Shed (20m x 10m)

Address:
473 Rockmount Rd,
Ellendale, TAS - 7140

Issue	Issue Name	Date

DESIGN DRAWINGS

CHECK all dimensions and measurements on site prior to fabrication and or construction. Dimensions are in millimeters "frame to frame" and do not allow for interior linings.

ALL work in Accordance with The Building Code of Australia (BCA) as amended, relevant Australian Standards (AS) Codes and good building practices. Drawings to be read in conjunction with specifications and schedules.

Sheet: COVER SHEET		
Drawn: GK		
Scale:	Size: A3	Date: 16/10/2025
Project: 473RRE/TAS/ARCH-2025	Sheet: A01	Rev:

473, Rockmount Rd, Ellendale, TAS - 7140

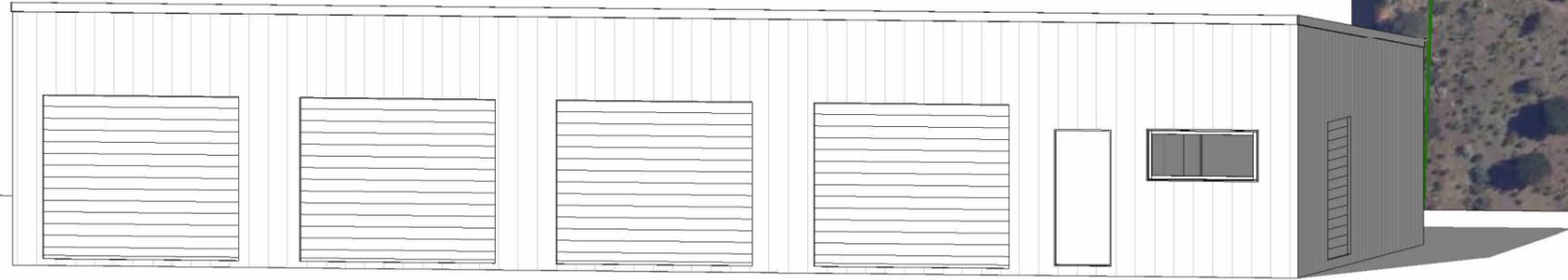
C.T. Reference: 182981/1

Property ID: 9441410

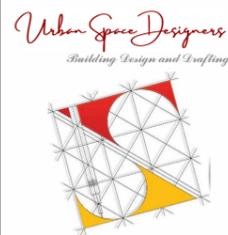
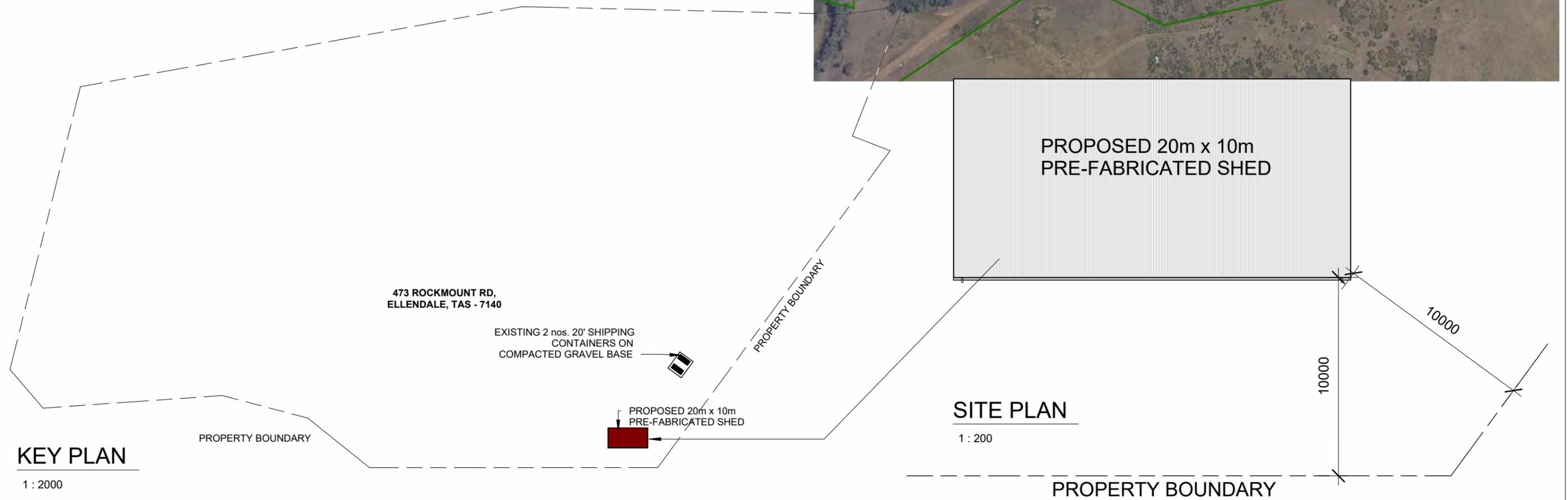
Purpose of Development:

Proposed shed to house tractors, mowers and other general site maintenance equipment for the overall upkeep of the communal spaces on the property.

Proposed bathroom in the shed to provide amenities for contractors undertaking above mentioned works.



3D View for Illustration purpose only



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Sheet: KEY DATA/ SITE PLAN			
Drawn: GK			
Scale: As indicated	Size: A3	Date: 16/10/2025	
Project: 473RRE/TAS/ARCH-2025	Sheet: A02	Rev:	

PART 10.3 ROOM HEIGHTS

Heights of rooms and other spaces (see Figure 10.3.1) must be not less than—

- a. in a habitable room excluding a kitchen— 2.4 m; and
- b. in a kitchen— 2.1 m; and
- c. in a corridor, passageway or the like— 2.1 m; and
- d. in a bathroom, shower room, laundry, sanitary compartment, airlock, pantry, storeroom, garage, car parking area or the like— 2.1 m; and
- e. in a room or space with a sloping ceiling or projections below the ceiling line within—
 - a habitable room—
 - 1. in an attic— a height of not less than 2.2 m for at least two-thirds of the floor area of the room or space; and
 - 2. in other rooms— a height of not less than 2.4 m over two-thirds of the floor area of the room or space; and
 - a non-habitable room— a height of not less than 2.1 m for at least two-thirds of the floor area of the room or space; and
- f. in a stairway, ramp, landing, or the like— 2.0 m measured vertically above the nosing line of stairway treads or the floor surface of a ramp, landing or the like.

Artificial Lighting

Sanitary compartments, bathrooms, shower rooms, airlocks and laundries must be provided with artificial lighting if natural light in accordance with the relevant provisions of 10.5.1 is not available—

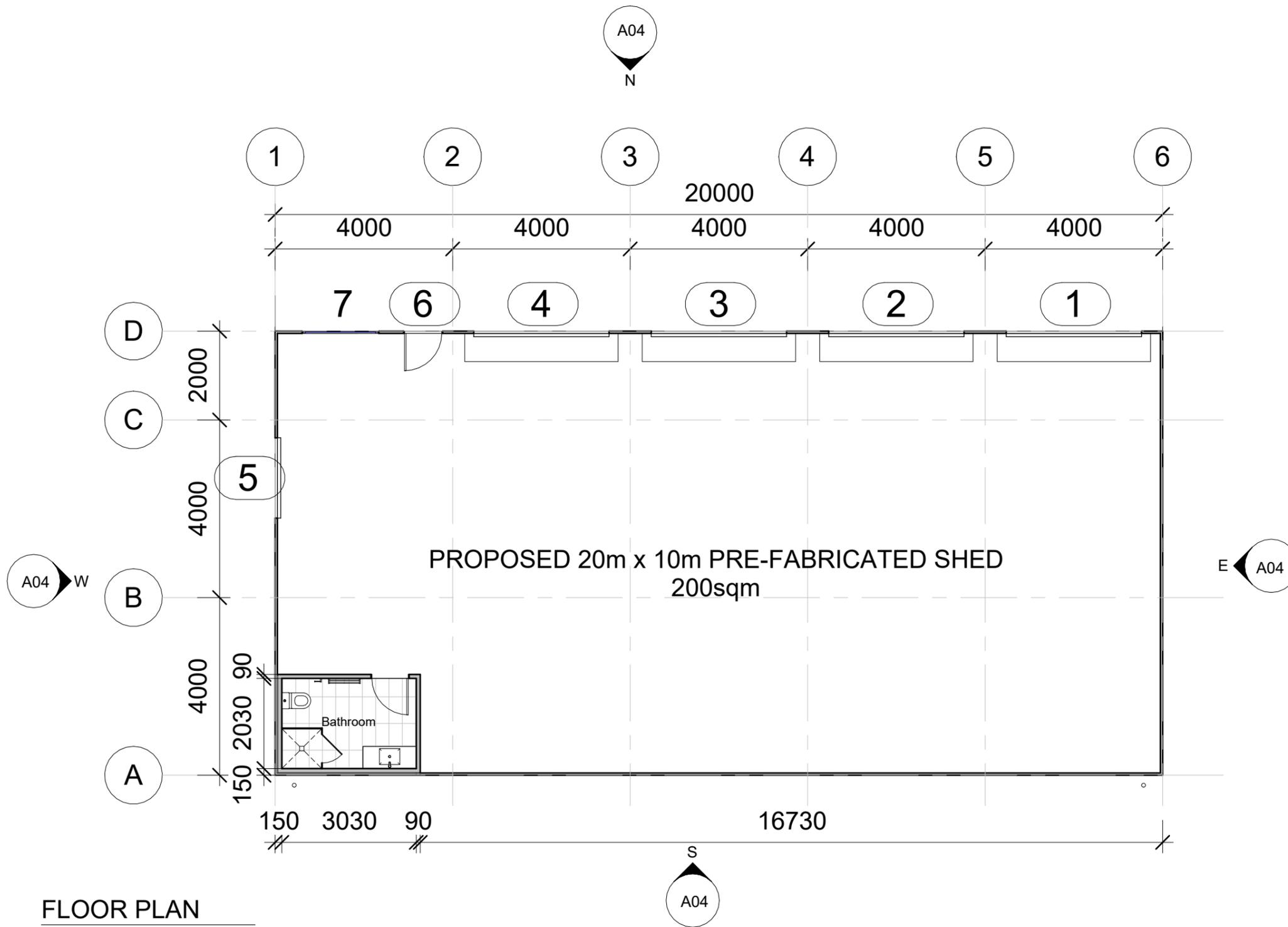
- a. at a rate of not less than one light fitting per 16 m² of floor area; or
- b. in accordance with AS/NZS 1680.0.

Stair Construction

Stairs must comply with-

- clause 8.1 of AS1428.1 : 2021 , including the notes; and
- clause 8.2 of AS1428.1 : 2021

Stair Risers : Min /Max = 115m m /190mm
 Public Stair Goings: Min /Max = 250mm /355mm
 Quantity Calculation Required ((2 x Riser)+Goings):
 Min /Max = 550mm /700mm
 Minimum of 2 risers and maximum of 18 in a flight; Not permit a 125mm sphere to pass through between treads; Solid construction (i.e. not perforated) if more than 10m high or more than 3 storeys; No winders (except internally of a residential apartment);



FLOOR PLAN

1 : 100



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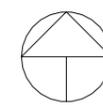
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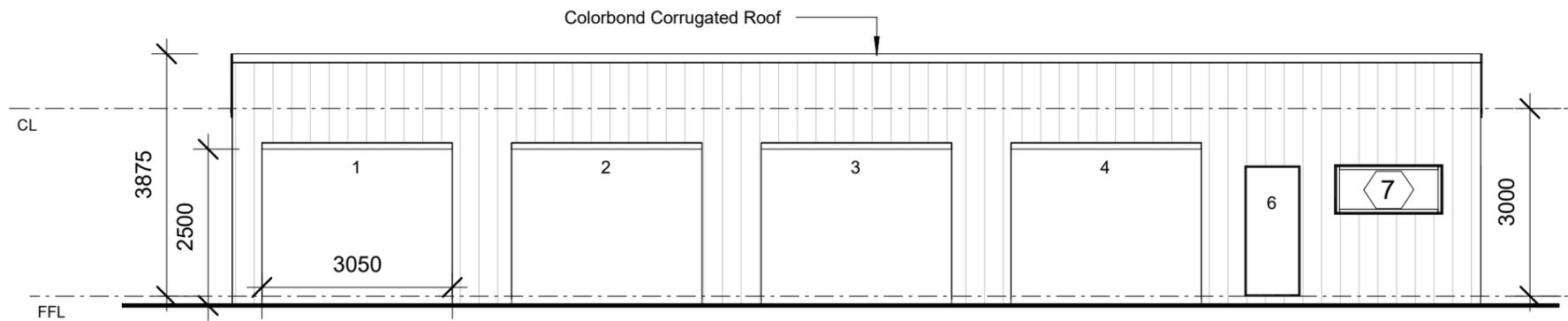
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Sheet: FLOOR PLAN		
Drawn: GK		
Scale: 1 : 100	Size: A3	Date: 16/10/2025
Project: 473RRE/TAS/ARCH-2025	Sheet: A03	Rev:

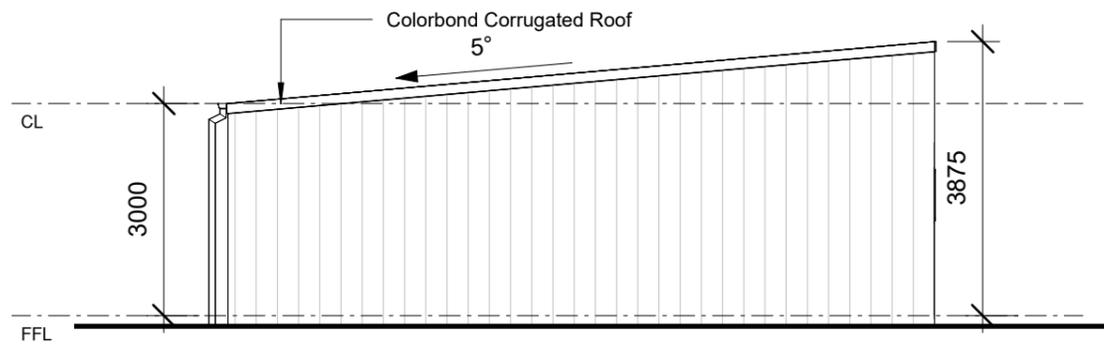


Door Schedule		
Number	Height	Width
1	2500	3050
2	2500	3050
3	2500	3050
4	2500	3050
5	2100	1810
6	2060	840

Window Schedule				
Number	Width	Height	Sill Height	Head Height
7	1731	790	1310	2100

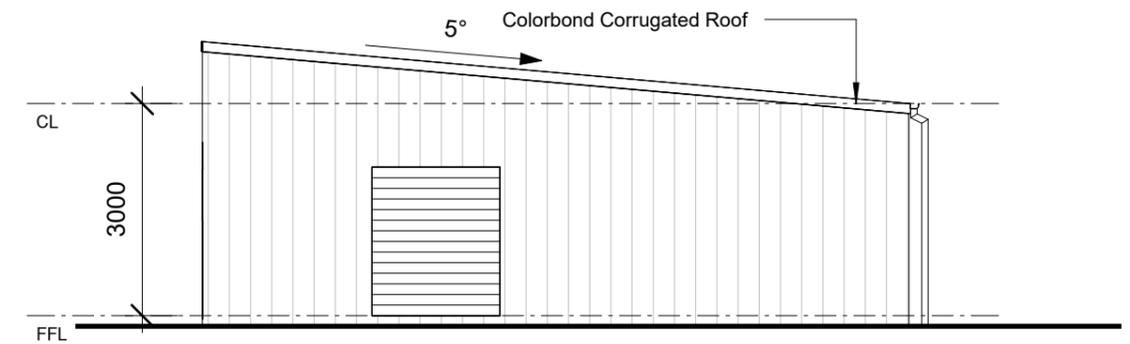
NORTH ELEVATION

1 : 100



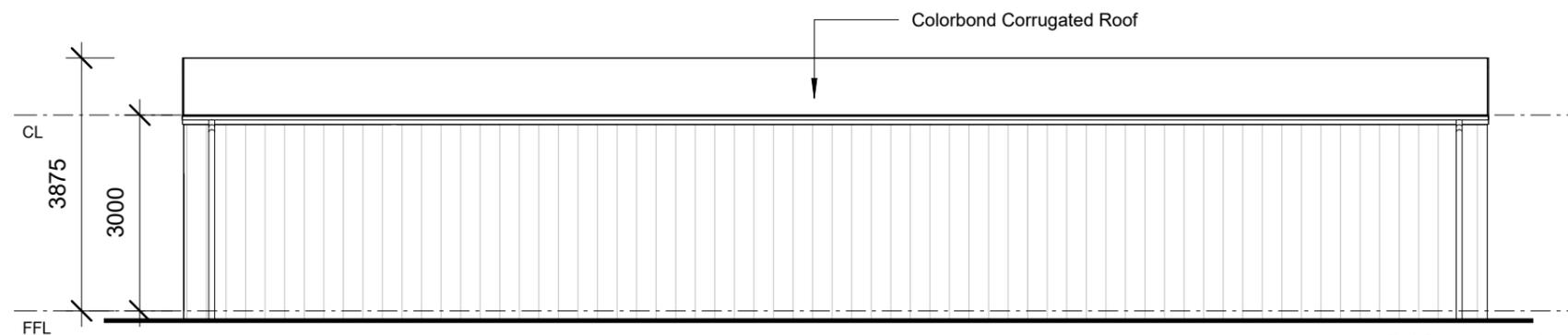
EAST ELEVATION

1 : 100



WEST ELEVATION

1 : 100



SOUTH ELEVATION

1 : 100

Fall Ground away from House a min. of 50mm over the first 1000mm in accordance with AS2870, NCC 2022 Part 3.3.3 & Fig. 3.3.3a



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Sheet: ELEVATIONS		
Drawn: GK		
Scale: 1 : 100	Size: A3	Date: 16/10/2025
Project: 473RRE/TAS/ARCH-2025	Sheet: A04	Rev:

STRUCTURAL GENERAL NOTES

1.0 General

- 1.1 These drawings are
 - a) Jointly owned by Easy Shed and Venn Engineering Pty Ltd
 - b) Provided for the sole purpose of obtaining building approval and guiding construction of a single building at the job address shown in the title block
 - c) Prohibited to be used for any other purpose without written authorisation from Easy Shed and Venn Engineering Pty Ltd.
 - d) Only valid if signed by the engineer and must not be altered in any way without signed approval from the engineer.
 - e) Produced to scale but dimensions shall not be obtained by measuring the drawings. All dimensions are in millimeters unless stated otherwise.
- 1.2 The engineer accepts no liability or responsibility for the contents of drawings that are invalid.
- 1.3 The word 'the engineer' used in these notes refers to an employee or nominated representative of Venn Engineering Pty Ltd.
- 1.4 The engineer is not the project manager or site supervisor for this project. It is the responsibility of the project manager or site supervisor in charge to ensure that the non-structural requirements of the Governing Building Code are considered and appropriately designed. This includes, but not limited to, fire & bushfire design, access requirements, future roof access requirements, lighting, glazing and electrical design, etc.

2.0 Structural Design

- 2.1 The structural framing components detailed in these drawings have been designed in accordance with the following documents for the design criteria detailed in these notes

Governing Building Code Loading Standards	2022 National Construction Code – Building Code of Australia Volume 2 and 2022 Housing Provisions Standard AS/NZS 1170.0:2002(+A5) AS/NZS 1170.1:2002(+A2) AS/NZS 1170.2:2021
Cold formed Steel member standard	AS/NZS 4600:2018
- 2.2 These drawings are also the limit of the Structural Design, any requirements for additional structural design of other items included in the project are specifically excluded if not shown on these drawings. This includes, but not limited to, requirements for additional loads that aren't specified including flood design loads, additional roof loads from solar panels, retaining walls required on site, driveway design etc.
- 2.3 These structural drawings and specifications represent the finished structure. The building is not considered complete until the installation of all components and details shown herein are installed according to the drawings.
- 2.4 No alterations are to be made to this structure without written approval of the engineer. This includes, but not limited to, modification to the plans and/or specifications, be the installation of additional openings, increased roof loads, skylight roof sheets or removal of cladding. If changes are made without written approval, such changes shall the legal and financial responsibility of the contractor or sub-contractors involved and it shall be their full responsibility to replace or repair the condition of the building as directed by the engineer.

3.0 Design Criteria

Building class.....	10a
Building Importance level.....	2
Wind region.....	A4
Terrain category.....	2.5
Topographic multiplier.....	1
Shielding multiplier.....	1
Ultimate design wind speed.....	39.2 m/s
Snow load.....	1.63 kPa
Slab imposed load.....	2.5 kPa or 9kN applied over 0.3x0.3m area (light vehicles)
Allowable bearing capacity of foundation supporting footings.....	100 kPa
Allowable bearing capacity of foundation supporting slab.....	50 kPa
Allowable skin friction of foundation.....	25 kPa
Soil Type.....	Non-aggressive (not saline or acid sulfate)

4.0 Installation Building Contractor Responsibilities

- 4.1 The contractor shall verify and confirm all site conditions and dimensions. Any discrepancies between drawings and site conditions shall be referred to the engineer for decision before proceeding with the work.
- 4.2 All workmanship and materials are to be in accordance with the Governing Building Code including all relevant Australian Standards and local statutory authorities except where varied by the contract documents.
- 4.3 The contractor shall be responsible for maintaining the structure in a stable condition and ensuring no part is overstressed under construction activities. They shall provide all temporary bracing, shoring or other means to avoid excessive stresses and to hold structural elements in place during erection. These temporary provisions shall remain in place until sufficient permanent members are erected to ensure the safety of partially erected structures. The contractor is responsible for meeting all laws regulating the erection of steel buildings including, but not limited to, Safe Work Australia guidelines.
- 4.4 The contractor shall be responsible for the location of all services in the vicinity of the works. Any services shown are provided for information only. The contractor shall confirm the location of all services prior to commencing and shall be responsible for the repair of any damage caused to services, as well as any loss incurred because of the damage to any service.

5.0 Foundation

- 5.1 The bearing capacity of the foundation supporting the footings and slab shall be confirmed before any concrete is placed.
- 5.2 No earth or debris is to fall into the footings or piers before and during placing of concrete.
- 5.3 All footings shall be located centrally under walls and columns unless noted otherwise.
- 5.4 Concrete embedment depths do not apply to locations where any uncompacted fill or disturbed ground exists or where walls of the excavation will not stand without support. Request further advice from the engineer in these circumstances.
- 5.5 Fill used for the support of a slab on ground shall be controlled fill or rolled fill as in accordance with clause 6.4.2 of AS 2870-2011.
- 5.6 Slabs less than 100sq.m in plan area are suitable for AS 2870-2011 site classes A, S & M. For larger slabs or for site classes M-D, H1, H1-D, H2, H2-D, E & E-D, the slab may experience cracking more than is considered normally acceptable. The cracking is considered of aesthetic concern only and should not effect the structural performance of the slab or shed. If this is not desired, contact the engineer for further advice.

6.0 Concrete

- 6.1 Concrete placement and workmanship shall be in accordance with AS 3600-2018 & AS 2870-2011.
- 6.2 Concrete shall be
 - a) N25 with slump of 100 mm in accordance with AS 1379-2007, with 20 mm maximum nominal aggregate size and no admixtures.
 - b) consolidated by mechanical vibration.
 - c) Cured for a minimum of 7 days using continuous ponding with potable water.
- 6.3 No holes, chases or embedment of pipes other than those shown on the drawings shall be made in concrete members without prior approval of the engineer.

7.0 Reinforcement

- 7.1 Reinforcement shall comply with AS/NZ 4671-2019.
- 7.2 Reinforcement is represented diagrammatically and not necessarily shown in true projection.
- 7.3 Welding of reinforcement shall not be permitted without the approval of the engineer.
- 7.4 All reinforcement shall be securely supported in its correct position ensuring the correct cover during placing of concrete by approved bar chairs, spacers or support bars. Approved chairs include stainless steel or plastic bar chairs for bottom reinforcement and plastic tipped wire bar chairs for top reinforcement. All chairs to be spaced at maximum of 750mm centres.
- 7.5 Cover to reinforcement shall be:
 - a) 50mm for surfaces of concrete in contact with the ground;
 - b) 30mm for top surfaces of slabs fully enclosed by the building without open bays or
 - c) 60mm for top surfaces of slabs more than 1 km from the coastline with open bays.
 - d) For buildings with open bays within 1km of the coast, contact the engineer for cover and concrete grade requirements.
- 7.6 Reinforcement shall be lapped 500mm for 12mmØ bars and 800mm for 16mmØ bars.
- 7.7 Mesh reinforcement shall be lapped such that the two outermost wires of one sheet overlap the two outermost wires of the other sheet by 25 mm.
- 7.8 Hooks, bends and cogs to be in accordance with AS 3600-2018 unless noted otherwise on drawings.

8.0 Anchor Bolts

- 8.1 All anchors bolts shall be installed in accordance with the manufacturer's installation instructions.
- 8.2 Drill holes using a percussion drill (coring not permitted) to the correct hole diameter and depth as specified in the drawings.
- 8.3 Thoroughly clean and blow the dust out of the holes using the cleaning accessories prescribed by the manufacturer's instructions.
- 8.4 Substitution of anchors bolts and chemical epoxy adhesive is not permitted unless written confirmation from the engineer is provided.
- 8.5 For chemical anchors, ensure load is not applied to the anchors whilst epoxy adhesive is curing.

9.0 Light Gauge Cold-formed Steel

- 9.1 All light gauge cold-formed steel shall comply with AS 1397-2021 and be the following grades

Thickness(mm)	Steel grade (yield stress, MPa)	Protective coating (g/m2)
BMT ≤ 1.0mm	G550	Z350
1.0mm < BMT < 1.5mm	G500	Z350
1.5mm ≤ BMT ≤ 3.0mm	G450	Z350
- 9.2 Welding of light gauge cold-formed steel shall not be permitted.
- 9.3 Column and rafter members shall not be drilled or notched without prior approval of the engineer.
- 9.4 Round holes may be drilled through any girt or purlin member within the middle third of the depth of that member and not within 600mm of member end unless noted otherwise.
- 9.5 All bolts used to connect light gauge cold-formed steel members shall be
 - a) Zinc coated M12 (min.) grade 4.6 snug tightened complying to AS 1111.1-2015 & AS 1112.3-2015 unless noted otherwise.
 - b) Spaced no less than 3 bolt diameters between centres.
 - c) Located no less than 1.5 bolt diameters from bolt centre to the end or edge of any light gauge member.
- 9.6 All screws used to connect light gauge cold formed steel members (excluding sheeting) shall be
 - a) 10g (min.) self-drilling screws complying with AS 3566.1-2002.
 - b) Corrosion resistance class 4 in accordance with AS 3566.2-2002 for buildings within 1 km from the coastline with open bays or class 3 otherwise.
 - c) Spaced no less than 3 bolt diameters between centres.
 - d) Located no less than 1.5 bolt diameters from bolt centre to the end or edge of any light gauge member.

