NOTICE OF PROPOSED DEVELOPMENT

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

SITE: 231 Greens Road, Orielton

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 2nd June 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 2nd June 2025.**

APPLICANT: **Daniel Lindahl Architecture**

APPLICATION NO: **DA 2024 /295 1**
DATE: **16 May 2025**

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

Full description of Proposal:	*Use:* family dwelling *Development:* construction of new residence and shed *Large or complex proposals should be described in a letter or planning report.*
Design and construction cost of proposal:	$ 800 000

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

Location of proposed works:	Street address: 231 Greens Rd Suburb: Orielton Postcode: TAS 7172 Certificate of Title(s) Volume: 180600 Folio: 4

Current Use of Site	vacant land

Current Owner/s:	Name(s) Josiah Huppatz and Aaron Huppatz

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/		

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

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: D. Lindah Date: 18 November 2024

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: 5.2024.295.1 - 231 Greens Road, Orielton Plans Reference: P1 Date Received: 18/11/2024

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

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
180600	4
EDITION	DATE OF ISSUE
2	30-Jun-2022

SEARCH DATE : 15-Jan-2024
SEARCH TIME : 03.14 PM

DESCRIPTION OF LAND

Parish of SORELL Land District of PEMBROKE
Lot 4 on Sealed Plan 180600
Derivation : Part of Lot 30000, 276A-1R-25P Gtd. to Owen Douglas Townsend
Prior CT 103907/8

SCHEDULE 1

M960680 TRANSFER to AARON JOSHUA HUPPATZ and JOSIAH ELIJAH HUPPATZ Registered 30-Jun-2022 at 12.01 PM

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP180600 FENCING COVENANT in Schedule of Easements
SP103907 FENCING PROVISION in Schedule of Easements
E308945 MORTGAGE to Bendigo and Adelaide Bank Limited Registered 30-Jun-2022 at 12.02 PM

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

OWNER: GREGORY RAYMOND COWEN

FOLIO REFERENCE: CT.103907-8

GRANTEE: PART OF LOT 30000 (276-1-25) GRANTED TO OWEN DOUGLAS TOWNSEND

PLAN OF SURVEY

BY SURVEYOR TIMOTHY LEIGH GOWLLAND
ROGERSON AND BIRCH SURVEYORS
UNIT 1 – 2 KENNEDY DRIVE, CAMBRIDGE PARK
PH 6248-5898 MOB. 0419-594-966

LAND DISTRICT OF PEMBROKE
PARISH OF SORELL
SCALE 1: 1250 LENGTHS IN METRES

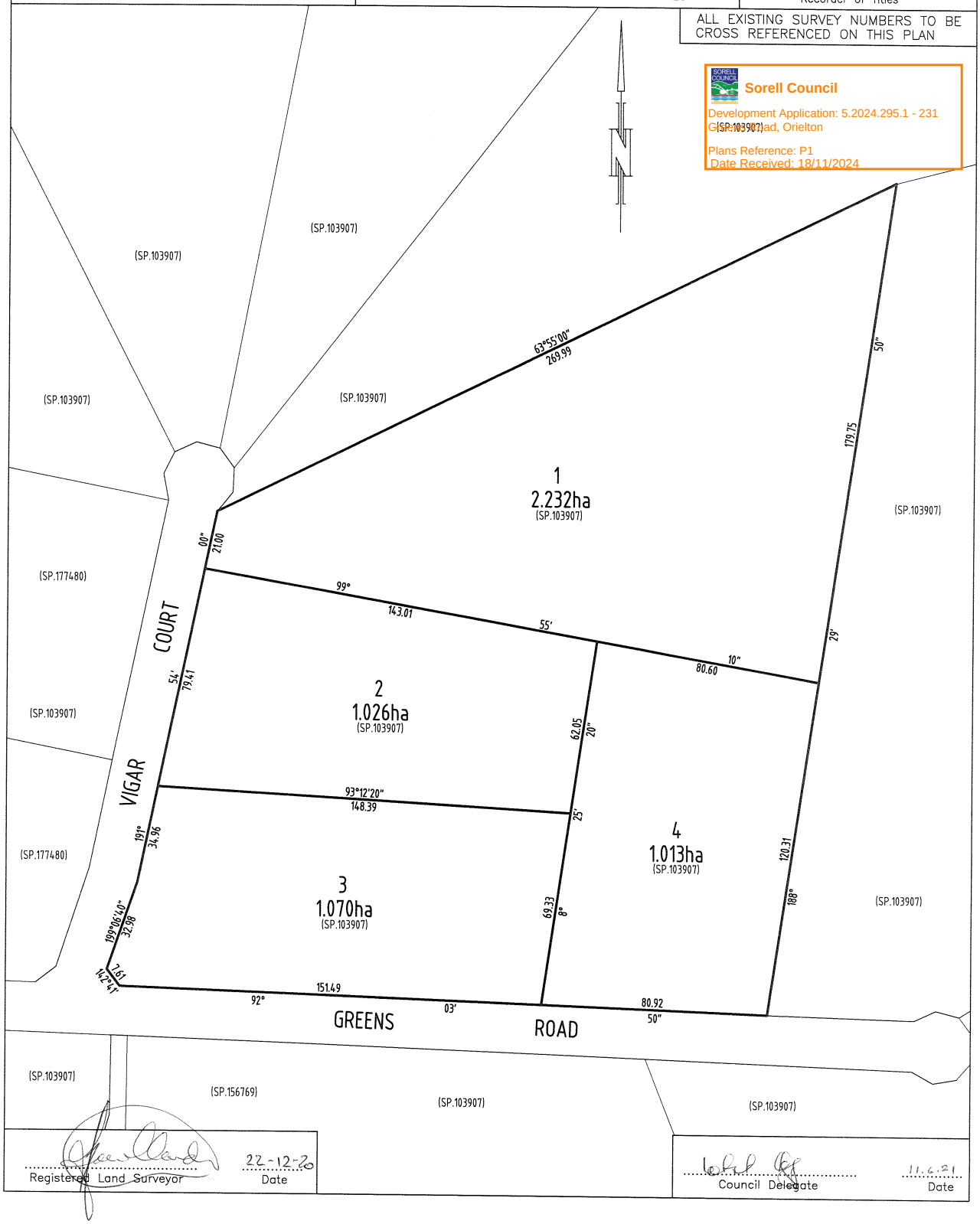
Registered Number
SP180600

APPROVED
EFFECTIVE FROM 16 JUL 2021

Recorder of Titles

ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

Sorell Council
Development Application: 5.2024.295.1 - 231 Gladstone Road, Orielton
Plans Reference: P1
Date Received: 18/11/2024



Registered Land Surveyor — 22-12-20 Date

Council Delegate — 11.6.21 Date

DISPERSIVE SOIL ASSESSMENT

231 Greens Road

Orielton

March 2025

GEO-ENVIRONMENTAL

SOLUTIONS

Investigation Details

Client:	Josiah Huppatz
Site Address:	231 Greens Road, Orielton
Date of Inspection:	25/03/2025
Proposed Works:	New house
Investigation Method:	Geoprobe 540UD - Direct Push
Inspected by:	C. Cooper

Site Details

Certificate of Title (CT):	180600/4
Title Area:	Approx. 1.014 ha
Applicable Planning Overlays:	Bushfire-prone areas, Landslip Hazard, Airport obstacle limitation area
Slope & Aspect:	18° SW facing slope
Vegetation:	Grass & Weeds

Background Information

Geology Map:	MRT
Geological Unit:	Tertiary Basalt
Climate:	Annual rainfall 550mm
Water Connection:	Tank
Sewer Connection:	Unserviced-On-site required
Testing and Classification:	AS2870:2011, AS1726:2017 & AS4055:2021

Investigation

A number of bore holes were completed to identify the distribution and variation of the soil materials at the site, bore hole locations are indicated on the site plan. See soil profile conditions presented below. Tests were conducted across the site to obtain bearing capacities of the material at the time of this investigation.

