NOTICE OF PROPOSED DEVELOPMENT

Notice is hereby given that an application has been made for planning approval for the following development:

SITE: 6 Sunningdale Close, Midway Point

PROPOSED DEVELOPMENT:
DWELLING AND OUTBUILDING

The relevant plans and documents can be inspected at the Council Offices at 47 Cole Street, Sorell during normal office hours, or the plans may be viewed on Council's website at www.sorell.tas.gov.au until **Monday 28th July 2025.**

Any person may make representation in relation to the proposal by letter or electronic mail (sorell.council@sorell.tas.gov.au) addressed to the General Manager. Representations must be received no later than **Monday 28th July 2025.**

APPLICANT: **Joscon Tasmania Pty Ltd**

APPLICATION NO: **DA 2025 / 00166 1**
DATE: **10 July 2025**

Part B: Please note that Part B of this form is publicly exhibited.

Full description of Proposal:	*Use:* New Residential Dwelling and outbuilding *Development:* Single Dwelling and outbuilding *Large or complex proposals should be described in a letter or planning report.*
Design and construction cost of proposal:	$ 650000

Is all, or some the work already constructed:	No: ☑ Yes: ☐

Location of proposed works:	Street address: 6 Sunningdale Close Suburb: Midway Point Postcode: 7171 Certificate of Title(s) Volume: 184768 Folio: 80

Current Use of Site	Vacant

Current Owner/s:	Name(s) Bianca Burgess & Jack Johnstone

Is the Property on the Tasmanian Heritage Register?	No: ☑ Yes: ☐	*If yes, please provide written advice from Heritage Tasmania*
Is the proposal to be carried out in more than one stage?	No: ☑ Yes: ☐	*If yes, please clearly describe in plans*
Have any potentially contaminating uses been undertaken on the site?	No: ☐ Yes: ☐	*If yes, please complete the Additional Information for Non-Residential Use*
Is any vegetation proposed to be removed?	No: ☑ Yes: ☐	*If yes, please ensure plans clearly show area to be impacted*
Does the proposal involve land administered or owned by either the Crown or Council?	No: ☑ Yes: ☐	*If yes, please complete the Council or Crown land section on page 3*
If a new or upgraded vehicular crossing is required from Council to the front boundary please complete the Vehicular Crossing (and Associated Works) application form https://www.sorell.tas.gov.au/services/engineering/		

Declarations and acknowledgements
• I/we confirm that the application does not contradict any easement, covenant or restriction specified in the Certificate of Title, Schedule of Easements or Part 5 Agreement for the land. • I/we consent to Council employees or consultants entering the site and have arranged permission and/or access for Council's representatives to enter the land at any time during normal business hours. • I/we authorise the provision of a copy of any documents relating to this application to any person for the purposes of assessment or public consultation and have permission of the copyright owner for such copies. • I/we declare that, in accordance with s52(1) of the *Land Use Planning and Approvals Act 1993*, that I have notified the owner(s) of the intention to make this application. • I/we declare that the information in this application is true and correct. *Details of how the Council manages personal information and how you can request access or corrections to it is outlined in Council's Privacy Policy available on the Council website.*
• I/we acknowledge that the documentation submitted in support of my application will become a public record held by Council and may be reproduced by Council in both electronic and hard copy format in order to facilitate the assessment process, for display purposes during public exhibition, and to fulfil its statutory obligations. I further acknowledge that following determination of my application, Council will store documentation relating to my application in electronic format only.
• Where the General Manager's consent is also required under s.14 of the *Urban Drainage Act 2013*, by making this application I/we also apply for that consent.

Applicant Signature:	Signature: ..... Date: 24.6.2025

Crown or General Manager Land Owner Consent
If the land that is the subject of this application is owned or administered by either the Crown or Sorell Council, the consent of the relevant Minister or the Council General Manager whichever is applicable, must be included here. This consent should be completed and signed by either the General Manager, the Minister, or a delegate (as specified in s52 (1D-1G) of the *Land Use Planning and Approvals Act 1993*). Please note: • If General Manager consent if required, please first complete the General Manager consent application form available on our website www.sorell.tas.gov.au • If the application involves Crown land you will also need a letter of consent. • Any consent is for the purposes of making this application only and is not consent to undertaken work or take any other action with respect to the proposed use or development.
I _____ being responsible for the administration of land at _____ declare that I have given permission for the making of this application for _____ Sorell Council Development Application: 5.2025.166.1 - Development Application - 6 Sunningdale Close, Midway Point P1.pdf Plans Reference:P1 Date Received:25/06/2025

Signature of General Manager, Minister or Delegate:	Signature: ..... Date: .....

JOSCON TASMANIA

AP2025-2456 - PROPOSED BURGESS & JOHNSTONE (1998) RESIDENCE
6 Sunningdale Close,
MIDWAY POINT

SHEET		DRAWING TITLE
01	C	SITE PLAN
01a	C	DRAINAGE PLAN
01b	C	SOIL & WATER MANAGEMENT PLAN
01c		SHED PLANS
02	C	FLOOR PLAN
03	C	ELEVATIONS SHEET 1
03a	C	ELEVATIONS SHEET 2
03b	C	PERSPECTIVE VIEWS SHEET 1
03c	C	PERSPECTIVE VIEWS SHEET 2

Sorell Council

Development Application: 5.2025.166.1 - Development Application - 6 Sunningdale Close, Midway Point P1.pdf
Plans Reference:P1
Date Received:25/06/2025

No.	Amendment	Date	Drawn	Checked	Sheet
C	Change deck to timber, Show privacy screening to deck, Show cladding to subfloor in lieu of brick, Change W06 & W07 to AW, Move Bed 1 entry door down to line up with hallway wall, Remove hi-light window from Living	23 June 2025	CK	RJ	01 - 01b, 02 - 03c, Electrical Plan
	DA PLAN SET	28 May 2025	CK	ST	01 - 03
B	Prelim changes: Reposition W20, Remove TV void framing, Amend W10 & W11, Increase Bath space taking evenly from bedrooms, Amend 2100 high windows to 2000	26 May 2025	CK	N/A	01, 02 - 03c
A	Prelim changes: Roof modifications, wall cladding changes, window changes, Room size and layout changes, Add shed outline to site, Deck changes, Update relevant sheets	22 May 2025	CK	N/A	01, 02 - 03c
	PRELIMINARY DA PLAN SET	30 Apr. 2025	CK	N/A	01 - 03

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Designer:

ANOTHER PERSPECTIVE PTY LTD
PO BOX 171
NORTH HOBART
LIC. NO. 685230609 (S. Turvey)
Ph: (03) 6231 4122
Fx: (03) 6231 4166
Email:
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Client / Project info

PROPOSED BURGESS & JOHNSTONE (1998) RESIDENCE

6 Sunningdale Close,
MIDWAY POINT

Soil Classification:	S
Title Reference:	CT184768/80
Floor Areas:	249.71m²
Porch / Deck Areas:	20.97m²
Wind Speed:	N3
Climate Zone:	7
Alpine Zone:	N/A
Corrosion Environment:	MEDIUM
Certified BAL:	LOW
Designed BAL:	LOW
(Refer to Standard Notes for Explanation)	

COVER SHEET

AP2025-2456

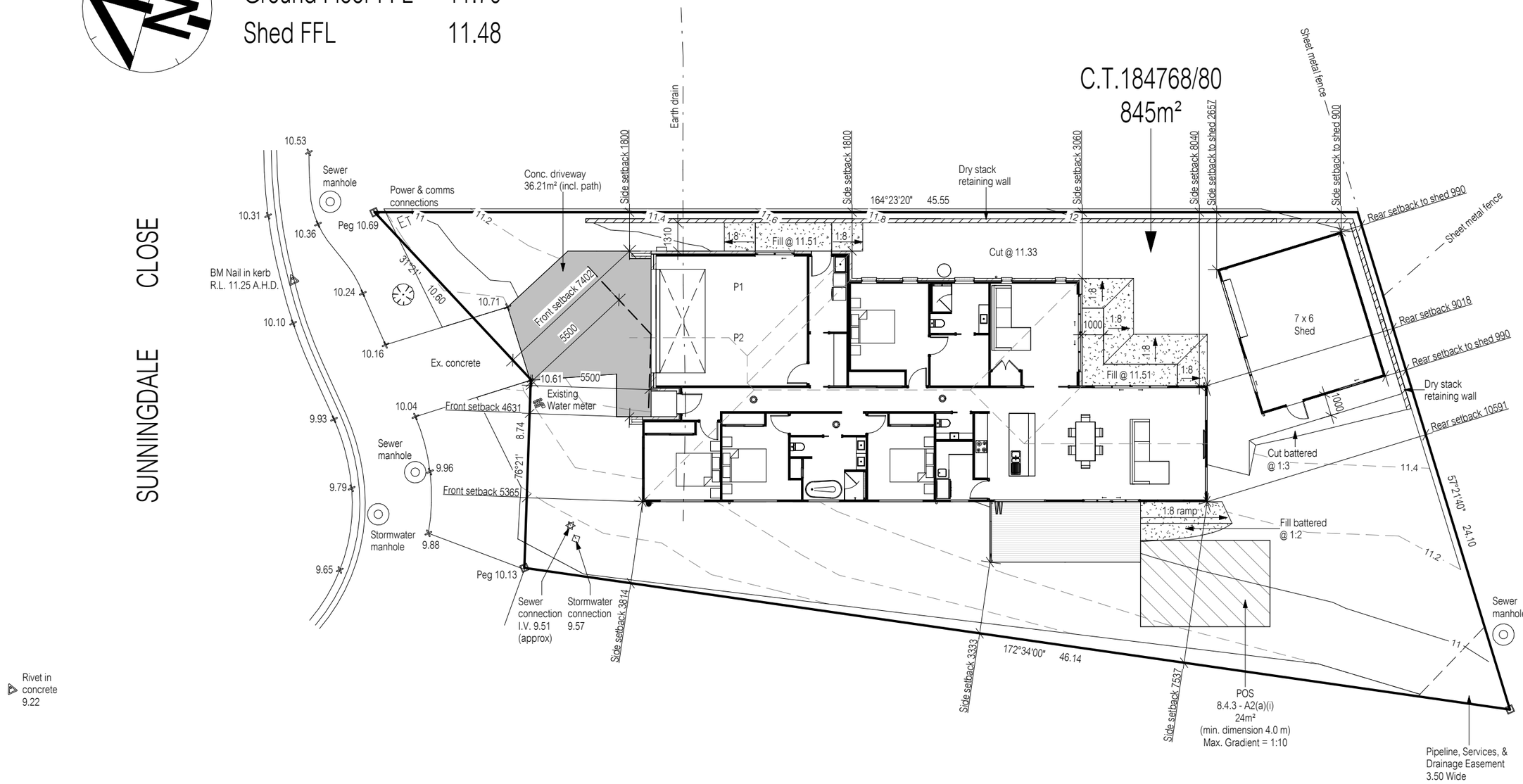
Date 28 May 2025

Scale

Sheet 00/03

Ground Floor FFL 11.70
Shed FFL 11.48

SUNNINGDALE CLOSE



EXPLANATORY NOTES: TASMANIAN PLANNING SCHEME - SORELL		
8.4.3 - Site coverage and private open space for all dwellings		
A1	(a)	Site Coverage: Max. 50% of site = 422.50m² Proposed site coverage (excl. eaves up to 0.6m): 259.03m² (30.65%)

Sorell Council
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No.	Date	Int.	Amendment changes as per cover sheet
C	23 June 2025	CK	
B	26 May 2025	CK	
A	22 May 2025	CK	

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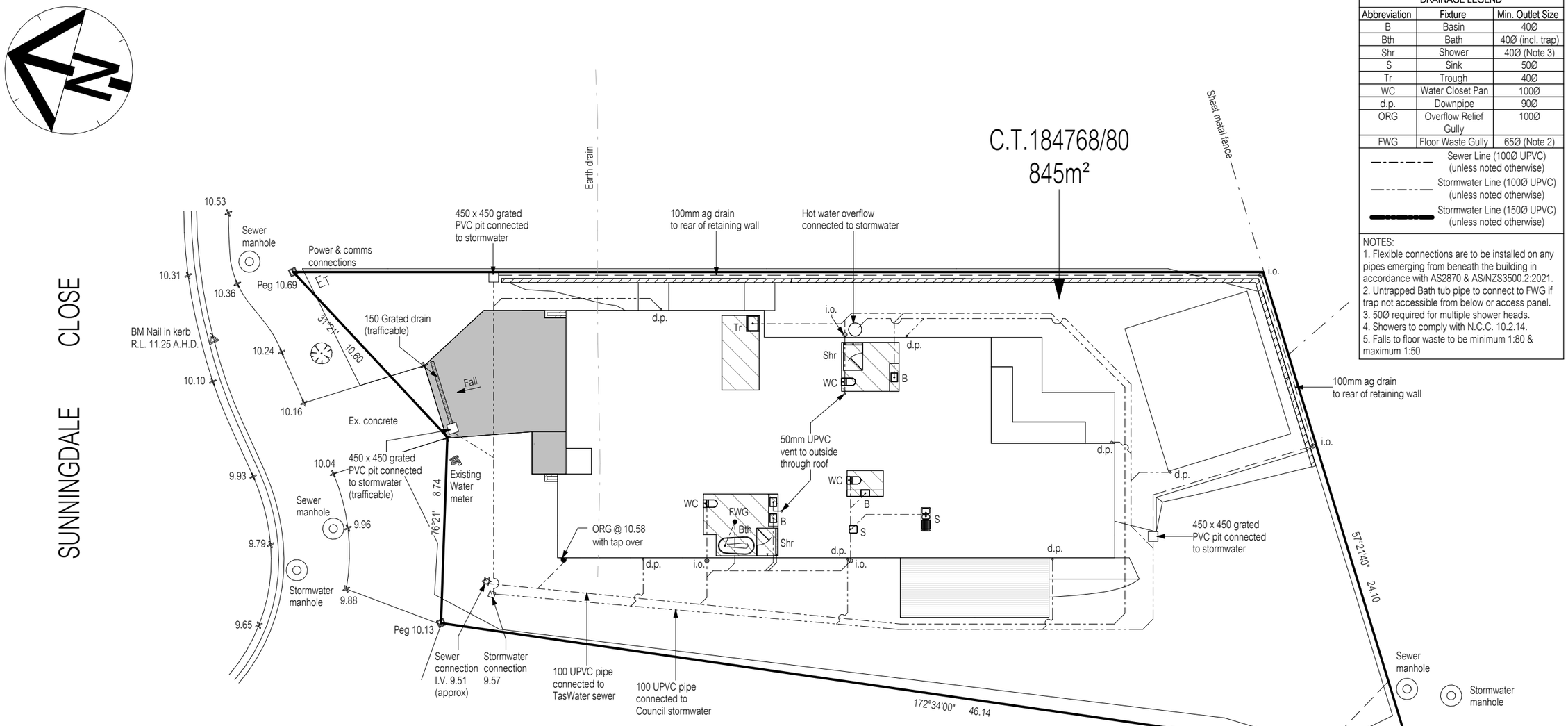
PROPOSED BURGESS & JOHNSTONE (1998) RESIDENCE
6 Sunningdale Close,
MIDWAY POINT