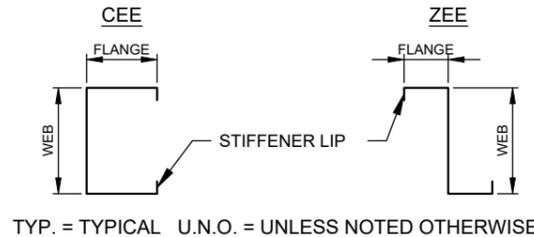
10.0 Roof & Wall Sheeting

- 10.1 Roof & wall sheeting shall comply with AS 1397-2018 and have suitable corrosion protection complying with Table 7.2.2a of the 2022 Housing Provisions Standard.
- 10.2 During construction and maintenance, no foot traffic shall occur within end spans of sheeting, foot traffic shall occur
 - a) Evenly across at least two ribs for corrugated profiled sheeting or
 - b) In the pans for pan-type profiled sheeting.
- 10.3 Any roof skylights shall be approved by the engineer
- 10.4 Safety mesh shall be installed in accordance with the building code

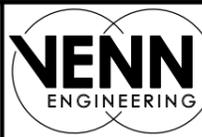
11.0 Door & Window Components

- 11.1 Wind-locked roller doors are assumed to remain in-place and resist the ultimate limit state wind loading except for in cyclonic regions
- 11.2 Non-wind-locked roller doors are assumed to have failed at the ultimate limit state wind loading
- 11.3 Personal access doors shall be rated for the wind loading parameters stated in the design criteria (see section 3.0)
- 11.4 All windows shall be in accordance with AS 1288-2021 & AS 2047-2014(+A2) as appropriate for the wind loading parameters stated in the design criteria (see section 3.0)

COMPONENT DIAGRAM



REV	DATE	DESCRIPTION
A	15-09-2025	-



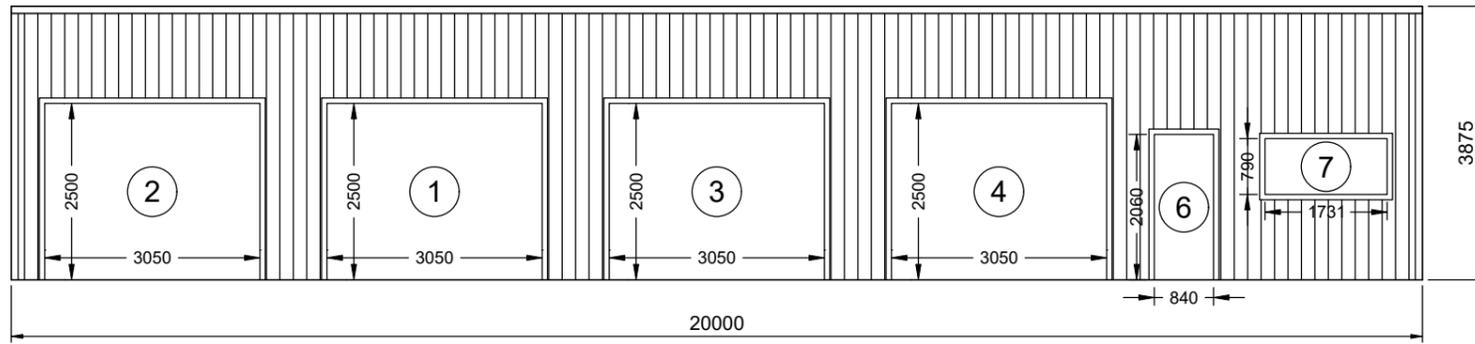
PO Box 3084
THIRROUL NSW 2515
sheds@venn.engineering
ABN 39 626 802 257

Signed Date 15-09-2025

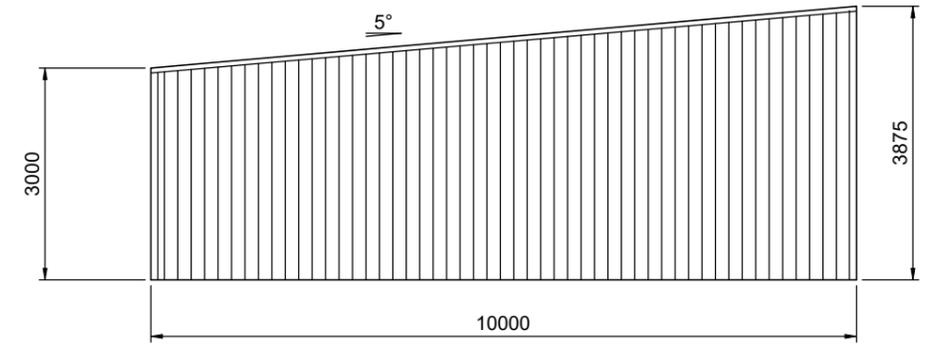
Grant J Wood MIEAust CPEng NER RPEQ
Registered EA Chartered Professional Engineer (No. 2383009)
Registered Professional Engineer QLD (No. 14384)
Registered Civil Engineer Building Practitioner VIC (No. PE0002499)
Registered Certifying Engineer (structural) NT (No. 306371ES)
Building Services Provider (Engineer Civil) TAS (No. 69030425)

Customer Name: Cahill Aherne
Site Address: Rockmount Rd
Ellendale,
TAS, 7140

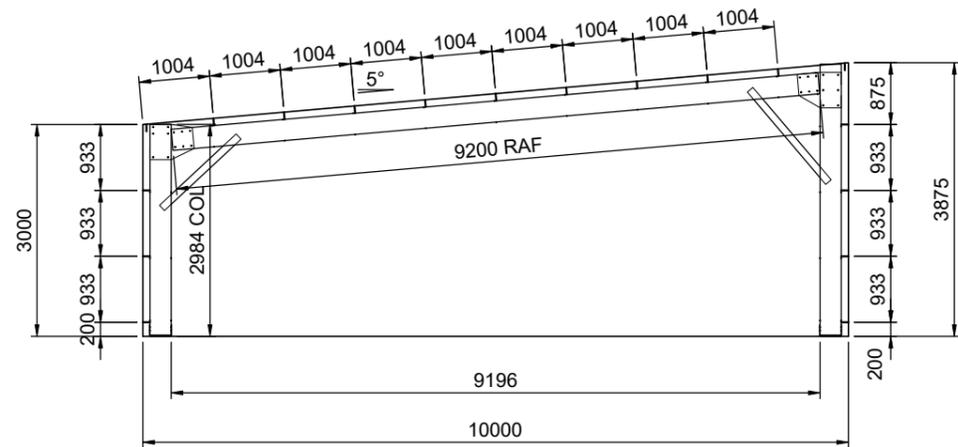
DATE 15-09-2025
JOB NO. EALB99553653
SHEET 1 of 11



2 SIDEWALL B BUILDING ELEVATION
2 SCALE: 1:100

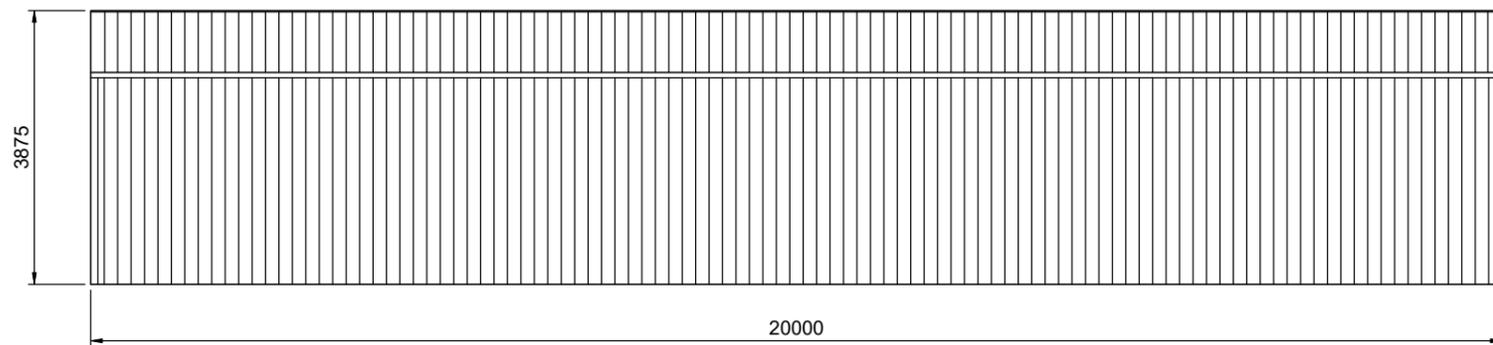


3 REAR BUILDING ELEVATION
2 SCALE: 1:100

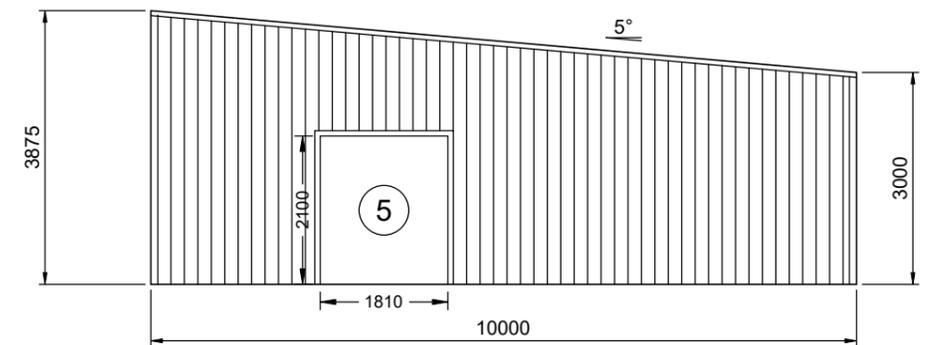


5 INTERNAL FRAMING ELEVATION
2 SCALE: 1:100

FRAMES 2-5

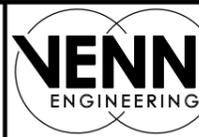


1 SIDEWALL A BUILDING ELEVATION
2 SCALE: 1:100



4 FRONT BUILDING ELEVATION
2 SCALE: 1:100

REV	DATE	DESCRIPTION
A	15-09-2025	-

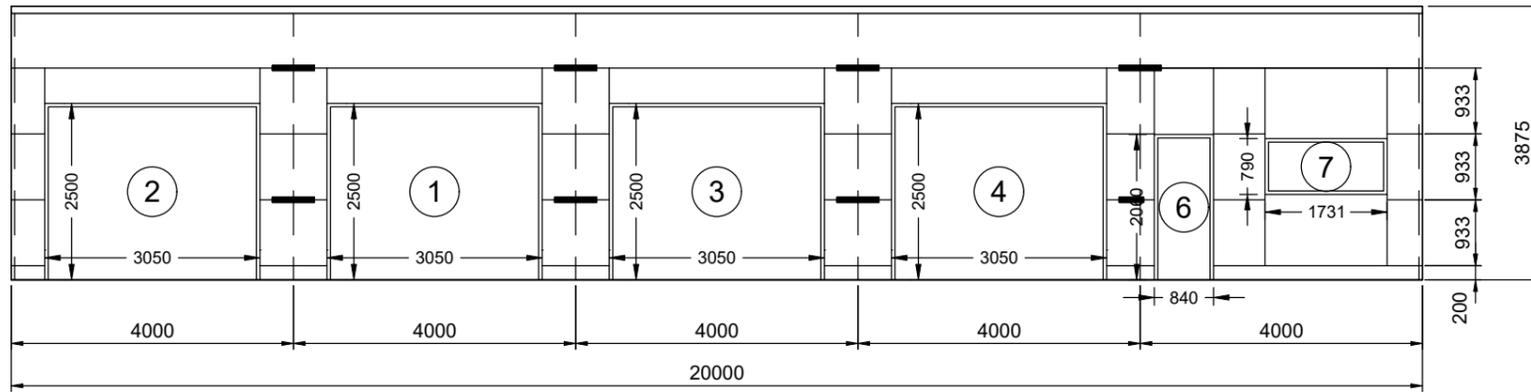


PO Box 3084
 THIRROUL NSW 2515
 sheds@venn.engineering
 ABN 39 626 802 257

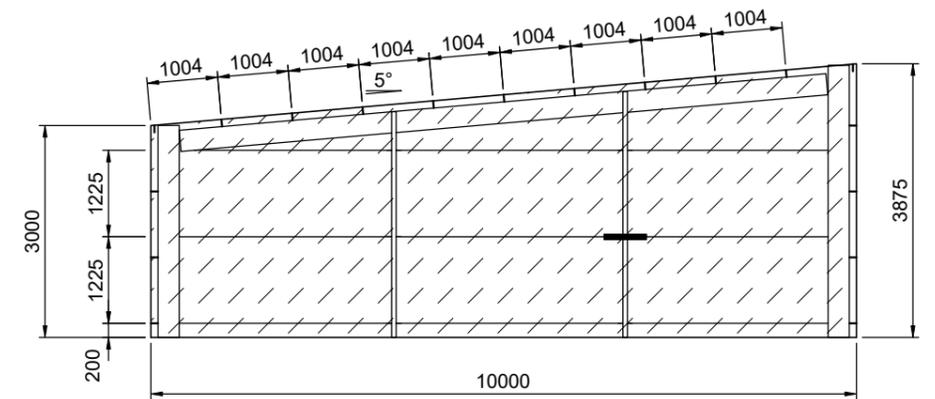
Signed *[Signature]* Date 15-09-2025
 Grant J Wood MIEAust CPEng NER RPEQ
 Registered EA Chartered Professional Engineer (No. 2383009)
 Registered Professional Engineer QLD (No. 14384)
 Registered Civil Engineer Building Practitioner VIC (No. PE0002499)
 Registered Certifying Engineer (structural) NT (No. 306371ES)
 Building Services Provider (Engineer Civil) TAS (No. 69030425)

Customer Name: Cahill Aherne
 Site Address: Rockmount Rd
 Ellendale,
 TAS, 7140

DATE 15-09-2025
 JOB NO. EALB99553653
 SHEET 2 of 11



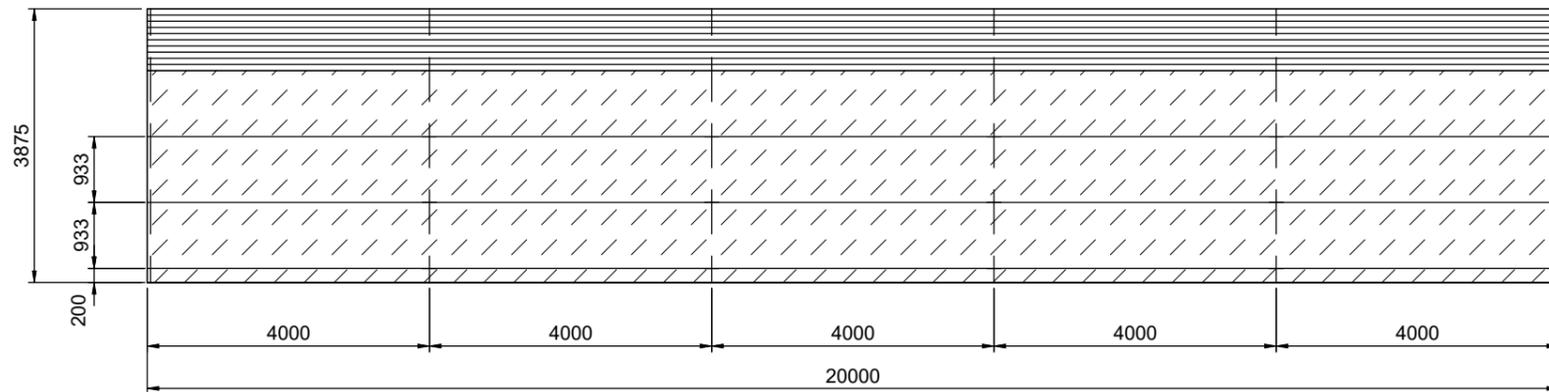
2 SIDEWALL B FRAMING ELEVATION
3 SCALE: 1:100



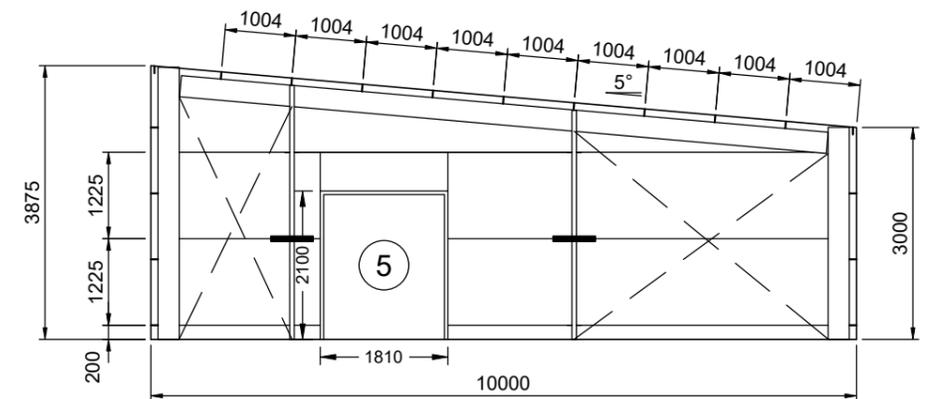
3 REAR FRAMING ELEVATION
3 SCALE: 1:100 FRAME #6

DIAPHRAGM SCHEDULE
 SHEETING IN DIAPHRAGM SECTIONS (SHOWN AS HATCHED AREA ON ELEVATIONS) NOT TO BE CUT UNDER ANY CIRCUMSTANCES

WALL	DISTANCE FROM WALL EDGE
Sidewall 'A'	0-20000
Endwall 'B'	0-10000

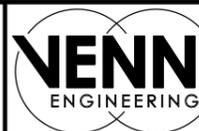


1 SIDEWALL A FRAMING ELEVATION
3 SCALE: 1:100



4 FRONT FRAMING ELEVATION
3 SCALE: 1:100 FRAME #1

REV	DATE	DESCRIPTION
A	15-09-2025	-

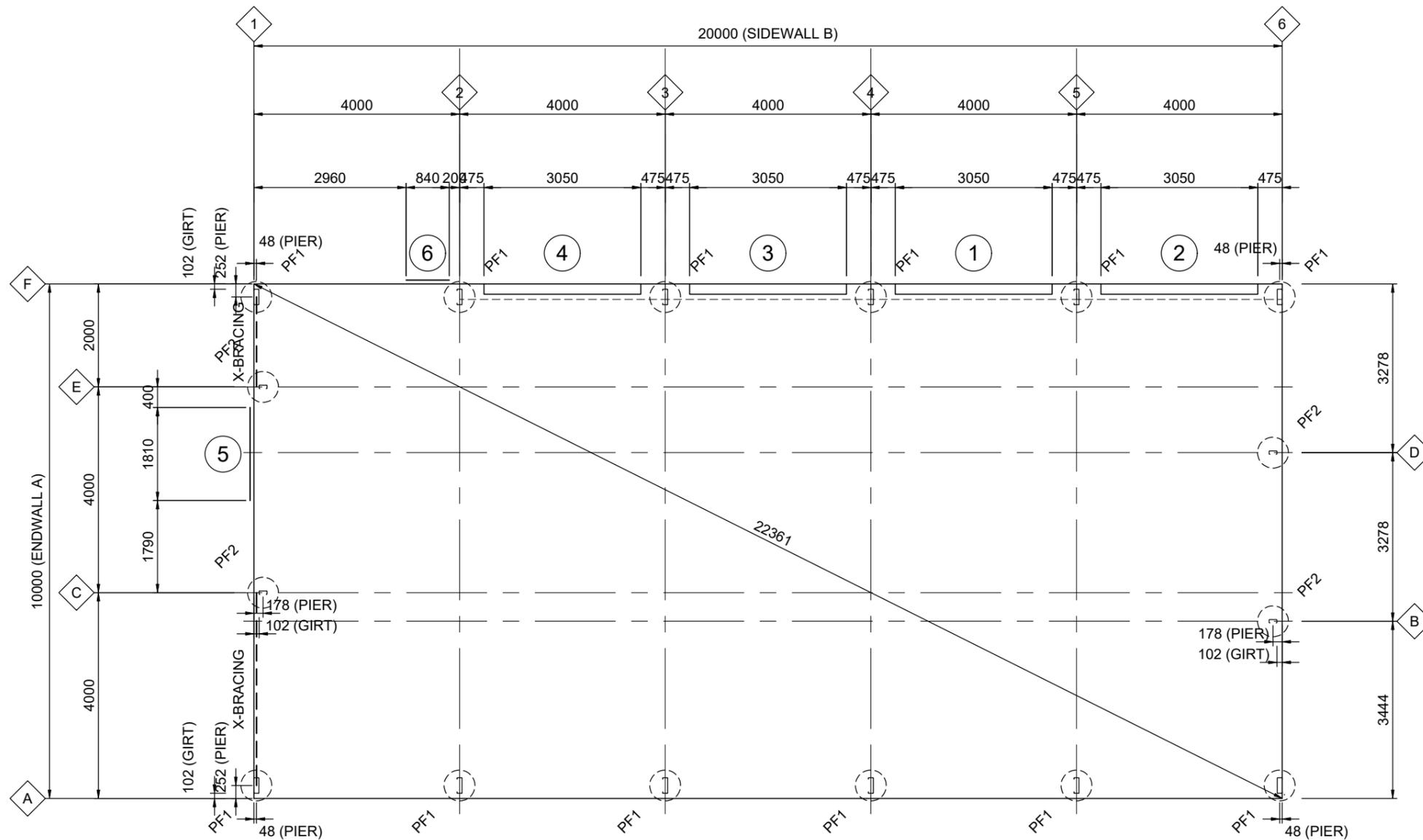


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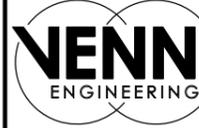
1 FOOTING/SLAB FLOOR PLAN

4 SCALE: 1:100 PF1 - 600Ø REINFORCED CONCRETE PIERS TO DETAIL
 PF2 - 600Ø REINFORCED CONCRETE PIERS TO DETAIL

SLAB IS DESIGNED FOR CARS AND LIGHT VANS
 NOT EXCEEDING 3500kg GROSS MASS

CONCRETE CONTROL JOINTS SHALL BE PROVIDED IN SLAB TO DETAIL AT
 NOT MORE THAN 10m CENTRES IN EACH DIRECTION, APPROXIMATELY
 EQUALLY SPACED AND LOCATED APPROXIMATELY MIDWAY BETWEEN
 COLUMNS/MULLIONS

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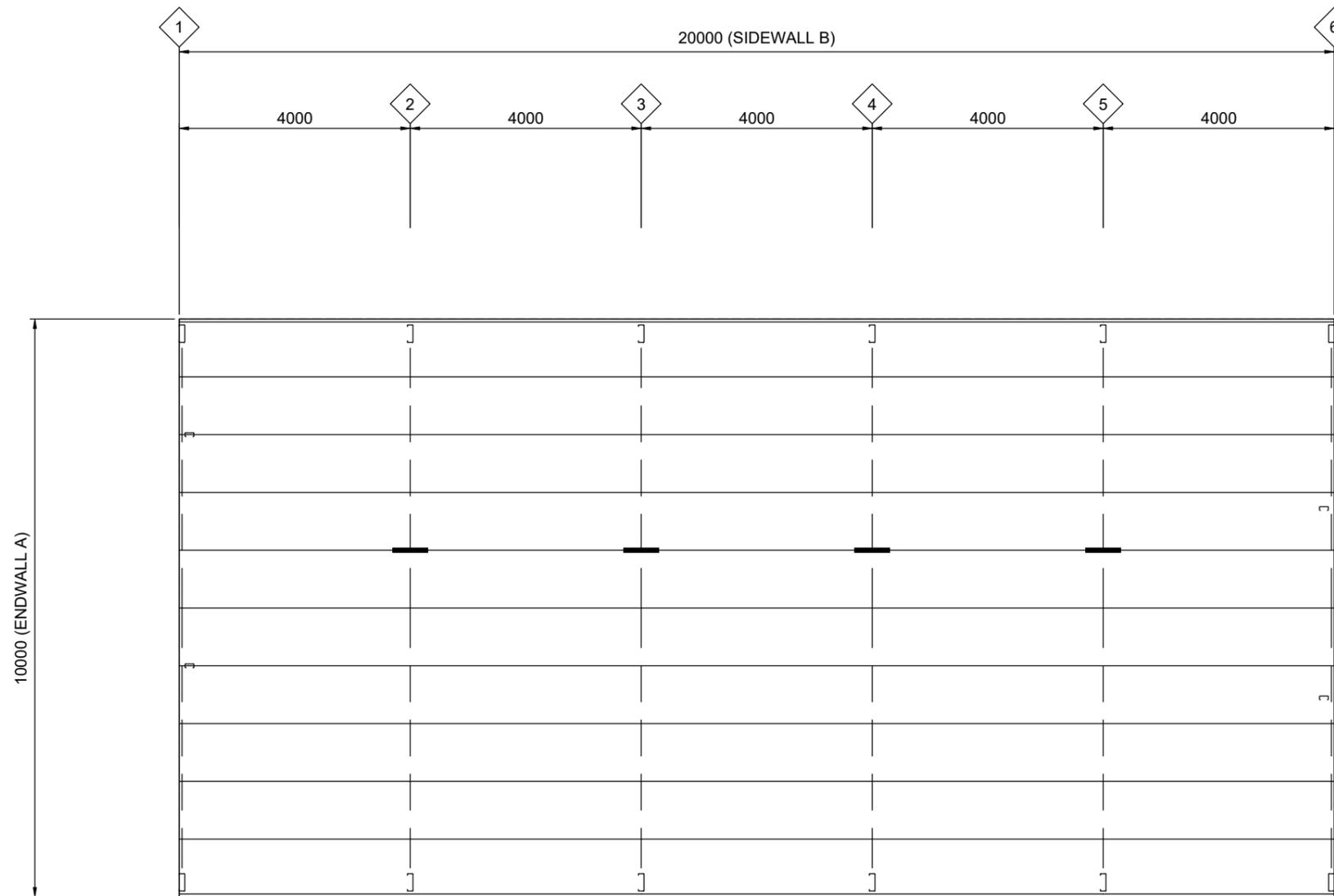


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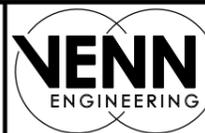
1 ROOF FRAMING PLAN
5 SCALE: 1:100

ROOF SHEETING IS USED AS DIAPHRAGM TO BRACE THE BUILDING AND IS NOT TO BE CUT UNDER ANY CIRCUMSTANCES

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ANOTHER
COLD FORMED BUILDING
DESIGNED BY
ACT BUILDING SYSTEMS

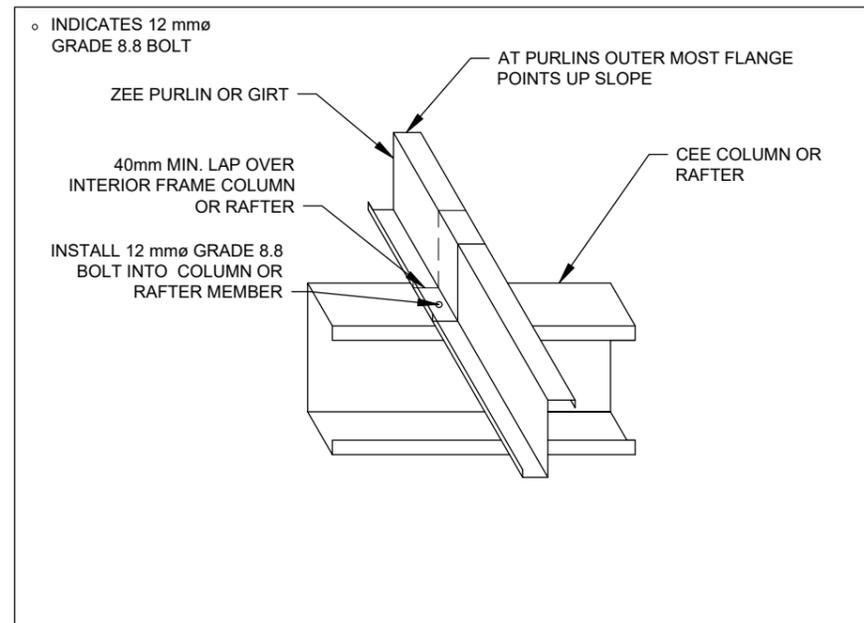


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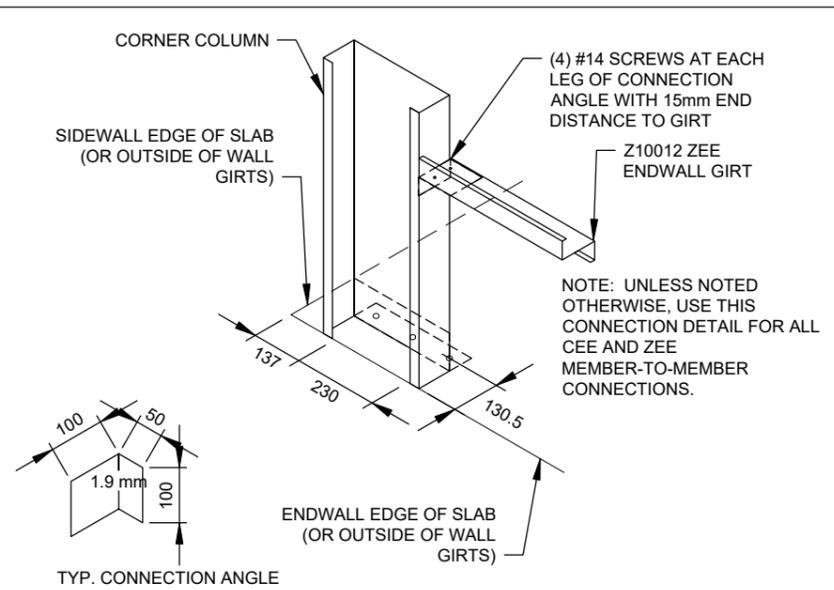
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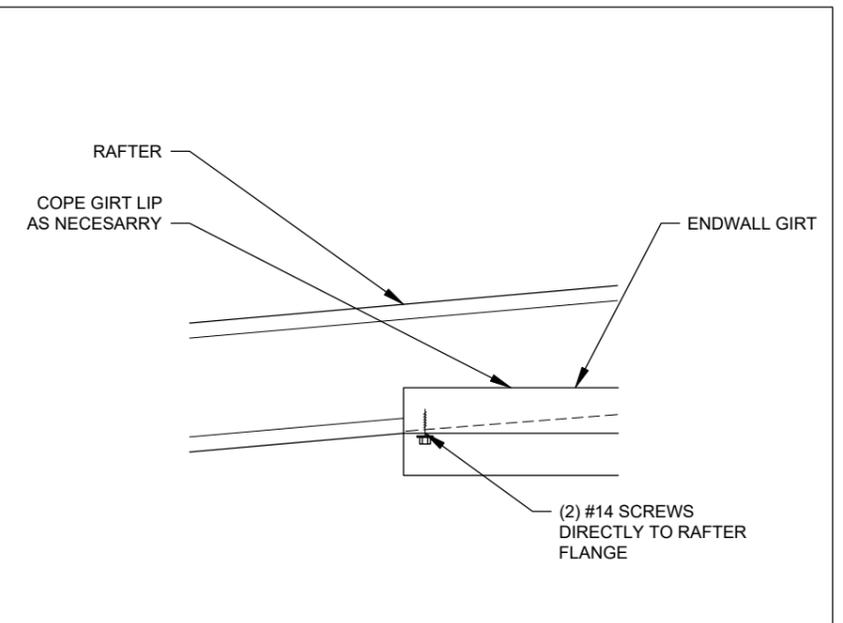
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 JOB NO. EALB99553653
 SHEET 5 of 11



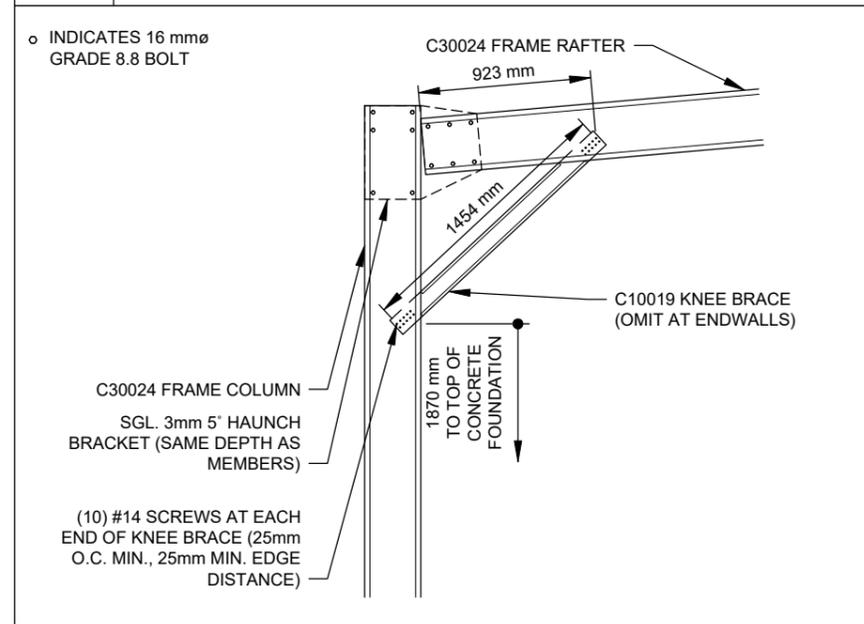
D ZEE PURLIN/GIRT CONNECTION



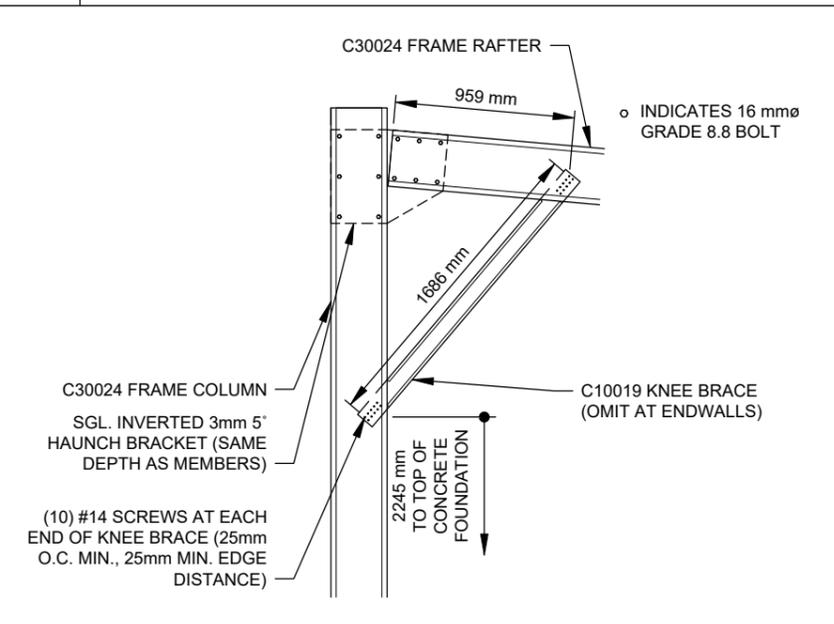
E GIRTS IN-LINE CORNER COLUMN CONNECTIONS