Soil Profile Summary

BH 1 Depth (m)	BH 2 Depth (m)	USCS	Description
0.00-2.40	0.00-1.70	GC	FILL: **Clayey GRAVEL**: pale brown, slightly moist, very dense,
2.40-2.90	1.70-2.20	CI	FILL: **Silty CLAY**: with gravels, medium plasticity, grey, dark grey, slightly moist, stiff,
2.90-3.00		ML	**Clayey SILT**: low plasticity, black, slightly moist, dense
3.00-3.50		GM	**Gravelly SILT**: low to medium plasticity, dark grey, pale grey, slightly moist, dense
3.50-3.80		CH	**Silty CLAY**: with gravels, medium to high plasticity, dark grey, slightly moist, stiff,
3.80-5.00+	2.20-3.00+	CL	**Gravelly CLAY**: medium plasticity, pink, red, green, slightly moist, stiff, no refusal

BH 3 Depth (m)	BH 4 Depth (m)	USCS	Description
0.00-0.70	0.00-0.90	GC	FILL: **Clayey GRAVEL**: pale brown, slightly moist, very dense,
0.70-0.80	0.90-1.00	ML	**Clayey SILT**: low plasticity, black, slightly moist, dense
0.80-1.00		CH	**Silty CLAY**: with gravels, medium to high plasticity, dark grey, slightly moist, stiff,
1.00-2.00+	1.00-2.00+	CL	**Gravelly CLAY**: medium plasticity, pink, red, green, slightly moist, stiff, no refusal

BH 5 Depth (m)	USCS	Description
0.00-0.20	ML	**Clayey SILT**: low plasticity, black, slightly moist, dense
0.20-1.20	CH	**Silty CLAY**: medium to high plasticity, dark grey, brown, slightly moist, stiff,
1.20-2.00+	GM	**Gravelly SILT**: pale brown, slightly moist, very dense, no refusal

Site Notes

Soils on the site are developing from Tertiary basalt, the clay fraction is likely to show significant ground surface movement with moisture fluctuations.

Dispersive Soil Assessment

The dispersive soil assessment of the property considers the proposed construction area.

Potential for dispersive soils

Tertiary sediments are known to produce soils with an excess of sodium on the soil exchange complex, which can cause soil dispersion. Under some circumstances the presence of dispersive soils can also lead to significant erosion, and in particular tunnel and/or gully erosion. Based upon field survey of the property and the surrounding area, no tunnel and gully erosion were identified at the site. A soil sampling program was undertaken to identify the presence of dispersive soils in the proposed development areas, with particular focus on the house site.

Soil sampling and testing

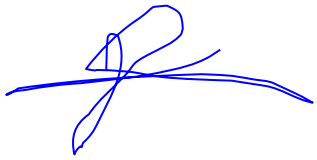
Two samples were taken at the site for assessment of dispersion. An Emerson (1968) Dispersion test was conducted to determine if these samples were dispersive.

The sampling and testing results indicate that the soil on site is non-dispersive. Based upon the test results there is a very low risk of soil dispersion and erosion on the site, and as such no dispersive soil management recommendations have been made.

Conclusions

There is a very low risk associated with dispersive soils and potential erosion on the site. It is recommended, however, that all excavation works on site should be monitored for signs of soil dispersion and remedial action taken as required if necessary.

It is recommended that during construction that GES be notified of any major variation to the soil conditions as predicted in this report.



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

Appendix 1– Soil test results

Laboratory Test Results

Sample Submitted By: A Plummer

Date Submitted: 26/3/25

Sample Identification: 2 samples – 231 Greens Road

Soil to be tested: **Emerson soil dispersion test**

Result:

Sample	Texture	Emerson class	Description
Sample 1	**Clay**	**Class 8**	**slaking**
Sample 2	**Clay**	**Class 8**	**slaking**

Sample Tested by: A Plummer

Disclaimer

This Report has been prepared in accordance with the scope of services between Geo-Environmental Solutions Pty. Ltd. (GES) and the Client. To the best of GES's knowledge, the information presented herein represents the client's requirements at the time of printing of the Report. However, the passage of time, manifestation of latent conditions or impacts of future events may result in findings differing from that discussed in this Report. In preparing this Report, GES has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organizations referenced herein. Except as otherwise stated in this Report, GES has not verified the accuracy or completeness of such data, surveys, analyses, designs, plans and other information.

The scope of this study does not allow for the review of every possible geotechnical parameter or the soil conditions over the whole area of the site. Soil and rock samples collected from the investigation area are assumed to be representative of the areas from where they were collected and not indicative of the entire site. The conclusions discussed within this report are based on observations and/or testing at these investigation points.

This report does not purport to provide legal advice. Readers of the report should engage professional legal practitioners for this purpose as required.

No responsibility is accepted for the use of any part of this report in any other context or for any other purpose by a third party.

ONSITE WASTEWATER ASSESSMENT

231 Greens Road

Orielton

April 2025

GES

GEO-ENVIRONMENTAL

SOLUTIONS

Investigation Details

Client:	Josiah Huppatz
Site Address:	231 Greens Road, Orielton
Date of Inspection:	25/03/2025
Proposed Works:	New house
Investigation Method:	Geoprobe 540UD - Direct Push
Inspected by:	C. Cooper

Site Details

Certificate of Title (CT):	180600/4
Title Area:	Approx. 1.014 ha
Applicable Planning Overlays:	Bushfire-prone areas, Landslip Hazard, Airport obstacle limitation area
Slope & Aspect:	15° SW facing slope
Vegetation:	Grass & Weeds

Background Information

Geology Map:	MRT
Geological Unit:	Tertiary Basalt
Climate:	Annual rainfall 550mm
Water Connection:	Tank
Sewer Connection:	Unserviced-On-site required
Testing and Classification:	AS1547:2012

Investigation

A number of bore holes were completed to identify the distribution and variation of the soil materials at the site, bore hole locations are indicated on the site plan. See soil profile conditions presented below. Tests were conducted across the site to obtain bearing capacities of the material at the time of this investigation.

Soil Profile Summary

BH 1 Depth (m)	BH 2 Depth (m)	USCS	Description
0.00-2.40	0.00-1.70	GC	FILL: **Clayey GRAVEL**: pale brown, slightly moist, very dense,
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BH 5 Depth (m)	USCS	Description
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0.20-1.20	CH	**Silty CLAY**: medium to high plasticity, dark grey, brown, slightly moist, stiff,
1.20-2.00+	GM	**Gravelly SILT**: pale brown, slightly moist, very dense, no refusal

Site Notes

The soil depth in the proposed building area is over 2.00m and the soil contains a significant amount of fill. The fill is of various size fractions and is likely to have variable bearing capacity and should not be used as a founding substrate.

Wastewater Classification & Recommendations

According to AS1547-2012 for on-site wastewater management the soil within the proposed application area is classified as **CLAY LOAM (Category 4)**. It is proposed to install a package treatment system (e.g., AWTS such as Econocycle, Envirocycle, Ozzikleen) to service the proposed development with treated effluent disposed via subsurface irrigation. A Design Irrigation Rate (DIR) of 3.5mm/day is typically applied to a category 4 soil, however this has been reduced to 2.8mm/day due to the slope angle onsite.

The proposed development has a maximum wastewater output of 720L/day. This is based on a tank water supply and a maximum occupancy of 6 people (120L/day/person). Using the DIR of 2.8mm/day, an irrigation area of at least 260m^2 will be required.

A 100% reserve area will need to be set aside for future wastewater requirements and be kept free from development. There is sufficient area available on site, therefore no formal reserve area has been assigned. A surface diversion drain will be required to divert stormwater flows away from the irrigation area.

The following setback distances are required to comply with Building Act 2016:

Upslope and level buildings:	3m
Downslope buildings:	6m
Upslope or level boundaries:	1.5m
Downslope boundary:	16.5m
Downslope surface water:	100m

Compliance with Building Act 2016 Guidelines for On-site Wastewater Management Systems is outlined in the attached table.

During construction GES will need to be notified of any major variation to the soil conditions or wastewater loading as outlined in this report.

Dr John Paul Cumming B.Agr.Sc (hons) PhD CPSS GAICD

Director

GES Pty Ltd

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Assessment Report

Site assessment for wastewater system

Assessment for	Josiah Huppatz	Assess. Date	29-Apr-25
		Ref. No.	
Assessed site(s)	231 Greens Rd Orielton	Site(s) inspected	25-Mar-25
Local authority	Sorell	Assessed by	John Paul Cumming

This report summarises wastewater volumes, climatic inputs for the site, soil characteristics and sustem sizing and design issues. Site Capability and Environmental sensitivity issues are reported separately, where 'Alert' columns flag factors with high (A) or very high (AA) limitations which probably require special consideration for system design(s). Blank spaces on this page indicate data have not been entered into TRENCH.