JOSCON TASMANIA

SITE PLAN

Drawn	CK	AP2025-2456	
Date	28 May 2025	Sheet	01/03
Scale	1 : 200		



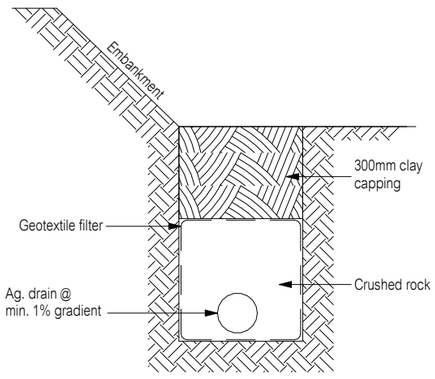
DRAINAGE LEGEND		
Abbreviation	Fixture	Min. Outlet Size
B	Basin	40Ø
Bth	Bath	40Ø (incl. trap)
Shr	Shower	40Ø (Note 3)
S	Sink	50Ø
Tr	Trough	40Ø
WC	Water Closet Pan	100Ø
d.p.	Downpipe	90Ø
ORG	Overflow Relief Gully	100Ø
FWG	Floor Waste Gully	65Ø (Note 2)

Sewer Line (100Ø UPVC) (unless noted otherwise)

Stormwater Line (100Ø UPVC) (unless noted otherwise)

Stormwater Line (150Ø UPVC) (unless noted otherwise)

NOTES:
1. Flexible connections are to be installed on any pipes emerging from beneath the building in accordance with AS2870 & AS/NZS3500.2:2021.
2. Untrapped Bath tub pipe to connect to FWG if trap not accessible from below or access panel.
3. 50Ø required for multiple shower heads.
4. Showers to comply with N.C.C. 10.2.14.
5. Falls to floor waste to be minimum 1:80 & maximum 1:50



TYPICAL AG. DRAIN DETAIL
(<1800 FROM HOUSE)
Not to scale

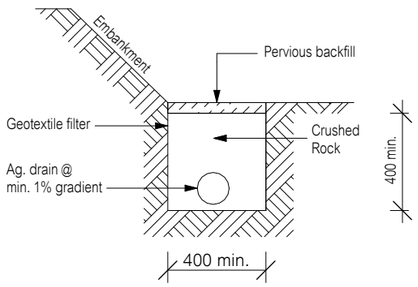
Where ag drain is < 1.5m from footing, the following engineering principles are required:

1. Ag drain to be capped with 300mm of clay to prevent ingress of surface run-off unless it is under a paving slab etc (ag drains are designed for removal of ground water, surface water should be dealt with separately).

2. Ag drain to have a minimum 1% fall to a grated pit which drains to the stormwater system.

3. Install a geotextile filter sock to the slotted drain, and enclose the whole drain in geofabric (to the underside of clay capping).

4. Provide additional grated pits / or inspection openings along the length of the ag drain and at the high point to make the effect of a blockage visible and enable a blockage to be cleared.



TYPICAL AG. DRAIN DETAIL
(≥1800 FROM HOUSE)
Not to scale

Refer to Roof Plan for downpipe calculations

All works are to in accordance with the Water Supply Code of Australia WSA 03-2011-3.1 Version 3.1 MRWA Edition V2.0 and Sewerage Code of Australia Melbourne Retail Water Agencies Code WSA 02-2014-3.1 MRWA Version 2.0 and TasWater's supplements to these codes.

ROOF DRAINAGE NOTE:
Min. medium rectangular gutter & min. 90ø downpipe specified as per N.C.C. part 7.4. These sizes and downpipe quantities are based on a max. roof catchment area of 70m²

Sewer manhole
Stormwater manhole? (sewer lid)

Nail in kerb 9.88

0 2 4 6 8m
1:200

Sorell Council
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No.	Date	Int.
C	23 June 2025	CK

Amendment changes as per cover sheet

Soil classification: S

Refer to Soil Report for nominated founding depth and description of founding material.

All Materials and construction to comply with AS/NZ3500 Part 2 & Part 3

- Wet areas to comply with NCC 10.2 and AS3740

Notes
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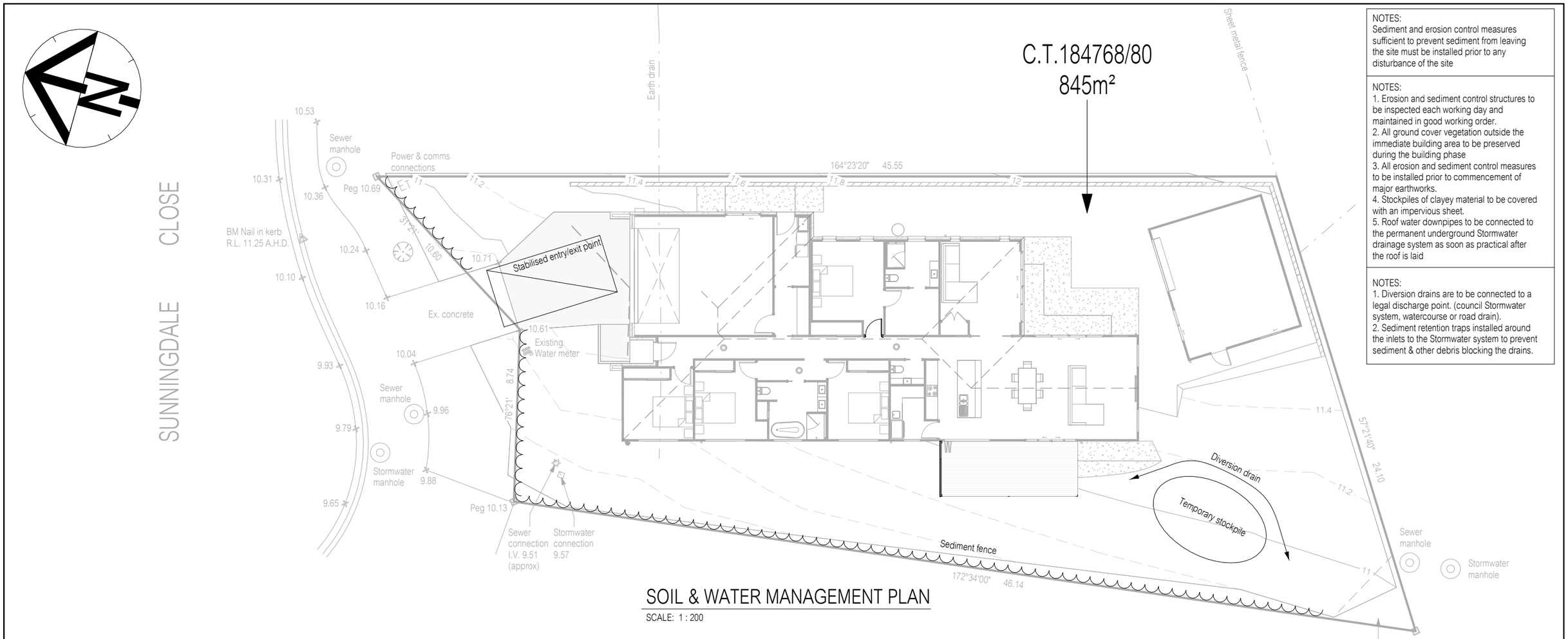
PROPOSED BURGESS & JOHNSTONE (1998) RESIDENCE

6 Sunningdale Close,
MIDWAY POINT

JOSCON TASMANIA

DRAINAGE PLAN

Drawn	CK	AP2025-2456	
Date	28 May 2025	Sheet	01a/03
Scale	1 : 200		



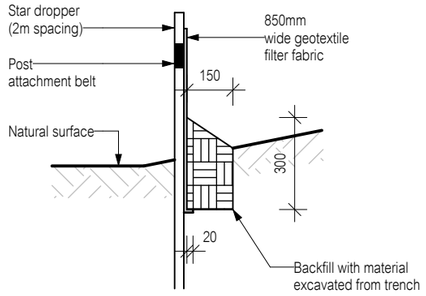
NOTES:
Sediment and erosion control measures sufficient to prevent sediment from leaving the site must be installed prior to any disturbance of the site

NOTES:
1. Erosion and sediment control structures to be inspected each working day and maintained in good working order.
2. All ground cover vegetation outside the immediate building area to be preserved during the building phase
3. All erosion and sediment control measures to be installed prior to commencement of major earthworks.
4. Stockpiles of clayey material to be covered with an impervious sheet.
5. Roof water downpipes to be connected to the permanent underground Stormwater drainage system as soon as practical after the roof is laid

NOTES:
1. Diversion drains are to be connected to a legal discharge point. (council Stormwater system, watercourse or road drain).
2. Sediment retention traps installed around the inlets to the Stormwater system to prevent sediment & other debris blocking the drains.

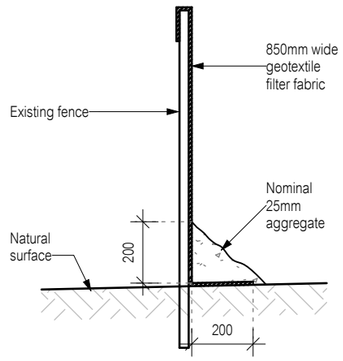
SOIL & WATER MANAGEMENT PLAN

SCALE: 1 : 200



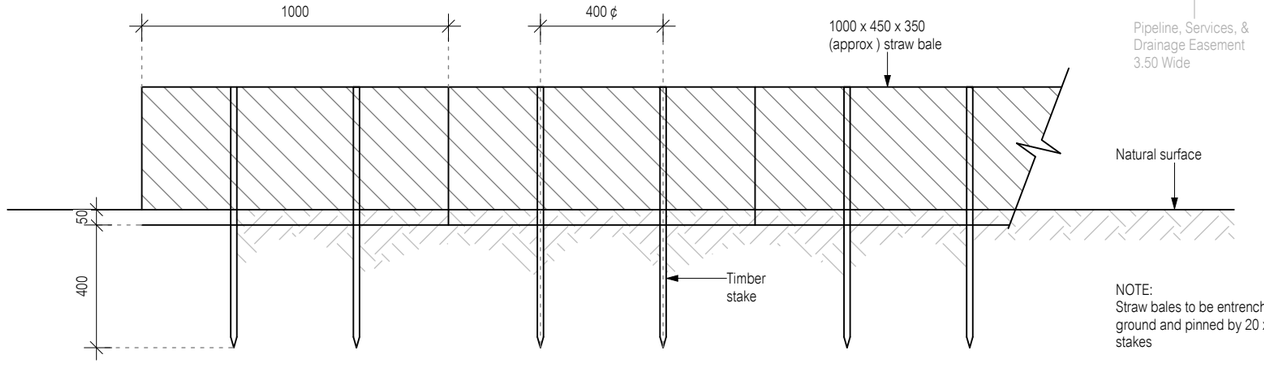
SILT STOP TYPE 1

TEMPORARY FENCE 1:20



SILT STOP TYPE 2

EXISTING FENCE 1:20



NOTE:
Straw bales to be entrenched 50mm in ground and pinned by 20 x 20mm timber stakes

STRAW BALE SEDIMENT TRAP SECTION DETAIL

SCALE 1:20

0 2 4 6 8m
1:200

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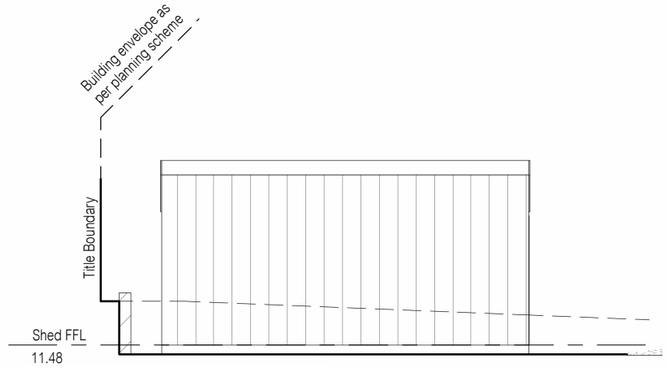
MIDWAY POINT

JOSCON TASMANIA

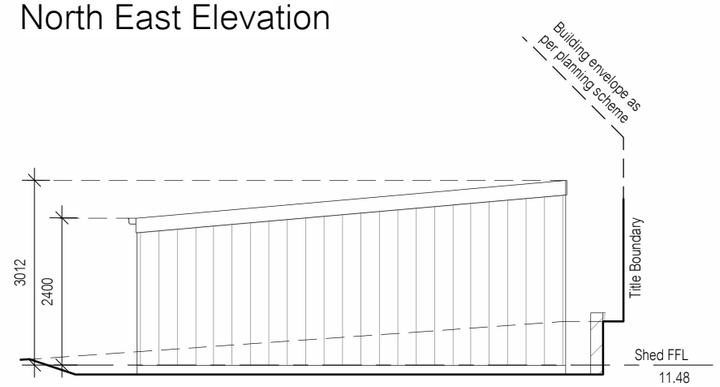
SOIL & WATER MANAGEMENT PLAN

Drawn	CK	AP2025-2456
Date	02 June 2025	Sheet 01b/03
Scale	As indicated	

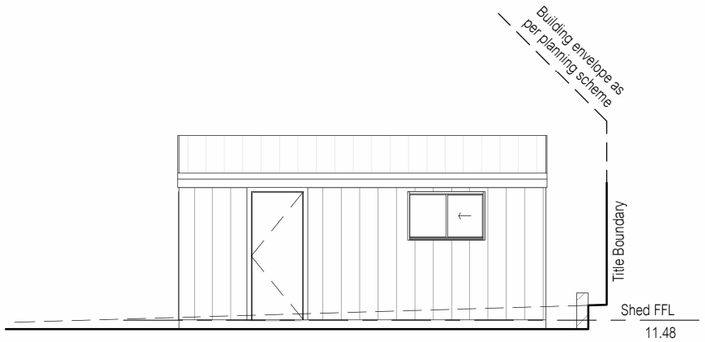
Material	Colour
Colorbond Roof	Monument
Wall colour	Monument



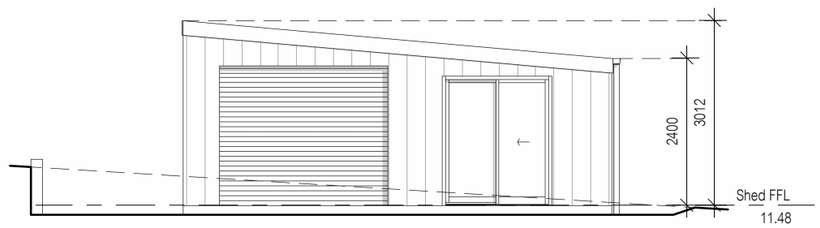
North East Elevation



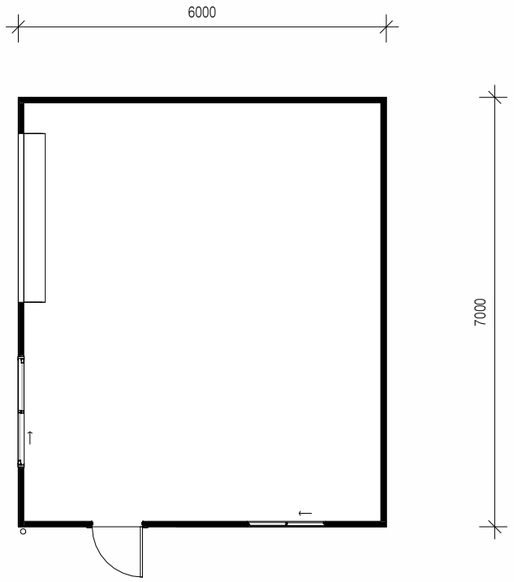
South East Elevation



South West Elevation



North West Elevation



NOTE:
Refer to shed manufacturer plans for full details.