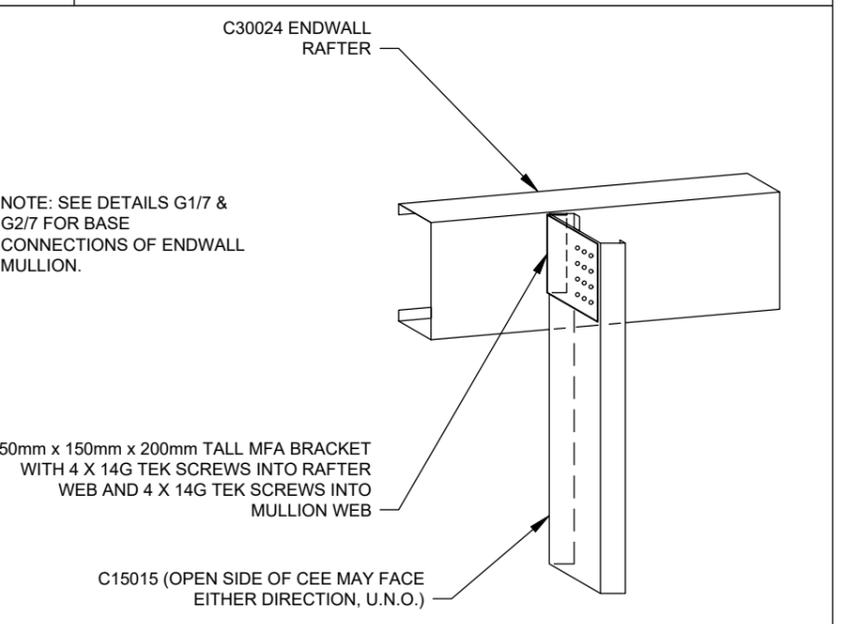
E2 END GIRT TO RAFTER



A HAUNCH CONNECTION



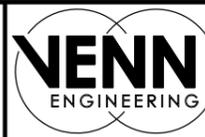
B HIGH EAVE HAUNCH CONNECTION



C ENDWALL MULLION TO RAFTER

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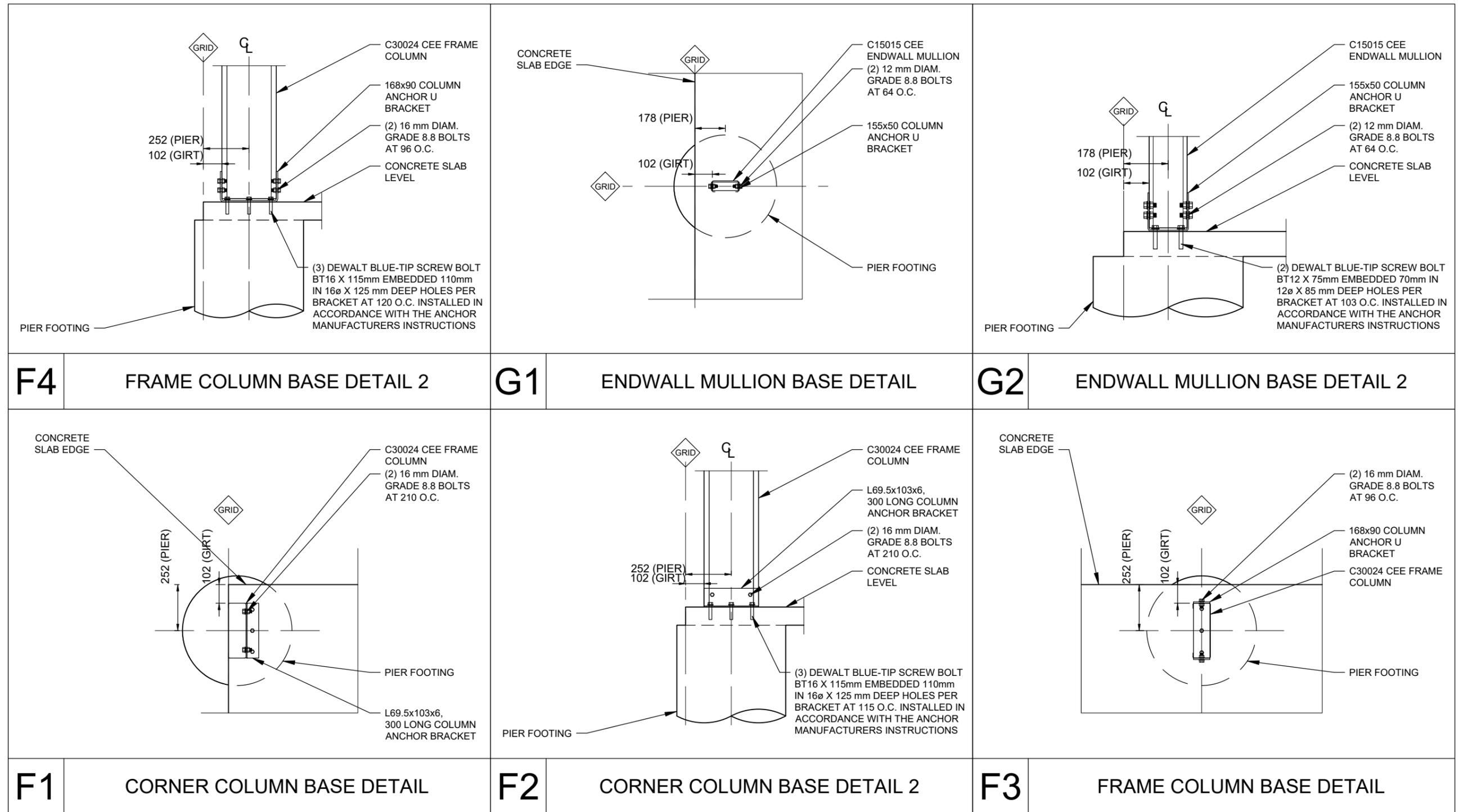


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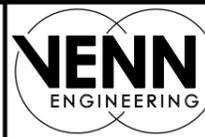
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SHEET 6 of 11



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SHEET 7 of 11

J2 ROLLER DOOR JAMB BASE CONNECTION	K1 OPENING CHANNEL JAMB GIRT CONNECTION	K2 OPENING ZEE JAMB GIRT CONNECTION
<p>NOTE: ONLY STRUCTURAL INFORMATION IS INCLUDED IN THIS DETAIL. CONSULT PANEL MANUFACTURER FOR ADDT'L WEATHERTIGHTNESS RECOMMENDATIONS.</p> <p>SCREW SD HEX TOP GRIP B8 12-14X51 AT HIGH RIBS AT ALL PURLINS AT SPACING SHOWN</p> <p>Stramit Monoclad 0.42</p>	<p>NOTE: ONLY STRUCTURAL INFORMATION IS INCLUDED IN THIS DETAIL. CONSULT PANEL MANUFACTURER FOR ADDT'L WEATHERTIGHTNESS RECOMMENDATIONS.</p> <p>SCREW SD HEX C4 10-16 ADJACENT TO HIGH RIBS AT ALL GIRTS AT SPACING SHOWN</p> <p>Stramit Monoclad 0.42</p>	
H ROOF SHEETING	I WALL SHEETING	J1 PA DOOR JAMB BASE CONNECTION

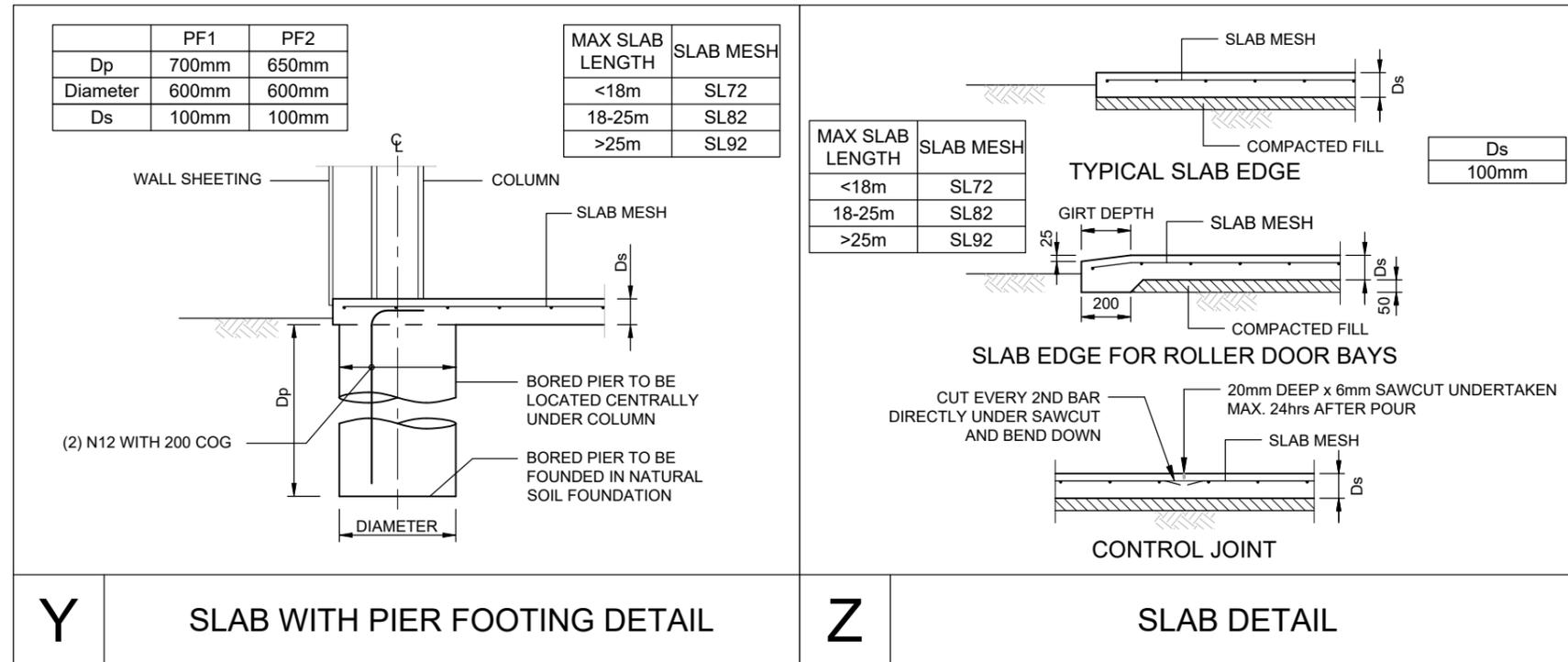
DETAIL DIMENSIONS ARE SHOWN IN MM UNLESS SPECIFIED OTHERWISE

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REV	DATE	DESCRIPTION									
A	15-09-2025	-									

<p>* SIDEWALL 'A': 84 mm SIDEWALL 'B': 65 mm</p>	<p>NOTE: SEE ROOF FRAMING PLAN AND ELEVATIONS FOR LOCATIONS OF FLYBRACING.</p>	<p>ALL NUTS AND BOLTS TO HAVE WASHER OR FLANGED HEADS</p>
<p>O EAVE PURLIN BRACKET</p>	<p>P FLYBRACING CONNECTION</p>	<p>U BOLT OPTIONS</p>
	<p>EXTERIOR VIEW</p>	<p>ENDWALLS: SGL. 30MM 1MM STRAP WITH (3) #14 SCREWS AT EACH END</p> <p>NOTES: 1) CONNECT STRAP AT TOP OF ADJACENT COLUMN OR RAFTER IN SAME MANNER. 2) IF DOUBLE STRAPS ARE SPECIFIED ABOVE, INSTALL SIDE-BY-SIDE, NOT ON TOP OF EACH OTHER.</p>
<p>L1 CHANNEL JAMB TO HEADER GIRT CONNECTION</p>	<p>L2 ZEE JAMB TO ZEE HEADER GIRT CONNECTION</p>	<p>M ROOF AND WALL X-BRACING CONNECTION</p>

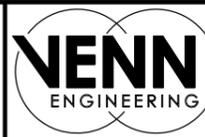
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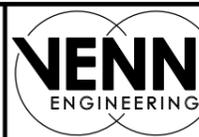
DATE 15-09-2025
JOB NO. EALB99553653
SHEET 10 of 11

MEMBER SCHEDULE			
COMPONENT		TYPE	
CLEAR SPAN PORTAL (FRAMES 2-5)	MEMBER	RAFTER	Single C30024
		COLUMN	Single C30024
		APEX BRACE	-
		KNEE BRACE	Single C10019
	BASE CONNECTION	BRACKET TYPE	Base cleat bolt down bracket BC.300
		ANCHOR BOLTS	(3) Dewalt Blue-tip screw bolt BT16 x 115mm embedded 110mm
ENDWALL PORTAL (FRAME 1)	MEMBER	RAFTER	Single C30024
		COLUMN	Single C30024
		APEX BRACE	-
		KNEE BRACE	-
	BASE CONNECTION	BRACKET TYPE	Angle base connection ABC.C300.210
		ANCHOR BOLTS	(3) Dewalt Blue-tip screw bolt BT16 x 115mm embedded 110mm
ENDWALL B PORTAL (FRAME 6)	MEMBER	RAFTER	Single C30024
		COLUMN	Single C30024
		APEX BRACE	-
		KNEE BRACE	-
	BASE CONNECTION	BRACKET TYPE	Angle base connection ABC.C300.210
		ANCHOR BOLTS	(3) Dewalt Blue-tip screw bolt BT16 x 115mm embedded 110mm
ENDWALL MULLION	MEMBER	COLUMN	Single C15015
	BASE CONNECTION	BRACKET TYPE	Base cleat bolt down bracket BC.150
		ANCHOR BOLTS	(2) Dewalt Blue-tip screw bolt BT12 x 75mm embedded 70mm
ROOF PURLINS	MEMBER		Single Z10019 @ 1004mm centres
EAVE PURLIN	MEMBER		Single C10019
SIDEWALL GIRTS	MEMBER		Single Z10012 @ 933mm centres
ENDWALL GIRTS	MEMBER		Single Z10012 @ 1225mm centres
OPENINGS (1-4)	MEMBER	JAMB	Single Z15012
		HEADER/SILL	Single C10012
	BASE CONNECTION	BRACKET TYPE	Angle base connection ABC.C150.60
		ANCHOR BOLTS	(2) Dewalt Blue-tip screw bolt BT12 x 75mm embedded 70mm
OPENINGS (5-6)	MEMBER	JAMB	Single Unlipped 102 x 1.5 Cee
		HEADER/SILL	Single C10012
	BASE CONNECTION	BRACKET TYPE	Angle base connection ABC.SINGLE
		ANCHOR BOLTS	(1) Dewalt Blue-tip screw bolt BT12 x 75mm embedded 70mm
OPENING (7)	MEMBER	JAMB	Single Unlipped 102 x 1.5 Cee
		HEADER/SILL	Single C10012
SIDEWALL X-BRACING		STRAP	-
ENDWALL X-BRACING		STRAP	30mm x 1.0 strap

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DESIGNED BY
ACT BUILDING SYSTEMS



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Generic Temporary Bracing Information

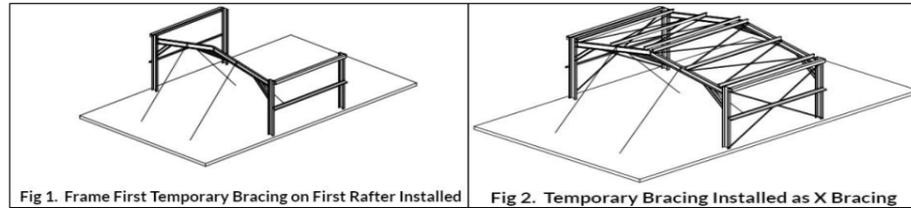
The installation of temporary bracing is critical to avoid building collapse or damaging structural movement during construction. This collapse can occur with no notice and as such the installation of appropriate temporary bracing is critical to avoid damage, injury, and possible death. Determination, procurement, and correct installation of temporary bracing is the responsibility of the builder / primary contractor / installer.

Bracing Materials

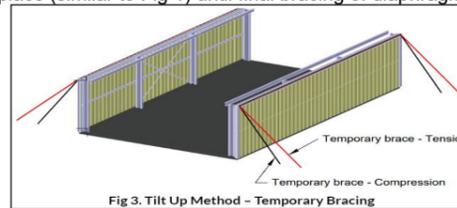
The constructor / installer is to supply suitably sized materials for temporary bracing. These materials are generally capable of tension, but in some circumstances will need to be capable of tension and compression. Load rated ratchet strapping of an appropriate size can be used to temporarily 'x-brace' bays in both directions, until the final bracing systems are fully installed. This is especially critical for buildings where X Bracing is not required in the final structure due to the use of moment frames or diaphragm bracing.

Temporary Bracing Location

The location of Temporary bracing will depend on the installation method used. Installation should be completed in accordance with the Construction Package, Engineering Plans, and Instruction Manuals. If the Frame First Method (most common) is used, then the use of tension only bracing and creating temporarily braced bays as per Fig 1 and Fig 2. can be used. As a basic guide, a minimum of every 4th bay should have temporary bracing installed as per Fig 2.



If the Tilt Up Method is used (where walls are constructed on the ground and then tilted into place), then the tops of columns are braced with a tension and compression brace in the same direction Fig 3. Then rafters and purlins can be installed with temporary bracing holding rafters in place (similar to Fig 1) until final bracing of diaphragm sheeting is installed.



Typically, braces should be positioned diagonally across the structure from the top to the bottom, intersecting near the midpoint to provide stability, optimally at a 45-degree angle but no less than a 20-degree angle. The connection strength of temporary bracing is a critical consideration and these connections must be capable of resisting the potentially substantial temporary bracing loads – whether this connection point be to the building, the foundations or to the ground. Dependent upon building size this may include heavy angles and post installed concrete anchors. The temporary bracing methods used must be capable of fully stabilising the structure during the construction process.

Additional Temporary Bracing

The temporary bracing described is a minimum requirement for a standard-sized building in average conditions. Additional consideration should be given to larger building spans and/or challenging site conditions. There may also be an increased risk in relation to partially completed buildings and exposed sites. It is recommended that extra temporary bracing is utilized if moderate wind speeds are expected on site. Additional support elements, such as steel cables may need to be introduced that can be attached to the building's framework and anchored to the ground or other stable structures to provide extra stability. The frame should remain rigid throughout and such responsibility lies with the constructor. Buildings should not be left in a partially completed state longer than necessary.

Bracing Removal

The temporary bracing should not be removed until all purlins, girts and permanent cross bracing, diaphragm bracing or moment frames where used are installed. The temporary bracing is to remain in place where possible, until the roof and wall cladding is fully installed. If you need any further information regarding the installation of temporary bracing or are at all unsure of the necessary requirements for this specific building, there are guides available through various industry bodies:

<https://www.safeworkaustralia.gov.au/> 'Construction work – steel erection. Information sheet', 2016.

<https://www.steel.org.au/> 'Structural steelwork fabrication and erection code of practice', 2014.

<https://www.standards.org.au/> AS/NZS 5131:2016 'Structural steelwork – Fabrication and erection.

Support is also available at support@actbuildingsystems.com.

THE ABOVE INFORMATION REGARDING TEMPORARY BRACING DOES NOT FORM PART OF THE ENGINEERING CERTIFICATION FOR THIS DESIGN AND IS PROVIDED AS A GUIDE TO AID INSTALLATION ONLY.

CERTIFICATE OF THE RESPONSIBLE DESIGNER

Section 94
Section 106
Section 129
Section 155

Form **35**

To: *Owner name*
 Address
 Suburb/postcode

Designer details:

Name: *Category:*
 Business name: *Phone No:*
 Business address:
 Fax No:
 Licence No: *Email address:*

Details of the proposed work:

Owner/Applicant *Designer's project reference No.*
Address: *Lot No:*

Type of work: Building work Plumbing work *(X all applicable)*

Description of work:

New class 10a building (non-habitable shed) with importance lvl 2 of size 10.000m span x 20.000m long x 3.000m eaves height. The building consists of cold formed steel framing members and cladding along with reinforced concrete pavement slab on ground where shown.

(new building / alteration / addition / repair / removal / re-erection / water / sewerage / stormwater / on-site wastewater management system / backflow prevention / other)

Description of the Design Work (Scope, limitations or exclusions): *(X all applicable certificates)*

Certificate Type:	Certificate	Responsible Practitioner
	<input type="checkbox"/> Building design	Architect or Building Designer
	<input checked="" type="checkbox"/> Structural design	Engineer or Civil Designer
	<input type="checkbox"/> Fire Safety design	Fire Engineer
	<input type="checkbox"/> Civil design	Civil Engineer or Civil Designer
	<input type="checkbox"/> Hydraulic design	Building Services Designer
	<input type="checkbox"/> Fire service design	Building Services Designer
	<input type="checkbox"/> Electrical design	Building Services Designer
	<input type="checkbox"/> Mechanical design	Building Service Designer
	<input type="checkbox"/> Plumbing design	Plumber-Certifier; Architect, Building Designer or Engineer
	<input type="checkbox"/> Other (specify)	
Deemed-to-Satisfy: <input checked="" type="checkbox"/>		Performance Solution: <input type="checkbox"/> <i>(X the appropriate box)</i>

Other details:

The design complies with the following deemed-to-satisfy parts of 2022 NCC-BCA Vol. 2 & Housing Provisions:

- Part H1D4(1)(a)(ii) for resistance of concrete (AS3600)
- Housing provision 2.2.4 for resistance of fastenings in concrete (AS5216)
- Part H1D6(3)(c) for resistance of cold-formed steel members (AS/NZS4600)
- Housing provision 2.2.3(a), (b) & (c) for the following actions to AS/NZS1170 parts 1 to 4:
 - o Imposed: 2.5 kPa to slab (light vehicles) where slab is shown
 - o Wind: Importance level 2, Region A4, Terrain Cat. 2.50, Topographic (Mt) 1.00, Shielding (Ms) 1.00 and Site wind speed (V_{sit,β}) 39.20 m/s
 - o Snow: 1.63 kpa
 - o Earthquake: Design category I

Design documents provided:

The following documents are provided with this Certificate –

Document description:

Drawing numbers:	Prepared by:	Date:
EALB99553653 sheets 1 to 11 revision A	Venn Engineering Pty Ltd	15/09/2025
Schedules:	Prepared by:	Date:
Specifications:	Prepared by:	Date:
Computations:	Prepared by:	Date:
Performance solution proposals:	Prepared by:	Date:
Test reports:	Prepared by:	Date:

Standards, codes or guidelines relied on in design process:

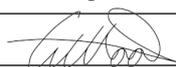
2022 National Construction Code – Building Code of Australia Volume 2 & Housing Provisions
 Australian Standard for Structural design Actions parts 0, 1, 2, 3 & 4 (AS/NZS 1170)
 Australian Standard for Cold-formed Steel Structures (AS/NZS 4600:2018)
 Australian Standard for Concrete Structures (AS 3600:2018)
 Australian Standard for Post-installed Fasteners in Concrete (AS 5216:2021)
 Australian Steel Institute Design Guide Portal Frame Steel Sheds and Garages 2nd edition June 2014

Any other relevant documentation:**Attribution as designer:**

I, Grant Wood, am responsible for the design of that part of the work as described in this certificate;

The documentation relating to the design includes sufficient information for the assessment of the work in accordance with the *Building Act 2016* and sufficient detail for the builder or plumber to carry out the work in accordance with the documents and the Act;

This certificate confirms compliance and is evidence of suitability of this design with the requirements of the National Construction Code.

	<i>Name: (print)</i>	<i>Signed</i>	<i>Date</i>
Designer:	Grant Wood		15/09/2025
Licence No:	690930425		

Assessment of Certifiable Works: (TasWater)

Note: single residential dwellings and outbuildings on a lot with an existing sewer connection are not considered to increase demand and are not certifiable.

If you cannot check ALL of these boxes, LEAVE THIS SECTION BLANK.

TasWater must then be contacted to determine if the proposed works are Certifiable Works.

I confirm that the proposed works are not Certifiable Works, in accordance with the Guidelines for TasWater CCW Assessments, by virtue that all of the following are satisfied:

- The works will not increase the demand for water supplied by TasWater
- The works will not increase or decrease the amount of sewage or toxins that is to be removed by, or discharged into, TasWater’s sewerage infrastructure
- The works will not require a new connection, or a modification to an existing connection, to be made to TasWater’s infrastructure
- The works will not damage or interfere with TasWater’s works
- The works will not adversely affect TasWater’s operations
- The work are not within 2m of TasWater’s infrastructure and are outside any TasWater easement
- I have checked the LISTMap to confirm the location of TasWater infrastructure
- If the property is connected to TasWater’s water system, a water meter is in place, or has been applied for to TasWater.

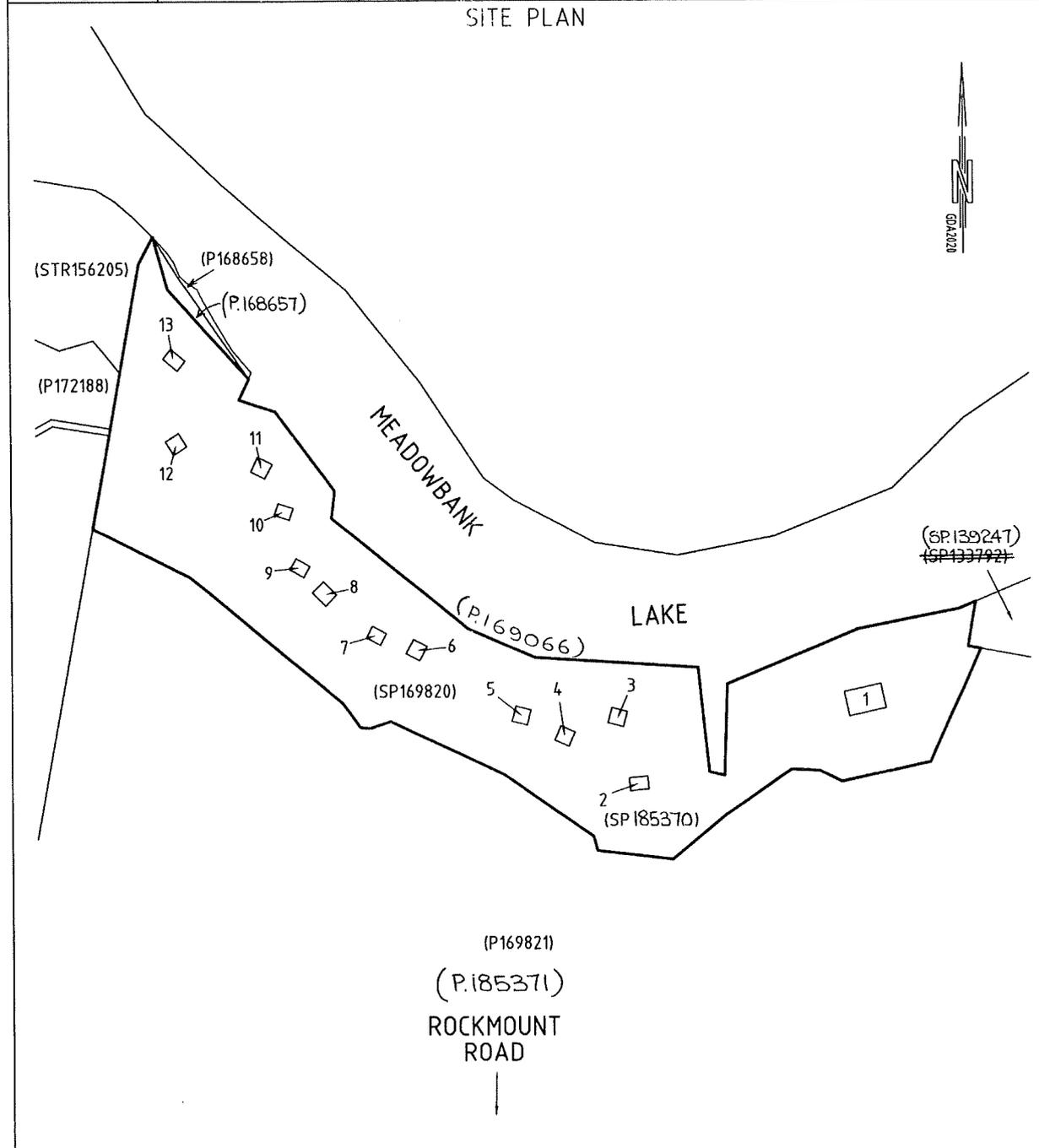
Certification:

I being responsible for the proposed work, am satisfied that the works described above are not Certifiable Works, as defined within the *Water and Sewerage Industry Act 2008*, that I have answered the above questions with all due diligence and have read and understood the Guidelines for TasWater CCW Assessments.