Wastewater Characteristics

Wastewater volume (L/day) used for this assessment = 720 (using a method independent of the no. of bedrooms)

Septic tank wastewater volume (L/day) = 240

Sullage volume (L/day) = 480

Total nitrogen (kg/year) generated by wastewater = 3.9

Total phosphorus (kg/year) generated by wastewater = 1.8

Climatic assumptions for site

(Evapotranspiration calculated using the crop factor method)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean rainfall (mm)	41	36	36	47	44	48	48	47	49	55	47	49
Adopted rainfall (R, mm)	41	36	36	47	44	48	48	47	49	55	47	49
Retained rain (Rr, mm)	32	29	29	38	35	38	38	38	39	44	38	39
Max. daily temp. (deg. C)												
Evapotrans (ET, mm)	130	110	91	63	42	29	32	42	63	84	105	126
Evapotr. less rain (mm)	**98**	**81**	**62**	**25**	**7**	**-9**	**-7**	**4**	**24**	**40**	**67**	**87**

Annual evapotranspiration less retained rain (mm) = 480

Soil characterisitics

Texture = Clay loam Category = 4 Thick. (m) = 2

Adopted permeability (m/day) = 0.78 Adopted LTAR (L/sq m/day) = 3 Min depth (m) to water = 5

Proposed disposal and treatment methods

Proportion of wastewater to be retained on site:	All wastewater will be disposed of on the site
The preferred method of on-site primary treatment:	In a package treatment plant
The preferred method of on-site secondary treatment:	In-ground
The preferred type of in-ground secondary treatment:	None
The preferred type of above-ground secondary treatment:	None
Site modifications or specific designs:	Not needed

Suggested dimensions for on-site secondary treatment system

Total length (m) =	29
Width (m) =	9
Depth (m) =	0.6
Total disposal area (sq m) required =	260
comprising a Primary Area (sq m) of:	260
and a Secondary (backup) Area (sq m) of:	

Sufficient area is available on site

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

Comment

Calculated DIR for the soil for wastewater is 2.8mm/day, with a required irrigation area of 260m^2.

GES Pty Ltd

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Site Capability Report

Site assessment for wastewater system

Assessment for	Josiah Huppatz	Assess. Date	29-Apr-25
		Ref. No.	
Assessed site(s)	231 Greens Rd Orielton	Site(s) inspected	25-Mar-25
Local authority	Sorell	Assessed by	John Paul Cumming

This report summarises data relating to the physical capability of the assessed site(s) to accept wastewater. Environmental sensitivity and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) site limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
	Expected design area	sq m	10,000	V. high	Very low		
	Density of disposal systems	/sq km	10	High	Very low		
	Slope angle	degrees	12	V. high	Moderate		
	Slope form	Straight simple		V. high	Low		
	Surface drainage	Mod. good		High	Low		
	Flood potential	Site floods <1:100 yrs		High	Very low		
	Heavy rain events	Infrequent		High	Moderate		
A	Aspect (Southern hemi.)	Faces SE or SW		V. high	High		
	Frequency of strong winds	Common		High	Low		
	Wastewater volume	L/day	720	High	Moderate		
	SAR of septic tank effluent		1.7	Mod.	Low		
	SAR of sullage		2.1	Mod.	Moderate		
	Soil thickness	m	2.0	V. high	Very low		
	Depth to bedrock	m	3.0	High	Very low		
	Surface rock outcrop	%	0	High	Very low		
	Cobbles in soil	%	0	High	Very low		
	Soil pH		6.0	High	Low		
	Soil bulk density	gm/cub. cm	1.5	High	Low		
	Soil dispersion	Emerson No.	8	V. high	Very low		
	Adopted permeability	m/day	0.78	High	Moderate		
A	Long Term Accept. Rate	L/day/sq m	3	High	High		

To enter comments, click on the line below 'Comments' . (This yellow-shaded box and the buttons on this page will not be printed.)

The site has the capability to accept secondary treated wastewater.

GES Pty Ltd

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Environmental Sensitivity Report

Site assessment for wastewater system

Assessment for	Josiah Huppatz	Assess. Date	29-Apr-25
		Ref. No.	
Assessed site(s)	231 Greens Rd Orielton	Site(s) inspected	25-Mar-25
Local authority	Sorell	Assessed by	John Paul Cumming

This report summarises data relating to the environmental sensitivity of the assessed site(s) in relation to applied wastewater. Physical capability and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
	Cation exchange capacity	mmol/100g	95	High	Low		
	Phos. adsorp. capacity	kg/cub m	0.6	Mod.	Moderate		
	Annual rainfall excess	mm	-480	High	Very low		
	Min. depth to water table	m	5	High	Very low		
	Annual nutrient load	kg	5.6	High	Low		
	G'water environ. value	Agric non-sensit		High	Low		
	Min. separation dist. required	m	2	High	Very low		
	Risk to adjacent bores	Very low		High	Very low		
	Surf. water env. value	Agric non-sensit		High	Low		
	Dist. to nearest surface water	m	400	High	Low		
	Dist. to nearest other feature	m	60	V. high	Low		
	Risk of slope instability	Very low		High	Very low		
	Distance to landslip	m	100	Mod.	Moderate		

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

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No responsibility is accepted for use of any part of this report in any other context or for any other purpose by a third party.

Demonstration of wastewater system compliance to *Building Act 2016 Guidelines for On-site Wastewater Disposal*

Acceptable Solutions	**Performance Criteria**	**Compliance**
A1 Horizontal separation distance from a building to a land application area must comply with one of the following: a) be no less than 6m; or b) be no less than: (i) 3m from an upslope building or level building; (ii) If primary treated effluent to be no less than 4m plus 1m for every degree of average gradient from a downslope building; (iii) If secondary treated effluent and subsurface application, no less than 2m plus 0.25m for every degree of average gradient from a downslope building.	P1 a) The land application area is located so that (i) the risk of wastewater reducing the bearing capacity of a building's foundations is acceptably low.; and (ii) is setback a sufficient distance from a downslope excavation around or under a building to prevent inadequately treated wastewater seeping out of that excavation	Complies with A1 (b) (i) Land application area will be located with a minimum separation distance of 3m from an upslope or level building.
A2 Horizontal separation distance from downslope surface water to a land application area must comply with (a) or (b) (a) be no less than 100m; or (b) be no less than the following: (i) if primary treated effluent 15m plus 7m for every degree of average gradient to downslope surface water; or (ii) if secondary treated effluent and subsurface application, 15m plus 2m for every degree of average gradient to down slope surface water.	P2 Horizontal separation distance from downslope surface water to a land application area must comply with all of the following: a) Setbacks must be consistent with AS/NZS 1547 Appendix R; b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A2 (a) Land application area located > 100m from downslope surface water

A3 Horizontal separation distance from a property boundary to a land application area must comply with either of the following: (a) be no less than 40m from a property boundary; or (b) be no less than: (i) 1.5m from an upslope or level property boundary; and (ii) If primary treated effluent 2m for every degree of average gradient from a downslope property boundary; or (iii) If secondary treated effluent and subsurface application, 1.5m plus 1m for every degree of average gradient from a downslope property boundary.	P3 Horizontal separation distance from a property boundary to a land application area must comply with all of the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A3 (b) (i) Land application area will be located with a minimum separation distance of 1.5m from an upslope or level property boundary Complies with A3 (b) (iii) Land application area will be located with a minimum separation distance of 16.5m of downslope property boundary
A4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must be no less than 50m and not be within the zone of influence of the bore whether up or down gradient.	P4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must comply with all of the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment completed in accordance with Appendix A of AS/NZS 1547 demonstrates that the risk is acceptable	Complies with A4 No bore or well identified within 50m

A5 Vertical separation distance between groundwater and a land application area must be no less than: (a) 1.5m if primary treated effluent; or (b) 0.6m if secondary treated effluent	P5 Vertical separation distance between groundwater and a land application area must comply with the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment completed in accordance with Appendix A of AS/NZS 1547 that demonstrates that the risk is acceptable	Complies with A5 (b)
A6 Vertical separation distance between a limiting layer and a land application area must be no less than: (a) 1.5m if primary treated effluent; or (b) 0.5m if secondary treated effluent	P6 Vertical setback must be consistent with AS/NZS1547 Appendix R.	Complies with A6 (b)
A7 nil	P7 A wastewater treatment unit must be located a sufficient distance from buildings or neighbouring properties so that emissions (odour, noise or aerosols) from the unit do not create an environmental nuisance to the residents of those properties	Complies

AS1547:2012 – Loading Certificate – AWTS Design

This loading certificate sets out the design criteria and the limitations associated with use of the system.