0 1 2 3 4m
1:100

Sorell Council

Development Application: 5.2025.166.1 - Development Application - 6 Sunningdale Close, Midway Point P1.pdf
Plans Reference:P1
Date Received:25/06/2025

No.	Date	Int.

Floor Area = 42m²

Articulation joints

Smoke Alarm (interconnected where more than 1)

All window sizes to be checked and/or confirmed on site prior to ordering glazing units

Amendment changes as per cover sheet

Shadows shown for stylisation purposes only

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PROPOSED BURGESS & JOHNSTONE (1998) RESIDENCE

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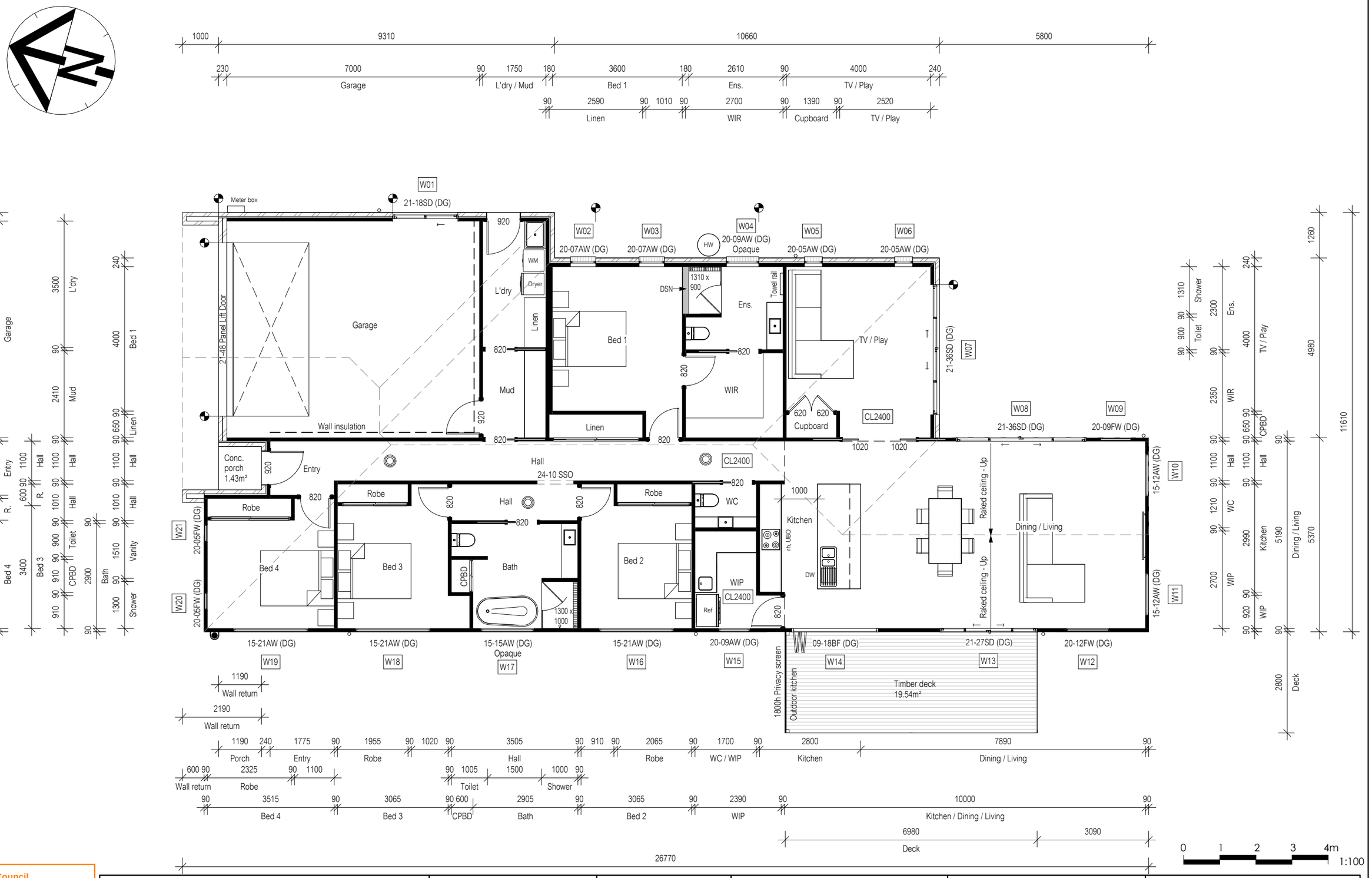
MIDWAY POINT

JOSCON TASMANIA

SHED PLANS

Drawn	CK	AP2025-2456	
Date	28 May 2025	Sheet	01c/03
Scale	1 : 100		



Sorell Council

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Plans Reference:P1
Date Received:25/06/2025

No.	Date	Int.
C	23 June 2025	CK
B	26 May 2025	CK
A	22 May 2025	CK

Amendment changes as per cover sheet

Floor Area = 249.71m²

Articulation joints

Smoke Alarm (interconnected where more than 1)

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PROPOSED BURGESS & JOHNSTONE (1998) RESIDENCE

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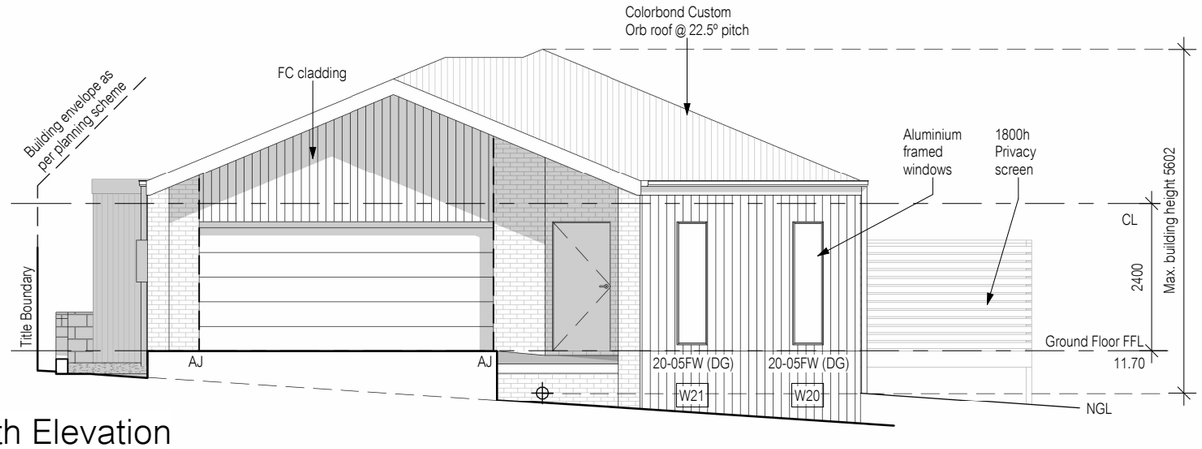
FLOOR PLAN

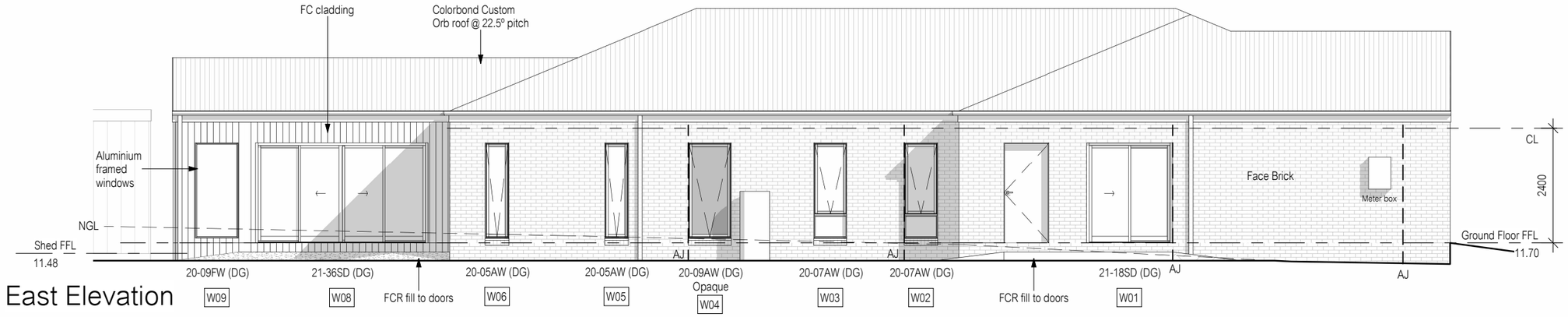
Drawn	CK	AP2025-2456	
Date	28 May 2025	Sheet	02/03
Scale	1 : 100		

Material	Colour
Colorbond Roof	tbc
Face Brick	tbc
FC Sheet	tbc

All lightweight cladding to be installed to manufacturer's guidelines. Refer to manufacturer's documentation.



North Elevation



East Elevation

Sorell Council
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Plans Reference:P1
Date Received:25/06/2025

No.	Date	Int.
C	23 June 2025	CK
B	26 May 2025	CK
A	22 May 2025	CK

Amendment changes as per cover sheet

All window sizes to be checked and/or confirmed on site prior to ordering glazing units

LEGEND:
AJ - Articulation Joint
BV - Brick Vent

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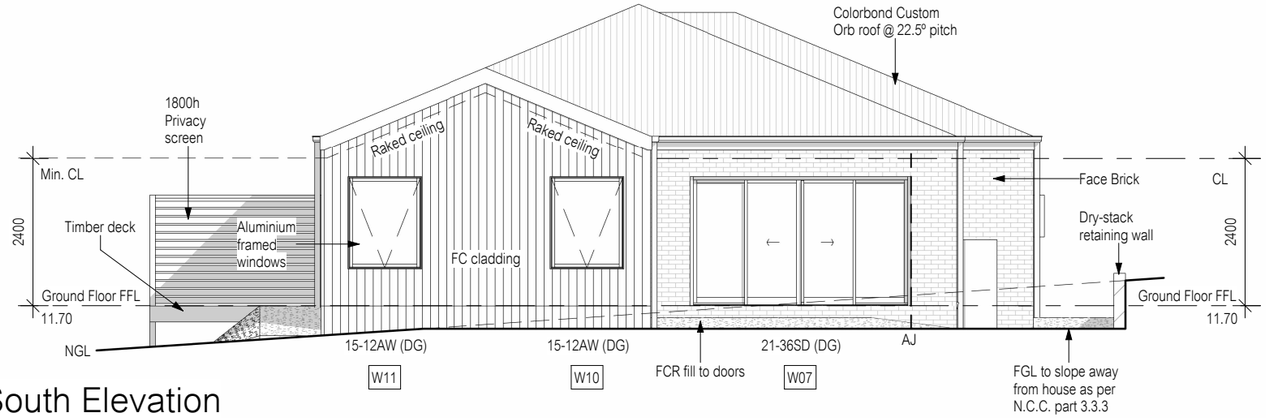
JOSCON TASMANIA

ELEVATIONS SHEET 1

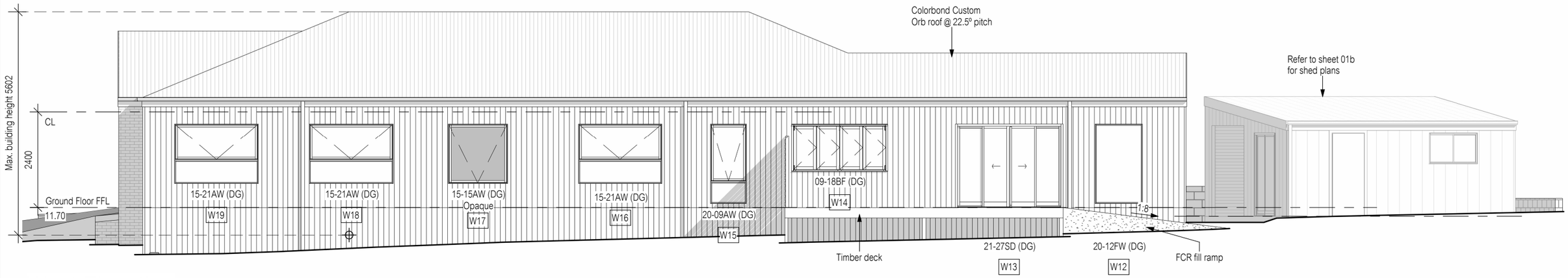
Drawn	CK	AP2025-2456
Date	28 May 2025	Sheet
Scale	1 : 100	03/03

Material	Colour
Colorbond Roof	tbc
Face Brick	tbc
FC Sheet	tbc

All lightweight cladding to be installed to manufacturer's guidelines. Refer to manufacturer's documentation.