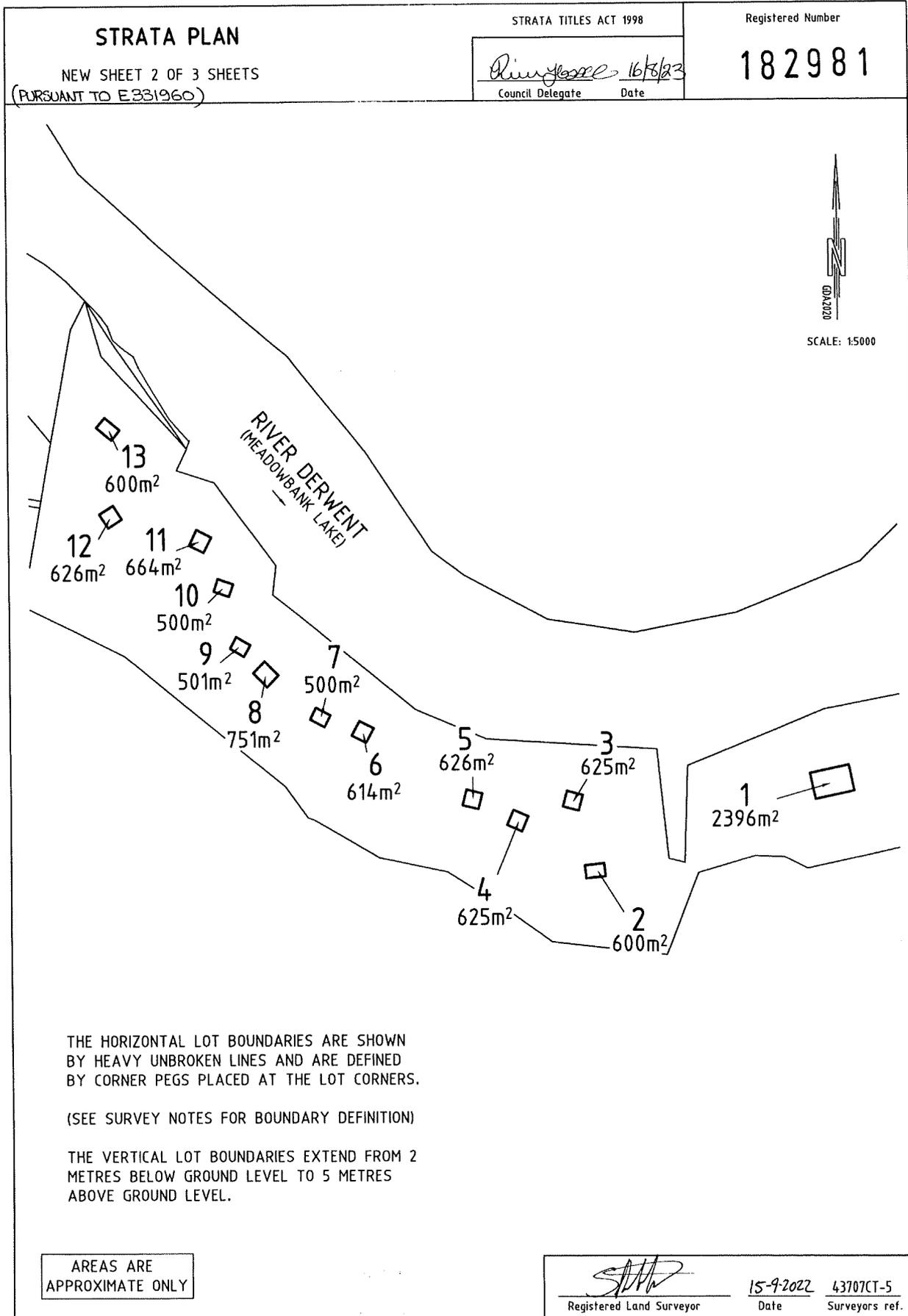
Note: the Guidelines for TasWater Certification of Certifiable Works Assessments are available at: www.taswater.com.au

	<i>Name: (print)</i>	<i>Signed</i>	<i>Date</i>
Designer:	<input type="text"/>	<input type="text"/>	<input type="text"/>

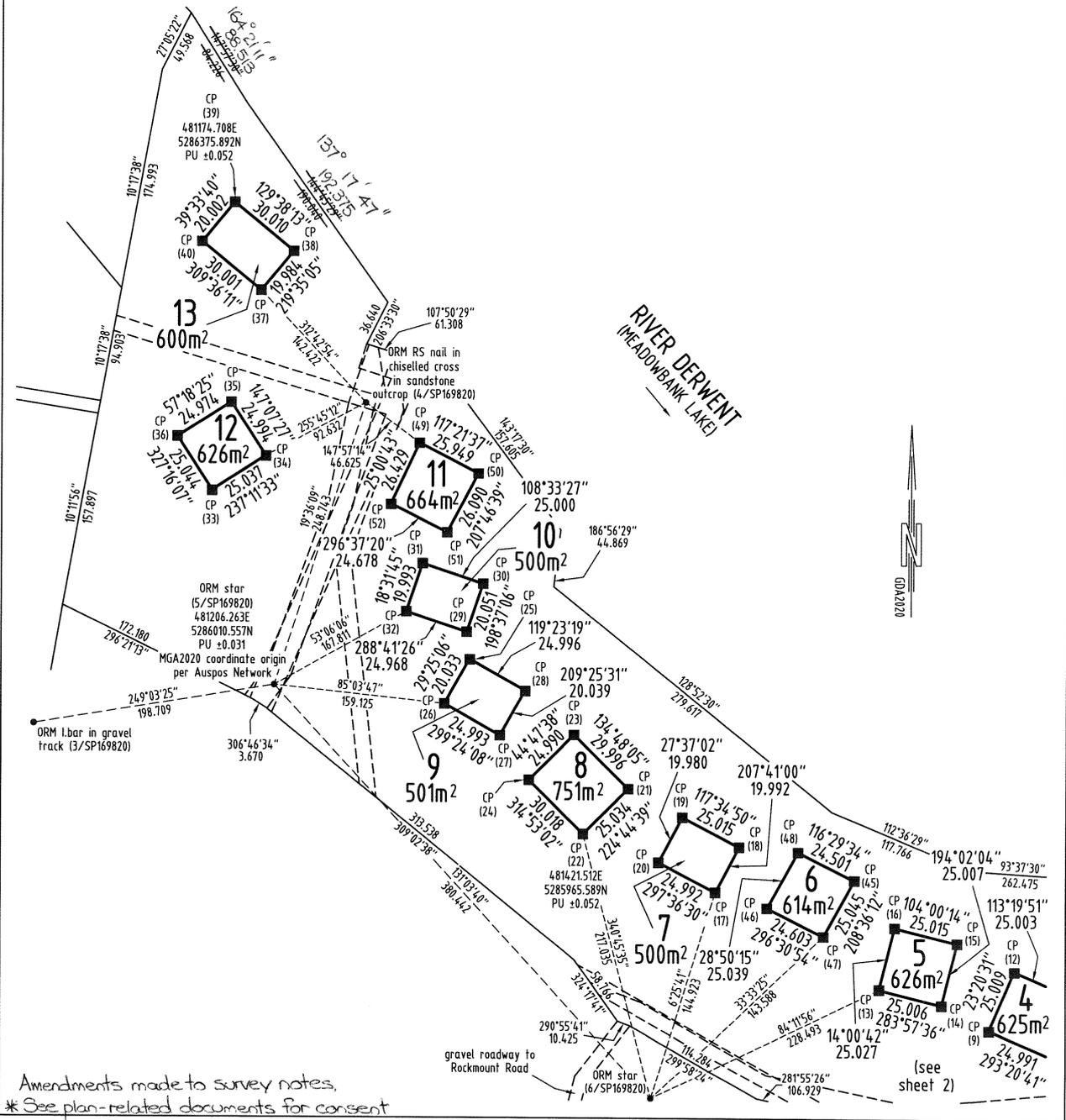
CITY/TOWN SUBURB/LOCALITY ELLENDALE FOLIO REFERENCE 185370-1 SITE COMPRISES THE WHOLE OF LOT 1 ON SEALED PLAN No. 185370		STRATA PLAN NEW SHEET 1 OF 3 SHEETS (PURSUANT TO E331966) NAME OF STRATA SCHEME 'PARADISE', 475 ROCKMOUNT ROAD, ELLENDALE		Registered Number 182981
MAPSHEET MUNICIPAL CODE No. 105	LAST UPI No.	SCALE 1:6000	LENGTHS IN METRES	STRATA TITLES ACT 1998 REGISTERED 14 JUL 2022 <i>Ren</i> Recorder of Titles



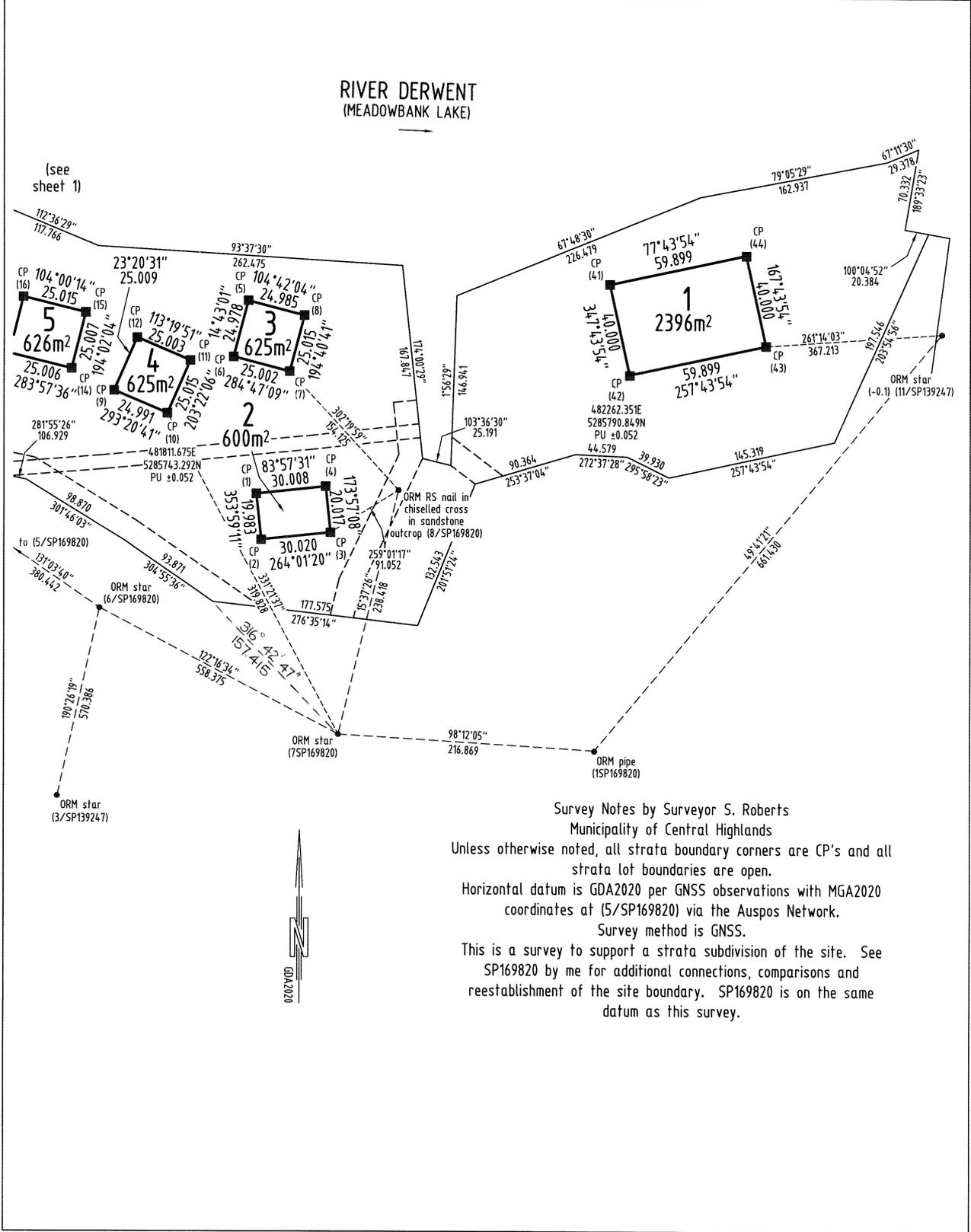
NOTES: (i) ALL BUILDINGS ON THE SITE TO BE SHOWN ON SHEET 1. (ii) BUILDING TO SITE BOUNDARY OFFSETS OF LESS THAN 2.00 METRES TO BE SHOWN ON SHEET 1.	<i>Peacock</i> 16/8/23 Council Delegate Date	<i>SAH</i> Registered Land Surveyor Date	43707CT-5 Ref. No. 15-9-2022 Date
	STAGED/COMMUNITY DEVELOPMENT. SCHEME No. (IF APPLICABLE) E256847 (SDS)		LOGGED BY PEACOCK DARCEY & ANDERSON



SURVEY NOTES		Registered number 182981		SURVEY CERTIFICATE	
SHEET 1 OF 2 SHEETS				I, Simon Roberts Hobart of in Tasmania, a Registered Land Surveyor, HEREBY CERTIFY that:	
CROSS REFERENCE PLAN NUMBERS USED AS PART OF THIS SURVEY		LENGTHS IN METRES		(a) this survey is based upon the best evidence that the nature of the case admits;	
Owner: Ian Charles Edwards				(b) the survey notes have been truly compiled from surveys made by me or made under my supervision; and	
Folio reference: 169820-1				(c) this survey and accompanying survey notes comply with relevant legislation affecting surveys and are correct for the purpose required.	
Purpose of survey: Strata subdivision of 13 lots				Date <u>24, 3, 2022</u>	
Survey commenced: 5th November 2013		Survey completed: 19th March 2014		Surveyors ref: 43707CT-3A	
Horizontal datum: GDA2020		Bearing datum: MGA2020		Combined scale factor: 0.999591	
MGA2020 COORDINATE ORIGIN					
AUSPOS	Local coordinated mark: (5/SP169820)	E 481206.263	N 5286010.557	EPU ±0.031	Measurement Duration: 1:37:00



<p>SURVEY NOTES ANNEXURE SHEET</p> <p>SHEET 2 OF 2 SHEETS</p> <p>CROSS REFERENCE PLAN NUMBERS USED AS PART OF THIS SURVEY</p>	<p>Owner: Ian Charles Edwards</p> <p>Folio reference: 169820-1</p>	<p>Registered Number</p> <p>182981</p>
	<p>THIS ANNEXURE SHEET FORMS PART OF THE ATTACHED SURVEY NOTES.</p> <p><i>S. Roberts</i> <u>24-3-2022</u> 43707CT-3A</p> <p>Registered Land Surveyor Date Surveyors ref.</p>	<p>LENGTHS IN METRES</p>



INTRODUCTION

This report aims to support a planning permit application under Section 57 of the Land Use Planning and Approvals Act 1993.

PROPOSED DEVELOPMENT:

Development of a rural storage shed with enclosed amenities block and associated wastewater treatment system In conjunction with this application following supporting documentation has been supplied for reference:

Site Plan

Shed design and engineering documentation

Geo-environmental Assessment

Environmental Values Report

Aboriginal Heritage Report

Soil Tests

Waste Management Treatment Design

Site details

Address: 473 Rockmount Road, Ellendale TAS 7140

Property ID:

Title No: 182981/1

Strata Corporation number: 182981

Land area: approx. 100 acres

Proposed site area: approx. 300m²

Reference Documents:

Planning Authority Central Highlands Council (Council)

Planning Scheme Tasmanian Planning Scheme – Central Highlands (Scheme)

Meadowbank Lake Specific area plan

PROPOSAL:

This proposal is for the construction of a single Colourbond shed on concrete slab. The shed's main purpose is to contain site maintenance machinery, plant, equipment and materials. The shed will also contain a small amenities block that will include vanity, toilet and shower facilities to service personnel completing these activities. The shed will have an overall dimension of 20m x 10m for a combined area of 200m². The internal amenities block has a dimension of 3m x 2m

Planning Scheme Assessment:

Zone assessment: Meadowbank Lake Specific Area Plan

Plan Purpose

The purpose of the Meadowbank Lake Specific Area Plan is:

- To recognise and protect the operation of the Meadowbank Lake Hydro-electric Power Station from incompatible use and development.
- To ensure that on-site wastewater management does not contribute to adverse impacts on water quality.
- To recognise Meadowbank Lake as the premier water-skiing facility in the State and to support associated use and development whilst managing other use and development to minimise conflict between activities.
- To encourage the use and development of Meadowbank Lake and the adjoining land for tourism, recreational and visitor accommodation purposes whilst maintaining and enhancing the natural, cultural and landscape values of the area.
- To recognise and protect Aboriginal heritage values.
- To encourage co-ownership and sharing of aquatic structures such as boat ramps, jetties, pontoons and water-based sports infrastructure.
- To protect the lake foreshore landscape, from becoming over-crowded with buildings for Visitor Accommodation.
- To encourage the orderly and strategic development of appropriately scaled and located Visitor Accommodation, particularly camping and caravan parks and overnight camping areas.
- To provide for Resource Development and Resource Processing compatible with recreation and tourism's use of the area.
- To provide for use and development which does not compromise the significant role the lake plays in the Greater Hobart drinking water system.

RESPONSE:

The Meadowbank Lake Specific area plan allows for recreational use in balance with the hydroelectric power station and the natural and cultural heritage values. The construction of the proposed shed will house maintenance materials and plant equipment to help facilitate the owners to care and enhance its lakeside area. Future works are planned to further develop the native vegetation while managing fire loads in an effort to protect the site as a whole. The proposed site of the shed, along with the desired colour palette were carefully selected to provide the lowest visual impact possible. The shed will be constructed in a small natural valley that is not visible from the lake.

CHI-S1.7 Development Standards for Buildings and Works

CHI-S1.7.1 Building height

This clause is in substitution for Rural Zone - clause 20.4.1 [Building height](#) and Environmental Management Zone - clause 23.4.2 [Building height](#), [setback](#) and siting A1 and P1.

Objective:	That buildings height is compatible with the natural, cultural and landscape values of the area and protects the visual and visitor accommodation amenity of adjoining properties.
Acceptable Solutions	Performance Criteria
A1 Building height must be not more than: (a) 4m for a camping and caravan park or overnight camping area ; (b) 5m for any Tourist Operation or Visitor Accommodation excluding a camping and caravan park or overnight camping area ; (c) 5m for an outbuilding ; and (d) 8m for any other building and works .	P1 Building height must be compatible with the landscape values of the area, having regard to: (a) the height, bulk and form of proposed buildings; (b) the height, bulk and form of adjacent existing buildings; (c) the topography of the site ; (d) the visual impact of the buildings when viewed from Meadowbank Lake, its foreshore or public places; and (e) the landscape values of the surrounding area.

RESPONSE

A1 The acceptable solution is met. The building is maximum 3.875m at the tallest point.

CHI-S1.7.2 Setbacks and siting

This clause is in substitution for Rural Zone - clause 20.4.2 Setbacks.

<p>Objective:</p>	<p>That building setback and siting is compatible with the natural, cultural and landscape values of the area and protects the visual and visitor accommodation amenity of adjoining properties.</p>
<p>Acceptable Solutions</p>	<p>Performance Criteria</p>
<p>A1 Buildings and works, excluding for a camping and caravan park or overnight camping area, must have a setback not less than 100m from full supply level.</p>	<p>P1 Buildings and works, excluding for a camping and caravan park or overnight camping area, must have a setback not less than 40m from full supply level and must be compatible with the natural, cultural and landscape values of the area and protect the amenity of the adjoining properties having regard to:</p> <ul style="list-style-type: none"> (a) the visual amenity of the rural setting when viewed from adjoining properties, or from Meadowbank Lake, its foreshore or public places; and (b) impacts of any stormwater discharge directly into Meadowbank Lake.
<p>A2 Buildings must have a setback from all boundaries of not less than 20m.</p>	<p>P2 Buildings must be sited to not cause an unreasonable loss of visitor accommodation amenity, or impact on landscape values of the site, having regard to:</p> <ul style="list-style-type: none"> (a) the topography of the site; (b) the size, shape and orientation of the site; (c) the side and rear setbacks of adjacent buildings; (d) the height, bulk, and form of existing and proposed buildings; (e) the need to remove vegetation as part of the development; (f) the appearance when viewed from adjacent property; (g) the landscape values of the area; and (h) the plan purpose statements.
<p>A3 Buildings and works for a camping and caravan park or overnight camping area must have a setback not less than 40m from full supply level.</p>	<p>P3 Buildings and works for a camping and caravan park or overnight camping area must have a setback not less than 20m from full supply level, only if compliance with the Acceptable Solution cannot reasonably be achieved due to site constrains.</p>

<p>A4 Individual campsites or caravan park sites must be no more than 50m² in area.</p>	<p>P4 No Performance Criteria.</p>
<p>A5 Buildings for a sensitive use must be separated from the boundary of an adjoining property outside the Specific Area Plan in the Rural Zone or Agriculture Zone a distance of:</p> <p>(a) not less than 200m; or</p> <p>(b) if the setback of an existing building for a sensitive use on the site is within 200m of that boundary, not less than the existing building.</p>	<p>P5 Buildings for a sensitive use must be sited to not conflict or interfere with uses in the Rural Zone or Agriculture Zone outside the Specific Area Plan, having regard to:</p> <p>(a) the size, shape and topography of the site;</p> <p>(b) the separation from those zones of any existing buildings for sensitive uses on adjoining properties;</p> <p>(c) the existing and potential use of land in the adjoining zones;</p> <p>(d) any buffers created by natural or other features; and</p> <p>(e) any proposed attenuation measures.</p>

RESPONSE

A1 The acceptable solution is met with the proposed site being far in excess of 100m from full supply level.

P2 The performance criteria are addressed. The proposed site for the shed along with overall dimension and colour selection were carefully selected to provide the lowest possible visual impact and to blend with its surroundings. The proposed shed will be constructed in a slight valley, not visible from the lake to minimise its visual impact. The area requires minimal clearing of vegetation with a small cut being undertaken to further recess the building into the ground. No other structures are within the proposed structures vicinity.

CHI-S1.7.3 Access

This clause is in addition to Rural Zone - clause 20.4.3 Access for new dwellings.

<p>Objective:</p>	<p>That safe and practicable vehicular access is provided with minimal impact on the surrounding natural, scenic and cultural values.</p>
<p>Acceptable Solutions</p>	<p>Performance Criteria</p>
<p>A1 Vehicular access is provided using existing vehicular tracks and internal roads.</p>	<p>P1</p>

	<p>The design, construction and location of vehicular access must have minimal impact on the surrounding natural, scenic and cultural values, having regard to:</p> <ul style="list-style-type: none"> (a) providing safe connections from existing road infrastructure; (b) minimising the total number of new roads and tracks within the Meadowbank Lake Specific Area Plan area; (c) being appropriate to the setting, and not substantially detracting from the rural character of the area; (d) avoiding impacts from dust, run-off and noise to other land users; and (e) consolidating and sharing vehicular access wherever practicable.
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RESPONSE

A1 The acceptable solution is met. All Vehicular access is via existing roads

CHI-S1.7.4 Landscape protection

This clause is an addition to Rural Zone - clause 20.4 [Development](#) Standards for Buildings and [Works](#).

Objective:	That buildings and works are compatible with the landscape values of the site and surrounding area and managed to minimise adverse impacts.
Acceptable Solutions	Performance Criteria
<p>A1 Buildings and works must:</p> <ul style="list-style-type: none"> (a) be located within a building area, if shown on a sealed plan; or (b) be an alteration or extension to an existing building providing it is not more than the existing building height; and (c) not include cut and fill greater than 1m; and (d) be on a site not requiring the clearing of native vegetation; and (e) be not less than 10m in elevation below a skyline or ridgeline. 	<p>P1.1 Buildings and works must be located to minimise impacts on landscape values, having regard to:</p> <ul style="list-style-type: none"> (a) the topography of the site; (b) the size and shape of the site; (c) the proposed building height, size and bulk; (d) any constraints imposed by existing development; (e) Visual impact when viewed from roads and public places; and (f) any screening vegetation, and <p>P1.2</p>

	<p>be located in an area requiring the clearing of native vegetation only if:</p> <p>(a) there are no sites clear of native vegetation and clear of other significant site constraints such as access difficulties or excessive slope, or the location is necessary for the functional requirements of infrastructure; and</p> <p>(b) the extent of clearing is the minimum necessary for bushfire protection.</p>
<p>A2 Buildings and works for a camping and caravan park or overnight camping ground must be of a temporary nature, such as not having footings and with the capacity to be easily removed from the site.</p>	<p>P2 Buildings and works for a camping and caravan park or overnight camping ground of a permanent nature must be for one or more of the following purposes:</p> <p>(a) a communal toilet/shower/laundry facility;</p> <p>(b) storage;</p> <p>(c) a site office or reception building.</p>
<p>A3 Exterior building finishes must have a light reflectance value not more than 40%, in dark natural tones of grey, green or brown.</p>	<p>P3 Exterior building finishes must not cause an unreasonable loss of amenity to occupiers of adjoining properties or detract from the landscape values of the site or surrounding area, having regard to:</p> <p>(a) the appearance of the building when viewed from roads or public places in the surrounding area;</p> <p>(b) any screening vegetation; and</p> <p>(c) the nature of the exterior finishes.</p>

RESPONSE

P1.1 Performance criteria are being met by the proposed site being in a natural valley to lessen the overall visual impact of the building to surrounding areas. The overall height of the shed was kept to a minimum (3.875m) while still properly servicing the sheds required use. The site was selected because of the minimal need for clearing of vegetation with no established trees in the surrounding area. The shed will not be visible from any public spaces while providing the lowest visual impact possible to the surrounding farm land. No adjacent structures are in the vicinity of the proposed site.

CHI-S1.7.5 Aquatic structures

This clause is in addition to Rural Zone - clause 20.4 [Development](#) Standards for Buildings and [Works](#) and Environmental Management Zone - clause 23.4 [Development](#) Standards for [Building](#) and [Works](#).

Objective:	That permanent aquatic structures such as pontoons, boat ramps and jetties on Meadowbank Lake or its foreshore are only constructed as necessary and are safe, functional, and do not detract from the natural, cultural and landscape values of the area or impede recreational use or the operational needs of Hydro Tasmania.
Acceptable Solutions	Performance Criteria
A1 An aquatic structure is: <ul style="list-style-type: none"> (a) for the replacement of an existing structure; (b) provided by or on behalf of the Crown, council or a State Authority; and (c) the rationalisation of two or more structures on Meadowbank Lake or its foreshore. 	P1 Aquatic structures must avoid adverse impacts on the natural, cultural and landscape values of Meadowbank Lake and only be constructed as necessary and safe having regard to: <ul style="list-style-type: none"> (a) the advice and operational needs of Hydro Tasmania; (b) rationalising existing aquatic structures as far as practicable; (c) avoiding the proliferation of aquatic structures in the immediate vicinity; (d) the demonstrated need for the aquatic structure; and (e) the plan purpose statements.

RESPONSE

Not applicable to this proposal

CHI-S1.7.6 Aboriginal heritage

This clause is in addition to Rural Zone - clause 20.4 [Development](#) Standards for Buildings and [Works](#).

Objective:	That Aboriginal heritage is not inappropriately disturbed.
Acceptable Solutions	Performance Criteria
A1 Building and works : <ul style="list-style-type: none"> (a) must not involve excavation; 	P1 Building and works must not inappropriately disturb Aboriginal heritage, having regard to any: <ul style="list-style-type: none"> (a) advice received from Aboriginal Heritage Tasmania; or

<p>(b) the application is accompanied by a record of advice and Unanticipated Discovery Plan, issued by Aboriginal Heritage Tasmania; or</p> <p>(c) is in accordance with an Approved Permit issued by the Minister for Aboriginal Affairs under Section 14 of the <i>Aboriginal Heritage Act</i> 1975.</p>	<p>(b) Aboriginal cultural heritage assessment by a suitably qualified person.</p>
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RESPONSE

P1 Performance criteria have been addressed as building works will not disturb any Aboriginal Heritage as outlined in the attached Aboriginal Heritage Report

CHI-S1.7.7 Protection of lake operation

This clause is in addition to Rural Zone - clause 20.4 [Development](#) Standards for Buildings and [Works](#).

<p>Objective:</p>	<p>That the operation of the lake for hydro-electric power generation and as a major source of potable water for greater Hobart is not compromised.</p>
<p>Acceptable Solutions</p>	<p>Performance Criteria</p>
<p>A1 Buildings and works within 20 metres of the full supply level must be accompanied by the written support of Hydro Tasmania, with or without conditions.</p>	<p>P1 Buildings and works within 20m of the full supply level must:</p> <ul style="list-style-type: none"> (a) not hinder the operation of the lake for hydro-electric generation purposes; and (b) not compromise water quality; having regard to any advice received from Hydro Tasmania and/or relevant authority.

RESPONSE

A1 The acceptable solution is met. Proposed site is greater than 20m from full supply

CHI-S1.7.8 On-site wastewater management

This clause is in addition to Natural Assets Code - Clause C7.6.1 [Development](#) Standards for Buildings and [Works](#).

<p>Objective:</p>	<p>That on-site wastewater management does not contribute to adverse impacts on water quality.</p>
<p>Acceptable Solutions</p>	<p>Performance Criteria</p>

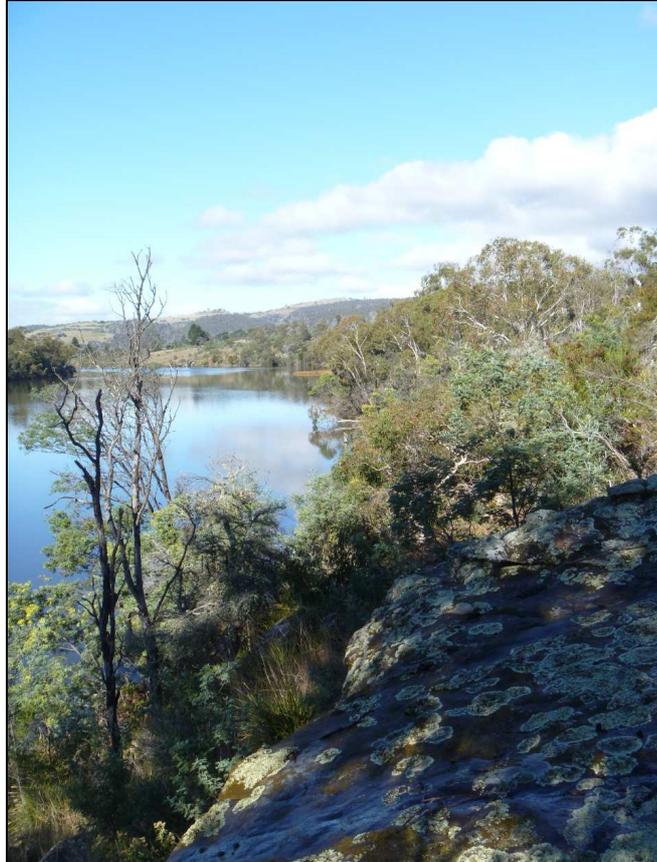
<p>A1 <u>Land application area</u> must be 100m from <u>full supply level</u>.</p>	<p>P1 <u>Land application area</u> must be of sufficient size and location to adequately manage wastewater treatment so that there are no adverse impacts on water quality in Meadowbank Lake, having regard to:</p> <ul style="list-style-type: none"> (a) the topography of the <u>site</u>; (b) the capacity of the <u>site</u> to absorb wastewater; (c) the size and shape of the <u>site</u>; (d) the existing buildings and any constraints imposed by existing <u>development</u>; (e) the area of the <u>site</u> to be covered by the proposed <u>development</u>; (f) the provision for landscaping, vehicle parking, driveways and <u>private open space</u>; (g) any adverse impacts on the quality of ground and surface waters; (h) any adverse environmental impact on surrounding properties and the locality; (i) any cumulative adverse impacts on the operation of the wastewater treatment system created by any nearby wastewater treatment systems; (j) the benefit, or otherwise, of collective wastewater treatment systems; and (k) written advice from a <u>suitably qualified person</u> (onsite wastewater management) about the adequacy of the on-site wastewater management system.
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RESPONSE

A1 Acceptable solution is met with the proposed site being in excess of 100m from full supply.