Site Address: 231 Greens Rd, Orielton

System Capacity: 6 persons @ 120L/person/day

Summary of Design Criteria

DIR: 2.8mm/day.

Irrigation area: 260m^2

Reserve area location /use: Not assigned – more than 100% available

Water saving features fitted: Standard fixtures

Allowable variation from design flows: 1 event @ 200% daily loading per quarter

Typical loading change consequences: Expected to be minimal due to use of AWTS and large land area

Overloading consequences: Continued overloading may cause hydraulic failure of the irrigation area and require upgrading/extension of the area. Risk considered acceptable due to monitoring through quarterly maintenance reports.

Underloading consequences: Lower than expected flows will have minimal consequences on system operation unless the house has long periods of non occupation. Under such circumstances additional maintenance of the system may be required. Long term under loading of the system may also result in vegetation die off in the irrigation areas and additional watering may be required. Risk considered acceptable due to monitoring through quarterly maintenance reports.

Lack of maintenance / monitoring consequences: Issues of underloading/overloading and condition of the irrigation area require monitoring and maintenance, if not completed system failure may result in unacceptable health and environmental risks. Monitoring and regulation by the permit authority required to ensure compliance.

Other considerations: Owners/occupiers must be made aware of the operational requirements and limitations of the system by the installer/maintenance contractor.

CERTIFICATE OF THE RESPONSIBLE DESIGNER

Section 94
Section 106
Section 129
Section 155

Form **35**

To: Josiah Huppatz *Owner name*
25 Maria Street *Address*
Swansea 7190 *Suburb/postcode*

Designer details:

Name: John-Paul Cumming
Category: Bld. Srvcs. Dsgnr. - Hydraulic
Business name: Geo-Environmental Solutions
Phone No: 03 6223 1839
Business address: 29 Kirksway Place
Battery Point 7004
Fax No: N/A
Licence No: CC774A
Email address: office@geosolutions.net.au

Details of the proposed work:

Owner/Applicant Josiah Huppatz
Designer's project reference No. J11536
Address: 231 Greens Road
Lot No: 180600/4
Orielton 7172

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

Description of work:
On-site wastewater management system - design

(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
	☐ Building design	Architect or Building Designer
	☐ Structural design	Engineer or Civil Designer
	☐ Fire Safety design	Fire Engineer
	☐ Civil design	Civil Engineer or Civil Designer
	☒ Hydraulic design	Building Services Designer
	☐ Fire service design	Building Services Designer
	☐ Electrical design	Building Services Designer
	☐ Mechanical design	Building Service Designer
	☐ Plumbing design	Plumber-Certifier; Architect, Building Designer or Engineer
	☐ Other (specify)	

Deemed-to-Satisfy: ☒ Performance Solution: ☐ *(X the appropriate box)*

Other details:

AWTS with irrigation

Design documents provided:

The following documents are provided with this Certificate –

Document description:

Drawing numbers:	Prepared by: Geo-Environmental Solutions	Date: Apr-25
Schedules:	Prepared by:	Date:
Specifications:	Prepared by: Geo-Environmental Solutions	Date: Apr-25
Computations:	Prepared by:	Date:
Performance solution proposals:	Prepared by:	Date:
Test reports:	Prepared by: Geo-Environmental Solutions	Date: Apr-25

Standards, codes or guidelines relied on in design process:

AS1547:2012 On-site domestic wastewater management.

AS3500 (Parts 0-5)-2013 Plumbing and drainage set.

Any other relevant documentation:

Onsite Wastewater Assessment - 231 Greens Road, Orielton - Apr-25

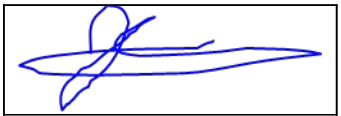
- 231 Greens Road, Orielton - Apr-25

Attribution as designer:

I John-Paul Cumming, 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.

	Name: (print)	*Signed*	*Date*
Designer:	John-Paul Cumming		29/04/2025
Licence No:	CC774A		

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.

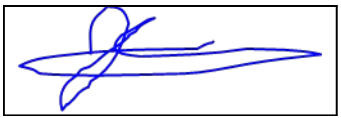
I confirm that the proposed works are not Certifiable Works, in accordance with the Guidelines for TasWater CCW Assessments, by virtue that all of the following are satisfied:

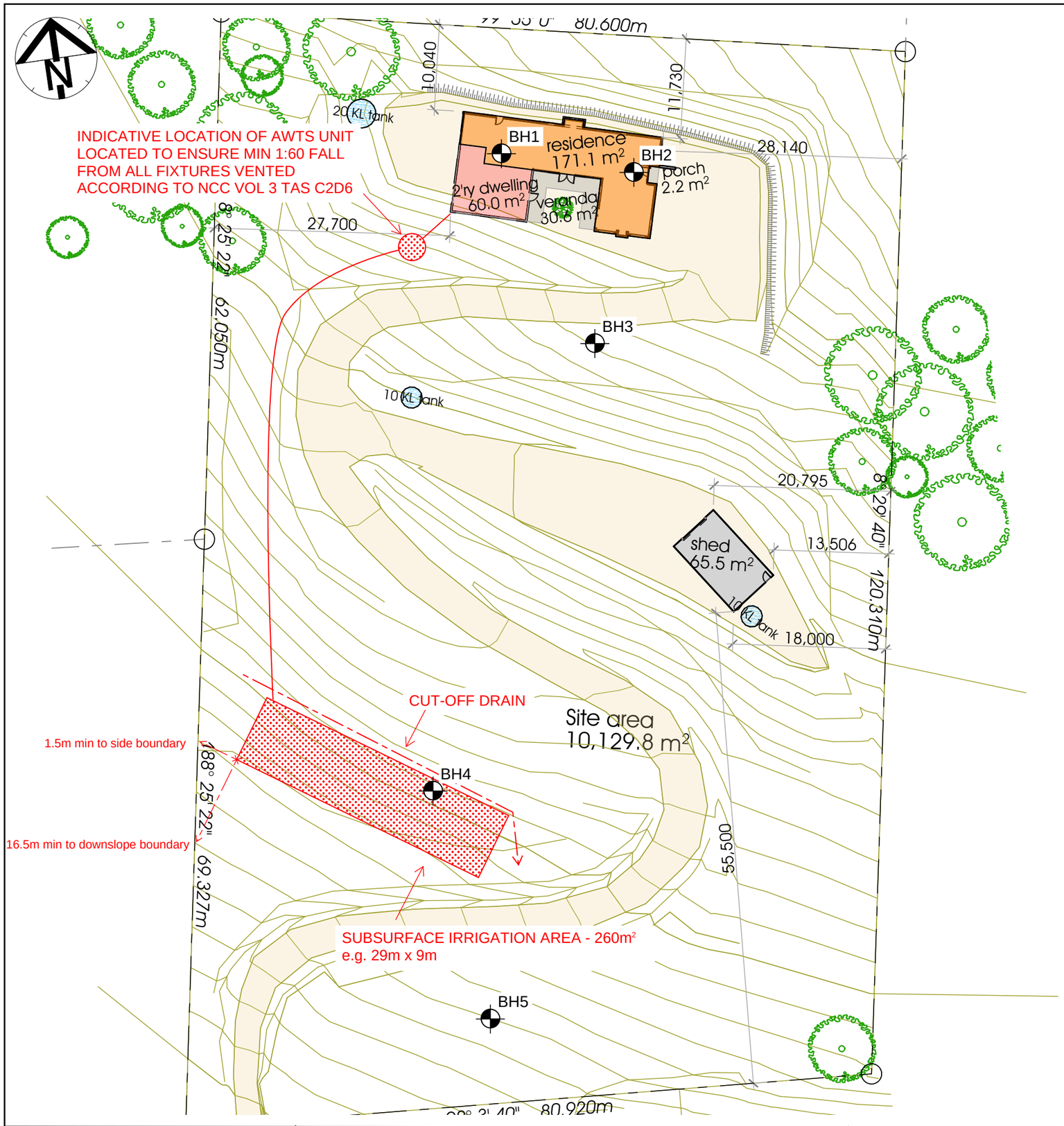
- [x] The works will not increase the demand for water supplied by TasWater
- [x] The works will not increase or decrease the amount of sewage or toxins that is to be removed by, or discharged into, TasWater's sewerage infrastructure
- [x] The works will not require a new connection, or a modification to an existing connection, to be made to TasWater's infrastructure
- [x] The works will not damage or interfere with TasWater's works
- [x] The works will not adversely affect TasWater's operations
- [x] The work are not within 2m of TasWater's infrastructure and are outside any TasWater easement
- [x] I have checked the LISTMap to confirm the location of TasWater infrastructure
- [x] 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 ..... John-Paul Cumming..... 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