South Elevation



West Elevation

Sorell Council

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Plans Reference:P1
Date Received:25/06/2025

No.	Date	Int.
C	23 June 2025	CK
B	26 May 2025	CK
A	22 May 2025	CK

Amendment changes as per cover sheet

All window sizes to be checked and/or confirmed on site prior to ordering glazing units

LEGEND:
AJ - Articulation Joint
BV - Brick Vent

Shadows shown for stylisation purposes only

Notes
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NORTH HOBART
LIC. NO. 685230609 (S. Turvey)
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Client / Project info

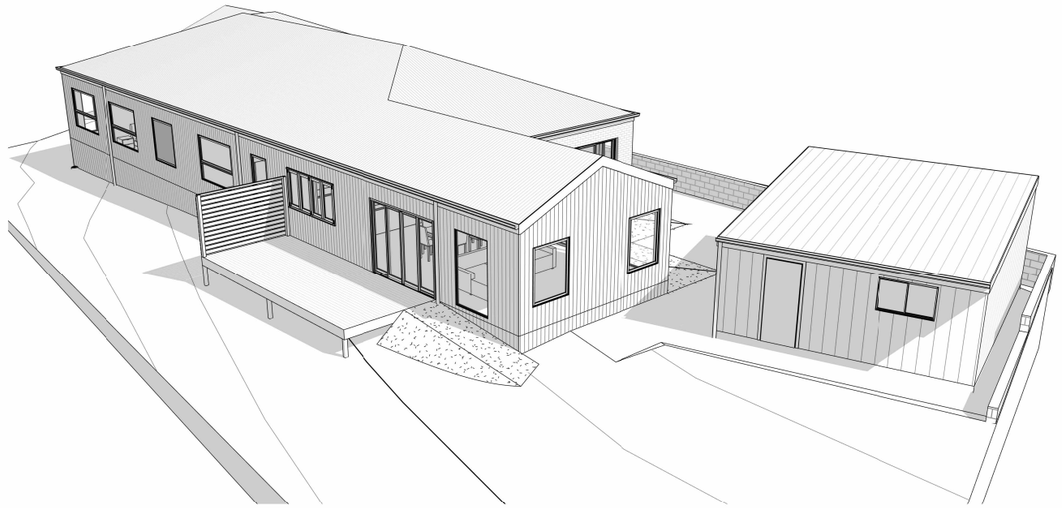
PROPOSED BURGESS & JOHNSTONE (1998) RESIDENCE

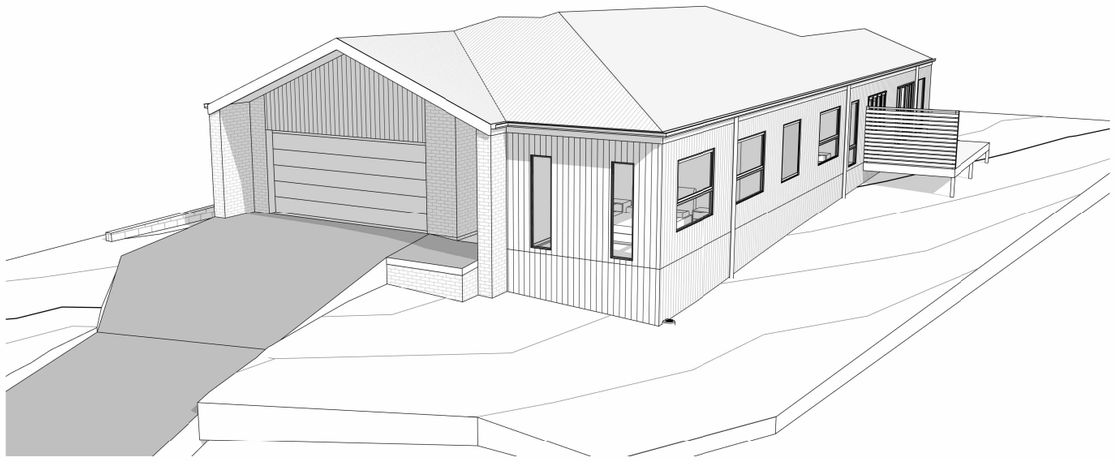
6 Sunningdale Close,
MIDWAY POINT

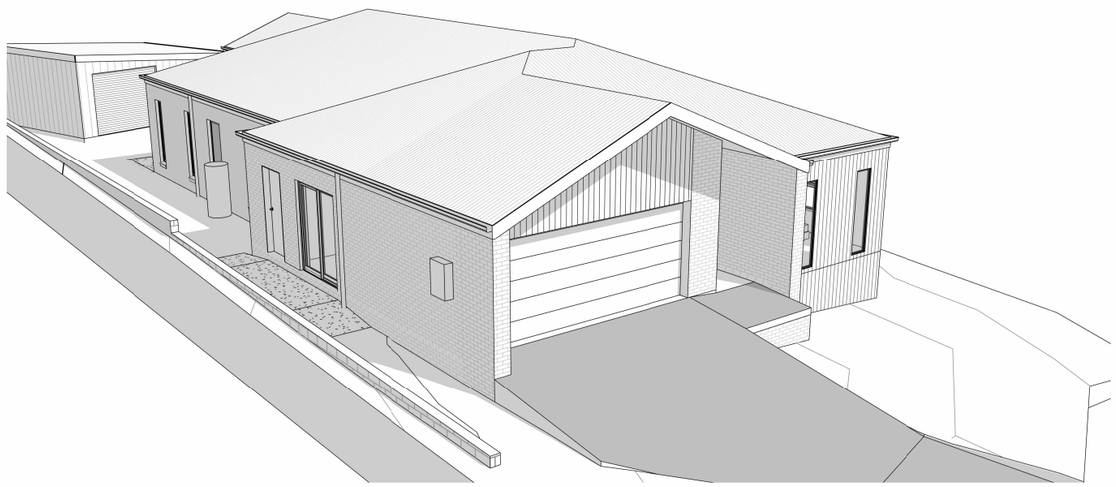
JOSCON TASMANIA

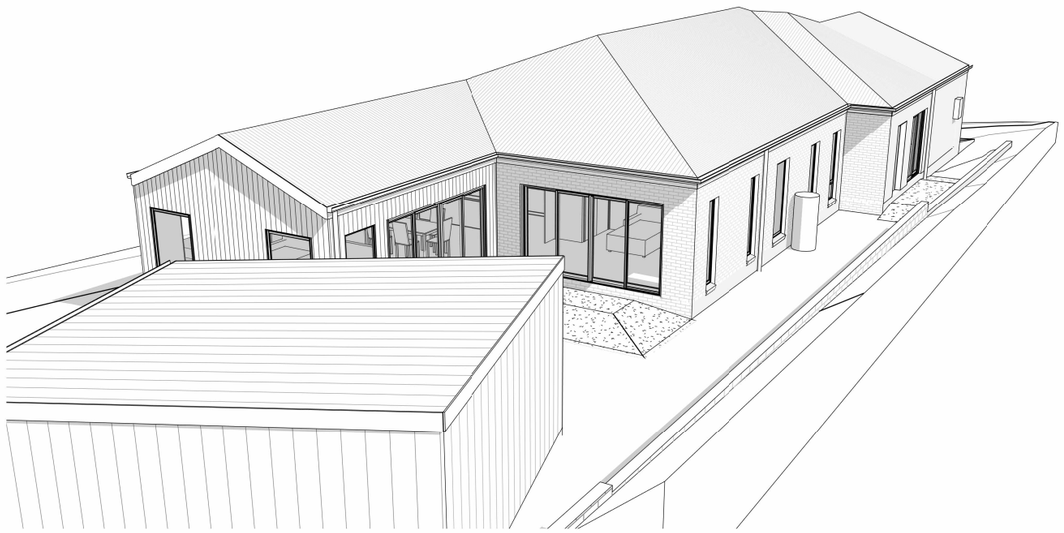
ELEVATIONS SHEET 2

Drawn	CK	AP2025-2456
Date	28 May 2025	Sheet
Scale	1 : 100	03a/03









Sorell Council

Development Application: 5.2025.166.1 - Development Application - 6 Sunningdale Close, Midway Point P1.pdf
Plans Reference:P1
Date Received:25/06/2025

No.	Date	Int.
C	23 June 2025	CK
B	26 May 2025	CK
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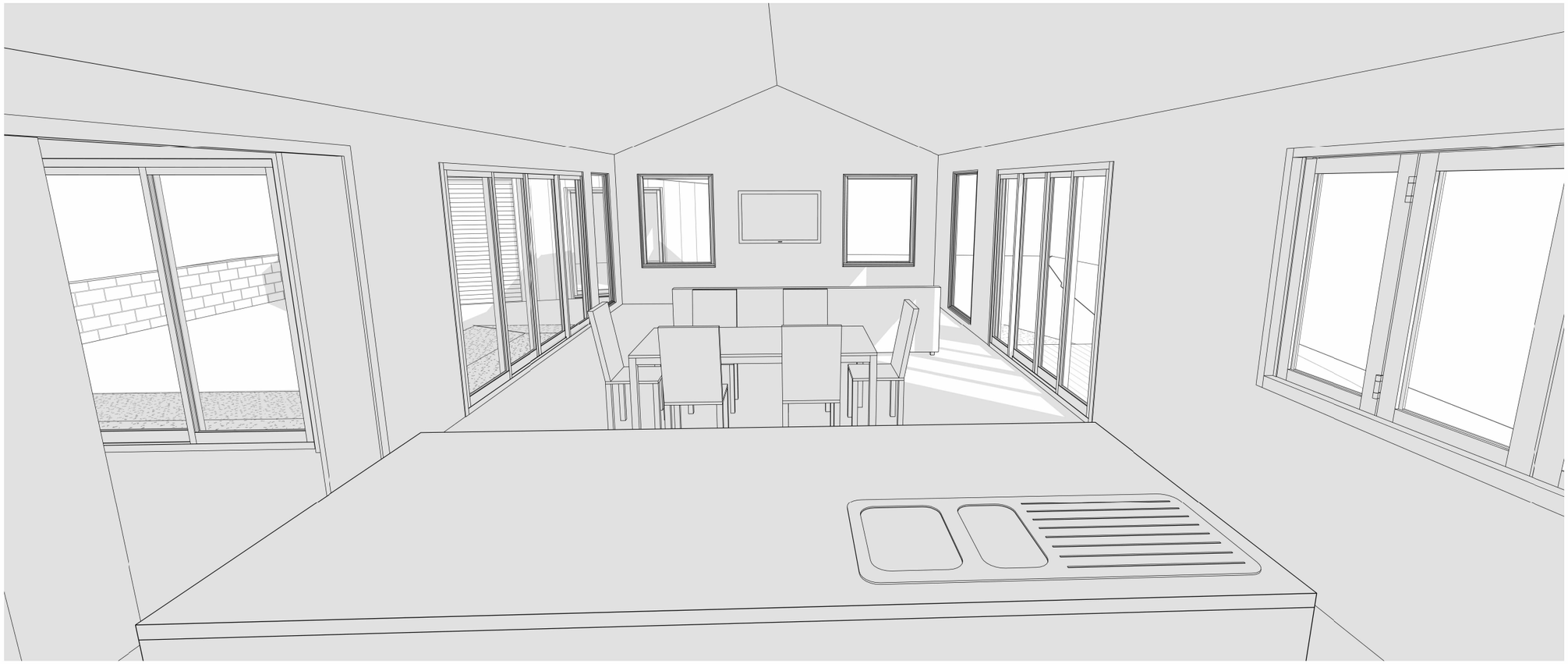
PROPOSED BURGESS & JOHNSTONE (1998) RESIDENCE