Environmental Values Assessment

For proposed subdivision and development at



475 Rockmount Road, Ellendale

For Ian Edwards

DRAFT 24th November 2011

Andrew Welling
Ecological Consultant

434 Van Morey Road
Margate, 7054
Phone: (03) 62672630
Mobile: 0400 151205
Email: awelling@bigpond.net.au

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1. Introduction

The following report outlines the environmental values of a large parcel of land off Rockmount Road in Ellendale.

This report has been commissioned to accompany a subdivision and development application for the site which involves the formation of a new smaller lot adjacent to the lake and a larger balance lot which will contain agricultural land and bushland to the south of the site (Figure 2 & 5).

Property Information

The 434ha+/- site is located to the north east of Ellendale and Mount Bethune and borders Meadowbank Lake (Figure 1).

The site contains a mixture of remnant native vegetation, regenerating vegetation and agricultural land. The southern half of the site contains low hills covered with woodland vegetation; the central portion of the site is predominantly flat and contains agricultural land which is used for grazing and cropping; whilst the section of the site bordering the lake contains degraded woodland vegetation and small forest remnants (Figure 2).

The elevation of the sites varies from 80m ASL at the lake up to 290m ASL at the hilltop to the south west of the site. The geology of the site is sandstone.

An assessment of the environmental values of the sites was conducted on the 19th August 2011. Only the section of the site bordering the lake was assessed in detail with only a cursory assessment done of the vegetation communities on the remainder of the site.

The vegetation communities contained on the portion of the site adjacent to the lake were mapped and a list of vascular plants compiled, significant fauna habitat assessed and the impacts of potential development of the site determined.

Development Proposal.

The proposed development will involve the subdivision of an approximate 40ha lot adjacent to the lake. It is proposed to develop a residential house site towards the eastern side of the new lot and development of up to 13 new 'shack' sites along the length of the lake (Figure 5).

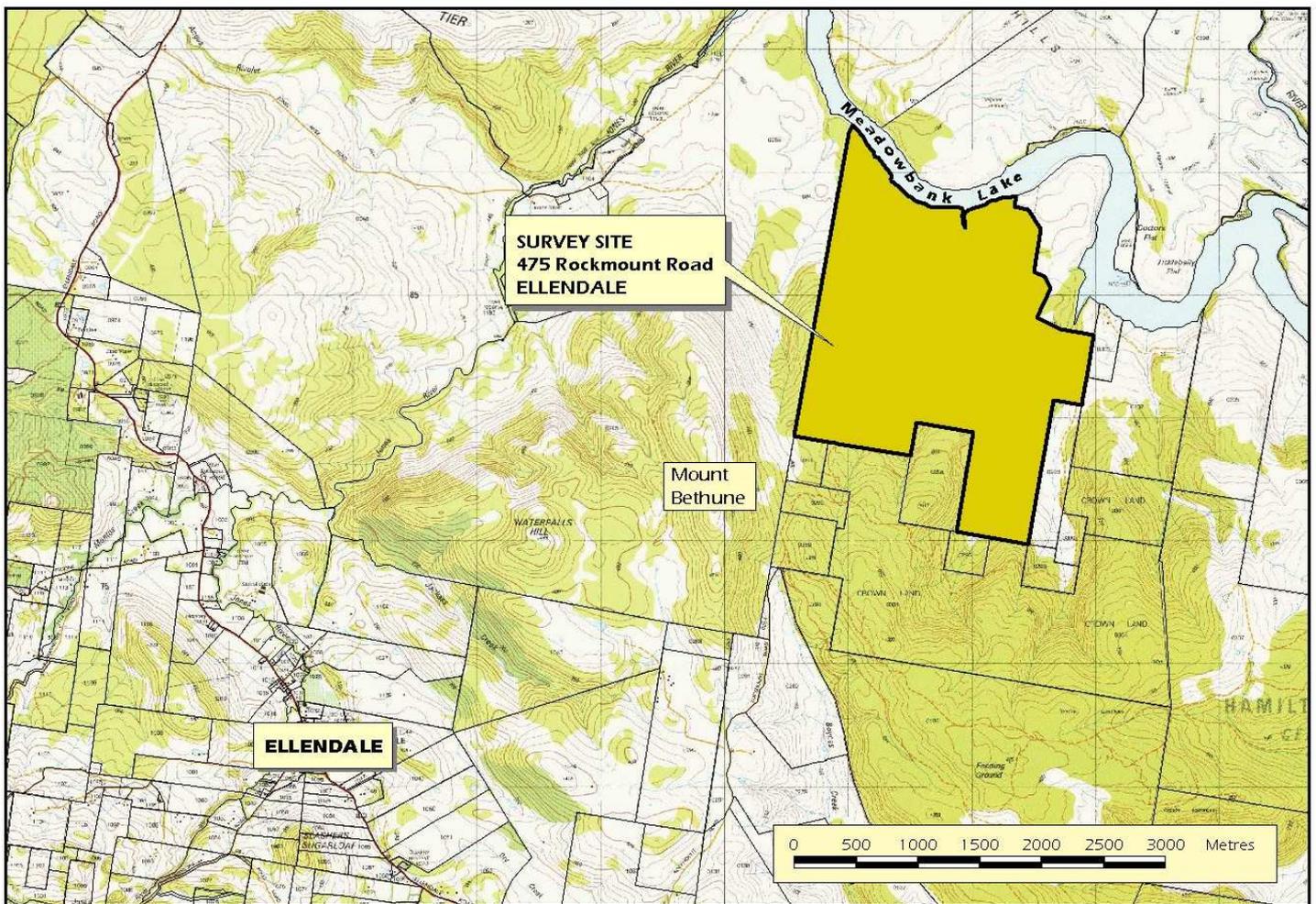


Figure 1 – Location Plan

Limitations of the survey

Whilst every effort was made to compile a complete list of vascular plant species occurring at the site, limitations of the survey method (Time Meander Method) and the timing of the survey means that some plants may not be apparent or lack reproductive material at the time of the survey and therefore cannot be identified to species level. Subsequent surveys of the site at a different time of the year and under different conditions are likely to reveal additional species.

2. Natural Values Assessment

Native Vegetation Communities

The assessment revealed that there are two (2) native vegetation communities and one (1) disturbance induced non-forest community across the survey site as per the TASVEG (v2.0)

vegetation classification system. The conservation status of these communities are summarised in Table 1 and description of each community follows. The distribution of all communities on the site is indicated in Figure 2.

TABLE 1 – SUMMARY OF VEGETATION COMMUNITIES OCCURRING ON THE SITE AND RESERVATION STATUS

VEGETATION COMMUNITY	TASVEG CODE (V1)	STATEWIDE STATUS**	STATUS PRIORITIES
<i>Eucalyptus tenuiramis</i> forest and woodland on sediments.	DTO	V*	Vulnerable on a statewide basis.
Bursaria - Acacia woodland and scrub	NBA	P	Common vegetation community
Agricultural Land	FAG	N/A	Altered community

*as per Schedule 3A of the *Nature Conservation Act 2002*

TASVEG Unit – *Eucalyptus amygdalina* forest on mudstone

Community Description – Dry eucalypt forest dominated by black peppermint on mudstone substrate.

TASVEG Code – DAM

General Description – *Eucalyptus tenuiramis* forest and woodland on sediments is dominated by *E. tenuiramis* trees rarely 25 m in height and often considerably shorter at highly insolated nutrient-poor sites. This dry sclerophyll community is generally characterised by shrubby understoreys with low cover and diversity. Grassy understoreys also occur in some areas.

The forest/woodland communities grade into, and are often difficult to distinguish from, *E. pauciflora* forest and woodland on sediments (DPO). There is often a similar mix of eucalypt species present (e.g. *E. pauciflora*, *E. rubida* and *E. tenuiramis*) and so canopy dominance becomes the principle distinguishing feature of these communities.

Eucalyptus tenuiramis forest and woodland on sediments is found on dry insolated sites in the south-east of the state and is strongly associated with Triassic sandstone and Permian mudstone at lower altitudes on the Central Plateau.

The dominant tree species is *E. tenuiramis* with other tree species sometimes present including *E. pauciflora*, *E. rubida*, *E. viminalis*, *E. obliqua* and *Acacia melanoxylon*.

Old-growth stands of this community are uncommon, as there is often rapid replacement before senescence due to the high fire frequency.

Substrate, insolation and fire frequency strongly influence the understorey, which generally has a low cover and diversity of shrubs. The medium-tall shrub layer is sparse but includes

Banksia marginata, *Allocasuarina littoralis*, *Acacia* species and *Exocarpos cupressiformis*. *Pteridium esculentum* often dominates the understorey, particularly on sandstone substrates or where fire frequency is high. Other low shrubs include *Epacris impressa*, *Astroloma humifusum*, *Pultenaea* species, *Aotus ericoides*, *Lomatia tinctoria* and *Tetratheca labillardierei*.

Density of the ground layer is variable. Native grasses such as *Poa rodwayi*, *Austrodanthonia* species, *Deyeuxia* species and *Austrostipa* species, as well as *Lomandra longifolia*, often dominate the ground layer where slope and aspect allow soil formation. However, ground cover can become very sparse on insolated sites where soil development is poor, or where fire frequency is high.

Site Specific Description - At this site silver peppermint (*E. tenuiramis*) is the dominant species with cabbage gum (*E. pauciflora* subsp. *pauciflora*) and white gum (*E. viminalis*) a co-dominant or sub-dominant species. The dominant secondary trees and tall shrubs include silver wattle (*Acacia dealbata*), prickly box (*Bursaria spinosa*) and native cherry (*Exocarpos cupressiformis*). Sparse black sheoak (*Allocasuarina littoralis*) and native hopsbush (*Dodonaea viscosa*) are found amongst the remnants whilst woolly teatree (*Leptospermum lanigerum*), blackwood (*A. melanoxylon*) and dogwood (*Pomaderris* sp.) are present along the lake edge.

The lower to mid-height shrubs vary in density across the site with some areas diverse and other areas containing few low shrubs. Common species include prostrate guineaflower (*Hibbertia prostrata*), leafy spiky bitterpea (*Daviesia sejugata*); twiggy beardheath (*Leucopogon virgatus* var. *virgatus*) and native currant (*Astroloma humifusum*) and peach heath (*Lissanthe strigosa*). Other less common shrubs include fineleaf hopsbush (*Dodonaea filiformis*), showy bossia (*Bossiaea cinerea*), golden pea (*Aotus ericoides*), rice flower (*Pimelea humilis*) and matted bushpea (*Pultenaea pedunculata*).

The ground layer is generally dominated by native grasses and graminoids. Kangaroo grass (*Themeda triandra*), wallabygrass (*Austrodanthonia* sp.), tussockgrass (*Poa* sp.) and speargrass (*Austrostipa* sp.) are widespread; whilst, sagg (*Lomandra longifolia*) and narrow swordedge (*Lepidosperma gunnii*) species are also common.

This community occurs in two remnants along the lake edge and across the southern hill on the site (Figure 2). The lake side remnants vary in composition with the remnant in the

north west corner of the site containing a tree layer dominated by white gum and cabbage gum; whilst the remnant in the centre of the site is dominated by silver peppermint with cabbage gum and black peppermint as subdominant species.

Both remnants are in fair condition with good species diversity and evidence of recruitment. The tree layer contains senescent trees due to past drought conditions. The absence of stock from these remnants in the recent past has enabled the understorey to re-establish and there is good diversity especially along the lake edge and near rocky outcrops.

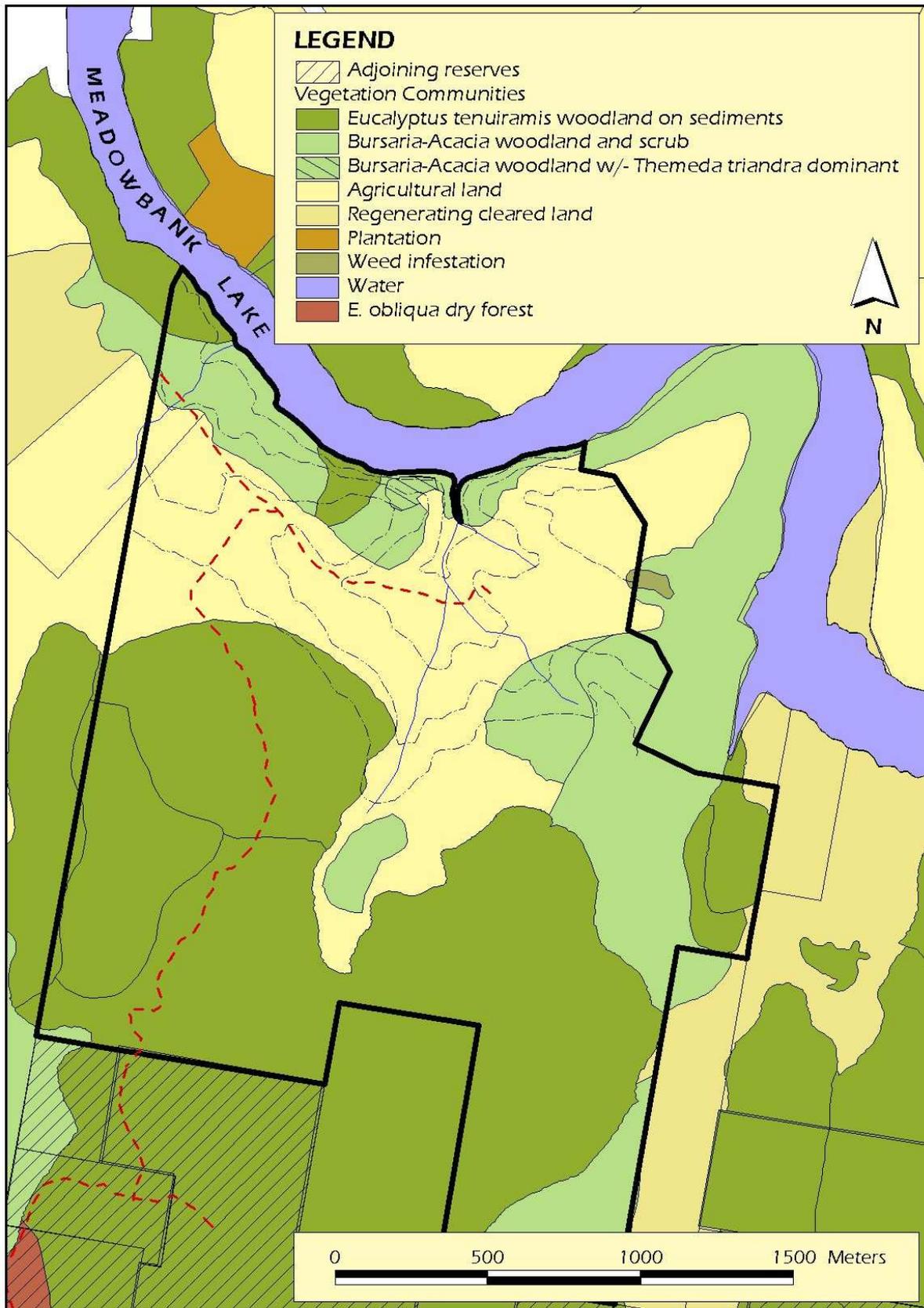


Figure 2 – Vegetation Communities across site.

TASVEG Unit –Bursaria-Acacia woodland and scrub

Community Description – Open woodland and scrub dominated by silver wattle

TASVEG Code – NBA

General Description – The community is characterised by scattered small (< 10 m) *Bursaria spinosa*, *Dodonaea viscosa* subspecies *spatulata*, *Acacia dealbata*, *A. mearnsii*, *A.*

melanoxydon, *A. verticillata* and other small trees and shrubs. They form a sparse to dense layer over a grassy sward dominated by *Themeda triandra* or *Austrodanthonia* species.

Bursaria- *Acacia* woodland and scrub refers to dry forest usually on dolerite or basalt which result either from slow degradation of eucalypt forest or from regeneration of *Bursaria spinosa*, *Acacia* species and *Dodonaea viscosa* where forest had been previously cleared. A grassland community where grazing has been minimal and small trees are becoming prominent is usually referred to a grassland community.

The community occurs on dry, slopes at low altitude (< 600 m) and occasionally on flats (dominated by *Acacia dealbata*), often on dolerite or basalt, and generally in areas that have been ploughed or disturbed. Such sites were formerly often *Eucalyptus viminalis* and *E. amygdalina* woodland and forest, but rural tree decline and tree removal has resulted in the virtual elimination of eucalypts from these sites.

Other grasses, herbs and small heathy shrubs may occur, as may scattered trees of *Eucalyptus viminalis*, *E. pauciflora*, *E. amygdalina* and *E. globulus*.

Site Specific Description - This vegetation community occurs across the front of the site adjacent to the lake and surrounds the two DTO remnants (Figure 2 & 4). This community is likely to have previously been DTO however a combination of overgrazing, tree clearance and drought have degraded the vegetation and converted it to NBA.

Silver wattle (*Acacia dealbata*) is the dominant species throughout the community and occurs in very dense stands in some areas (Figure 3). Other scattered shrubs in this community include black sheoak (*Allocasuarina littoralis*) and prickly box (*Bursaria spinosa*) and there are emergent eucalypts also present in small numbers.

The groundlayer is dominated by native grasses and sedges such as wallabygrass (*Austrodanthonia*), speargrass (*Austrostipa* sp.), kangaroo grass (*Themeda triandra*), sagg (*Lomandra longifolia*) and sword sedge (*Lepidosperma* sp.). Low shrubs and herbs are also present in small numbers with dwarf riceflower (*Pimelea humilis*), peachberry heath (*Lissanthe*

strigosa), prostrate guineaflower (*Hibbertia prostrata*) and beardheath (*Leucopogon* sp.) most common.



Figure 3 – *Acacia dealbata* woodland indicating dense stands of silver wattle.

The community contains a number of small areas where native grasses are dominant with the shrub layer virtually absent (Figure3). These small patches are dominated by kangaroo grass (*Themeda triandra*), speargrass (*Austrostipa* sp.) and wallabygrass (*Austrodanthonia* sp.) and are consistent with the grassland community 'lowland *Themeda triandra* grassland complex - GTL'. This community is classified as a sub-type of the critically endangered vegetation community 'Lowland Native Grassland' under the 'Environmental Protection and Biodiversity Conservation Act 1999'. However the small size (<1 ha) of the remnants and their condition (low species diversity) means they do not meet condition thresholds to receive full protection or qualify as a matter of national environmental significance under the EPBC Act.

TASVEG Unit – Agricultural Land

Community Description – Cleared land containing exotic grassland, orchards and vineyards.

TASVEG Code – FAG

General Description - Tasmania's improved pastures support sheep and cattle grazing, the best examples of which contain exotic temperate grass mixes and clovers. Croplands are diverse and range from common temperate vegetables and orchard fruits through to a variety of crops.

The mapping unit occurs in agricultural areas, most commonly on lowland fertile dolerite and basalt soils, but occurring over a range of geology types and altitudes.

Specific Site Description - This community occurs across the centre of the site beyond the woodland remnants adjacent to the lake edge up to the base of the hill at the southern end of the site (Figure 2). The land is currently used for grazing and cropping.

Pasture grasses and common exotic herbs occur in this community with scattered native sedges, grasses and shrubs also present. Sagg and sword sedge are common along with speargrass, kangaroo grass and wallabygrass. There are also scattered silver wattle, prickly box and black sheoak amongst the cleared land. Large radiata pine trees occur in the north eastern part of the site either side of a small inlet from the lake and around the ruins of an old residence.

Flora of Conservation Significance

During the survey 65 native plant species (not including introduced species) were recorded across the front portion of the site (Refer to Appendix 1). Whilst every effort was made to record all species present in the survey are limitation of the survey technique and seasonal factors means that additional species are likely to be recorded at the site during further surveys undertaken in spring or summer. In particular native grass, herb and orchid species were not apparent or were unable to be identified to species level during the survey.

Threatened Species

Two (2) threatened flora species listed under Schedule 3 and Schedule 5 of the *Threatened Species Protection Act 1995* were recorded at the site.

Shade peppergrass (*Lepidium pseudotasmanicum*) – Listed as Rare under TSPA.

A perennial, weedy looking erect herb between 60-70 cm high. Species has hairless stems, smooth and round in cross section. The lower stem leaves are shortly toothed and the upper leaves are entire or with the tip shortly toothed. The flowers are green,

tinged with purple, minute and borne on an elongating stem. Flowering occurs from spring to autumn.

Two individuals were found amongst the silver peppermint woodland close to the lake edge (Figure 2).

Pretty pearlflower (*Cryptandra amara*) – Listed as Endangered under TSPA

A small, wiry shrub between 15-30 cm tall with young branches that are covered in tiny star-shaped hairs. The branches are rigid and often end in a fine spine. The leaves are thin, roughly oblong in shape, blunt and between 2-6 mm long and are arranged alternately on the stem. The flowers are solitary or in clusters of 2-3 and arranged in succession along the stem with oldest flowers at the base (racemes). The racemes are borne in the axils of the side branches. Flowering is from (June) August to October (December) (Flora of Victoria).

Approximately 10 plants were recorded amongst the woodland vegetation in the north western corner of the site (Figure 5). This population represents an expansion of the known range for this species.

No flora species listed under the *Environmental Protection and Biodiversity Act 1999* were recorded during the survey.

The search of the Natural Value Atlas database (DPIPWE) revealed that two (2) threatened species have been previously recorded within 500m of the site. There have been a further 13 threatened species recorded within a 5km radius of the site. These species are listed in Table 2 & 3 including a comment on the likelihood of them occurring at this site.

Table 2 – Threatened flora recorded within a 500m radius of the subject sites.

Species	Status TSPA	Status EPBCA	Comments
<i>Agrostis diemenica</i> Flatleaf southern bent	r		Not recorded on site however grasses not seedling at time of survey so could be easily overlooked.
<i>Austrostipa nodosa</i> Knotty speargrass	r		Occupies drier areas in grassland and open forest and remnants. Not recorded during survey however limited reproductive material was collected so may occur on the site.

Table 3 – Threatened flora recorded within a 5km radius of site.

Species	Status TSPA	Status EPBCA	Comments
<i>Acacia axillaris</i> midlands wattle	r		Occurs in riparian areas. Suitable habitat along lake edge however not recorded.
<i>Agrostis diemenica</i> Flatleaf southern bent	r		As above
<i>Austrostipa nodosa</i> Knotty speargrass	r		As above

<i>Carex gunniana</i> mountain sedge	r		Found in wet eucalypt forest and sandy heathlands, by sides of streams, littoral sands and shingle with seepage. No suitable habitat on site. Not recorded.
<i>Dianella amoena</i> grassland flaxlily	r	EN	Not recorded at the site.
<i>Discaria pubescens</i> Spiky anchorplant	e		Recorded in grassy banks/roadsides and sandy or gravelly soil in basalt talus slopes, clefts amongst fractured dolerite rocks. No suitable habitat, not recorded.
<i>Lobelia pratioides</i> Poison lobelia	v		Recorded from marshlands, swamps and roadside soaks – damp ground and along margins of rivers. Not recorded.
<i>Pilularia novae-hollandiae</i> austral pillwort	r		Found in mud silt of shallow and slow moving rivers, seasonally inundated margins of lakes, dams & depressions – often hidden among grasses and sedges in damp mud, bogs and swamps. Not recorded.
<i>Pimelea curviflora</i> Curved rice flower	P		Not recorded.
<i>Velleia paradoxa</i> spur velleia	v		Found in grassland and grassy woodland. Not recorded.
<i>Vittadinia burbridgeae</i> smooth new-holland-daisy	pr		No <i>Vittadinia</i> sp recorded during survey.
<i>Vittadinia cuneata</i> var. <i>cuneata</i> fuzzy new-holland-daisy	r		Found in dry grasslands. No <i>Vittadinia</i> sp recorded during survey.
<i>Vittadinia gracilis</i> woolly new-holland-daisy	r		Found in dry grasslands, sandy/gravelly/basalt and dolerite substrates. Not recorded.
<i>Westringia angustifolia</i> narrowleaf westringia	r		Distinctive plant not recorded.
<i>Xanthoparmelia amphixantha</i> Lichen species	e		Non vascular plants not identified.

Notes on preferred habitats for threatened plants sourced from document produced by Threatened Species Unit (DPIPWE).

Introduced Plants

The area of the site that was surveyed contained a range of exotic grasses and herb species typical of cleared land used for grazing. Common pasture grasses and weeds included cocksfoot (*Dactylis glomerata*), yorkshire fog (*Holcus lanatus*), capeweed (*Arctotheca caladenia*), sorrel (*Acetosella vulgaris*) and cat's ear (*Hypochoeris radicata*).

There are a number of large radiata pines (*Pinus radiata*) on the site surrounding an old residence and either side of an inlet of the lake (Figure 5).

No declared weed species (as listed under the *Weed Management Act 1999*) were recorded during the survey.

Fauna of Conservation Significance

To assess the conservation significance of the site for fauna species a visual search and a search for scats, tracks and diggings was undertaken and habitat types were recorded. This data was then assessed against the requirements of threatened species known to occur in the area.

The survey identified potential habitat for two threatened species at the site. Scats and tracks consistent with the endangered Tasmanian devil were recorded in two caves along the edge of Meadowbank Lake and appear to be denning sites.

In addition a skink was sighted amongst grassy/sedgy habitat in the north eastern corner of the site. Marking on the species were consistent with the 'vulnerable' tussock skink (*Pseudemoia pagenstecheri*), however confirmation of this species will require pit trapping for identification as it could not be caught at the time of sighting.

The search of the Natural Values Atlas database (DPIPWE) revealed that no threatened species have been recorded within 500m of the site. There have however been eight (8) threatened species recorded within a 5km radius of the site. These species are listed in Table 4 including a comment on the likelihood of them occurring at this site.

Table 4 – Threatened Fauna recorded within a 5000m radius of site.

Species	Status TSPA	Status EPBCA	Comments
<i>Aquila audax fleayi</i> Wedge-tailed eagle	e	EN	Nesting sites are usually found in undisturbed forest of at least 10ha in size. Site does not provide suitable nest sites.
<i>Astacopsis gouldi</i> giant freshwater crayfish	v	VU	Found in streams/rivulets in still deep or shallow pools which are sheltered and well shaded beneath. No suitable habitat.
<i>Haliaeetus leucogaster</i> White-bellied sea-eagle	v		Forages and nests in large trees along the coastline. No nesting sites recorded during survey. Larger trees on lake edge may be used for perching/roosting.
<i>Litoria raniformis</i> Green and gold frog	v	VU	Occurs in permanent or temporary water bodies such as swamps, well-vegetated and high nutrient pools. No suitable habitat in survey area.
<i>Perameles gunnii</i> Eastern barred bandicoot		VU	Prefers open grassy areas but requires thick groundcover of tussocks or grasses for shelter and nesting. Site provides marginal habitat due to an absence of thick groundcover on the site.
<i>Pseudemoia pagenstecheri</i> tussock skink	v		Restricted to lowland <i>Poa</i> tussock grassland and open grassland. Suitable habitat on survey site. Possible sighting however not confirmed.
<i>Thylacinus cynocephalus</i> thylacine	e	EX	Extinct species.
<i>Tyto novaehollandiae castanops</i> Masked owl (Tasmanian)	e		Found in dry forest and woodland nearby to open country. Requires large hollows in old growth trees for nesting. May forage over site but unlikely to nest on site..

Notes on preferred habitats sourced from Bryant and Jackson 1999

Habitat Values

The vegetation along the lake edge provides potential habitat for a wide range of native bird, mammal, reptile and invertebrate species due to the range of habitat niches including native grassland, woodland, riparian habitat, sandstone cliffs and caves and rocky outcrops.

Two caves long the lake edge contained den sites for the Tasmanian devil (*Sarcophilus harrisii*) with scats and track consistent with this species found outside each cave (Figure 5).

Due to the proximity of the vegetation to the lake it is likely that the white bellied sea eagle would utilise the site for roosting and/or perching however there are limited trees suitable for nesting sites.

The site contains some suitable habitat contained for the tussock skink (*Pseudemoia pagenstecheri*) and an individual that had marking consistent with this species was sighted during the survey. Trapping of species would be required to confirm the species as at least 3 other skinks share similar habitat and are similar in body size and shape and colour pattern.

3. Proposed Site Development and Impacts

The proposed development of the site involves the subdivision of the lot to form a new 40ha lot adjacent to Meadowbank Lake. Within this new lot a new residence is to be developed and up to 13 sites developed as strata shack sites (Figure 5).

The location of the development sites was assessed during a site visit to determine locations where there will be minimal impacts on the natural values of the site. Within each site vegetation will need to be cleared for a structure and associated fire protection zones and for access roads to each site.

Access to the house site and shack sites will be via Right of Way through centre of balance lot and then along rear of new lot (Figure 5). Each shack site will be access from the ROW across the rear of the site or utilise existing roads and tracks to minimise impacts.

Impacts of the each proposed site

SITE 1

The residential house site is to be located towards the eastern side of the site close to the lake on a small rise (Figure 4 & 5).



Figure 4 – Proposed location of Site 1

The proposed location for this site is amongst cleared agricultural land with scattered native sedges, grasses and groundcover plants nearby to site (Figure 4). An unidentified skink species was sighted in close proximity to this site which may be a listed species, however no other values will be impacted by development in this location.

Access to Site 1 will be via an existing rough track through agricultural land and past an old burnt down residence. No significant values will be impacted by the development of this site.

SITE 2

Site 2 is located amongst degraded woodland vegetation on the side of a low hill to the west of a small inlet into the lake (Figure 5). The area is dominated by silver wattle with a groundcover of sagg, sword sedge, native grasses and exotic grasses and herbs.

No significant species were recorded in this area during the survey.

Access to the site will be through degraded agricultural land.

SITE 3

Site 3 is to be located at the edge of woodland vegetation and degraded agricultural land to the west of small inlet off Meadowbank Lake (Figure 5). The area contains mature radiata pine trees and native grasses.

No significant species were recorded in this area during the survey, however there were a range of native grass species present in this location which was not identified to species level. Additional collections of grass species would be required during summer to confirm if any threatened grass species were present at this site. If threatened species were recorded in this location it is likely that the building envelope could be relocated to avoid the native grasses.

Access to Site 3 will be through degraded agricultural land and be shared with access to Site 2.