	Name: (print)	*Signed*	*Date*
Designer:	John-Paul Cumming		29/04/2025



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29 Kirksway Place, Battery Point
T| 62231839 E| office@geosolutions.net.au

Wastewater system:

AWTS unit located to ensure min 1:60 fall from all fixtures. Vented according to NCC Vol 3 Tas C2D6

Cut-off drain

Subsurface irrigation - 260m²
e.g. 29m x 9m

Min 3m from upslope buildings
Min 1.5m from upslope or level boundaries
Min 16.5m from downslope boundary
Min 100m from downslope surface water

Refer to GES report

Dr. John Paul Cumming
Building Services Designer-Hydraulic
CCC774A

23/4/2025

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Do not scale from these drawings. Dimensions to take precedence over scale.	231 Greens Rd ORIELTON 7172	C.T.: 180600/4	Date: 23/4/2025	On-Site Wastewater Management Plan	1:500 @ A3	Sheet 1 of 1 Drawn by: SR

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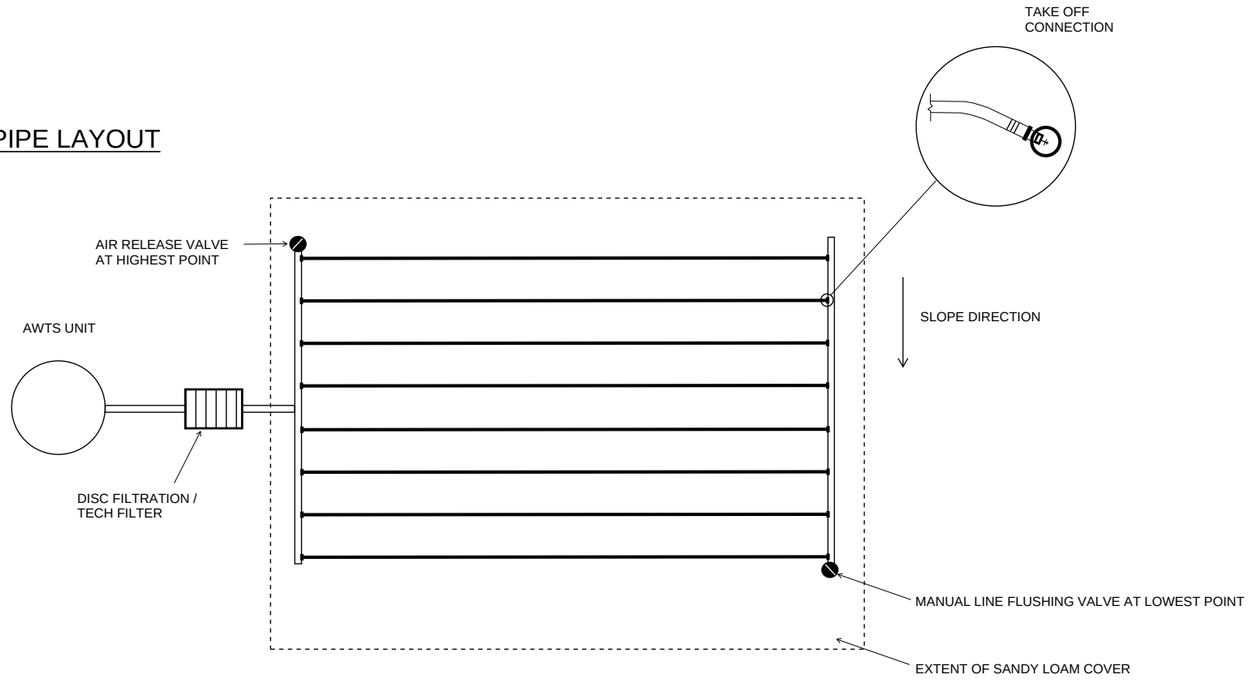
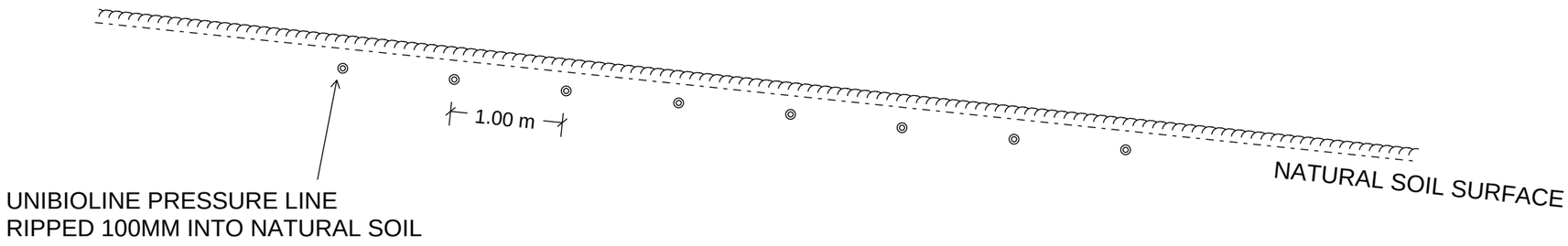
BED PLAN PIPE LAYOUT



APPLICATION AREA NOTES

1. APPLICABLE FOR SLOPE ANGLES 10-20%
2. BASE OF APPLICATION AREA TO BE SCARIFIED TO BREAK SURFACE LAYER. ALTERNATIVELY LINES CAN BE RIPPED INTO TOPSOIL WITH SUITABLE TRACTOR AND PIPE LAYER. SMEARING AND COMPACTION TO BE AVOIDED
3. IRRIGATION LINES TO BE INSTALLED INTO NATURAL SANDY TOPSOIL MIN 100mm DEPTH
4. DEPENDANT ON TREATMENT SYSTEM A 200µm FILTER MAY BE INSTALLED AT THE PUMPING CHAMBER OUTLET, BUT A 100-120µm INLINE DISC FILTER SHOULD BE INSTALLED PRIOR TO DISCHARGE INTO THE IRRIGATION AREA.
5. A VACUUM BREAKER VALVE MUST BE INSTALLED AT THE HIGHEST POINT OF THE IRRIGATION AREA IN A MARKED AND PROTECTED VALVE CONTROL BOX.
6. A FLUSH LINE MUST BE INSTALLED AT THE LOWEST POINT OF THE IRRIGATION AREA
7. THE MINIMUM IRRIGATION PUMPING CAPACITY SHOULD BE EQUIVALENT TO 120 kpa (i.e. 12m OF HEAD) AT THE HIGHEST POINT OF THE IRRIGATION AREA.
8. CUT-OFF DIVERSION DRAIN UPSLOPE AS REQUIRED
9. ALL WORKS TO COMPLY WITH AS3500 AND TASMANIAN PLUMBING CODE

APPLICATION AREA CROSS-SECTION



Do not scale from these drawings. Dimensions to take precedence over scale.				CROSS-SECTION SUBSURFACE APPLICATION SLOPES 10-20%		Sheet 1 of 1 Drawn by: SR