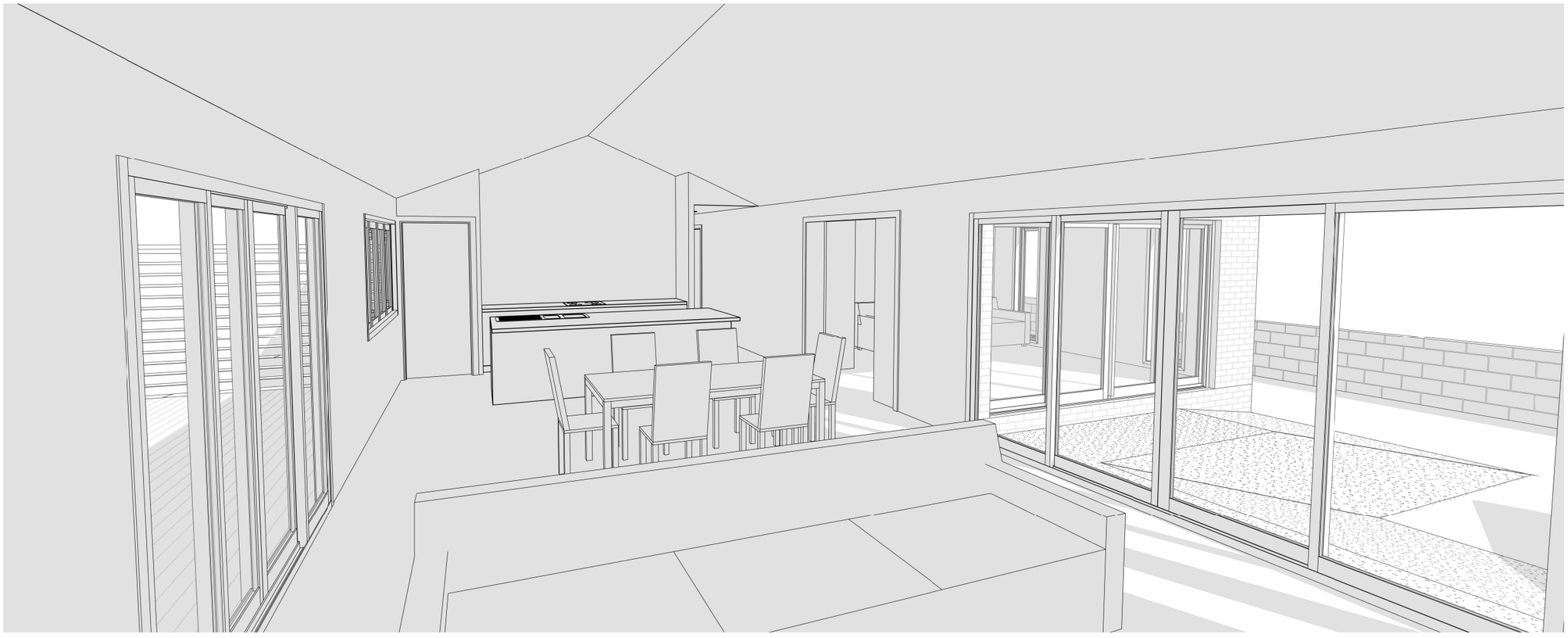
6 Sunningdale Close,
MIDWAY POINT

JOSCON TASMANIA

PERSPECTIVE VIEWS SHEET 1

Drawn	CK	AP2025-2456
Date	28 May 2025	Sheet 03b/03
Scale		





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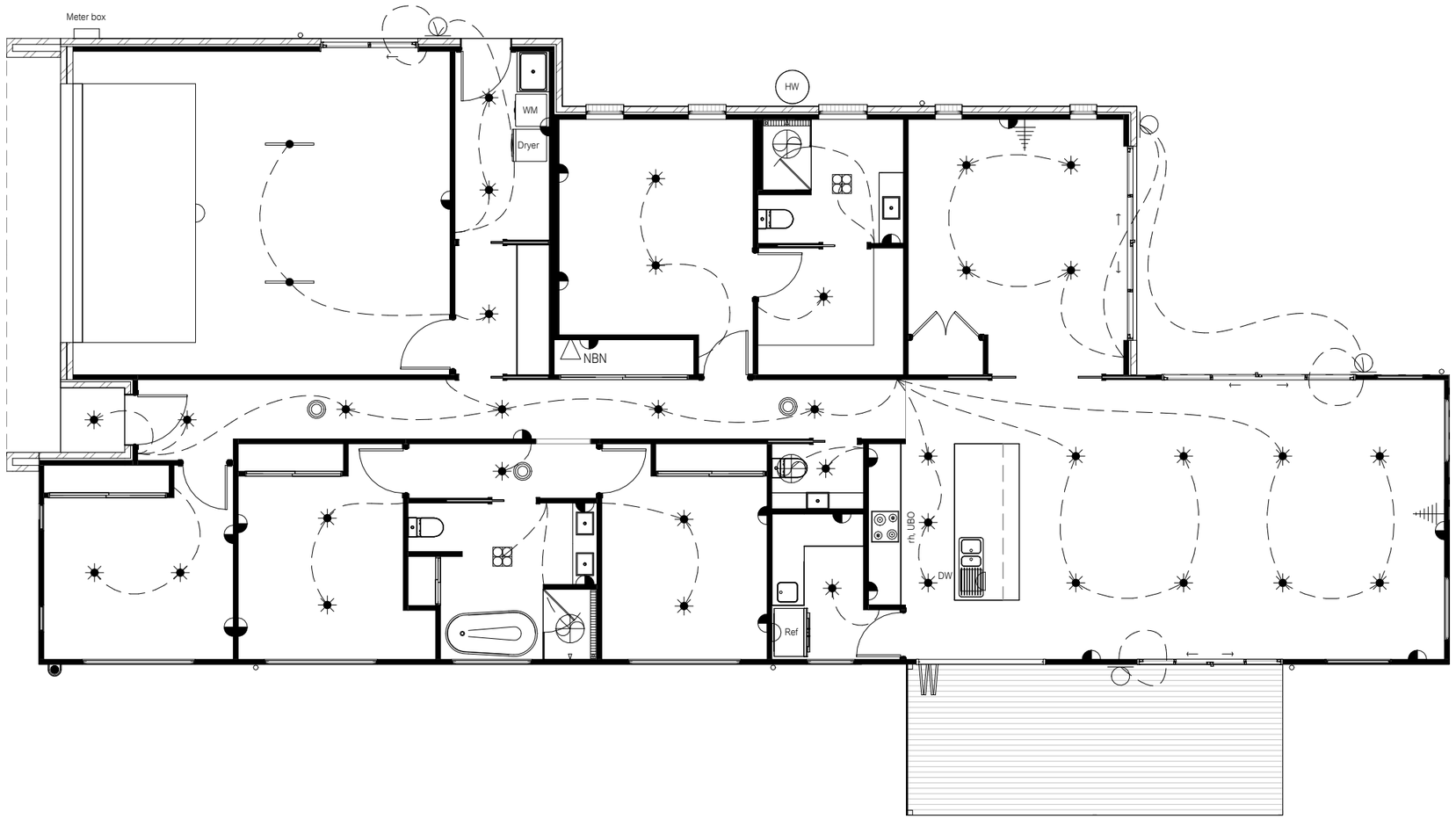
PROPOSED BURGESS & JOHNSTONE (1998) RESIDENCE

6 Sunningdale Close,
MIDWAY POINT

JOSCON TASMANIA

PERSPECTIVE VIEWS SHEET 2

Drawn	CK	AP2025-2456	
Date	28 May 2025	Sheet	03c/03
Scale			



LEGEND (W = Wattage e.g. 35W = 35 Watts.)

- STANDARD CEILING LIGHT POINT (30W)
- DOWNLIGHT POINT (UNVENTED) (35W)
- LED DOWNLIGHT POINT (10W) SUITABLE FOR & FITTED WITH INSULATION OVER. (IC RATED)
- PENDANT LIGHT (30W)
- WALL LIGHT POINT (30W)
- 2 x 900mm FLUORESCENT LIGHT POINT (36W)
- 2 x SLIM T5 900mm FLUORESCENT LIGHT POINT (28W)
- SINGLE POWER POINT
- DOUBLE POWER POINT
- DOUBLE POWER POINT WITH USB
- WATER PROOF POWER POINT
- MAINS POWERED SMOKE ALARM (INTERCONNECTED WHERE MORE THAN 1)
- FAN / HEATER / LIGHT (8W) (VENT IN ACCORDANCE WITH N.C.C. 10.8.2)
- TV CONNECTION POINT
- NBN/TELEPHONE CONNECTION POINT
- SENSOR LIGHT
- EXHAUST FAN (VENT IN ACCORDANCE WITH N.C.C. 10.8.2)
- FLOOD LIGHT
- CAT 6 CONNECTION POINT
- TREAD LIGHTS (2W)
- DUCTED VACUUM POINT
- SECURITY SYSTEM KEYPAD
- SECURITY SYSTEM SENSOR

ALL EXHAUST FANS:
25 L/s for a bathroom or sanitary compartment, 40 L/s for a kitchen or laundry. Exhaust from a kitchen, kitchen range hood, bathroom, sanitary compartment, or laundry must be discharged directly or via a shaft or duct to outdoor air.

Where no external ventilation / windows provided, exhaust fans to wet areas/ laundry to be fitted with a run on timer. 20mm gap base of door to comply with N.C.C. 10.8.2 (5)(a).

No.	Date	Int.	Amendment changes as per cover sheet
C	23 June 2025	CK	

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PROPOSED BURGESS & JOHNSTONE (1998) RESIDENCE

6 Sunningdale Close,
MIDWAY POINT

JOSCON TASMANIA

ELECTRICAL PLAN

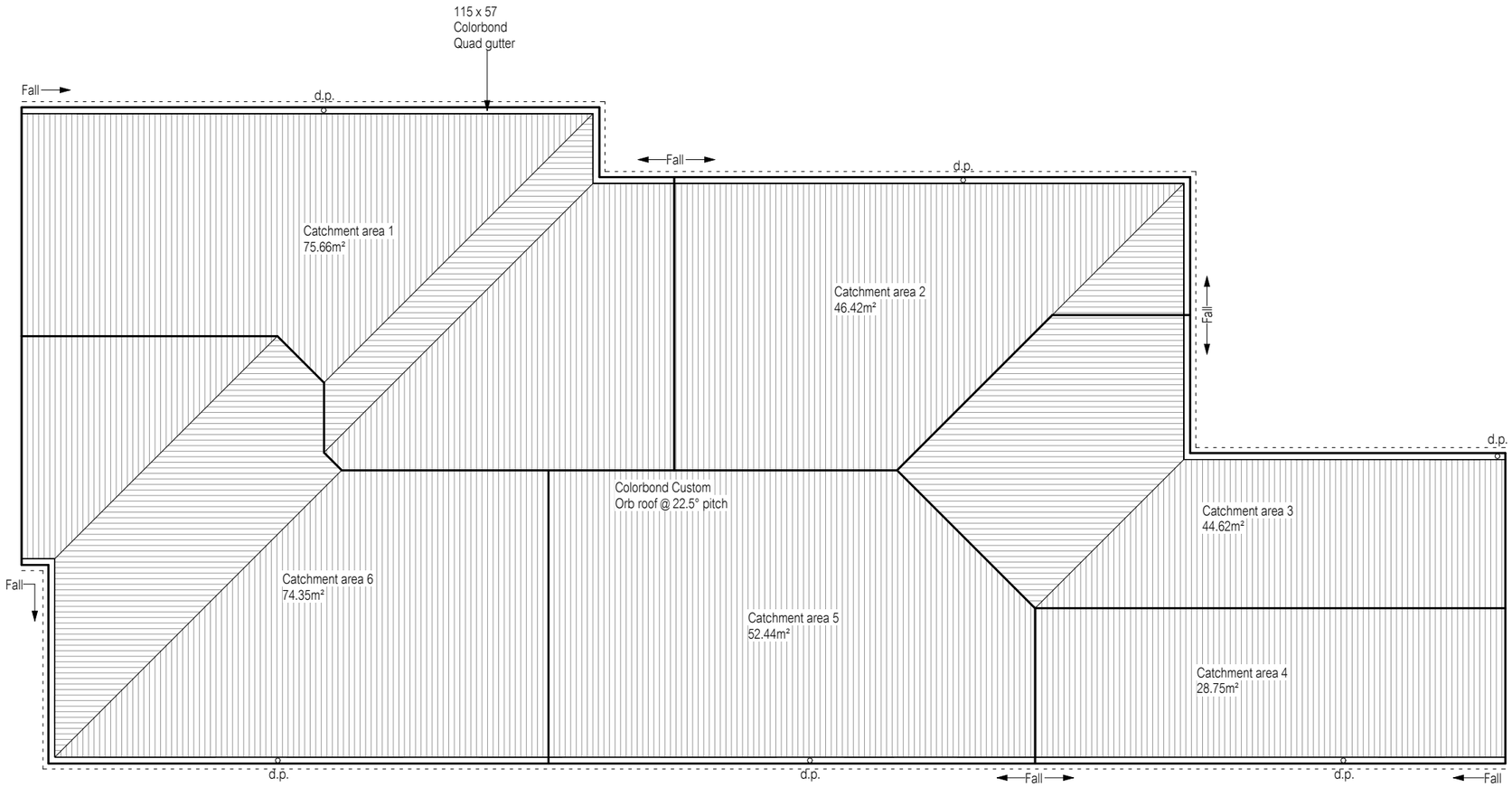
Drawn	CK	AP2025-2456	
Date	28 May 2025	Sheet	09/03
Scale	1 : 100		

GUTTER OVERFLOW REQUIREMENTS as per N.C.C. Figure 7.4.6a: Minimum slot opening area of 1200 mm² per metre of gutter and the lower edge of the slots installed a minimum of 25 mm below the top of the fascia. The acceptable overflow capacity must be 0.5 L/s/m.

Batten fixings: 100mm type 17, 14g bugle screws to comply with AS1684, or refer to AS1684 for alternatives.

Batten spacing: 75 x 38 F8 @ 900 Centre

Colorbond fixings: 50mm M6 11 x 50 EPDM seal to comply with AS3566 or refer to AS3566 for alternatives.



Position and quantity of downpipes are not to be altered without consultation with designer

Area's shown are surface areas / catchment areas, not plan areas.

DOWNPIPE AND ROOF CATCHMENT AREA CALCULATIONS (as per AS/NZS 3500.3)		
Ah¹	259.03	Area of Roof (excluding 115mm Quad gutter) (m²)
Ah²	266.31	Area of Roof (including 115mm Quad gutter) (m²)
Ac	322.24	Ah² x Slope factor (Table 3.2 from AS/NZS 3500.3) (m²)
Ae	6555	Cross sectional area of assumed 57 x 115 Quad Gutter. (mm²)
DRI	86.9	Design Rainfall Intensity (determined from Appendix D from AS/NZS 3500.3)
ACDP	77	Catchment area per Downpipe (determined from Figure 3.5.4(A) from AS/NZS 3500.3) (m²)
Required Downpipes	4.18	Ac ÷ Acdp
Downpipes Provided	6	Additional d.p. due to roof design

Sarking to be cut / discontinuous along ridge line. Custom orb profile to provide N.C.C. required ventilation between ridge capping and roofing sheet.

EAVES VENT NOTE: EaveFlo SBP25000 (Refer to manufacturer's documentation for installation details)

Sorell Council

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PROPOSED BURGESS & JOHNSTONE (1998) RESIDENCE

6 Sunningdale Close,
MIDWAY POINT

JOSCON TASMANIA

ROOF PLAN

Drawn	CK	AP2025-2456	
Date	28 May 2025	Sheet	11/03
Scale	1 : 100		

enviro•tech
CONSULTANTS
Geotechnical & Environmental Services

FOUNDATION CLASSIFICATION

6 SUNNINGDALE CLOSE - MIDWAY POINT

PROPOSED PURCHASE OF LAND

Client: Jack Johnstone

Certificate of Title: 184768/80

Investigation Date: 16/01/2025

Refer to this Report As

Enviro-Tech Consultants Pty. Ltd. 2025. Foundation Classification Report for a Proposed Purchase of Land, 6 Sunningdale Close - Midway Point. Unpublished report for Jack Johnstone by Enviro-Tech Consultants Pty. Ltd., 16/01/2025.

Report Distribution

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Limitations of this report

In some cases, variations in actual Site conditions may exist between subsurface investigation boreholes. This report only applies to the tested parts of the Site at the Site of testing, and if not specifically stated otherwise, results should not be interpreted beyond the tested areas.

The Site investigation is based on the observed and tested soil conditions relevant to the inspection date and provided design plans (building footprints presented in Attachment A). Any site works which has been conducted which is not in line with the Site plans will not be assessed. Subsurface conditions may change laterally and vertically between test Sites, so discrepancies may occur between what is described in the reports and what is exposed by subsequent excavations. No responsibility is therefore accepted for any difference in what is reported, and actual Site and soil conditions for parts of the investigation Site which were not assessed at the time of inspection.