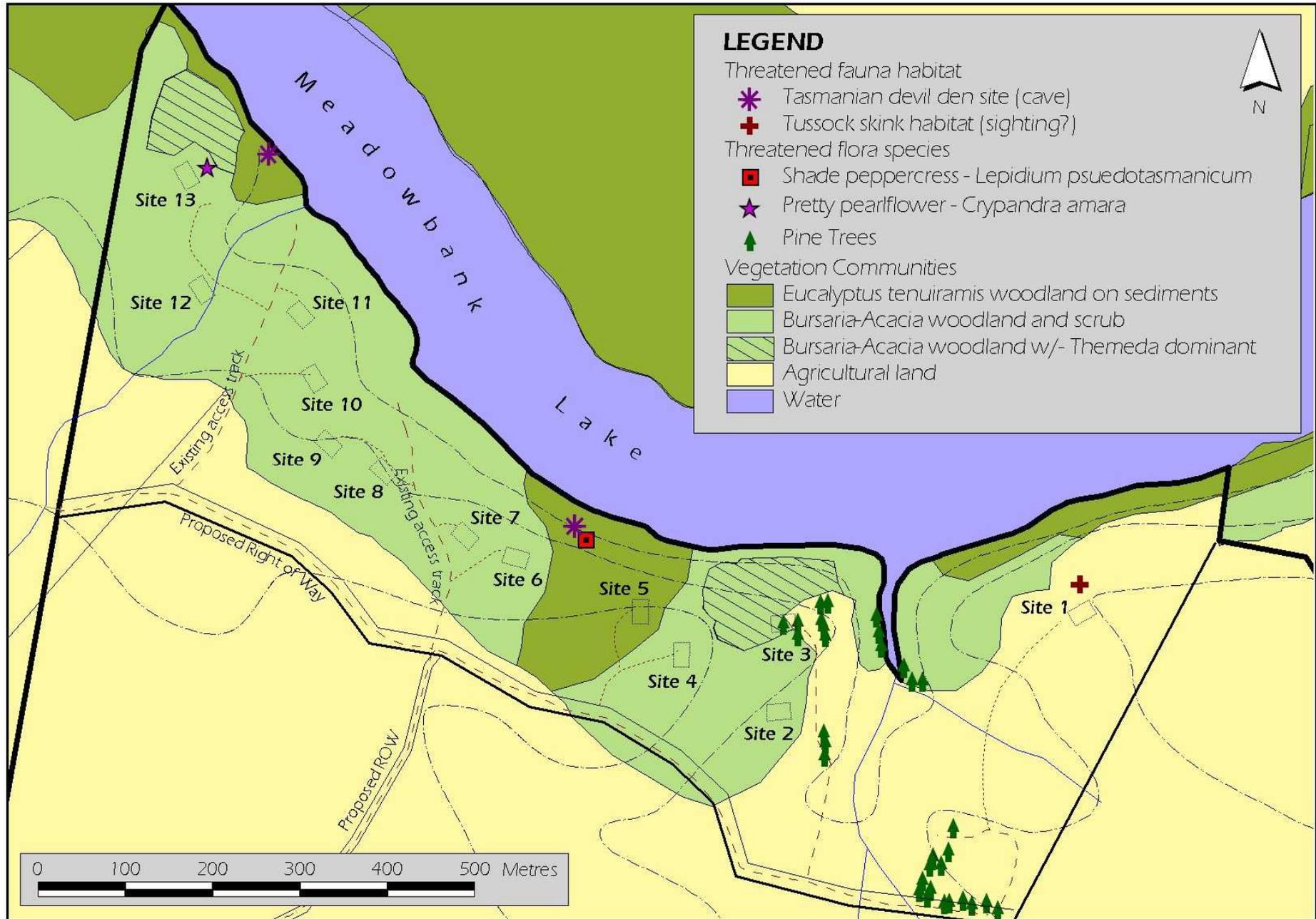


Figure 5- Proposed new lot and development sites.

SITE 4

Site 4 is proposed for the top of the small ridge adjacent to the lake edge amongst Bursaria-Acacia woodland with the access road through similar vegetation (Figure 5). The location contains an open area devoid of wattles with a groundcover of sagg, sword sedge and native grasses with no significant flora species or fauna habitat (Figure 6). The establishment of a structure on this site will have minimal environmental impacts.



Figure 6 – Site 4 in open area amongst NBA.

SITE 5

Site 5 is to be located towards the eastern edge of the *Eucalyptus tenuiramis* forest (DTO), adjacent to the Bursaria woodland (Figure 5). The area contains scattered *E. tenuiramis* trees amongst silver wattles with a diverse understorey containing prostrate guineaflower (*Hibbertia prostrata*), leafy spiky bitterpea (*Daviesia sejugata*), twiggy beardheath (*Leucopogon virgatus* var. *virgatus*) and a variety of native grasses and herbs.

Vegetation clearance for this site will require a permit from the local council as the vegetation community is listed as 'vulnerable' under Schedule 3A of the *Nature Conservation Act 2002*. In addition the site is relatively close to a Tasmanian devil den site and therefore will need to be referred to the Policy and Conservation Assessment Branch (PCAB), DPIPWE for comment.

Access to the site is shared with access to Site 4 from the ROW across the rear of the new lot.

SITE 6

Site 6 is located amongst NBA vegetation on the western side of a silver peppermint remnant (Figure 5 & 6). The vegetation contains scattered low silver wattles, prostrate guineaflower, golden pea and groundcover plants such as sagg, sword sedge, creeping bossia (*Bossia prostrata*) and native pigface (*Carpobrotus rossii*). The impacts of the development of this site will be minimal with only NBA woodland to be cleared. The adjacent remnant of silver peppermint forest and the devil den site and shade peppercress plants will not be disturbed.

Access to this site will be through degraded woodland vegetation and will no impact any significant environmental values.



Figure 7 – Location of Site 6 in a sparse area of NBA woodland.

SITE 7 & 8

Sites 7 & 8 are located amongst sparse NBA vegetation with limited natural values present. The sites are accessed from either side of an existing road that accesses the lake edge (Figure 5 & 8).



Figure 8 – Site 7 amongst sparse NBA

SITE 9

Site 9 is close to Site 8 amongst also sparse NBA vegetation adjacent to a stand of large cabbage gums (Figure 5 & 9). The site will be accessed via a shared track to Site 8. The stand of cabbage gums will not be impacted by this building envelope.



Figure 9 – Proposed site 9 amongst NBA vegetation adjacent to a stand of cabbage gums.

SITE 10

Site 10 is located on the western side of small drainage line behind an existing camp site with access to the lake. The site is devoid of a tree/shrub layer and contains sparse native grasses and sedges (Figure 5 & 10). There are no significant natural values at this site.

The site is to be accessed from a vehicle track that leads to an existing pump shed at the lake edge (Figure 5).



Figure 10 – Proposed site 10 amongst sparse woodland vegetation.

SITES 11 & 12

Sites 11 and 12 are located in similar vegetation to site 8 – 10 amongst sparse silver wattles over a sparse grass and sedge groundlayer (Figures 11 & 12). There are a number of white gums nearby to site 11 however these trees will be retained. Access to both sites 11 & 12 is via an existing track to a pump shed on the lake edge (Figure 5).



Figure 11 – Site 11 (flagged stake near large tree).



Figure 12 – Proposed location of site 12

SITE 13

Site 13 is located towards the north-west corner of the site in an open area which contains native grasses (Figure 5 & 13). No significant natural values were located within the proposed building envelope, however the timing of the survey meant that many native grass species could not be identified to species level and therefore it is possible that a threatened grass species could occur close to this site.

This site is within close proximity of a small population of the endangered pretty pearlflower (*Cryptandra amara*) and due to this proximity the development of this site will need to be referred to Policy and Conservation Assessment Branch (PCAB), DPIPWE for comment. The site is also within close proximity to a Tasmanian devil den site.

Access to the site is via a new track that extends from the existing track to the pump shed and is shared with the access road to site 12.



Figure ? – Site 13 amongst grassy area of NBA woodland.

Development of the balance lot

The remainder of the site (approximately 383ha) will be retained in its current form and utilised for grazing and cropping. The large area of silver peppermint forest that occurs in the low hills across the southern half of the site will be retained.

Impacts on Threatened Species

Under the current proposal the development of Site 13 may lead to the disturbance of the endangered pretty pearlflower and the development of Site 5 & 6 and Site 3 are in relatively close proximity to Tasmanian devil denning sites and may to the potential disturbance of this species.

Due to potential impacts on these flora and fauna species the proposed development should be referred to PCAB for comment. Some conditions may be imposed on the development that ensures these values are managed and protected.

Site 13 and Site 3 are located amongst native grassland vegetation which contained a number of grass species that could not be identified to species level. There are existing records of threatened grass species from the local area and it is therefore possible that threatened grass species could occur on the site. As such a further survey of sites 3 and 13 would be required in summer to confirm the presence or absence of such species.

The remaining sites and access roads associated with the development will not impact on any threatened flora or fauna species or habitat.

4. Legislative and regulatory requirements

The following section outlines the potential legislative implications of the subdivision and site development.

Requirements under the state *Threatened Species Protection Act 1995*.

Under the *Threatened Species Protection Act 1995*, referral to the Policy and Conservation Assessment Branch (PCAB), DPIPW, is required if the proposal will disturb or destroy threatened species or their habitat (where species have been recorded only).

The proposed development at Site 13 is in close proximity to a population of the endangered pretty pearlflower and as such comment should be sought on potential disturbance to this population and the instigation of measures to protect the populations.

Sites 5, 6 and 13 are nearby to recorded Tasmanian devil den sites and as such referral to PCAB for comment should also be sought in order to minimise any impacts to this species.

Requirements under the *Environmental Protection & Biodiversity Conservation Act 1999*.

Under this EPBC Act referral is required if:

'An action has, will have, or is likely to have a significant impact on a vulnerable/endangered species if it does, will or is likely to (amongst other things):

- *modify, destroy, remove isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*
- *adversely affect habitat critical to the survival of a species'*

The Tasmanian devil is listed as endangered under the EPBC Act and as the development has the potential to disturb two den sites of this species referral under the Act may be required.

Requirements under the *Land Use Planning and Approvals Act 1993*

Under this act a permit is required to remove any threatened vegetation (due to a development or subdivision application) listed under the Schedule 3A of *Nature Conservation Act 2002*.

The formation of a building envelope, fire protection zones and access road to Site 5 will require the clearance of a small area of *Eucalyptus tenuiramis* forest and woodland on sediments (DTO) which is listed as 'vulnerable' under the NCA. As such a permit will need to be issued by the Central Highlands Council to disturb this vegetation.

All other sites are within common and well reserved native vegetation communities or altered vegetation and as such no permit are required.

5. Summary

A survey of vegetation communities and flora and fauna values of land (approx. 40ha) on the banks of the Meadowbank Lake was undertaken in August 2011 as part of a proposed subdivision and shack site development.

The proposal involves the subdivision of a 40ha (approx.) lot from the overall 420ha site and the development of numerous shack sites within the newly formed 40ha lot.

The 40ha site adjacent to the lake was found to contain two (2) native vegetation communities and areas of agricultural land. There are two small patches of *Eucalyptus tenuiramis* forest and woodland (DTO) along the lake side amongst larger area of Bursaria-Acacia woodland (NBA). The DTO community is classified as a 'vulnerable' vegetation type.

The survey area was also found to contain two (2) threatened flora species - pretty pearlflower (*Cryptandra amara*) and shade peppergrass (*Lepidium pseudotasmanicum*); and habitat for two (2) threatened fauna species - Tasmanian devil (*Sarcophilus harrisii*) and tussock skink (*Pseudemoia pagenstecheri*).

During the survey 13 potential building envelopes were identified within the proposed 40ha lot with these envelopes located where possible in areas of minimal environmental value. The majority of the proposed development sites are to be located amongst cleared land or degraded woodland vegetation with limited environmental impact.

Access to each site will be via existing and new roads from a common ROW that runs along the rear of the proposed new lot.

One (1) site (Site 5) is to be located amongst the DTO vegetation and within proximity to Tasmanian devil den site. Another two sites (Site 6 and Site 13) are also within proximity to Tasmanian devil den sites with one of these sites (Site 13) also adjacent to a population of the endangered pearlflower. A further site (Site 1) is to be located within degraded agricultural land nearby to sedgy grassland habitat which provides potential habitat the southern grass skink.

Development on these lots may impact these threatened species and therefore referral to the Policy and Conservation Assessment Branch of DPIPW is required for these sites.

Overall the proposed subdivision and development of shack sites will have limited impact on the largely degraded natural values of the site. The majority of the sites will be located within degraded regrowth woodland vegetation where there is no significant fauna habitat for threatened flora species.

Three (3) sites are nearby to threatened flora species or fauna habitat and development of shack sites (and required fire protection zones) has the potential to impact on these species. Any impacts may be mitigated by some relocation of the sites or the implementation of suitable management actions that protect these values.

References

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Appendix 1

Flora Species list for 475 Rockmount Road, Ellendale.

Recorder: A. Welling

Date: August 2011

1 = *E. tenuiramis* forest and woodland on sediments (DTO)

2 = Bursaria-Acacia woodland (NBA)

3 = Agricultural land (FAG)

e = endemic

i = introduced

d = declared weed

r = Rare (as per TSPA)

Dicotyledonae

Family name	Species name	Common name	Location
AIZOACEAE			
	<i>Carpobrotus rossii</i>	Native Pigface	1, 2
ASTERACEAE			
	<i>Cassinia aculeata</i>	Dolly Bush	1
	<i>Chrysocephalum apiculatum</i>	Clustered Everlasting	1, 2
	<i>Senecio</i> sp.		1,2,3
BRASSICACEAE			
	<i>Lepidium pseudotasmanicum</i>	Peppercress	1
CAMPANULACEAE			
	<i>Wahlenbergia</i> sp.	Bluebell	2
CARYOPHYLLACEAE			
	<i>Scleranthus biflorus</i>	Twin-flower Knawel	1
CASUARINACEAE			
	<i>Allocasuarina littoralis</i>	Bulloak	2
CHENOPODIACEAE			
	<i>Einadia nutans</i> subsp. <i>nutans</i>	Climbing Salt-bush	1, 2
CRASSULACEAE			
	<i>Crassula sieberiana</i> subsp. <i>sieberiana</i>	Austral Stonecrop	1, 2
DILLENACEAE			
	<i>Hibbertia prostrata</i>	Bundled Guinea-flower	1, 2

EPACRIDACEAE

<i>Astroloma humifusum</i>	Native Cranberry	1, 2
<i>Leucopogon ericoides</i>	Pink Beard-heath	2
<i>Leucopogon virgatus</i> var. <i>virgatus</i>	Common Beard-heath	1
<i>Lissanthe strigosa</i> subsp. <i>subulata</i>		1, 2

EUPHORBIACEAE

<i>Amperea xiphoclada</i>	Broom spurge	1
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FABACEAE

<i>Aotus ericoides</i>	Common Aotus	2
<i>Bossiaea cinerea</i>	Showy Bossiaea	1, 2
<i>Bossiaea prostrata</i>	Creeping Bossiaea	1, 2
<i>Daviesia latifolia</i>	Bitter-leaf	2
<i>Daviesia sejugata</i>	Native Gorse	1, 2
<i>Hovea heterophylla</i>	Winter purplepea	1
<i>Kennedia prostrata</i>	Running Postman	1
<i>Pultenaea juniperina</i>	Prickly Beauty	1
<i>Pultenaea pedunculata</i>	Matted Bush-pea	1
<i>Trifolium</i> sp.		2, 3

GERANIACEAE

<i>Geranium</i> sp.		1, 2, 3
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HALORAGACEAE

<i>Gonocarpus teucrioides</i>	Raspwort	1, 2
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MIMOSACEAE

<i>Acacia dealbata</i> subsp. <i>dealbata</i>	Silver Wattle	1, 2, 3
<i>Acacia melanoxylon</i>	Blackwood	1, 2

MYRTACEAE

e <i>Eucalyptus amygdalina</i>	Black peppermint	1, 2
<i>Eucalyptus pauciflora</i> subsp. <i>pauciflora</i>	Cabbage Gum	1, 2
e <i>Eucalyptus tenuiramis</i>	Silver Peppermint	1
<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	White Gum	1, 2
<i>Leptospermum lanigerum</i>	Woolly Tea-tree	1, 2

PITTOSPORACEAE

<i>Bursaria spinosa</i> subsp. <i>spinosa</i>	Prickly box	1, 2
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POLYGONACEAE

i	<i>Acetosella vulgaris</i>	Sorrel	1, 2, 3
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RHAMNACEAE

	<i>Cryptandra amara</i>	Bitter Cryptandra	2
	<i>Pomaderris apetala subsp. apetala</i>	Dogwood	1, 2
e	<i>Pomaderris elliptica var. elliptica</i>	Yellow Pomaderris	1

ROSACEAE

	<i>Acaena sp.</i>	Sheep's Burr	1, 2, 3
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SANTALACEAE

	<i>Exocarpos cupressiformis</i>	Native Cherry	1, 2
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SAPINDACEAE

e	<i>Dodonaea filiformis</i>	Fined-leaved Hop-bush	1, 2
	<i>Dodonaea viscosa subsp. spatulata</i>	Broadleaf hopsbush	1

STYLIDIACEAE

	<i>Stylidium graminifolium</i>	Trigger Plant	2
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THYMELAEACEAE

	<i>Pimelea humilis</i>	Dwarf Rice-flower	1, 2, 3
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VIOLACEAE

e	<i>Viola hederacea subsp. hederacea</i>	Native Violet	1, 2
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Gymnospermae

Family name	Species name	Common name	
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PINACEAE

i	<i>Pinus radiata</i>	Monterey Pine	2, 3
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Monocotyledonae

Family name	Species name	Common name	
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CYPERACEAE

	<i>Carex appressa var. virgata</i>		2
	<i>Lepidosperma gunnii</i>	Narrow Sword-sedge	1, 2, 3

e	<i>Lepidosperma inops</i>	Fan Sedge	1, 2
JUNCACEAE			
	<i>Juncus pallidus</i>	Pale Rush	2, 3
JUNCAGINACEAE			
	<i>Triglochin sp.</i>	Water-ribbons	1, 2
LILIACEAE			
	<i>Arthropodium milleflorum</i>	Pale Vanilla-lily	1, 2
	<i>Bulbine bulbosa</i>	Bluish Bulbine-lily	1
	<i>Dianella revoluta</i>	Spreading flax lily	1, 2
	<i>Dianella tasmanica</i>	Flax lily	1
POACEAE			
	<i>Austrodanthonia sp. x 2</i>	Wallabygrass	1, 2, 3
	<i>Austrostipa rudis subsp. australis</i>	Speargrass	1, 2, 3
	<i>Austrostipa sp. x 2</i>	Speargrass	1, 2, 3
i	<i>Holcus lanatus</i>	Yorkshire fog-grass	2, 3
	<i>Poa sp.</i>		1, 2, 3
	<i>Poa labillardierei</i>		1, 2
	<i>Themeda triandra</i>	Kangaroo Grass	1, 2, 3
XANTHORRHOEACEAE			
	<i>Lomandra longifolia</i>	Sagg	1, 2, 3
<i>Pteridophyta</i>			
Family name	Species name	Common name	
ASPLENIACEAE			
	<i>Asplenium flabellifolium</i>	Necklace Fern	1
DENNSTAEDTIACEAE			
	<i>Pteridium esculentum</i>	Bracken	1, 2, 3



GEO-ENVIRONMENTAL

S O L U T I O N S

GEO-ENVIRONMENTAL ASSESSMENT

475 Rockmount Rd, Ellendale

CLIENT

JMG Engineers & Planners

September 2011



SUMMARY

Geo-Environmental Solutions P/L was engaged to complete a land capability and geotechnical assessment on the property at 475 Rockmount Road Ellendale on behalf of Johnstone, McGee & Gandy P/L. The agricultural land capability assessment conferred with the published mapping of Musk and DeRose (2000) that the property is predominantly a mix of class 4, 5 and 6 land.

The property exhibits good examples of class 4, 5 and 6 land capability types, however the results of the field survey carried out by GES suggested significant error in the 1:100 000 land capability mapping available for the area. From the survey information collected, it was clear that the majority of the land to the SE and SW of the title was Class 6 land, extending north to some Class 5 and Class 4 land on the lower cleared northern slopes of the property, with the remainder of land bordering the lake edge classified Class 6.

From this information a revision of the land capability mapping for the area was developed which more accurately represents the agricultural suitability of the landscape, soil type, and agricultural potential. Given the revision made to the land capability mapping it is highly unlikely that the residential development of the site would fetter any significant agricultural development.

It is also concluded that the proposed development areas are suitable for residential construction and on site wastewater disposal, and no significant geotechnical impediments were identified.

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1 Founding statement

This assessment report is one of many completed by John Paul Cumming of Geo-Environmental Solutions P/L (GES). John Paul holds a first class honours degree in Agricultural Science (major in soil science) and a PhD in environmental soil chemistry. John Paul is currently an Honorary Research Associate in the Faculty of Engineering, Science, and Technology where he has participated in a number of academic and research projects pertaining to soil and environmental management. John Paul has current status as a Stage 2 Certified Professional Soil Scientist from the Australian Society of Soil Science Inc.

John Paul is a graduate member of the Australian Institute of company directors, and a director of Geo-Environmental Solutions P/L (GES). In his role at GES John Paul has completed numerous land capability assessments for Federal, State and Local Government agencies. In addition, over the past eight years John Paul has completed over 4000 site and soil classifications for residential developments according to AS2870-1996 and AS/NZS1547-2000.

2 Introduction

The proposed development site is located at 475 Rockmount Road in the locality of Hamilton adjacent to Meadowbank Lake. The total current land area of the development is approximately 440 ha (139332/1), of which it is proposed to develop up to twelve (12) strata titles for holiday use in appropriate areas adjacent the lake.

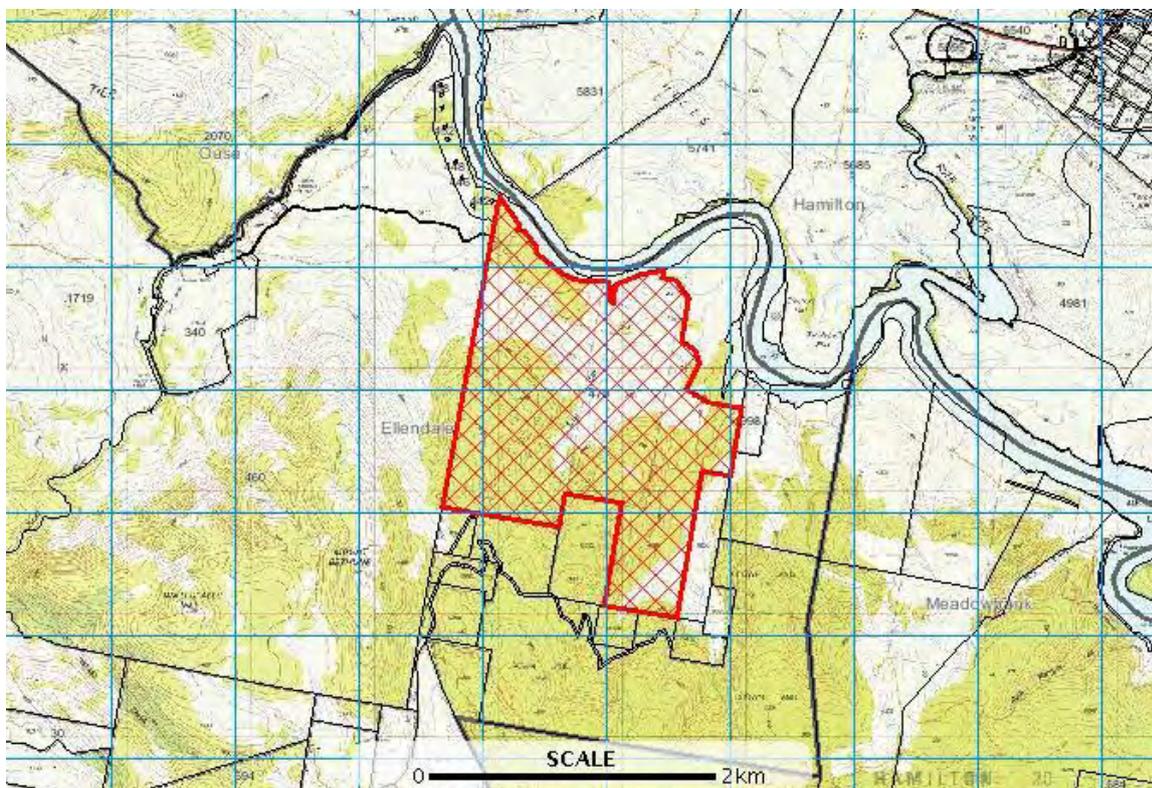


Figure 1 – Site location – title area in red

The land surveyed is gently to moderately sloping rural land with mixed forest, pasture, agricultural, and native vegetation land types. The site has good access from Rockmount Road and power is available via existing transmission lines on the property.

It is the scope of this report to consider the capability of the land to support the development of holiday strata titles and to ensure that the proposed use of the land will not infringe upon or fetter any potential agricultural production.

3 Site information

Site information pertaining to the capability of the land to sustain residential development without causing environmental harm was collected from desktop and field survey. A geotechnical field survey was undertaken utilising a 4wd mounted earthprobe rig or a hand auger with soil samples assessed according to AS2870-2011 and AS/NZS1547-2000 for suitability for residential construction and mapping of soil type for use in land classification. Laboratory testing of selected samples for linear shrinkage, dispersion, and plasticity was also undertaken in the Soil Science Laboratories at the University of Tasmania.

Topography and surface water hydrology

The site is located at an elevation of approximately 80 – 240m AHD on the SE side of Meadowbank Lake, below Mt. Bethune which are the two dominate features in the surrounding landscape. The majority of the property has a gradient of between 5-20% with gentle slopes extending to the shoreline of the lake.

There are a number of small drainage channels and creeks which feed into Meadowbank Lake but which rarely flow, except during periods of persistent high rainfall. It is however beyond the scope of this report to comment upon detailed surface water management with the exception that no risk of flooding was identified which could provide a geotechnical impediment to the development. It is however clear that the small drainage lines on site will require adequate consideration in civil designs to ensure adequate surface water management post development.

Geology

The study area falls within the Mineral Resources Tasmania 1:50 000 mapping sheet for Hamilton (see figure 3) which indicates the area is predominantly Triassic Sandstone with smaller areas of underlain Jurassic aged Dolerite. Field inspection and soil profiles detailed as part of this assessment would concur with sandstone as the dominant parent material in all profiles.



Figure 2 – Typical topography photo looking east across the northern end of the property.

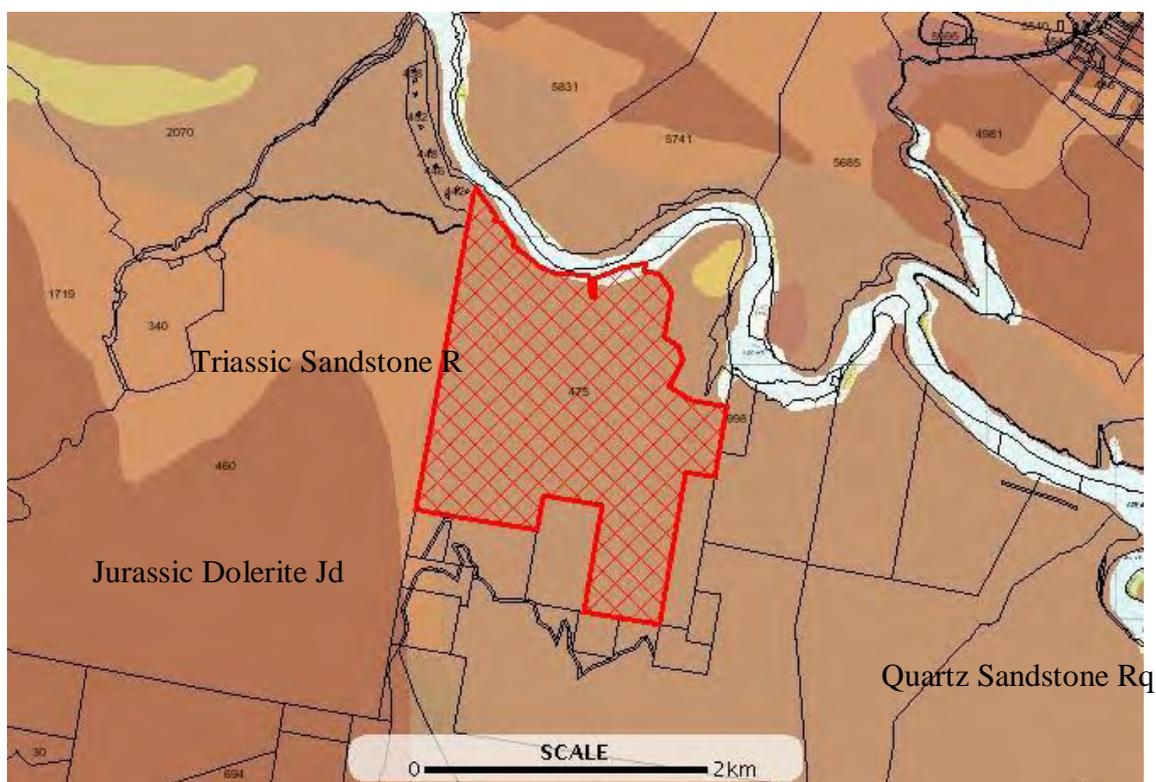


Figure 3 – Geology of the local area (ListMap 250K Geology Polygons)

Soil distribution

The soil found on the property shows a close correlation with underlying geological material, and is therefore classified according to geological association. Soil distribution within the proposed development area was variable, with variation in soil depth and horizon delineation according to Aeolian input and underlying clay content (please refers to bore logs in appendix 1).

Soils on Triassic Sandstone

Soils of this type are dominated generally by poorly structured sandy top soils overlying sandy clay subsoils, with an overall shallow profile on slightly weathered sandstone bedrock.

In some cases in areas that are particularly steep the soils can be as little as 200 - 400mm in depth. The soils on the lower slopes are generally the deepest and best suited to agricultural uses.

In general shallow well draining soils are poorly suited to intense agricultural production due to their inherently poor water and nutrient holding capacities or physical fertility. Grazing of annual grass growth is viable on some land however stocking rates should be kept low to avoid removal of the permanent vegetation which would result in accelerated soil erosion.

4 Geotechnical summary

Published and field survey information was integrated to compile a preliminary geotechnical summary of the proposed development site. General suitability for residential construction, pavement design, infrastructure and identification of possible geotechnical hazards was undertaken. Bore logs from detailed site drilling and sample assessment are presented in appendix 1.