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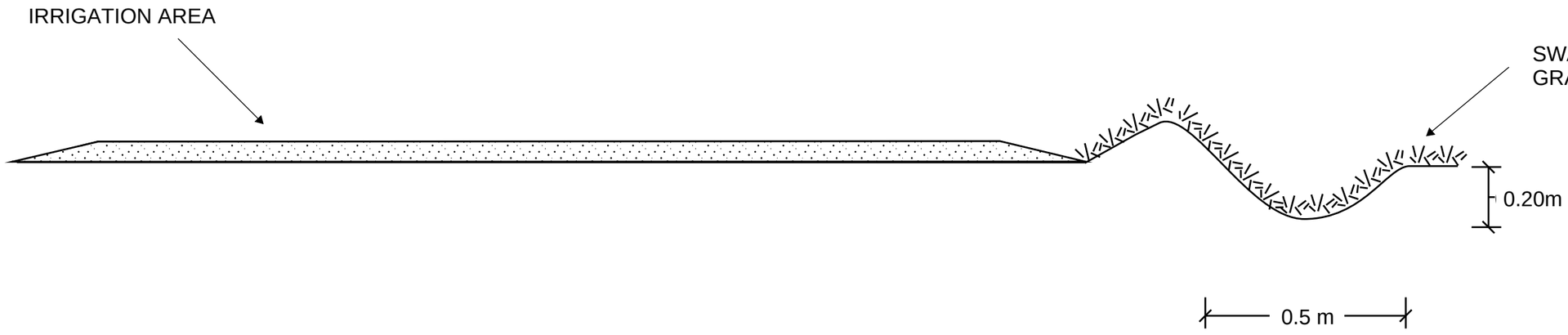
TYPICAL GRASSED SWALE DRAIN CROSS-SECTION

SWALE DRAIN TO BE MIN 0.5M WIDE BY MIN 0.20M DEEP

GRASS COVER TO BE MAINTAINED TO SLOW WATER FLOW AND MINIMSE EROSION



Do not scale from these drawings. Dimensions to take precedence over scale.	Geo-Environmental Solutions		Date: Nov 2021	Grassed swale drain typical cross-section	Sheet 1 of 1 Drawn by SR

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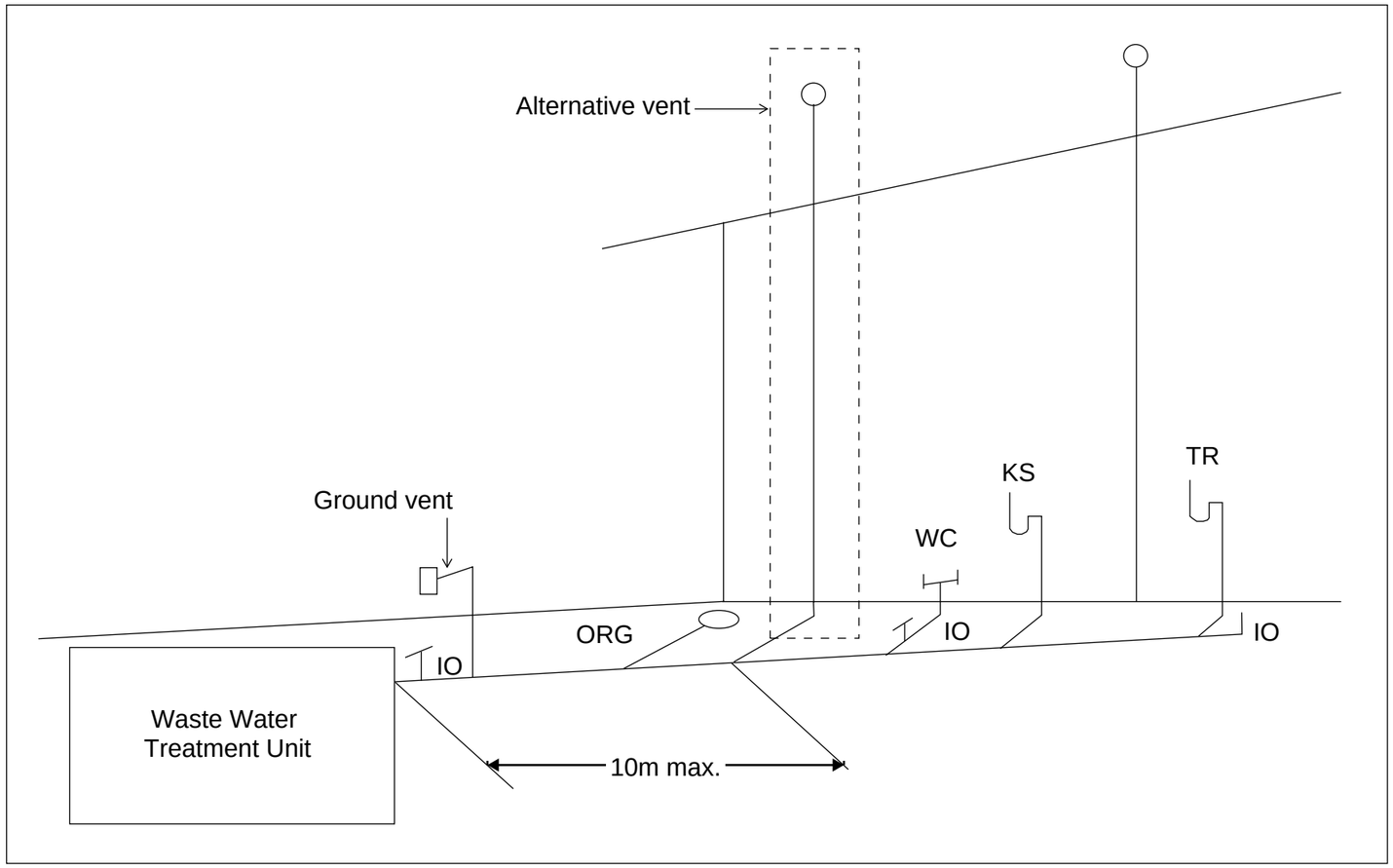

Tas Figure C2D6 Alternative Venting Arrangements

Vents must terminate in accordance with AS/NZS 3500.2

Alternative venting to be used by extending a vent to terminate as if an upstream vent, with the vent connection between the last sanitary fixture or sanitary appliance and the on-site wastewater management system. Use of a ground vent in not recommended

Inspection openings must be located at the inlet to an on-site wastewater management system treatment unit and the point of connection to the land application system and must terminate as close as practicable to the underside of an approved inspection opening cover installed at the finished surface level

Access openings providing access for desludging or maintenance of on-site wastewater management system treatment unites must terminate at or above finished surface level

Do not scale from these drawings. Dimensions to take precedence over scale.				Tas Figure C2D6 Alternative Venting Arrangements		Sheet 1 of 1

GES

GEO-ENVIRONMENTAL

SOLUTIONS

LANDSLIP RISK ASSESSMENT

PROJECT:

New Residential Dwelling

Site Address:

231 Greens Road
Orielton
TAS
7172

CLIENT:

Josiah Huppatz

DATE:

12/05/2025

DOCUMENT CONTROL

Document Prepared By:

Geo-Environmental Solutions Pty Ltd

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29 Kirksway Place

Battery Point

TAS, 7004

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W: geosolutions.net.au

DOCUMENT CONTROL		
Report Title:	GES Orielton – 231 Greens Road	
Project Type:	Landslip Risk Assessment	
Client:	Josiah Huppatz	
Project Job Number:	J11536	
Revision Version:	V01	
Date:	12/05/2025	
Approved By:	V. Gupta	
	Signature:	Date
		12/05/2025

FIGURES

TABLE

1 INTRODUCTION

Geo-Environmental Solutions Pty Ltd (GES) were contacted by Josiah Huppatz (the Client) to provide a geotechnical assessment to assess a landslip risk for a proposed new residential dwelling in Orielton which lays within the Tasmanian Planning Scheme – Sorell mapped in a low landslip hazard zone.

Figure 1 - Location of the site

The proposed development is located at 231 Greens Road in Orielton (The Site); cadastral title (CT – 180600/4). GES are to undertake a geotechnical assessment relating to the construction of a proposed new dwelling development in conjunction with the requirements of the Landslide Hazard Code, part of the Tasmanian Planning Scheme – Sorell. GES have written this report with reference to the Australian Geomechanics Guidelines (AGS 2007).