This report has been prepared based on provided plans detailed herein. Should there be any significant changes to these plans, then this report should not be used without further consultation which may include drilling new investigation holes to cover the revised building footprint. This report should not be applied to any project other than indicated herein.

No responsibility is accepted for subsequent works carried out which deviate from the Site plans provided or activities onsite or through climate variability including but not limited to placement of fill, uncontrolled earthworks, altered drainage conditions or changes in groundwater levels.

At the time of construction, if conditions exist which differ from those described in this report, it is recommended that the base of all footing excavations be inspected to ensure that the founding medium meets that requirement referenced herein or stipulated by an engineer before any footings are poured.

Investigation Summary

Site Classification

In accordance with AS2870 – 2011 and after thorough consideration of the known details pertaining to the proposed building and associated works (hereafter referred to as the Site), the geology, soil conditions, soil properties, and drainage characteristics of the Site have been classified as follows:

CLASS S is based on soil profiles around the proposed building envelope being classified as slightly reactive to soil moisture variation, with test locations potentially subject to surface movement ranging from 0 to 20 mm.

Foundations

It is recommended that concentrated loads including but not limited to slab edge or internal beam or strip footings supported directly on piers or pads which are founded in the Extremely Weathered SANDSTONE Bedrock at 0.7 to 0.9 m depth or greater**.**

Wind Load Classification

The AS 4055-2021 Wind loads for Housing classification is summarised.

Region:	A
Terrain category:	TC1
Shielding Classification:	NS
Topographic Classification:	T0
Wind Classification:	N3
Design Wind Gust Speed (Vh,u) m/s	50

I recommend that during construction, I and/or the design engineer are notified of any major variation in the foundation conditions as predicted in this report.

Kris Taylor, BSc (hons)

Environmental & Engineering Geologist

Site Investigation

The Site investigation is summarised in Table 1.

Table 1 Summary of Site Investigation

Client	Jack Johnstone
Project Address	6 Sunningdale Close - Midway Point
Council	Sorell
Planning Scheme	Tasmanian Planning Scheme
Inundation, Erosion or Landslip Overlays	Low Coastal Erosion Hazard Code, Dispersive Soils Specific Area Plan.
Proposed	Purchase Of Land
Investigation	Fieldwork was carried out by an Engineering Geologist on the 16/1/2025
Site Topography	The building site has a gentle slope of approximately 7% (4°) to the west
Site Drainage	The site receives overland flow runoff directly from the east.
Soil Profiling	Two investigation holes were direct push sampled from surface level around the proposed purchase of land (Appendix A):
Investigation Depths	The target excavation depth was estimated at 2.3 m. Borehole BH01 was direct push sampled to 1 m and borehole BH02 was direct push sampled to 1.2 m (both ending in SANDSTONE). Borehole logs and photos are presented in Appendix B & C.
Soil moisture and groundwater	All recovered soil at the site ranged from dry to slightly moist. Groundwater was not encountered.
Geology	According to 1:250,000 Mineral Resources Tasmania geological mapping (accessed through The LIST), the geology comprises of: Permian - Triassic Dominantly quartz sandstone.

Soil Profiles

The geology of the site has been documented and described according to Australian Standard AS1726 for Geotechnical Site Investigations, which includes the Unified Soil Classification System (USCS). Soil layers, and where applicable, bedrock layers, are summarized in Table 2.

Table 2 Soil Summary Table

#	Layer	Details	USCS	BH01	BH02
1	Silty SAND	TOPSOIL: Silty SAND, black, well sorted, medium grained sand, trace roots, 5 % roots, D	SM	0-0.2 DS@0.0	0-0.3
2	Sandy CLAY	Sandy CLAY, yellowish brown, mottled yellowish red, well sorted, low plasticity, medium grained sand, St-VSt	CL	0.2-0.6 DS@0.3	0.3-0.5
3	Clayey Sandy SILT	Clayey Sandy SILT trace gravel, greenish grey, mottled yellowish brown, well sorted, low plasticity, medium grained sand	ML		0.5-0.8 DS@0.6
4	SANDSTONE	Extremely Weathered SANDSTONE Bedrock		0.6-0.9	0.8-1.1
5	SANDSTONE	Distinctly Weathered SANDSTONE Bedrock		0.9-1 REF	1.1-1.2 REF

Consistency[1] **VS** Very soft; **S** Soft; **F** Firm; **St** Stiff; **Vst** Very Stiff; **H** Hard. Consistency values are based on soil strengths AT THE TIME OF TESTING and is subject to variability based on field moisture condition

Density[2] **VL** Very loose; **L** Loose; **MD** Medium dense; **D** Dense; **VD** Very Dense

Rock Strength **EL** Extremely Low; **VL** Very Low; **L** Low; M Medium; **H** High; **VH** Very High; **EH** Extremely High

PL Point load test (lump)

DS Disturbed sample

PV Pocket vane shear test

FV Downhole field vane shear test

U50 Undisturbed 48mm diameter core sample collected for laboratory testing.

REF Borehole refusal

INF DCP has continued through this layer and the geology has been inferred.

[1] Soil consistencies are derived from a combination of field index, DCP and shear vane readings.

[2] Soil density descriptions presented in engineering logs are derived from the DCP testing.

Recommendations

Dispersive soils

Findings

The results presented in Appendix D indicate that severely dispersive soil layers are present at the Site with the following observations:

- Layer 1 has Emerson Class 3 characteristics and are considered slightly dispersive.
- Layer 2 and 3 comprises Emerson Class 1 category soils which are considered severely dispersive

Site specific recommendations

- It is recommended that retaining walls are installed at the Site where cuts are proposed to prevent tunnels from developing. The retaining walls do not need to be engineered if they do not exceed 1.0m height (may comprise gabions or timber sleepers), but the retaining walls will need to be designed with the following between the soil and the structure:
  - Aggregate wrapped entirely with geofabric drainage cloth
  - An aggregate drain (ag drain) inside and at the base of the geofabric wrapping
  - A 5% fall in the ag drain to divert water away from the retained area.
- If soil batters are proposed, the soil cuts will need to be stabilised with gypsum at a rate of 1.0kg/m2 and covered with at least 0.2m thickness of loam. Recommendations for batter angles and erosion control are presented in a following section of this report.
- The dispersive soil is NOT to be used as fill beneath the building unless it is compacted in 0.15m thick layers (lifts) with a medium weight vibrating compactor and stabilised with gypsum at a rate of 1.0kg/m2 between each of the lifts.
- Service trenches should be backfilled with sand to prevent tunnel development.

Plumbing

Refer to hydraulic design drawings for detailed plumbing advice and requirements.

If fill[3] work is proposed, with non-sand fill exceeding 0.4 m or sand fill exceeding 0.8 m in depth, a Class P plumbing classification applies. To ensure Table 3 *is applicable, it is recommended to use non-reactive material like sand or FCR near pipework.*

Refer to Table 3 to assess soil movement (Ys) around pipework for different depth ranges.

When determining the appropriate classification, consideration is to be given to future cut and fill with reference to borehole locations at the time of testing (see borehole easting and northings in Appendix B for details). Where precise vertical elevations are not available in the logs, elevations may be obtained from a survey representative of site levels at the time of soil testing.

*Table 3 Millimetres soil movement (Ys) for determining plumbing requirements for various soil depths **

Building	Profiles	P*	E Ys >75	H2 Ys 60-75	H1 Ys 40-60	M Ys 20-40	S Ys 0-20	A Ys 0
BH01	BH01	No					0-0.6	0.6-3
BH02	BH02	No					0-0.8	0.8-3

* Depths in this table are based on surfaces at the time of testing and do not allow for the influence of any additional fill added to the soil profile. If additional fill is proposed to be added at these locations, then the reactivity will need to be recalculated depending on the thickness and reactivity of any additional fill added.

[3] FILL depth - For a slab, depth measured from the underside of the footing to the natural surface level. For a strip or pad footing system, depth measured from the finished ground level to the natural surface level.

Site Drainage

Subsurface drains to remove groundwater shall not be used within I .5 m of the building unless designed according to engineering principles.

Surface drainage shall be considered in the design of the footing system, and necessary modifications shall be included in the design documentation. The surface drainage of the site shall be controlled from the beginning of the preparation and construction of the site. The drainage system shall be completed after the completion of the building construction.

Ideally, the areas around the footprint of the building should be graded or drained so that the water cannot pond against or near the building. As soon as footing construction has been completed, the ground immediately adjacent to the building should be graded to a uniform fall of 50mm minimum away from the building over the first metre. The final provision of paving to the edge of the building can greatly limit soil moisture variations due to seasonal wetting and drying.

All paved services are to be adequately drained into a grate to prevent erosion of dispersive soils.

The base of cuts should have a concrete, plastic lined gravel or topsoil spoon drain to divert water into a grate to be transported offsite.

Temporary Site Drainage

It is recommended that cut off mounds comprising IMPORTED topsoil (non-dispersive soil) are put in place above (upgradient of) the work area to prevent water and sediment from accumulating in and around footings and reduce the risk of erosion and instability around any proposed earth retaining structures. Drainage trenches are not to be cut into the slope unless they comprise gravel and are lined with geofabric with an ag drain.

Rock Excavatability

It is recommended that a 5 tone excavator or larger fitted with a GP bucket and possibly claw will be required to effectively remove the bedrock.

Permanent Cut Batters – Soil and Rock

To ensure that cuts remain serviceable, it is recommended that unretained cuts in soil do not exceed 1V: 3H and unsupported baters in bedrock do not exceed 2V: 1H.

Filling Works

In the case where filling works are proposed at the Site:

- Subject to compaction control, all footings (edge beams, internal beams, and load support thickenings) must be founded on natural ground through:
    - FILL OTHER THAN SAND not exceeding 0.4 m depth. If FILL OTHER THAN SAND is to exceed 0.4 m depth, then a Class P applies (AS2870 Clauses 2.5.2 and 2.5.3), with footings designed in accordance with engineering specifications.
    - SAND FILL not exceeding 0.8 m depth. If SAND FILL is to exceed 0.8 m depth, then a Class P applies (AS2870 Clauses 2.5.2 and 2.5.3), with footings designed in accordance with engineering specifications.
- Where readily available, SAND FILL is always recommended rather than fill containing SILT or CLAY.
- Compacted CLAY or SAND FILL on well drained slopes should not exceed 1V:3H unless supported by an engineered retaining wall.
- Compacted stable rock fill on well drained slopes should not exceed 2V:3H unless supported by an engineered retaining wall.

- Any proposed filling works must be in accordance with AS3798 'Earthworks for Residential and Commercial Developments'.
- Before placing fill for landscaping, all topsoil should be removed from the filled area.
- Ideally, the fill should be free draining and placed to prevent water ponding. The fill should be placed in layers no greater than 150mm height and suitably compacted.

Long-term erosion management

The following measures are generally recommended for maintaining long-term erosion stability of soil slopes:

- Slopes exceeding 1V: 4H and up to 1V: 3H will need to be effectively stabilised with mulch/topsoil mixes, drill/broadcast seeding, hydroseeding or soil binders.

Earth-Retaining Structures

Any excavations higher than 1.0m and exceeding the recommended batter angle should be supported with a retaining wall engineered that allows free drainage of the retained soil and rock.

Building Pad Preparation

Any organic matter or other deleterious materials will need to be removed from the building envelope.

Unless otherwise stated in an engineering report, fill or loose, soft, low bearing capacity soil should either be removed from the building pad, or otherwise footings should ideally be established to the base of this material.

Earthworks should be carried out in accordance with AS3798 'Earthworks for Residential and Commercial Developments'. Unsuitable materials in structural fill are listed in AS2870 Section 4.3.

Pad Preparation - Compaction

Ordinarily, compaction is not recommended for CLAY soils, but in this case, Emerson Class 1 to Class 2 soil layers are to be compacted if exposed at surface.

It is recommended that any crushed rock, sand or granular soils across the building pad, filled areas and the base of the footing excavations are compacted with several passes with a medium weight (~80 kg) plate compactor (80 kg).

Bored Pier Impediments - Obstructions

There were no obvious impediments to auguring such as cobbles or boulders obstructions.

Footing Preparation

Footing excavations must be free of loose earth, tree roots, mud or debris immediately before pouring concrete, ensuring the footing is appropriately seated on the target layer.

Foundation Maintenance

Details on appropriate site and foundation maintenance practises from the CSIRO BTF 18 Foundation Maintenance and Footing Performance: A Homeowner's Guide are presented in Appendix F of this report.

Kris Taylor, BSc (hons)

Environmental & Engineering Geologist

Notes About Your Assessment

The Site classification provided and footing recommendations including foundation depths are assessed based on the subsurface profile conditions present at the time of fieldwork and may vary according to any subsequent *Site works* carried out. *Site works* may include changes to the existing soil profile by cutting more than 0.5 m and filling more than 0.4 to 0.8 m depending on the type of material and the design of the footing. All footings must be founded through fill *other than* sand not exceeding 0.4 m depth or sand not exceeding 0.8 m depth, or otherwise a Class P applies (AS2870 Clauses 2.5.2 and 2.5.3).

For reference, borehole investigation depths relative to natural soil surface levels are stated in borehole logs where applicable.

In some cases, variations in actual Site conditions may exist between subsurface investigation boreholes. At the time of construction, if conditions exist which differ from those described in this report, it is recommended that the base of all footing excavations be inspected to ensure that the founding medium meets the requirement referenced herein or stipulated by an engineer before any footings are poured.

The site classification assumes that the performance requirements as set out in Appendix B of AS 2870 are acceptable and that site foundation maintenance is carried out to avoid extreme wetting and drying.

It is the responsibility of the homeowner to ensure that the soil conditions are maintained and that abnormal moisture conditions do not develop around the building. The following are examples of poor practises that can result in abnormal soil conditions:

- The effect of trees being too close to a footing.
- Excessive or irregular watering of gardens adjacent to the building.
- Failure to maintain Site drainage.
- Failure to repair plumbing leaks.
- Loss of vegetation near the building.

The pages that make up the last six pages of this report are an integral part of this report. The notes contain advice and recommendations for all stakeholders in this project (i.e. the structural engineer, builder, owner, and future owners) and should be read and followed by all concerned.