Residential construction

The soils examined across the site all appear suitable for residential construction within the parameters of AS2870-2011 *Residential Slabs and Footings - Construction*. The soils examined would be classified as predominantly Class S to M, which is slightly to moderately reactive sandy clays. The drilling generally concurs with prior assessments undertaken on nearby properties, which are underlain by similar parent materials. The risk of foundation failure is considered to be low due to the low plasticity of the sandy clays on site and the shallow depths to sandstone. I would however recommend that site specific AS2870-1996 site assessment is undertaken on each proposed lot prior to any building approvals, and prospective purchasers should be made aware of prior geotechnical site assessment to enable informed decisions.

Pavement and infrastructure design

Site conditions and the soils examined suggest that conventional pavement designs, and engineering design of infrastructure will be appropriate for the site. Preliminary Dynamic Cone Penetration (DCP) testing across the site indicates that California Bearing Ratios (CBR) across the site will vary according to depth of topsoils, and variable stripping and sub-grade depths may be required. The sandy clay soils may also be suitable for limited on site stormwater retention/absorption as part of Water Sensitive Urban design (WSUD) elements within the development. Therefore I would recommend that the engineering design phase consider WSUD principles wherever possible.

Potential geotechnical risks

A number of geotechnical risk scenarios have been considered for the residential development; risk of land instability, risk of inundation/flooding, risk of foundation failure, and erosion risk. The level of risk associated with any possible event is described in terms of likelihood and consequence (see table 2 for an explanation of terminology). That is, how likely is the event to occur (eg rare, unlikely, likely possible etc), and what is the consequence of the event (eg loss of life, serious capital damage, limited capital damage, localised erosion etc). Based upon an assessment of the site and the likely risks, the **overall** geotechnical risk associated with the development is rated as **very low to low** (see table 1 - geotechnical risk summary). The level of risk is therefore acceptable and there is no significant geotechnical impediment to the proposed development.

Table 1 – Summary of geotechnical hazards, consequences and risk, with suggested treatment options

Hazard	Likelihood of occurrence	Consequences to property	Level of risk to property	Treatment options
Surface erosion	Likely	Minor	Low	Soil and Water Management Plan (SWMP)
Subsoil or tunnel erosion	Unlikely	Minor	Very Low to Low	Dispersion testing of subsoils as part of AS2870-2011 assessment
Soil creep	Unlikely	Minor	Very Low	None required
Shallow seated landslide (eg. Debris slide/flows)	Unlikely	Minor	Very Low	Adequate AS2870-2011 assessment & SWMP
Deep seated landslide (eg. Boulder bed/talus instability)	Not credible	Major	Very Low	None required
Excessive foundation movement (eg. Due to extremely reactive soils)	Unlikely	Medium	Low	Thorough AS2870-2011 assessment and appropriate engineering foundation design
Foundation failure (eg. Excessive settlement, fill failure)	Unlikely	Medium	Low	Thorough AS2870-2011 assessment and appropriate engineering foundation design
Flooding or inundation	Unlikely	Minor	Very Low	Adequate stormwater design as part of detailed engineering for the development
Site contamination	Possible	Minor	Low	Visual inspection of site/soils and review of prior activities

Concepts and terminology from AGS Sub-committee (March 2007) Landslide Risk Management Concepts and Guidelines.

Table 2 - Geotechnical Risk Assessment – Example of Qualitative Terminology

Adapted from AGS Sub-committee (March 2007) Landslide Risk Management Concepts and Guidelines.

Qualitative Measures of Likelihood

Level	Descriptor	Description	Indicative Annual Probability
A	Almost Certain	The event is expected to occur	$> \sim 10^{-1}$
B	Likely	The event will probably occur under adverse conditions	$\sim 10^{-2}$
C	Possible	The event could occur under adverse conditions	$\sim 10^{-3}$
D	Unlikely	The event might occur under very adverse circumstances	$\sim 10^{-4}$
E	Rare	The event is conceivable only under exceptional circumstances	$\sim 10^{-5}$
F	Not Credible	The event is inconceivable or fanciful	$\sim 10^{-6}$

Note: “~” means approximate

Qualitative Measures of Consequences to Property/Element at risk

Level	Descriptor	Description
1	Catastrophic	Structure completely destroyed or large scale damage requiring major engineering works for stabilization.
2	Major	Extensive damage to most of structure, or extending beyond site boundaries requiring significant stabilization works.
3	Medium	Moderate damage to some of structure, or significant part of site requiring large remedial works.
4	Minor	Limited damage to part of structure or part of site requiring some reinstatement or remedial works.
5	Insignificant	Little damage or effect.

Note: The “Description” may be edited to suit a particular case.

Qualitative Risk Analysis Matrix – Level of Risk to Property/Element at Risk

Likelihood	Consequences to Property				
	1: Catastrophic	2: Major	3: Medium	4: Minor	5: Insignificant
A – Almost Certain	VH	VH	H	H	M
B – Likely	VH	H	H	M	L-M
C – Possible	H	H	M	L-M	VL-L
D – Unlikely	M-H	M	L-M	VL-L	VL
E – Rare	M-L	L-M	VL-L	VL	VL
F – Not Credible	VL	VL	VL	VL	VL

Risk Level Implications

Risk Level	Example Implications
VH Very High Risk	Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to acceptable levels; may be too expensive and not practical
H High Risk	Detailed investigation, planning and implementation of treatment option required to reduce risk to acceptable levels
M Moderate Risk	Tolerable provided treatment plan is implemented to maintain or reduce risks. May be acceptable. May require investigation and planning of treatment options.
L Low Risk	Usually acceptable. Treatment requirements and responsibility to be defined to maintain or reduce risks.
VL Very Low Risk	Acceptable. Manage by normal site maintenance procedures.

- Notes:**
- (1) The implications for a particular situation are to be determined by all parties to the risk assessment; these are only given as a general guide.
 - (2) Judicious use of dual descriptors for likelihood, Consequence and Risk to reflect the uncertainty of the estimate may be appropriate in some cases

5 Site Suitability for Onsite Wastewater Disposal

One indicative soil profile from each proposed building area was chosen for classification according to AS/NZS1547-2000 (on-site wastewater management). Bore logs for each proposed lot based upon onsite geotechnical drilling are presented in Appendix 1 whilst site and soil factors pertinent to wastewater disposal under AS/NZS1547-2000 are presented in Table 3 overleaf.

The soils across the site area classified according to AS1547-2000 as **category 3 loams** due to the presence of the clayey sand to light sandy clay subsoils, with low to moderate Long Term Acceptance Rates (LTAR's).

Modelling utilising a median four bedroom house on tank water with standard plumbing fixtures indicates that a disposal area of up to 200m² plus a reserve area of up to 200m² totalling 400m² that should be set aside in the vicinity of each dwelling for wastewater disposal. Based upon allowances for adequate down slope boundary setbacks and sufficient construction, access, and recreational space, then the proposed locations of each building area appear suitable. The design of wastewater systems should also take into consideration the variable slope angles across the site when assigning absorption areas to ensure adequate setbacks to sensitive features are observed (eg surface water).

Nutrient balance and sustainable wastewater application

The soils across the entire site are developed from Triassic Sandstone with moderate cation exchange complex in the sandy clay subsoils. The soils examined are also moderately structured, with a low organic content in surface horizons, and a moderate estimated Cation Exchange Capacity (CEC). Therefore the soils have a moderate ability to retain applied nutrients in wastewater and given the available area the risk of nutrient attenuation associated with wastewater application is low. Furthermore, it is recommended that adequate site specific testing and wastewater design is undertaken in proposed disposal areas on each lot to ensure the predicted soil behaviour and effluent disposal standards are met.

Hydrological balance and wastewater disposal

Modelling of wastewater application was undertaken utilising the Trench program, long term weather average for Hamilton weather station, and estimated flows from an average four bedroom home (ABS data 2007 median home in Australia is four bedrooms). This yielded a primary AWTS application area of approximately 200 square meters per lot for a four bedroom home, which is further amended to 400 square meters to fulfil the requirements for a 100% reserve area Based upon a Design Irrigation Rate of 4mm/day). Based upon the modelling undertaken in trench, the required areas are more than adequate to sustain long term wastewater application.

It should however be noted that the modelling is based upon the installation of packaged treatment systems (eg AWTS) for dwellings on each lot. Given that the subsoils onsite have a moderately permeability, the use of septic systems with absorption trenches would also be possible with further water balance modelling upon the creation of dwelling specific site plans. As an indication a Design

Loading Rate of 10-14L/m²/day would be appropriate for a septic tank system, with a required absorption area of approximately 60-80m² for a four bedroom dwelling. The final decision of wastewater system approval rests with the permit authority at the time of site specific design to ensure the most compatible environmental and economic outcomes.

Setbacks distances to boundaries and sensitive features

The minimum discretionary boundary setbacks modelled for the development are;

- Boundaries (upslope/across slope) – 2m minimum
- Boundaries down slope – 5m minimum
- Surface water – 25m

The actual down slope setbacks applied will require fine tuning at the special plumbing permit stage as access, parking, and building footprints are finalised in conjunction with wastewater disposal areas. Modelling at this planning stage does however suggest that sufficient room is available in the vicinity of each proposed dwelling to accommodate the required setbacks.

Down slope boundaries – Modelling of the required setbacks in the Trench program has been undertaken based upon measured and estimated soil properties across the building areas in reference to a range of slope angles. The modelling was performed utilising the Duplex soil model in Trench which has a tendency to over estimate the required setbacks on gradational or uniform textured soils (the model utilises a 90% permeability differential to describe subsoil flow). Therefore I consider the following approximate down slope setbacks calculated in Trench to be conservative.

- Slope 8-11° – Minimum Setback 10m
- Slope 5-8° - Minimum Setback 8m
- Slope 0-5° – Minimum Setback 5m

Surface waters

For proposed building areas immediately upslope and adjacent to any open surface water bodies (i.e. the lake frontage), an absolute minimum setback of 25m is recommended from wastewater disposal areas to any surface water.

Proposed Lot Number	Soil Depth to Auger Refusal (m)	Slope Type, Magnitude and Aspect (%)	Soil Classification according to AS1547-2000	Dispersion Potential	Sensitive Environmental Receptors	Suitability for Septic/AWTS
Lot 1	0.60	Convex 3% North West	CAT 3 Loam	Low	Surface water 100m	Septic may be suitable with suitable setbacks
Lot 2	0.90	Convex 6% North East	CAT 3 Loam	Low	Surface water 75m	Septic may be suitable with suitable setbacks
Lot 3	0.80	Simple 6% North West	CAT 3 Loam	Low	Surface water 100m	Septic may be suitable with suitable setbacks
Lot 4	0.70	Simple 9% North	CAT 3 Loam	Low	Surface water 75m	Septic may be suitable with suitable setbacks
Lot 5	0.90	Simple 10% North	CAT 3 Loam	Low	Surface water 100m	Septic may be suitable with suitable setbacks
Lot 6	1.0	Simple 12% North	CAT 3 Loam	Low	Surface water 120m	Septic may be suitable with suitable setbacks
Lot 7	0.90	Simple 6% North East	CAT 3 Loam	Low	Surface water 100m	Septic may be suitable with suitable setbacks
Lot 8	1.0	Simple 10% North	CAT 3 Loam	Low	Surface water 80m	Septic may be suitable with suitable setbacks
Lot 9	0.90	Simple 6% North	CAT 3 Loam	Low	Surface water 120m	Septic may be suitable with suitable setbacks
Lot 10	0.90	Concave 6% North East	CAT 3 Loam	Low	Surface water 130m	Septic may be suitable with suitable setbacks
Lot 11	0.90	Convex 6% North East	CAT 3 Loam	Low	Surface water 50m	Septic may be suitable with suitable setbacks
Lot 12	0.70	Convex 6% North West	CAT 3 Loam	Low	Surface water 75m	Septic may be suitable with suitable setbacks

Table 3 - Site specific factors affecting Wastewater Disposal

6 Agricultural Land Capability Assessment

Agricultural Land Capability assessment has been developed in Tasmania by the Department of Primary Industries Water and Environment according to the guidelines described in Noble (1992) and Grose (1999). The system uses a rating system of 7 classes to classify land according to the ability of the land to sustain a range of agricultural uses without land degradation. Agricultural land capability is generally based upon the permanent biophysical features of the land such as geology, soils, slope, climate, erosion hazard etc and does not include economic or social factors.

The agricultural land capability system in Tasmania utilizes a hierarchical framework of 7 classes which describe the degree of limitation from little to no limitations in class 1, to extreme limitations in class 7. Subclasses then describe the dominant limitation(s) within the class, i.e. erosion, wetness, soils, and climate.

Land classified as class 1-4 is generally suitable for cropping activities subject to the limitations of each class, class 5&6 land is generally suitable only for grazing with careful management, and class 7 land is unsuitable for agricultural use (Grose 1999). According to the State Policy on the Protection of Agricultural Land 2009 land classified as class 1, 2 and 3 is defined as prime agricultural land. The revised Protection of agricultural land policy also has provision for the protection of significant agricultural land from other land classes, and in particular land within declared irrigation districts. Therefore the task of the current land capability assessment was to confirm the published land capability mapping of the area, and further define the agricultural capability of the site in terms of irrigation availability and economic sustainability.

Agricultural Land Capability Classes

The land contained within the study area was the subject of a site specific land capability assessment according to the methodology of the land capability handbook of Grose (1999). Reference was also paid to the published 1:100 000 land capability series for the Derwent Sheet (Musk & De Rose 2000) which indicated class 4, 5 & 6 land (see figure 4).

In depth field survey was also undertaken to classify soil types on the property, geology, slope angle, topography and microclimate to evaluate any potential error associated with the original land capability mapping. In addition reference was made to published climate averages available (appendix 2) to evaluate possible agriculture production scenarios.

The land area surveyed is classified as substantially **Class 4, 5 & 6** for agricultural use. The entirety of land proposed for development of land strata titles falls in area classified as Class 6 land, and is buffered from the Class 4 land by >40m of native vegetation comprised of dry sclerophyll forest.

The results from the field survey show the agricultural capability of the land is generally low and is limited by shallow infertile well drained soils, low rainfall, and high soil erosion potential. The low inherent land quality combined with local climatic conditions imposes significant limitations to agricultural production. The areas of land best suited to agriculture, and classified as Class 4 land, are found on lower cleared slopes on the northern end of the property.

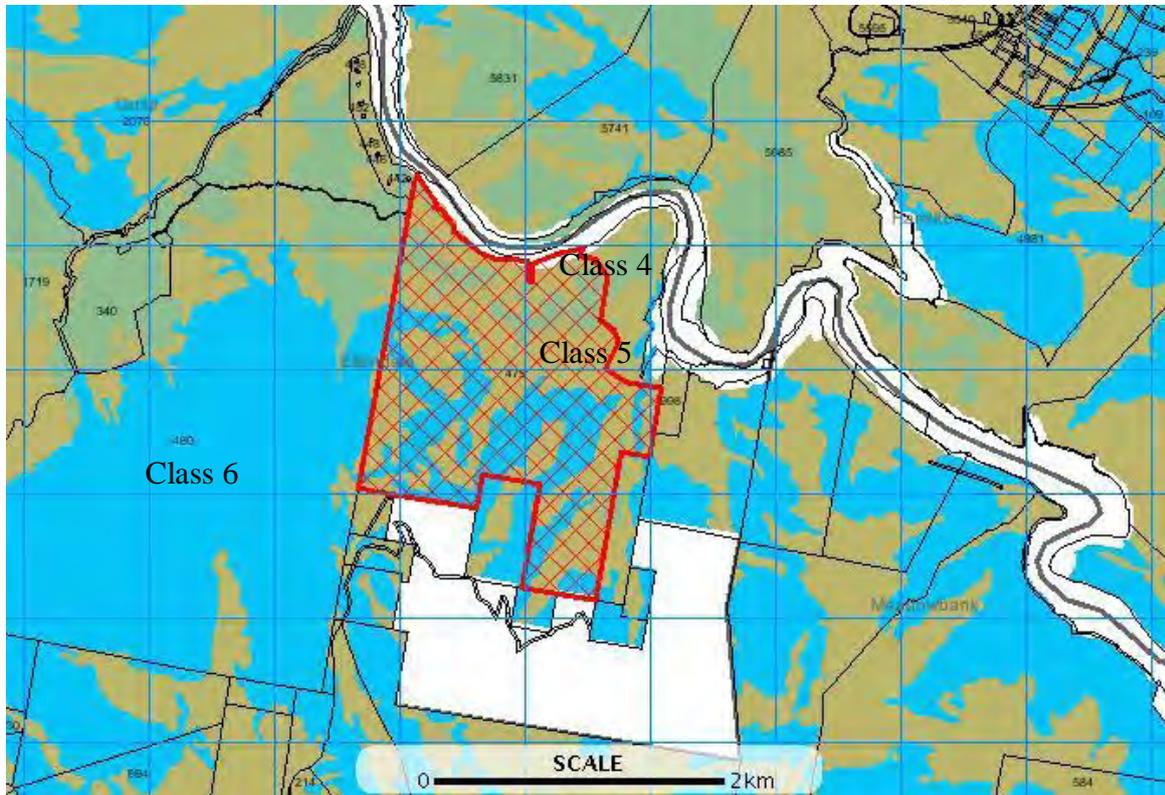


Figure 4: Existing 1:100 000 Land capability mapping showing areas of Class 5 and 6 land with small areas of Class 4 land on the lower slopes of the property (deemed inaccurate by field survey).

Revision of Land Capability Mapping

The 1:100 000 Land Capability map is produced by modeling a combination of factors to determine land capability. The resolution of that mapping is very low, and has in many cases not been corrected by field survey testing. From our own landscape and soil evaluation the majority of land capability mapping is incorrect, in particular the classification of much of the forested and lakeside land with a majority of rocky outcrops being classified as Class 5. From our field survey data we have produced a corrected map of land capability.

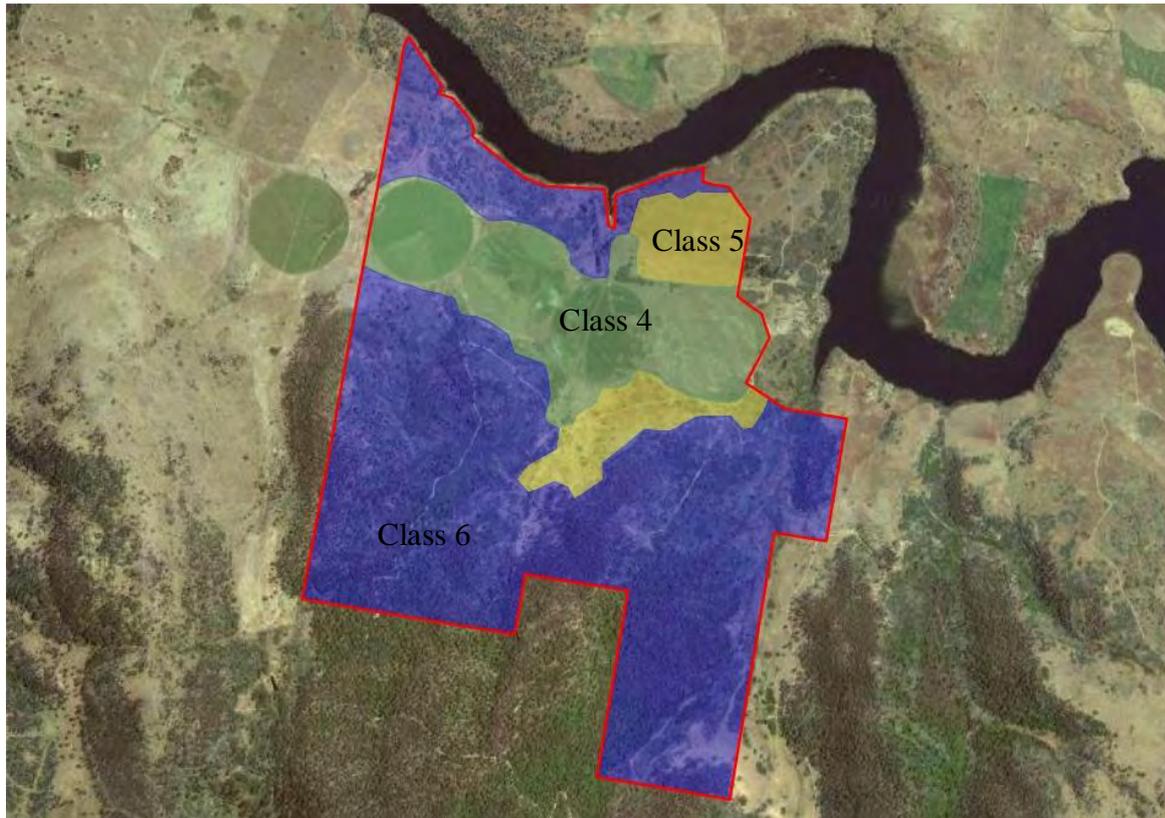


Figure 5: Revised land capability mapping from detailed site survey.

Class 4 is defined as “*Land primarily suitable for grazing but which may be used for occasional cropping. Severe limitations restrict the length of cropping phase and/or severely restrict the range of crops that could be grown. Major conservation treatments and/or careful management is required to minimize degradation*”

Generally it is recommended that cropping on class four soils be limited to one to two years out of ten in a rotation with pasture or green manures to avoid soil structural decline. Class 4 land on Tertiary and Quaternary Alluvium in South East Tasmania is commonly utilised for cropping where irrigation infrastructure is available (eg South East Irrigation area around Richmond) as climate and soil moisture can severely limit dry land cropping options. The primary limitations identified on the site were areas of shallow soil, low rainfall and potential for soil erosion. The class 4 land on the site is all in the northern slopes of the property with some irrigation infrastructure in place and some development potential.

The class 4 land surveyed would be suitable for grazing and occasional intermittent grain cropping.



Figure 6 – View looking to class 4 land in the distance (file photo).

Class 5 is defined as *“Land with slight to moderate limitations for pastoral use. This land is unsuitable for cropping, although some areas on easier slopes may be cultivated for pasture establishment or renewal. The effects of limitations on the grazing potential may be reduced by applying appropriate soil conservation measures and land management practices”.*

The areas of class 5 land surveyed would be suitable for low density grazing, provided adequate management of soil erosion risks and soil drainage. According to the report of Musk and DeRose (2000) small inclusions of class 4 and 6 land are common within class 5 land, with the class 4 land usually found on concave slopes and colluvial deposits while the class 6 land is more common along ridge crests and slopes over 28%. Field survey of the site agrees with this topographic interpretation of the class distribution.

Small areas of Class 5 land are present on the steeper slopes with shallow soils that are entirely unsuitable for any tillage or cropping. The main limitations to agriculture on the class 5 land being erosion risk from moderate slopes (Musk and DeRose give 18-28%), stone content and the climatic limitations of a range of possible agricultural enterprises.



Figure 7 – View looking across class 5 land.

Class 6 land is described as “*Land marginally suitable for grazing because of severe limitations. This land has low productivity, high risk of erosion, low natural fertility or other limitations that severely restrict agricultural use*”. The areas of class 6 land on Triassic sandstone is characterised by shallow soils with rock outcropping, and high erosion potential. The area of class 6 land includes the forested areas with some rocky outcrops and the very rocky land immediately adjacent the lake.

It is generally recommended that these areas be excluded from all stock, and that appropriate rehabilitation and revegetation plans are developed to prevent further land degradation.



Figure 8 – View of Class 6 land with very shallow infertile soils with sparse native vegetation, some forested areas and some protruding rocky outcrops.

Agricultural Land Capability Summary

The property exhibits good examples of class 4, 5 and 6 land capability types, however the results of the field survey carried out by GES suggested significant error in the 1:100 000 land capability mapping available for the area. From the survey information collected, it was clear that the majority of the land to the SE and SW of the title was Class 6 land, extending north to some Class 5 and Class 4 land on the lower cleared northern slopes of the property, with the remainder of land bordering the lake edge also classified Class 6.

From this information a revision of the land capability for the area was developed which more accurately represents the agricultural suitability of the landscape with reference to the soil characteristics and local climate.

The class 4 land would be well suited to moderate density grazing on perennial pastures if there is adequate water availability and the currently irrigation infrastructure is maintained. There is scope for intermittent cropping providing there is appropriate awareness of the shallow and poorly structured nature of the top soil which is extremely susceptible to erosion by heavy rainfall.

It is not advised that the Class 5 land be used for any cropping, and the density of grazing should be kept low, especially on higher or steeper ground, to ensure the native vegetation is not lost and soil erosion accelerated.

Ideally the Class 6 land should be fenced from stock to allow appropriate regeneration of the undergrowth and maintenance of the very shallow soils.

Given the revisions made to the land capability mapping it is highly unlikely that the residential development of the site would fetter any significant agricultural development. Given that the property is not within a declared irrigation district, and does not have a history of highly intensive agricultural production, the land is not deemed to have local or regional significance to the protection of agricultural land.

It is therefore my professional opinion that further development of the site for shack strata title use would not be in conflict with the state policy of the protection of prime agricultural land. I do however recommend that the development consider the fencing and removal of stock from Class 6 land to aid in regeneration and to prohibit any future soil erosion.

7 Conclusions

In conclusion, I feel that the land area examined is capable of supporting residential development provided that the identified landscape constraints are addressed with appropriate site specific management strategies.

- The property and the land immediately surrounding the property is predominantly classified as class 4, 5 and 6 land for agricultural use.
- The region of proposed holiday strata title development is buffered from any Class 4 land by >50m of forested land.
- None of the land examined is prime agricultural land as defined under the State Protection of Agricultural land Policy 2009
- The land is not within a declared irrigation district and does not have listed agricultural significance
- The risk of land instability on lots to be created is low, and the risk acceptable.
- The risk of inundation or flooding from uncontrolled stormwater flows is also perceived to be low and formal flood mitigation structures are not envisaged as part of engineering design
- The risk of foundation instability is low and standard footing designs in accordance with AS2870-2011 Class S-M would be applicable
- The sites examined would be suitable for on site wastewater disposal with either septic tank systems or packaged secondary treatment systems subject to site specific design
- This assessment is a scoping document only, therefore I recommend that specific geotechnical assessment be undertaken prior to infrastructure and pavement design for the approved development
- Thorough Soil and Water Management Plans (SWMP) should also be prepared and implemented prior to any earthworks and construction activities

It is my professional opinion that the land surveyed is suitable to support residential development without sustaining environmental harm or causing undue risk to capital.



Dr John Paul Cumming B.Agr.Sc (Hons) PhD CPSS GAICD
Environmental and Engineering Soil Scientist

8 References

Grose. C.K. (1999). Land Capability Survey Handbook – Second Edition
Department of Primary Industries, Water and Environment, Tasmania

Isbell. R.F. (1996). The Australian Soil Classification. CSIRO Publishing.

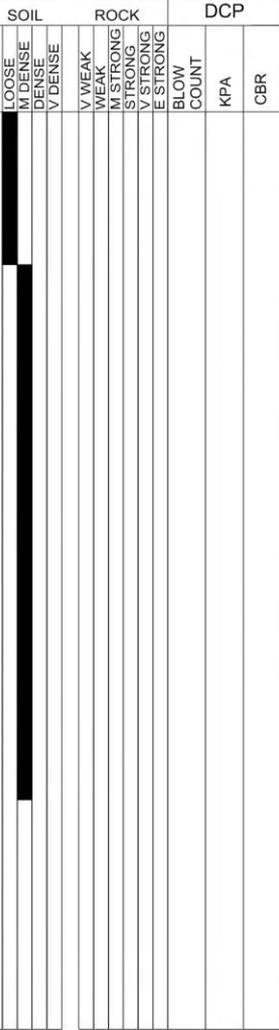
Musk R and De Rose R (2000). Land Capability survey of the Derwent.
Department of Primary Industries, Water and Environment, Tasmania

Noble K E (1992). Land Capability Survey Handbook. Department of Primary
Industries, Water and Environment, Tasmania

The Department of Natural Resources and Water (2006). Planning Guidelines:
Separating Agricultural and Residential Land Uses – Buffer Areas, Minimising
conflict between agricultural and residential areas. Queensland Government.

Appendix 1 – Soil Bore Logs.