GES have undertaken this assessment using previous site observations and investigation, photographs and publicly available datasets in the construction of this report. Estimations are determined by approximation with regional information applied where appropriate to site specific information.

2 OBJECTIVES

The objective of the site investigation is to:

- Identify the requirements of the Landslip Hazard Code;
- Conduct a Landslip risk assessment of the proposed works with reference to the Australian Geomechanics Society (AGS) *Landslip Risk Management (2007) guidelines'*.
- Identify which planning scheme codes need to be addressed in terms of Landslip and identify the relevant performance criteria relevant to the project which need addressing.

- Use borehole drilling information, geological mapping and site inspections to determine site physical conditions;
- Conduct a site risk assessment for the proposed development ensuring relevant performance criteria are addressed.

3 Site Details

3.1 Project Area Land Title

The land studied in this report is defined by the following title reference:

- CT – 180600/4

This parcel of land is referred to as the 'Site' and/or the 'Project Area' in this report.

3.2 Australian Building Code Board

This report presents a summary of the overall site risk to Landslip hazards. This assessment has been conducted for the year 2075 which is representative of a 'normal' 50-year building design life category.

Per the Australian Building Code Board (ABCB 2015), when addressing building minimum design life:

> *'The design life of buildings should be taken as 'Normal" for all building importance categories unless otherwise stated.'*
>
> As per Table 3-1, the building design life is 50 years for a normal building.

Table 3-1 Design life of building and plumbing installations and their components

Building Design Life Category	*Building Design Life (years)*	*Design life for components or sub systems readily accessible and economical to replace or repair (years)*	*Design life for components or sub systems with moderate ease of access but difficult or costly to replace or repair (years)*	*Design life for components or sub systems not accessible or not economical to replace or repair (years)*
Short	1 < dl < 15	5 or dl (if dl<5)	dl	dl
Normal	50	5	15	50
Long	100 or more	10	25	100

Note: Design Life (dl) in years

3.3 The Tasmanian Building Regulations 2016

Building in hazardous areas

As outlined in the Consumer, Builder and Occupational Services (CBOS) web site:

Building in hazardous areas

Hazardous areas include areas which are bushfire prone, comprise reactive soils or substances, or are subject to coastal erosion, coastal flooding, riverine flooding, and landslip.

Division 5 - Landslip. Section 59. Landslip hazard areas

- For the purposes of the Act, land is a landslip hazard area if –
    - the land is shown on a planning scheme overlay map as being land that is within a landslip hazard area; and
    - the land is classified as land within a hazard band of a landslip hazard area.
- For the purposes of the definition of *hazardous area* in section 4(1) of the Act –
    - classification under a landslip determination as being land that is within a hazard band of a landslip hazard area is a prescribed attribute; and
    - a landslip hazard area is a hazardous area.

3.4 Tasmanian Planning Scheme Landslip Overlay – Sorell Council

The site predominately lies within low landslip overlay (Figure 2).

3.5 Site and Proposed Works

The site is located in a rural area near Orielton, a locality within the Sorell local government area, situated in the Central and Hobart regions of Tasmania, Australia. It lies approximately 10 kilometres north of the town of Sorell. The project area is positioned at the lower elevations of Flat Top Hill and currently consists of a land parcel area of approximately 10,129 m², with a few minor existing structures. The proposed development involves the construction of a Class 1a residential building. At the time of assessment, the site had already undergone substantial earthworks, including the formation of cut and fill platforms for the proposed dwelling and access driveway. The proposed residence is planned to be constructed on one of these platforms. The client has provided GES with the existing dwelling plans, which are shown in Figure 3.

3.5.1 Development & Works Acceptable Solutions

Where applicable, the need for further performance criteria compliance is outlined in Appendix 1.

3.5.2 Landslip Hazard Code (LHC)

Given that the proposed dwelling is within the low Landslip Hazard Area and there are no acceptable solutions for the proposed works the Performance Criteria will need to be addressed.

3.5.3 Development Performance Criteria

The following performance criteria need to be addressed:

- *C15.6.1 P1*

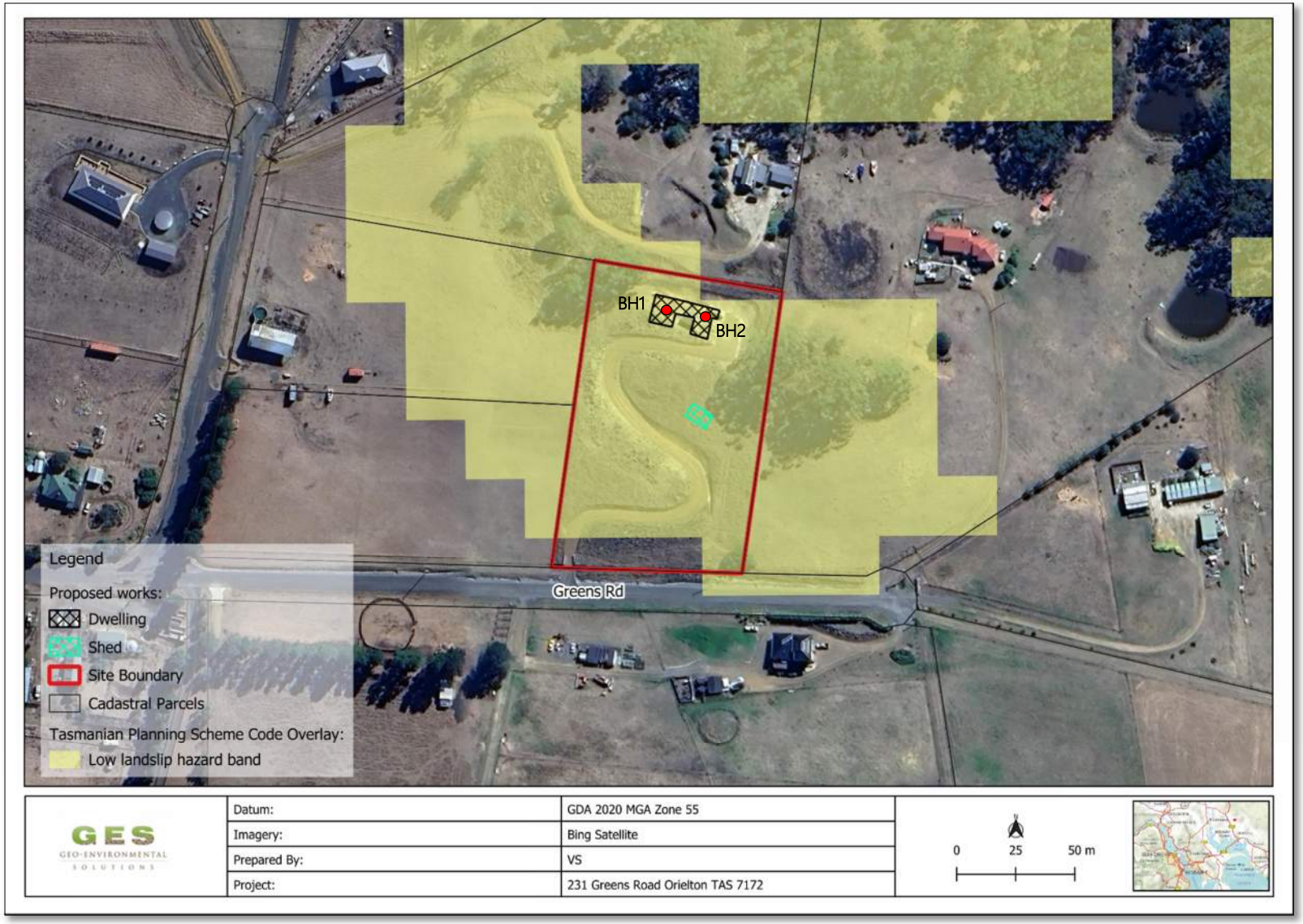

Figure 2 – Landslip Overlay (low denotes 'yellow') at the Site (The List) with approximate location of proposed residential dwelling (boreholes shown in red)