References

AS 1289.6.3.2-2003 Soil strength and consolidation tests - Determination of the penetration resistance of a soil - 9 kg dynamic cone penetrometer test, Standards Australia, Sydney, Retrieved from SAI Global

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Appendix A Mapping

Figure 1 Site Borehole Locations

Appendix B Borehole Logs

enviro·tech CONSULTANTS

ASSESSMENT: Foundation Classification
STRUCTURE: Purchase Of Land
EASTING: 542588 **HORIZONTAL**
NORTHING: 5262592 **ACCURACY:** 1m

HOLE ID NO.: BH01
DATE TESTED: 16/01/2025
LOGGED BY: M. Scalisi
ELEVATION:

LOCATION: 6 Sunningdale Close - Midway Point
CLIENT: Jack Johnstone

EQUIPMENT: AMS Powerprobe 9120 RAP
NATURAL SURFACE (RL):

DEPTH (m)	GRAPHIC	DESCRIPTION	LAYER	DENSITY CONSISTENCY STRENGTH	MOISTURE INDEX	%	SAMPLES	TEST	Cu (kPa)	UCS (kg/cm²)	BLOW COUNT	DCP blows/100mm 0 5 10 15 20
0.0	SM	TOPSOIL: Silty SAND, black, well sorted, medium grained sand, trace roots, 5 % roots	1	dense	Dry	8	DS				12.0 9.0	
0.5	CL	Sandy CLAY, yellowish brown, mottled yellowish red, well sorted, low plasticity, medium grained sand	2	stiff to very stiff	Slightly Moist	14	DS				2.9 2.8 4.0 8.0	
		Extremely Weathered SANDSTONE Bedrock pale yellow	4		Slightly Moist						REF	
		Distinctly Weathered SANDSTONE Bedrock pale yellow	5									
1.0		Direct Push Sampler Refusal on Distinctly Weathered SANDSTONE Bedrock End of borehole at 1m depth.										

GROUNDWATER: Not Encountered
TESTING: Penetrometer: AS 1289.6.3.2

PAGE 1 of 1

Where blows per 100mm are less than 1, distance travelled per penetrometer blow is measured and converted to blows per 100mm.

DS - Disturbed Sample; U50 - Undisturbed 50mm Core; FV - Field Vane (Ømm); PP - Pocket Penetrometer; CBR - Califronian Bearing Ratio: PV - Pocket Vane

enviro·tech CONSULTANTS

ASSESSMENT: Foundation Classification
STRUCTURE: Purchase Of Land
EASTING: 542601 **HORIZONTAL**
NORTHING: 5262578 **ACCURACY:** 1m

HOLE ID NO.: BH02
DATE TESTED: 16/01/2025
LOGGED BY: M. Scalisi
ELEVATION:

LOCATION: 6 Sunningdale Close - Midway Point
CLIENT: Jack Johnstone

EQUIPMENT: AMS Powerprobe 9120 RAP
NATURAL SURFACE (RL):

DEPTH (m)	GRAPHIC	DESCRIPTION	LAYER	DENSITY CONSISTENCY STRENGTH	MOISTURE INDEX	%	SAMPLES	TEST	Cu (kPa)	UCS (kg/cm²)	BLOW COUNT	blows/100mm 0 5 10 15 20
0.0	SM	TOPSOIL: Silty SAND, black, well sorted, medium grained sand, trace roots, 5 % roots	1	medium dense to dense	Slightly Moist							
	CL	Sandy CLAY, yellowish brown, mottled yellowish red, well sorted, low plasticity, medium grained sand	2	stiff to very stiff	Slightly Moist							
0.5	ML	Clayey Sandy SILT trace gravel, greenish grey, mottled yellowish brown, well sorted, low plasticity, medium grained sand	3	stiff to hard	Slightly Moist	16	DS					
		Extremely Weathered SANDSTONE Bedrock pale yellow	4									
1.0		Distinctly Weathered SANDSTONE Bedrock pale yellow	5									
		Direct Push Sampler Refusal on Distinctly Weathered SANDSTONE Bedrock End of borehole at 1.2m depth.										

GROUNDWATER: Not Encountered

PAGE 1 of 1

TESTING:

Where blows per 100mm are less than 1, distance travelled per penetrometer blow is measured and converted to blows per 100mm.

DS - Disturbed Sample; U50 - Undisturbed 50mm Core; FV - Field Vane (Ømm); PP - Pocket Penetrometer; CBR - Califronian Bearing Ratio: PV - Pocket Vane

Appendix C Core Photographs

BH01

BH02

*** 1 metre core tray length**

Appendix D Geotechnical Testing

Dynamic Cone Penetrometer (DCP)

Dynamic cone penetrometer (DCP) testing was conducted according to AS 1289.6.3.2 with the results presented in Appendix B.

Soil Dispersion (Emerson aggregate test)

Select soil samples were tested for sodicity using the Emerson Class number method according to AS1289.3.8.1. The results presented in Table 4 demonstrate that:

- Layer 1 has Emerson Class 3 characteristics and are considered slightly dispersive.
- Layer 2 and 3 comprises Emerson Class 1 category soils which are considered severely dispersive

It is recommended that the dispersive soils are adequately managed corresponding to the Emerson Class number and pH value, as detailed in the recommendations section of this report.

Table 4 Summary of the Emerson class results.

Layer	Soil	Depth	Sample ID	Emersion Class	Date Tested	Water	pH
1	Silty SAND	0	BH01 0.0	Class 3	21/01/2025	DI 24°C	
2	Sandy CLAY	0.3	BH01 0.3	Class 1	21/01/2025	DI 24°C	7.84
3	Clayey Sandy SILT	0.6	BH02 0.6	Class 1	21/01/2025	DI 24°C	6.68

Appendix E Geotechnical Interpretation

Footing Minimum Target Depths

Footing design for the proposed structures are to consider the depths of limiting layers at the base of Class P soils where present. Where practical/allowable, thickened beams may be deepened through problematic soil layers according to engineering specifications (Table 5). Table 6 should be referred to where only 50kPa allowable bearing capacity is required.

Table 5 also presents a summary of the estimated soil depths and associated layers where less than 5mm of vertical soil movement can expected due to soil moisture fluctuations from normal seasonal wetting and drying cycles. Where 5mm tolerances are required, concentrated loads including but not limited to slab edge or internal beam or strip footings shall be supported directly on piers in accordance with minimum target layer depths presented in Table 5, with considerations given to required bearing capacities in accordance with Table 6.

Table 5 Soil characteristic surface movements and recommended footing minimum target depths

Footing design parameters	BH01	BH02
Ys Calculation Depth^	0.00	0.00
Surface movement Ys (mm)	15	15
Soil class	S	S
Base of problem soil layer (m)*	-	-
Layer at base of problem soil*	-	-
Pier/Footing recommended target depth (m)#	0.7	0.9
Pier/footing recommended target layer#	4	4

- No problem layers encountered

*Base of problematic soil layer depth at test location below top of borehole surface to achieve 100 kPa allowable bearing capacity or greater.

Target soil layer depth below top of borehole surface where Ys values from normal wetting and drying cycles are estimated at less than 5mm vertical movement

^ Calculated based on depth below cut (with negative value) or above fill (with positive value) borehole drilling depth. Inferred fill reactivity will be conservatively assessment unless requested otherwise.

Soil and Rock Allowable Bearing Capacity

Soil allowable bearing capacity was calculated from correlations with DCP blow counts. Where high clay and silt content is observed in the soil, soil allowable bearing capacity is determined from undrained shear strengths using a field vane. Interpretive bearing capacity values are presented in Table 6.

Table 6 Soil allowable bearing capacities and problematic ground conditions.

Depth from (m)	Allowable Bearing Capacity (kPa)	
	BH01	BH02
0	**480***	
0.1	**360**	
0.2	**220**	
0.3	**140**	
0.4	**210**	
0.5	**250**	
0.6	**SANDSTONE**	
0.7	**SANDSTONE**	
0.8	**SANDSTONE**	**SANDSTONE**
0.9	**SANDSTONE**	**SANDSTONE**
1		**SANDSTONE**
1.1		**SANDSTONE**

Correlations drawn from DCP and vane shear testing.
REF - Penetrometer Refusal
*Soil layer expected at the base of problematic soil layers at test location (or at surface where problematic soils not encountered) to achieve 100 kPa allowable bearing capacity or greater.

Foundation Maintenance and Footing Performance:
A Homeowner's Guide

CSIRO

BTF 18
replaces
Information
Sheet 10/91

Buildings can and often do move. This movement can be up, down, lateral or rotational. The fundamental cause of movement in buildings can usually be related to one or more problems in the foundation soil. It is important for the homeowner to identify the soil type in order to ascertain the measures that should be put in place in order to ensure that problems in the foundation soil can be prevented, thus protecting against building movement.

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

Soil Types

The types of soils usually present under the topsoil in land zoned for residential buildings can be split into two approximate groups – granular and clay. Quite often, foundation soil is a mixture of both types. The general problems associated with soils having granular content are usually caused by erosion. Clay soils are subject to saturation and swell/shrink problems.

Classifications for a given area can generally be obtained by application to the local authority, but these are sometimes unreliable and if there is doubt, a geotechnical report should be commissioned. As most buildings suffering movement problems are founded on clay soils, there is an emphasis on classification of soils according to the amount of swell and shrinkage they experience with variations of water content. The table below is Table 2.1 from AS 2870, the Residential Slab and Footing Code.

Causes of Movement

Settlement due to construction
There are two types of settlement that occur as a result of construction:

- Immediate settlement occurs when a building is first placed on its foundation soil, as a result of compaction of the soil under the weight of the structure. The cohesive quality of clay soil mitigates against this, but granular (particularly sandy) soil is susceptible.
- Consolidation settlement is a feature of clay soil and may take place because of the expulsion of moisture from the soil or because of the soil's lack of resistance to local compressive or shear stresses. This will usually take place during the first few months after construction, but has been known to take many years in exceptional cases.

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

Erosion
All soils are prone to erosion, but sandy soil is particularly susceptible to being washed away. Even clay with a sand component of say 10% or more can suffer from erosion.

Saturation
This is particularly a problem in clay soils. Saturation creates a bog-like suspension of the soil that causes it to lose virtually all of its bearing capacity. To a lesser degree, sand is affected by saturation because saturated sand may undergo a reduction in volume – particularly imported sand fill for bedding and blinding layers. However, this usually occurs as immediate settlement and should normally be the province of the builder.

Seasonal swelling and shrinkage of soil
All clays react to the presence of water by slowly absorbing it, making the soil increase in volume (see table below). The degree of increase varies considerably between different clays, as does the degree of decrease during the subsequent drying out caused by fair weather periods. Because of the low absorption and expulsion rate, this phenomenon will not usually be noticeable unless there are prolonged rainy or dry periods, usually of weeks or months, depending on the land and soil characteristics.

The swelling of soil creates an upward force on the footings of the building, and shrinkage creates subsidence that takes away the support needed by the footing to retain equilibrium.

Shear failure
This phenomenon occurs when the foundation soil does not have sufficient strength to support the weight of the footing. There are two major post-construction causes:

- Significant load increase.
- Reduction of lateral support of the soil under the footing due to erosion or excavation.
- In clay soil, shear failure can be caused by saturation of the soil adjacent to or under the footing.

GENERAL DEFINITIONS OF SITE CLASSES

Class	Foundation
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites with only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites, which can experience moderate ground movement from moisture changes
H	Highly reactive clay sites, which can experience high ground movement from moisture changes
E	Extremely reactive sites, which can experience extreme ground movement from moisture changes
A to P	Filled sites
P	Sites which include soft soils, such as soft clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soils subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise

Tree root growth
Trees and shrubs that are allowed to grow in the vicinity of footings can cause foundation soil movement in two ways:

- Roots that grow under footings may increase in cross-sectional size, exerting upward pressure on footings.
- Roots in the vicinity of footings will absorb much of the moisture in the foundation soil, causing shrinkage or subsidence.

Unevenness of Movement

The types of ground movement described above usually occur unevenly throughout the building's foundation soil. Settlement due to construction tends to be uneven because of:

- Differing compaction of foundation soil prior to construction.
- Differing moisture content of foundation soil prior to construction.

Movement due to non-construction causes is usually more uneven still. Erosion can undermine a footing that traverses the flow or can create the conditions for shear failure by eroding soil adjacent to a footing that runs in the same direction as the flow.

Saturation of clay foundation soil may occur where subfloor walls create a dam that makes water pond. It can also occur wherever there is a source of water near footings in clay soil. This leads to a severe reduction in the strength of the soil which may create local shear failure.

Seasonal swelling and shrinkage of clay soil affects the perimeter of the building first, then gradually spreads to the interior. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Swelling gradually reaches the interior soil as absorption continues. Shrinkage usually begins where the sun's heat is greatest.

Effects of Uneven Soil Movement on Structures

Erosion and saturation
Erosion removes the support from under footings, tending to create subsidence of the part of the structure under which it occurs. Brickwork walls will resist the stress created by this removal of support by bridging the gap or cantilevering until the bricks or the mortar bedding fail. Older masonry has little resistance. Evidence of failure varies according to circumstances and symptoms may include:

- Step cracking in the mortar beds in the body of the wall or above/below openings such as doors or windows.
- Vertical cracking in the bricks (usually but not necessarily in line with the vertical beds or perpends).

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

Seasonal swelling/shrinkage in clay
Swelling foundation soil due to rainy periods first lifts the most exposed extremities of the footing system, then the remainder of the perimeter footings while gradually permeating inside the building footprint to lift internal footings. This swelling first tends to create a dish effect, because the external footings are pushed higher than the internal ones.

The first noticeable symptom may be that the floor appears slightly dished. This is often accompanied by some doors binding on the floor or the door head, together with some cracking of cornice mitres. In buildings with timber flooring supported by bearers and joists, the floor can be bouncy. Externally there may be visible dishing of the hip or ridge lines.

As the moisture absorption process completes its journey to the innermost areas of the building, the internal footings will rise. If the spread of moisture is roughly even, it may be that the symptoms will temporarily disappear, but it is more likely that swelling will be uneven, creating a difference rather than a disappearance in symptoms. In buildings with timber flooring supported by bearers and joists, the isolated piers will rise more easily than the strip footings or piers under walls, creating noticeable doming of flooring.

As the weather pattern changes and the soil begins to dry out, the external footings will be first affected, beginning with the locations where the sun's effect is strongest. This has the effect of lowering the external footings. The doming is accentuated and cracking reduces or disappears where it occurred because of dishing, but other cracks open up. The roof lines may become convex.

Doming and dishing are also affected by weather in other ways. In areas where warm, wet summers and cooler dry winters prevail, water migration tends to be toward the interior and doming will be accentuated, whereas where summers are dry and winters are cold and wet, migration tends to be toward the exterior and the underlying propensity is toward dishing.