 GEO-ENVIRONMENTAL SOLUTIONS		PROJECT: MEADOWBANK LAKE		Log No. SB01																																	
		CLIENT: JMG CONSULTANTS		SURFACE ELEVATION (m AHD):																																	
DRILLING CONTRACTOR: GEO-ENVIRONMENTAL SOLUTIONS		LOCATION: CABIN AREA 1		EASTING (GDA94):																																	
DRILLING EQUIPMENT: 70mm HAND AUGER		DRILLING METHOD: HAND		NORTHING (GDA94):																																	
HAMMER WEIGHT:		DROP:		TOTAL DEPTH (m): DEPTH TO WATER (m):																																	
				DATE/TIME STARTED:																																	
				DATE/TIME FINISHED:																																	
DEPTH (m)	SOIL										ROCK										DCP			DESCRIPTION										SAMPLES			DEPTH (m)
	V LOOSE	M LOOSE	M DENSE	V DENSE	V WEAK	WEAK	M STRONG	STRONG	V STRONG	E STRONG	BLOW COUNT	KPA	CBR	HORIZON	MUNSELL COLOUR	MOISTURE											USCS	SAMPLE ID	ATTB	DISP							
0.0														A1	10YR 5/1	M	Grey (10YR 5/1) SAND (SP), loam fabric, weak polyhedral structure, common fine roots, moist loose consistency, irregular boundary to													0.0							
0.2																															0.2						
0.4														A2	10YR 6/1	M	Light Grey (10YR 6/1) SAND (SP), loam fabric, weak polyhedral structure, few fine roots, moist firm consistency, irregular boundary to													0.4							
0.6														B2	10YR 4/5	M	Brown (10YR 4/5) CLAYEY SAND (SC), medium sand with approx 10-15% clay, angular blocky structure, few fine roots, moist firm consistency, gradual boundary to auger refusal on slightly weathered sandstone bedrock.													0.6							
0.8																															0.8						
1.0																															1.0						
1.2																															1.2						
GEO ENVIRONMENTAL SOLUTIONS - 86 QUEEN ST, SANDY BAY - T: 03 6223 1839																						Page 1 of 1															

 GEO-ENVIRONMENTAL SOLUTIONS		PROJECT: MEADOWBANK LAKE Log No. SB02																							
		CLIENT: JMG CONSULTANTS	SURFACE ELEVATION (m AHD):																						
		LOCATION: CABIN AREA 2	EASTING (GDA94):																						
DRILLING CONTRACTOR: GEO-ENVIRONMENTAL SOLUTIONS		NORTHING (GDA94):																							
DRILLING EQUIPMENT: 70mm HAND AUGER		TOTAL DEPTH (m):	DEPTH TO WATER (m):																						
DRILLING METHOD: HAND		DATE/TIME STARTED:																							
HAMMER WEIGHT: DROP:		DATE/TIME FINISHED:																							
DEPTH (m)	SOIL											ROCK			DCP			DESCRIPTION			SAMPLES			DEPTH (m)	
	V LOOSE	V LOOSE	M DENSE	V DENSE	V WEAK	WEAK	M STRONG	STRONG	V STRONG	E STRONG	BLOW COUNT	KPA	CBR	HORIZON	MUNSELL COLOUR	MOISTURE	USCS	SAMPLE ID	ATTB	DISP					
0.0															A1	10YR 5/1	M	Grey (10YR 5/1) SAND (SP), loam fabric, weak polyhedral structure, common fine roots, moist loose consistency, irregular boundary to							0.0
0.2															A2	10YR 6/1	M	Light Grey (10YR 6/1) SAND (SP), loam fabric, weak polyhedral structure, few fine roots, moist firm consistency, irregular boundary to							0.2
0.4															BC	10YR 4/5	M	Yellowish Brown (10YR 4/5) CLAYEY SAND (SC), medium sand with approx 10-15% clay, angular blocky structure, few fine roots, moist firm consistency, trace of sandstone fragments grading to auger refusal on slightly weathered sandstone bedrock.							0.4
0.6																					0.6				
0.8																								0.8	
1.0																								1.0	
1.2																								1.2	
GEO ENVIRONMENTAL SOLUTIONS - 86 QUEEN ST, SANDY BAY - T: 03 6223 1839																		Page 1 of 1							

 GEO-ENVIRONMENTAL SOLUTIONS		PROJECT: MEADOWBANK LAKE Log No. SB03																							
		CLIENT: JMG CONSULTANTS	SURFACE ELEVATION (m AHD):																						
		LOCATION: CABIN AREA 3	EASTING (GDA94):																						
DRILLING CONTRACTOR: GEO-ENVIRONMENTAL SOLUTIONS		NORTHING (GDA94):																							
DRILLING EQUIPMENT: 70mm HAND AUGER		TOTAL DEPTH (m):	DEPTH TO WATER (m):																						
DRILLING METHOD: HAND		DATE/TIME STARTED:																							
HAMMER WEIGHT: DROP:		DATE/TIME FINISHED:																							
DEPTH (m)	SOIL											ROCK			DCP			DESCRIPTION				SAMPLES			DEPTH (m)
	V LOOSE	V LOOSE	M DENSE	V DENSE	V WEAK	W WEAK	M STRONG	V STRONG	E STRONG	BLOW COUNT	KPA	CBR	HORIZON	MUNSELL COLOUR	MOISTURE				USCS	SAMPLE ID	ATTB	DISP			
0.0												A1	10YR 5/1	M	Grey (10YR 5/1) SAND (SP), loam fabric, weak polyhedral structure, common fine roots, moist loose consistency, irregular boundary to							0.0			
0.2												A2	10YR 6/1	M	Light Grey (10YR 6/1) SAND (SP), loam fabric, weak polyhedral structure, few fine roots, moist firm consistency, irregular boundary to							0.2			
0.4												BC	10YR 4/5	M	Yellowish Brown (10YR 4/5) CLAYEY SAND (SC), medium sand with approx 5% clay, weak angular blocky structure, few fine roots, moist firm consistency, trace of sandstone fragments grading to auger refusal on slightly weathered sandstone bedrock.							0.4			
0.6																							0.6		
0.8																							0.8		
1.0																							1.0		
1.2																							1.2		
GEO ENVIRONMENTAL SOLUTIONS - 86 QUEEN ST, SANDY BAY - T: 03 6223 1839																			Page 1 of 1						

 GEO-ENVIRONMENTAL SOLUTIONS		PROJECT: MEADOWBANK LAKE Log No. SB04										
		CLIENT: JMG CONSULTANTS	SURFACE ELEVATION (m AHD):									
DRILLING CONTRACTOR: GEO-ENVIRONMENTAL SOLUTIONS		EASTING (GDA94):										
DRILLING EQUIPMENT: 70mm HAND AUGER		TOTAL DEPTH (m):	DEPTH TO WATER (m):									
DRILLING METHOD: HAND		DATE/TIME STARTED:										
HAMMER WEIGHT: DROP:		DATE/TIME FINISHED:										
DEPTH (m)	SOIL ROCK DCP DESCRIPTION SAMPLES											DEPTH (m)
	V LOOSE LOOSE M DENSE DENSE V DENSE V WEAK WEAK M STRONG STRONG V STRONG E STRONG BLOW COUNT KPA CBR	HORIZON	MUNSELL COLOUR	MOISTURE	USCS	SAMPLE ID	ATTB	DISP				
0.0		A1	10YR 5/1	M	Grey (10YR 5/1) SAND (SP), loam fabric, weak polyhedral structure, common fine roots, moist loose consistency, irregular boundary to				0.0			
0.2		A2	10YR 6/1	M	Light Brownish Grey (10YR 6/2) SAND (SP), loam fabric, weak polyhedral structure, few fine roots, moist firm consistency, irregular boundary to				0.2			
0.4									0.4			
0.6		BC	10YR 4/5	M	Brown (10YR 4/5) CLAYEY SAND (SC), medium sand with approx 5% clay, angular blocky structure, few fine roots, moist firm consistency, gradual boundary to auger refusal on slightly weathered sandstone bedrock.				0.6			
0.8									0.8			
1.0									1.0			
1.2									1.2			
GEO ENVIRONMENTAL SOLUTIONS - 86 QUEEN ST, SANDY BAY - T: 03 6223 1839								Page 1 of 1				

 GEO-ENVIRONMENTAL SOLUTIONS		PROJECT: MEADOWBANK LAKE Log No. SB05										
		CLIENT: JMG CONSULTANTS	SURFACE ELEVATION (m AHD):									
		LOCATION: CABIN AREA 5	EASTING (GDA94):									
DRILLING CONTRACTOR: GEO-ENVIRONMENTAL SOLUTIONS		NORTHING (GDA94):										
DRILLING EQUIPMENT: 70mm HAND AUGER		TOTAL DEPTH (m):	DEPTH TO WATER (m):									
DRILLING METHOD: HAND		DATE/TIME STARTED:										
HAMMER WEIGHT: DROP:		DATE/TIME FINISHED:										
DEPTH (m)	SOIL ROCK DCP DESCRIPTION SAMPLES											DEPTH (m)
	V LOOSE LOOSE M DENSE DENSE V DENSE V WEAK WEAK M STRONG STRONG V STRONG E STRONG BLOW COUNT KPA CBR	HORIZON	MUNSELL COLOUR	MOISTURE	USCS	SAMPLE ID	ATTB	DISP				
0.0		A1	10YR 5/1	M	Grey (10YR 5/1) SAND (SP), loam fabric, weak polyhedral structure, common fine roots, moist loose consistency, irregular boundary to				0.0			
0.2		A2	10YR 6/1	M	Light Grey (10YR 6/1) SAND (SP), loam fabric, weak polyhedral structure, few fine roots, moist firm consistency, irregular boundary to				0.2			
0.4		B1	10YR 6/3	M	Light Brown (7.5 YR 6/3) CLAYEY SAND (SC), medium sand with approx 5-10% clay, weak angular blocky structure, few fine roots, moist firm consistency, clay content increasing to				0.4			
0.6		BC	10YR 4/5	M	Yellowish Brown (10YR 4/5) CLAYEY SAND (SC), medium sand with approx 5-10% clay, weak angular blocky structure, moist firm consistency, common sandstone fragments grading to auger refusal on slightly weathered sandstone bedrock.				0.6			
0.8									0.8			
1.0									1.0			
1.2									1.2			
GEO ENVIRONMENTAL SOLUTIONS - 86 QUEEN ST, SANDY BAY - T: 03 6223 1839								Page 1 of 1				

 GEO-ENVIRONMENTAL SOLUTIONS		PROJECT: MEADOWBANK LAKE Log No. SB06										
		CLIENT: JMG CONSULTANTS	SURFACE ELEVATION (m AHD):									
		LOCATION: CABIN AREA 6	EASTING (GDA94):									
DRILLING CONTRACTOR: GEO-ENVIRONMENTAL SOLUTIONS		NORTHING (GDA94):										
DRILLING EQUIPMENT: 70mm HAND AUGER		TOTAL DEPTH (m):	DEPTH TO WATER (m):									
DRILLING METHOD: HAND		DATE/TIME STARTED:										
HAMMER WEIGHT: DROP:		DATE/TIME FINISHED:										
DEPTH (m)	SOIL ROCK DCP DESCRIPTION SAMPLES											DEPTH (m)
	V LOOSE LOOSE M DENSE DENSE V DENSE V WEAK WEAK M STRONG STRONG V STRONG E STRONG BLOW COUNT KPA CBR	HORIZON	MUNSELL COLOUR	MOISTURE	USCS	SAMPLE ID	ATTB	DISP				
0.0		A1	10YR 5/1	M	Grey (10YR 5/1) SAND (SP), loam fabric, weak polyhedral structure, common fine roots, moist loose consistency, irregular boundary to			0.0				
0.2		A2	10YR 6/1	M	Light Grey (10YR 6/1) SAND (SP), loam fabric, weak polyhedral structure, few fine roots, moist firm consistency, irregular boundary to			0.2				
0.4		B2	10YR 6/8 10YR 5/1	M	Mixed Brownish Yellow (10 YR 6/8) & Grey (10 YR 5/1) Sandy CLAY (CL), approx 70% medium to coarse sand, low plasticity, moderately developed angular blocky structure, trace red/light yellow mottles, moist firm but friable consistency, sand content increasing to			0.4				
0.6								0.6				
0.8		BC	10YR 4/5	M	Yellowish Brown (10YR 4/5) CLAYEY SAND (SC), medium sand with approx 5-10% clay, weak angular blocky structure, moist firm consistency, common sandstone fragments grading to auger refusal on slightly weathered sandstone bedrock.			0.8				
1.0								1.0				
1.2								1.2				
GEO ENVIRONMENTAL SOLUTIONS - 86 QUEEN ST, SANDY BAY - T: 03 6223 1839								Page 1 of 1				

 GEO-ENVIRONMENTAL SOLUTIONS		PROJECT: MEADOWBANK LAKE Log No. SB07										
		CLIENT: JMG CONSULTANTS	SURFACE ELEVATION (m AHD):									
DRILLING CONTRACTOR: GEO-ENVIRONMENTAL SOLUTIONS		EASTING (GDA94):										
DRILLING EQUIPMENT: 70mm HAND AUGER		TOTAL DEPTH (m):	DEPTH TO WATER (m):									
DRILLING METHOD: HAND		DATE/TIME STARTED:										
HAMMER WEIGHT: DROP:		DATE/TIME FINISHED:										
DEPTH (m)	SOIL ROCK DCP DESCRIPTION SAMPLES											DEPTH (m)
	V LOOSE LOOSE M DENSE DENSE V DENSE V WEAK WEAK M STRONG STRONG V STRONG E STRONG BLOW COUNT KPA CBR	HORIZON	MUNSELL COLOUR	MOISTURE	USCS	SAMPLE ID	ATTB	DISP				
0.0		A1	10YR 5/1	M	Grey (10YR 5/1) SAND (SP), loam fabric, weak polyhedral structure, common fine roots, moist loose consistency, irregular boundary to			0.0				
0.2		A2	10YR 6/1	M	Light Grey (10YR 6/1) SAND (SP), weak polyhedral structure, few fine roots, common 5-20mm rounded pebbles/stones, moist firm consistency, irregular boundary to			0.2				
0.4		B1	10YR 6/3	M	Brownish Grey (10 YR 6/3) SAND (SP), weak polyhedral structure, trace of clay, moist firm consistency, irregular boundary to			0.4				
0.6		BC	10YR 6/8 10YR 5/1	M	Mixed Brownish Yellow (10YR 6/8) & Grey (10 YR 5/1) CLAYEY SAND (SC), medium to coarse sand with approx 5-10% clay, weak angular blocky structure, moist firm consistency, trace of sandstone fragments grading to auger refusal on slightly weathered sandstone bedrock.			0.6				
0.8								0.8				
1.0								1.0				
1.2								1.2				
GEO ENVIRONMENTAL SOLUTIONS - 86 QUEEN ST, SANDY BAY - T: 03 6223 1839								Page 1 of 1				

 GEO-ENVIRONMENTAL SOLUTIONS		PROJECT: MEADOWBANK LAKE Log No. SB08										
		CLIENT: JMG CONSULTANTS	SURFACE ELEVATION (m AHD):									
		LOCATION: CABIN AREA 8	EASTING (GDA94):									
DRILLING CONTRACTOR: GEO-ENVIRONMENTAL SOLUTIONS		NORTHING (GDA94):										
DRILLING EQUIPMENT: 70mm HAND AUGER		TOTAL DEPTH (m):	DEPTH TO WATER (m):									
DRILLING METHOD: HAND		DATE/TIME STARTED:										
HAMMER WEIGHT: DROP:		DATE/TIME FINISHED:										
DEPTH (m)	SOIL ROCK DCP DESCRIPTION SAMPLES											DEPTH (m)
	V LOOSE LOOSE M DENSE DENSE V DENSE V WEAK WEAK M STRONG STRONG V STRONG E STRONG BLOW COUNT KPA CBR	HORIZON	MUNSELL COLOUR	MOISTURE	USCS	SAMPLE ID	ATTB	DISP				
0.0		A1	10YR 5/1	M	Grey (10YR 5/1) SAND (SP), loam fabric, weak polyhedral structure, common fine roots, moist loose consistency, irregular boundary to				0.0			
0.2		A2	10YR 6/1	M	Light Grey (10YR 6/1) SAND (SP), weak polyhedral structure, few fine roots, common 5-20mm rounded pebbles/stones, moist firm consistency, irregular boundary to				0.2			
0.4		B1	10YR 6/3	M	Brownish Grey (10 YR 6/3) SAND (SP), weak polyhedral structure, trace of clay, moist firm consistency, irregular boundary to				0.4			
0.6		BC	10YR 6/8 10YR 5/1	M	Mixed Brownish Yellow (10YR 6/8) & Grey (10 YR 5/1) CLAYEY SAND (SC), medium to coarse sand with approx 10-20% clay, weak angular blocky structure, moist firm consistency, trace of sandstone fragments and red/yellow mottles grading to auger refusal on slightly weathered sandstone bedrock.				0.6			
0.8									0.8			
1.0									1.0			
1.2									1.2			
GEO ENVIRONMENTAL SOLUTIONS - 86 QUEEN ST, SANDY BAY - T: 03 6223 1839								Page 1 of 1				

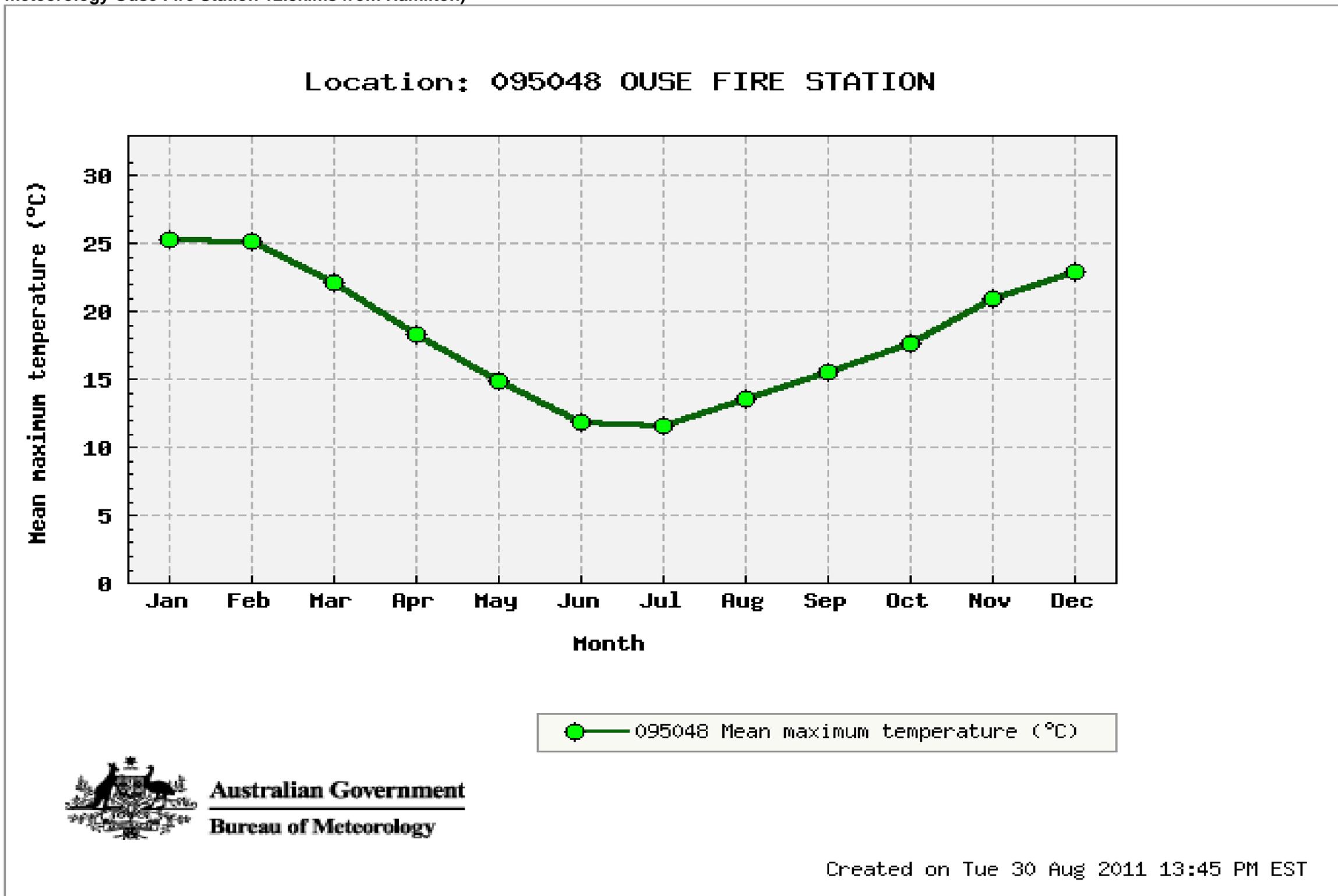
 GEO-ENVIRONMENTAL SOLUTIONS		PROJECT: MEADOWBANK LAKE Log No. SB09										
		CLIENT: JMG CONSULTANTS	SURFACE ELEVATION (m AHD):									
		LOCATION: CABIN AREA 9	EASTING (GDA94):									
DRILLING CONTRACTOR: GEO-ENVIRONMENTAL SOLUTIONS		NORTHING (GDA94):										
DRILLING EQUIPMENT: 70mm HAND AUGER		TOTAL DEPTH (m):	DEPTH TO WATER (m):									
DRILLING METHOD: HAND		DATE/TIME STARTED:										
HAMMER WEIGHT: DROP:		DATE/TIME FINISHED:										
DEPTH (m)	SOIL ROCK DCP DESCRIPTION SAMPLES											DEPTH (m)
	V LOOSE LOOSE M DENSE DENSE V DENSE V WEAK WEAK M STRONG STRONG V STRONG E STRONG BLOW COUNT KPA CBR	HORIZON	MUNSELL COLOUR	MOISTURE	USCS	SAMPLE ID	ATTB	DISP				
0.0		A1	10YR 5/1	M	Grey (10YR 5/1) SAND (SP), loam fabric, weak polyhedral structure, common fine roots, moist loose consistency, common surface stones, irregular boundary to				0.0			
0.2		A2	10YR 6/1	M	Light Grey (10YR 6/1) SAND (SP), weak polyhedral structure, few fine roots, trace of sandstone rock/stones, moist firm consistency, irregular boundary to				0.2			
0.4		B1	10YR 6/3	M	Brown (10 YR 4/5) SAND (SP), weak polyhedral structure, trace of clay, moist firm consistency, trace of sandstone rocks/stones, irregular boundary to				0.4			
0.6		BC	10YR 6/8 10YR 5/1	M	Mixed Brownish Yellow (10YR 6/8) & Grey (10 YR 5/1) CLAYEY SAND (SC), medium to coarse sand with approx 5-10% clay, weak angular blocky structure, moist firm consistency, trace of sandstone fragments grading to auger refusal on slightly weathered sandstone bedrock.				0.6			
0.8	0.8											
1.0									1.0			
1.2									1.2			
GEO ENVIRONMENTAL SOLUTIONS - 86 QUEEN ST, SANDY BAY - T: 03 6223 1839								Page 1 of 1				

 GEO-ENVIRONMENTAL SOLUTIONS		PROJECT: MEADOWBANK LAKE Log No. SB10										
		CLIENT: JMG CONSULTANTS	SURFACE ELEVATION (m AHD):									
		LOCATION: CABIN AREA 10	EASTING (GDA94):									
DRILLING CONTRACTOR: GEO-ENVIRONMENTAL SOLUTIONS		NORTHING (GDA94):										
DRILLING EQUIPMENT: 70mm HAND AUGER		TOTAL DEPTH (m):	DEPTH TO WATER (m):									
DRILLING METHOD: HAND		DATE/TIME STARTED:										
HAMMER WEIGHT: DROP:		DATE/TIME FINISHED:										
DEPTH (m)	SOIL ROCK DCP DESCRIPTION SAMPLES											DEPTH (m)
	V LOOSE LOOSE M DENSE DENSE V DENSE V WEAK WEAK M STRONG STRONG V STRONG E STRONG BLOW COUNT KPA CBR	HORIZON	MUNSELL COLOUR	MOISTURE	USCS	SAMPLE ID	ATTB	DISP				
0.0		A1	10YR 5/1	M	Grey (10YR 5/1) SAND (SP), loam fabric, weak polyhedral structure, common fine roots, moist loose consistency, common surface stones/rocks, irregular boundary to				0.0			
0.2		A2	10YR 6/1	M	Light Grey (10YR 6/1) SAND (SP), weak polyhedral structure, few fine roots, common rocks/stones, moist firm consistency, irregular boundary to				0.2			
0.4		B1	10YR 6/3	M	Brown (10 YR 4/5) SAND (SP), weak polyhedral structure, trace of clay, moist firm consistency, trace of rocks/stones, irregular boundary to				0.4			
0.6		BC	10YR 6/8 10YR 5/1	M	Mixed Brownish Yellow (10YR 6/8) & Grey (10 YR 5/1) CLAYEY SAND (SC), medium to coarse sand with approx 10-20% clay, weak angular blocky structure, moist firm consistency, trace of sandstone rocks/fragments and red/yellow mottles grading to auger refusal on slightly weathered sandstone bedrock.				0.6			
0.8	0.8											
1.0									1.0			
1.2									1.2			
GEO ENVIRONMENTAL SOLUTIONS - 86 QUEEN ST, SANDY BAY - T: 03 6223 1839								Page 1 of 1				

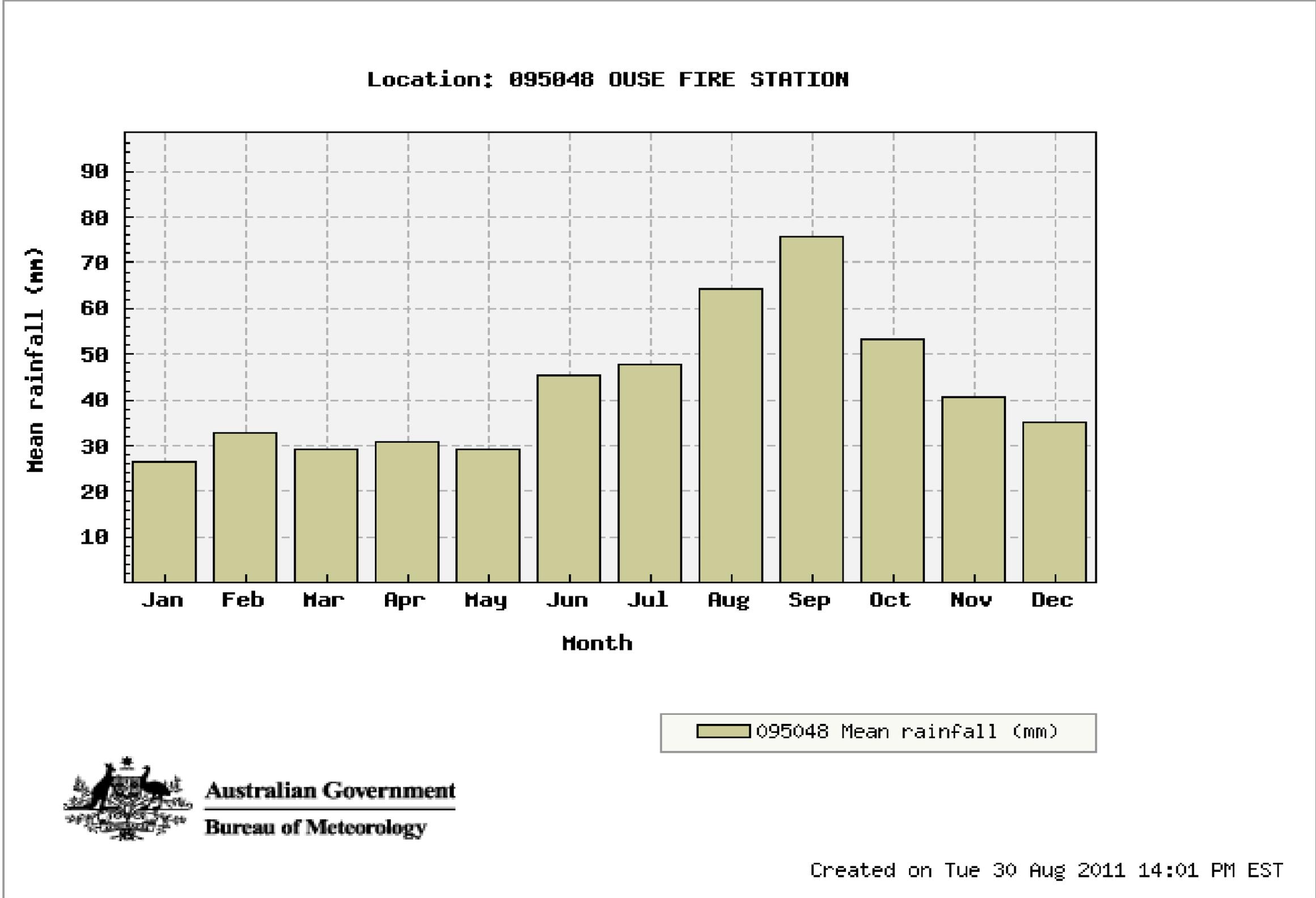
 GEO-ENVIRONMENTAL SOLUTIONS		PROJECT: MEADOWBANK LAKE Log No. SB11										
		CLIENT: JMG CONSULTANTS	SURFACE ELEVATION (m AHD):									
DRILLING CONTRACTOR: GEO-ENVIRONMENTAL SOLUTIONS		EASTING (GDA94):										
DRILLING EQUIPMENT: 70mm HAND AUGER		TOTAL DEPTH (m):	DEPTH TO WATER (m):									
DRILLING METHOD: HAND		DATE/TIME STARTED:										
HAMMER WEIGHT: DROP:		DATE/TIME FINISHED:										
DEPTH (m)	SOIL ROCK DCP DESCRIPTION SAMPLES											DEPTH (m)
	V LOOSE LOOSE M DENSE DENSE V DENSE V WEAK WEAK M STRONG STRONG V STRONG E STRONG BLOW COUNT KPA CBR	HORIZON	MUNSELL COLOUR	MOISTURE	USCS	SAMPLE ID	ATTB	DISP				
0.0		A1	10YR 5/1	M	Grey (10YR 5/1) SAND (SP), loam fabric, weak polyhedral structure, common fine roots, moist loose consistency, common surface stones/rocks, irregular boundary to				0.0			
0.2		A2	10YR 6/1	M	Light Grey (10YR 6/1) SAND (SP), weak polyhedral structure, few fine roots, common rocks/stones, moist firm consistency, irregular boundary to				0.2			
0.4					Brown (10 YR 4/5) SAND (SP), weak polyhedral structure, trace of clay, moist firm consistency, trace of rocks/stones, irregular boundary to auger refusal on slightly weathered sandstone bedrock.				0.4			
0.6		B1	10YR 6/3	M					0.6			
0.8									0.8			
1.0									1.0			
1.2									1.2			
GEO ENVIRONMENTAL SOLUTIONS - 86 QUEEN ST, SANDY BAY - T: 03 6223 1839								Page 1 of 1				

 GEO-ENVIRONMENTAL SOLUTIONS		PROJECT: MEADOWBANK LAKE Log No. SB12																					
		CLIENT: JMG CONSULTANTS	SURFACE ELEVATION (m AHD):																				
DRILLING CONTRACTOR: GEO-ENVIRONMENTAL SOLUTIONS		EASTING (GDA94):																					
DRILLING EQUIPMENT: 70mm HAND AUGER		TOTAL DEPTH (m):	DEPTH TO WATER (m):																				
DRILLING METHOD: HAND		DATE/TIME STARTED:																					
HAMMER WEIGHT: DROP:		DATE/TIME FINISHED:																					
DEPTH (m)	SOIL										ROCK			DCP			DESCRIPTION			SAMPLES			DEPTH (m)
	V LOOSE	LOOSE	M DENSE	DENSE	V DENSE	V WEAK	WEAK	M STRONG	STRONG	V STRONG	E STRONG	BLOW COUNT	KPA	CBR	HORIZON	MUNSELL COLOUR	MOISTURE		USCS	SAMPLE ID	ATTB	DISP	
0.0															A1	10YR 5/1	M	Grey (10YR 5/1) SAND (SP), loam fabric, weak polyhedral structure, common fine roots, moist loose consistency, common surface stones/rocks, irregular boundary to				0.0	
0.2															A2	10YR 6/1	M	Light Grey (10YR 6/1) SAND (SP), weak polyhedral structure, few fine roots, common rocks/stones, moist firm consistency, irregular boundary to				0.2	
0.4															B1	10YR 6/3	M	Brown (10 YR 4/5) SAND (SP), weak polyhedral structure, trace of clay, moist firm consistency, trace of rocks/stones, irregular boundary to auger refusal on slightly weathered sandstone bedrock.				0.4	
0.6																						0.6	
0.8																						0.8	
1.0																						1.0	
1.2																						1.2	
GEO ENVIRONMENTAL SOLUTIONS - 86 QUEEN ST, SANDY BAY - T: 03 6223 1839																				Page 1 of 1			

Appendix 2 – Climate Data
(Bureau of meteorology Ouse Fire Station 12.8klms from Hamilton)



Mean maximum temperature Jan - December



Mean rainfall (mm) January - December f

Appendix 3 – Development Plan