Movement caused by tree roots
In general, growing roots will exert an upward pressure on footings, whereas soil subject to drying because of tree or shrub roots will tend to remove support from under footings by inducing shrinkage.

Complications caused by the structure itself
Most forces that the soil causes to be exerted on structures are vertical – i.e. either up or down. However, because these forces are seldom spread evenly around the footings, and because the building resists uneven movement because of its rigidity, forces are exerted from one part of the building to another. The net result of all these forces is usually rotational. This resultant force often complicates the diagnosis because the visible symptoms do not simply reflect the original cause. A common symptom is binding of doors on the vertical member of the frame.

Effects on full masonry structures
Brickwork will resist cracking where it can. It will attempt to span areas that lose support because of subsided foundations or raised points. It is therefore usual to see cracking at weak points, such as openings for windows or doors.

In the event of construction settlement, cracking will usually remain unchanged after the process of settlement has ceased.

With local shear or erosion, cracking will usually continue to develop until the original cause has been remedied, or until the subsidence has completely neutralised the affected portion of footing and the structure has stabilised on other footings that remain effective.

In the case of swell/shrink effects, the brickwork will in some cases return to its original position after completion of a cycle, however it is more likely that the rotational effect will not be exactly reversed, and it is also usual that brickwork will settle in its new position and will resist the forces trying to return it to its original position. This means that in a case where swelling takes place after construction and cracking occurs, the cracking is likely to at least partly remain after the shrink segment of the cycle is complete. Thus, each time the cycle is repeated, the likelihood is that the cracking will become wider until the sections of brickwork become virtually independent.

With repeated cycles, once the cracking is established, if there is no other complication, it is normal for the incidence of cracking to stabilise, as the building has the articulation it needs to cope with the problem. This is by no means always the case, however, and monitoring of cracks in walls and floors should always be treated seriously.

Upheaval caused by growth of tree roots under footings is not a simple vertical shear stress. There is a tendency for the root to also exert lateral forces that attempt to separate sections of brickwork after initial cracking has occurred.

The normal structural arrangement is that the inner leaf of brickwork in the external walls and at least some of the internal walls (depending on the roof type) comprise the load-bearing structure on which any upper floors, ceilings and the roof are supported. In these cases, it is internally visible cracking that should be the main focus of attention, however there are a few examples of dwellings whose external leaf of masonry plays some supporting role, so this should be checked if there is any doubt. In any case, externally visible cracking is important as a guide to stresses on the structure generally, and it should also be remembered that the external walls must be capable of supporting themselves.

Effects on framed structures
Timber or steel framed buildings are less likely to exhibit cracking due to swell/shrink than masonry buildings because of their flexibility. Also, the doming/dishing effects tend to be lower because of the lighter weight of walls. The main risks to framed buildings are encountered because of the isolated pier footings used under walls. Where erosion or saturation cause a footing to fall away, this can double the span which a wall must bridge. This additional stress can create cracking in wall linings, particularly where there is a weak point in the structure caused by a door or window opening. It is, however, unlikely that framed structures will be so stressed as to suffer serious damage without first exhibiting some or all of the above symptoms for a considerable period. The same warning period should apply in the case of upheaval. It should be noted, however, that where framed buildings are supported by strip footings there is only one leaf of brickwork and therefore the externally visible walls are the supporting structure for the building. In this case, the subfloor masonry walls can be expected to behave as full brickwork walls.

Effects on brick veneer structures
Because the load-bearing structure of a brick veneer building is the frame that makes up the interior leaf of the external walls plus perhaps the internal walls, depending on the type of roof, the building can be expected to behave as a framed structure, except that the external masonry will behave in a similar way to the external leaf of a full masonry structure.

Water Service and Drainage

Where a water service pipe, a sewer or stormwater drainage pipe is in the vicinity of a building, a water leak can cause erosion, swelling or saturation of susceptible soil. Even a minuscule leak can be enough to saturate a clay foundation. A leaking tap near a building can have the same effect. In addition, trenches containing pipes can become watercourses even though backfilled, particularly where broken rubble is used as fill. Water that runs along these trenches can be responsible for serious erosion, interstrata seepage into subfloor areas and saturation.

Pipe leakage and trench water flows also encourage tree and shrub roots to the source of water, complicating and exacerbating the problem.
Poor roof plumbing can result in large volumes of rainwater being concentrated in a small area of soil:

- Incorrect falls in roof guttering may result in overflows, as may gutters blocked with leaves etc.
- Corroded guttering or downpipes can spill water to ground.
- Downpipes not positively connected to a proper stormwater collection system will direct a concentration of water to soil that is directly adjacent to footings, sometimes causing large-scale problems such as erosion, saturation and migration of water under the building.

Seriousness of Cracking

In general, most cracking found in masonry walls is a cosmetic nuisance only and can be kept in repair or even ignored. The table below is a reproduction of Table C1 of AS 2870.

AS 2870 also publishes figures relating to cracking in concrete floors, however because wall cracking will usually reach the critical point significantly earlier than cracking in slabs, this table is not reproduced here.

Prevention/ Cure

Plumbing
Where building movement is caused by water service, roof plumbing, sewer or stormwater failure, the remedy is to repair the problem. It is prudent, however, to consider also rerouting pipes away from the building where possible, and relocating taps to positions where any leakage will not direct water to the building vicinity. Even where gully traps are present, there is sometimes sufficient spill to create erosion or saturation, particularly in modern installations using smaller diameter PVC fixtures. Indeed, some gully traps are not situated directly under the taps that are installed to charge them, with the result that water from the tap may enter the backfilled trench that houses the sewer piping. If the trench has been poorly backfilled, the water will either pond or flow along the bottom of the trench. As these trenches usually run alongside the footings and can be at a similar depth, it is not hard to see how any water that is thus directed into a trench can easily affect the foundation's ability to support footings or even gain entry to the subfloor area.

Ground drainage
In all soils there is the capacity for water to travel on the surface and below it. Surface water flows can be established by inspection during and after heavy or prolonged rain. If necessary, a grated drain system connected to the stormwater collection system is usually an easy solution.

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

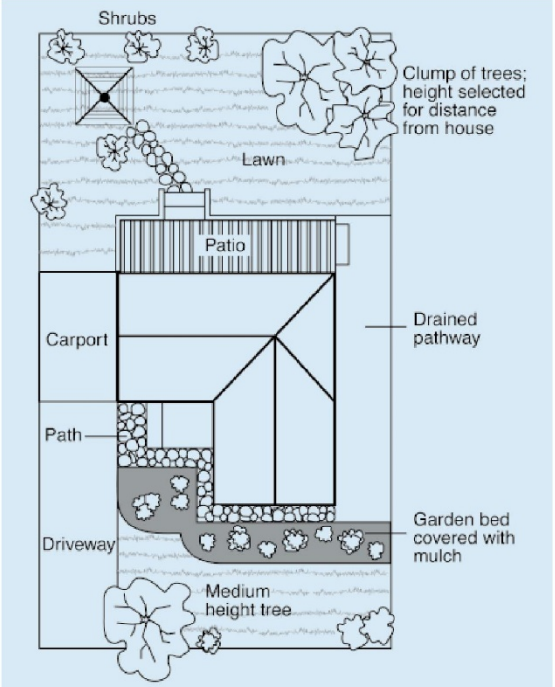
Protection of the building perimeter
It is essential to remember that the soil that affects footings extends well beyond the actual building line. Watering of garden plants, shrubs and trees causes some of the most serious water problems.

For this reason, particularly where problems exist or are likely to occur, it is recommended that an apron of paving be installed around as much of the building perimeter as necessary. This paving

CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS

Description of typical damage and required repair	Approximate crack width limit (see Note 3)	Damage category
Hairline cracks	<0.1 mm	0
Fine cracks which do not need repair	<1 mm	1
Cracks noticeable but easily filled. Doors and windows stick slightly	<5 mm	2
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weathertightness often impaired	5–15 mm (or a number of cracks 3 mm or more in one group)	3
Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted	15–25 mm but also depend on number of cracks	4

Gardens for a reactive site



should extend outwards a minimum of 900 mm (more in highly reactive soil) and should have a minimum fall away from the building of 1:60. The finished paving should be no less than 100 mm below brick vent bases.

It is prudent to relocate drainage pipes away from this paving, if possible, to avoid complications from future leakage. If this is not practical, earthenware pipes should be replaced by PVC and backfilling should be of the same soil type as the surrounding soil and compacted to the same density.

Except in areas where freezing of water is an issue, it is wise to remove taps in the building area and relocate them well away from the building – preferably not uphill from it (see BTF 19).

It may be desirable to install a grated drain at the outside edge of the paving on the uphill side of the building. If subsoil drainage is needed this can be installed under the surface drain.

Condensation
In buildings with a subfloor void such as where bearers and joists support flooring, insufficient ventilation creates ideal conditions for condensation, particularly where there is little clearance between the floor and the ground. Condensation adds to the moisture already present in the subfloor and significantly slows the process of drying out. Installation of an adequate subfloor ventilation system, either natural or mechanical, is desirable.

Warning: Although this Building Technology File deals with cracking in buildings, it should be said that subfloor moisture can result in the development of other problems, notably:

- Water that is transmitted into masonry, metal or timber building elements causes damage and/or decay to those elements.
- High subfloor humidity and moisture content create an ideal environment for various pests, including termites and spiders.
- Where high moisture levels are transmitted to the flooring and walls, an increase in the dust mite count can ensue within the living areas. Dust mites, as well as dampness in general, can be a health hazard to inhabitants, particularly those who are abnormally susceptible to respiratory ailments.

The garden
The ideal vegetation layout is to have lawn or plants that require only light watering immediately adjacent to the drainage or paving edge, then more demanding plants, shrubs and trees spread out in that order.

Overwatering due to misuse of automatic watering systems is a common cause of saturation and water migration under footings. If it is necessary to use these systems, it is important to remove garden beds to a completely safe distance from buildings.

Existing trees
Where a tree is causing a problem of soil drying or there is the existence or threat of upheaval of footings, if the offending roots are subsidiary and their removal will not significantly damage the tree, they should be severed and a concrete or metal barrier placed vertically in the soil to prevent future root growth in the direction of the building. If it is not possible to remove the relevant roots without damage to the tree, an application to remove the tree should be made to the local authority. A prudent plan is to transplant likely offenders before they become a problem.

Information on trees, plants and shrubs
State departments overseeing agriculture can give information regarding root patterns, volume of water needed and safe distance from buildings of most species. Botanic gardens are also sources of information. For information on plant roots and drains, see Building Technology File 17.

Excavation
Excavation around footings must be properly engineered. Soil supporting footings can only be safely excavated at an angle that allows the soil under the footing to remain stable. This angle is called the angle of repose (or friction) and varies significantly between soil types and conditions. Removal of soil within the angle of repose will cause subsidence.

Remediation

Where erosion has occurred that has washed away soil adjacent to footings, soil of the same classification should be introduced and compacted to the same density. Where footings have been undermined, augmentation or other specialist work may be required. Remediation of footings and foundations is generally the realm of a specialist consultant.

Where isolated footings rise and fall because of swell/shrink effect, the homeowner may be tempted to alleviate floor bounce by filling the gap that has appeared between the bearer and the pier with blocking. The danger here is that when the next swell segment of the cycle occurs, the extra blocking will push the floor up into an accentuated dome and may also cause local shear failure in the soil. If it is necessary to use blocking, it should be by a pair of fine wedges and monitoring should be carried out fortnightly.

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

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CERTIFICATE OF QUALIFIED PERSON – ASSESSABLE ITEM

Section 321

Form 55

To: Jack Johnstone *Owner /Agent*

1 Lagoon View Court *Address*

Midway Point 7171 *Suburb/postcode*

Qualified person details:

Qualified person: Kris Taylor

Address: 162 Macquarie Street

Hobart 7000

Phone No: 036224 9197

Fax No:

Licence No: NA

Email address: office@envirotechtas.com.au

Qualifications and Insurance details: Bachelor of Science with Honours in Geology. Lloyd's Underwriting $2,000,000: Site classification. Soil & rock testing. Soil & rock mechanics.

(description from Column 3 of the Director's Determination - Certificates by Qualified Persons for Assessable Items

Speciality area of expertise: Foundation classification in accordance with AS 2870*

(description from Column 4 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)

Details of work: Foundation Classification

Address: 6 Sunningdale Close

Lot No: 80

Midway Point 7171

Certificate of title No: 184768/80

The assessable item related to this certificate: Classification of foundation Conditions according to AS2870-2011*

(description of the assessable item being certified)
Assessable item includes –
- *a material;*
- *a design*
- *a form of construction*
- *a document*
- *testing of a component, building system or plumbing system*
- *an inspection, or assessment, performed*

Certificate details:

Certificate type: Foundation classification - AS 2870 and Stability Report in accordance with Foundation and Footings Society (Tasmania) Code of Practice.*

(description from Column 1 of Schedule 1 of the Director's Determination - Certificates by Qualified Persons for Assessable Items n)

This certificate is in relation to the above assessable items, at any stage, as part of – *(tick one)*

(•) building work, plumbing work or plumbing installation or demolition work

OR

( ) a building, temporary structure or plumbing installation

In issuing this certificate the following matters are relevant –

Documents:	*Enviro-Tech Consultants Pty. Ltd. 2025. Foundation Classification Report for a Proposed Purchase Of Land, 6 Sunningdale Close - Midway Point. Unpublished report for Jack Johnstone by Enviro-Tech Consultants Pty. Ltd., 16/01/2025.
Relevant calculations:	
References:	AS2870-2011 Residential Slabs and Footings AS1726-2017 Geotechnical site investigations AS1289-2014 Methods of testing soils for engineering purposes CSIRO Building technology file – 18.

Substance of Certificate: *(what it is that is being certified)*

Foundation classification consistent with AS2870-2011.

Scope and/or Limitations

The classification applies to the Site as inspected and does not account for future alteration to foundation conditions as a result of earth works, placement of fill, uncontrolled earthworks, drainage condition changes, variations in site maintenance other than indicated in supplied plans.

*This report contains soil classification information prepared in accordance with AS2870 as well as AS2870 extracts which may be used as general guidance for plumbing design. The hydraulic designer is to use their own judgment in the application of this information and this report must be read in in conjunction with hydraulic plans prepared for the proposed development.

I certify the matters described in this certificate.

	Signed:	*Certificate No:*	*Date:*
Qualified person:			16/01/2025