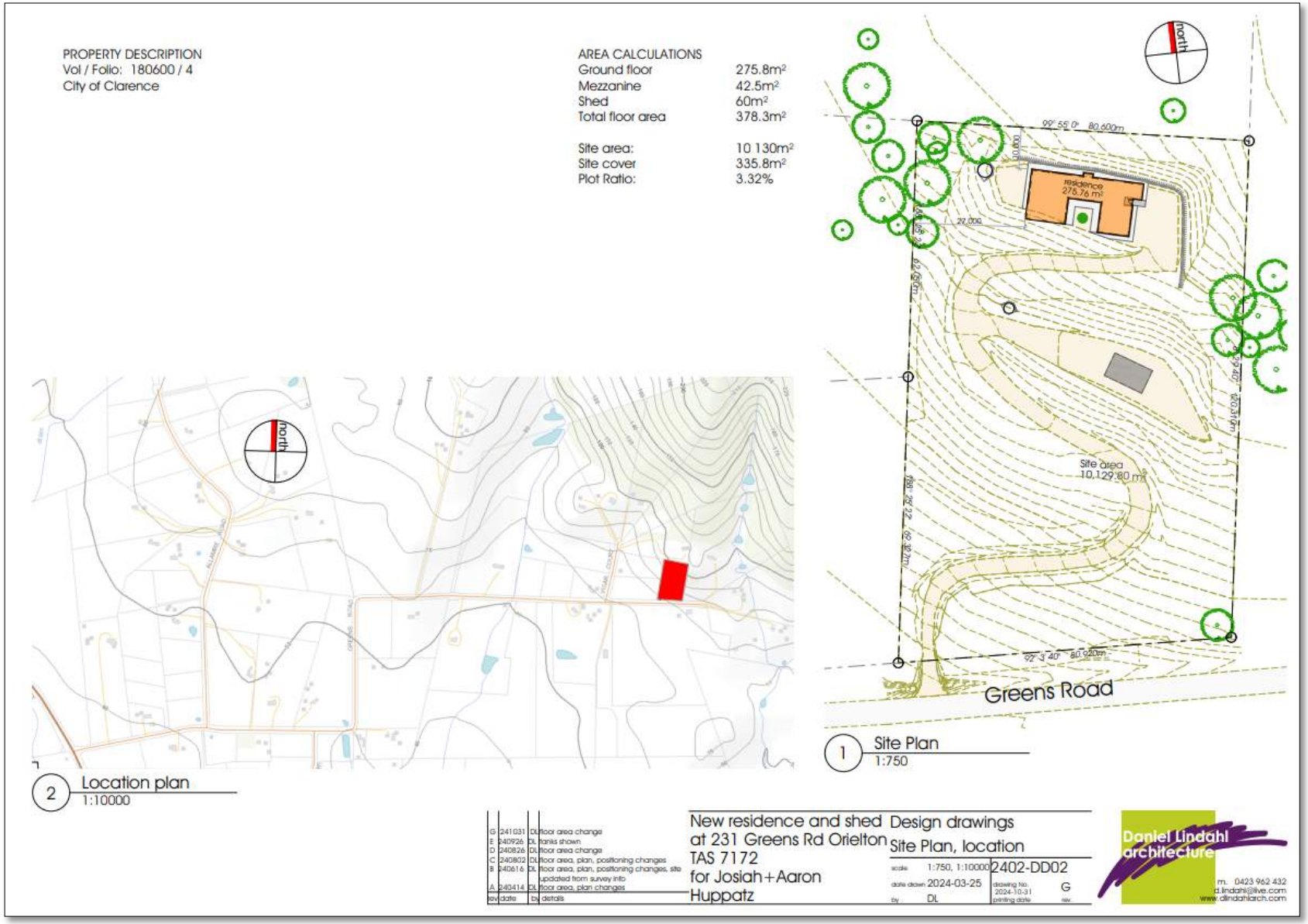

Figure 3 - Site Plan showing proposed extent of works

4 Site Mapping

4.1 Geological Mapping

Based on the MRT 1:50,000 Mineral Resources Tasmania (MRT) mapping of Sorell, the site geology comprises of the following geological unit (refer Figure 4):

- Igneous Rocks (Map Unit – Tb): Tertiary Basalt

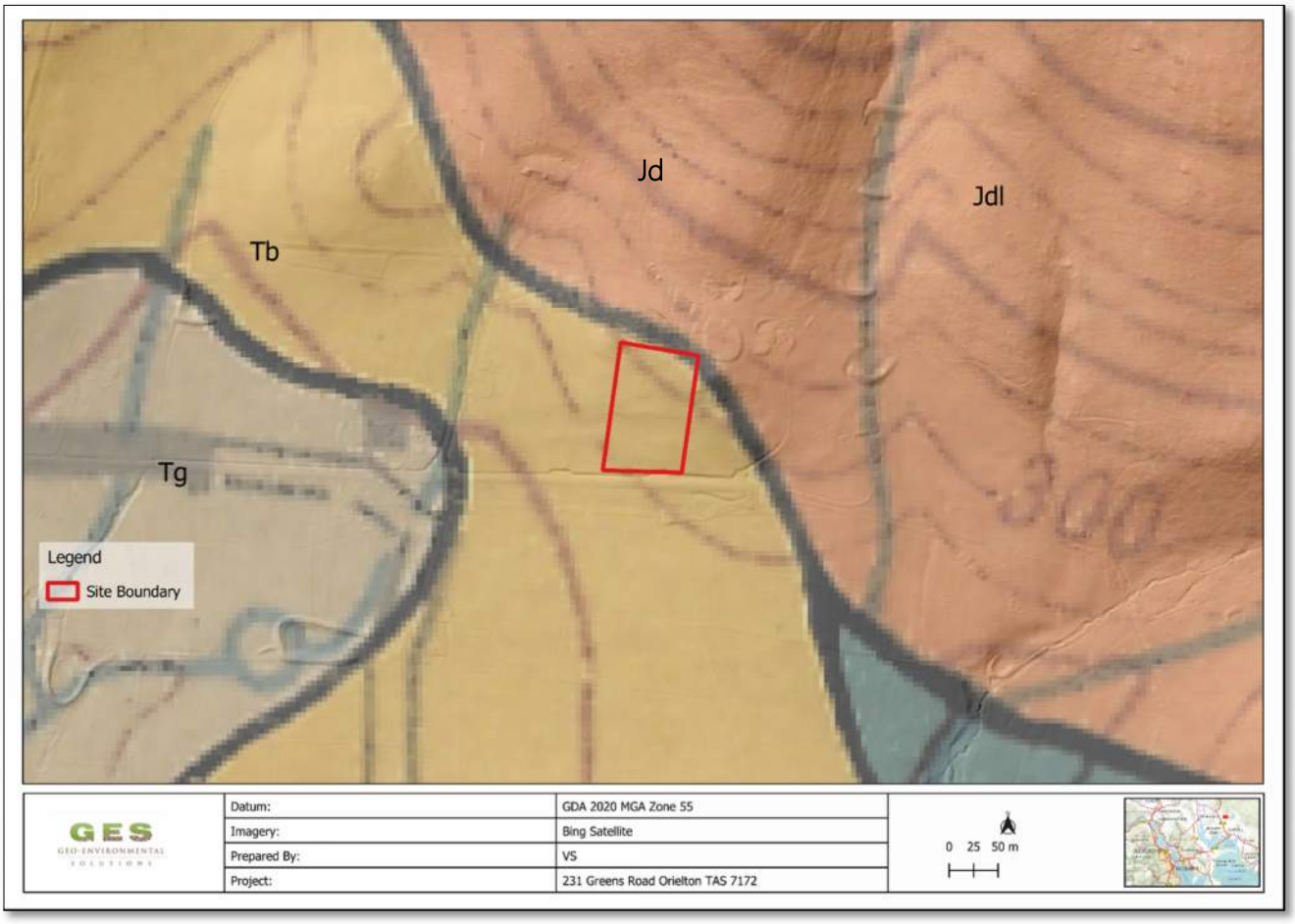

Figure 4 – Mapped geology (source: LIST Mapping 1:50,000)

4.2 Site Geomorphology

The site is located on the on south and southwest facing slopes associated with the southern extent of Flat Top Hill. The cut and fill had already been placed at the time of inspection. No confirmation can be made as to whether it has been appropriately keyed into the slopes and all organic matter and weak material was removed before its placement. As such, it must be deemed as uncontrolled fill. Therefore, foundations should not be placed within the fill and no certification of concrete slabs on the fill can be made. Elevation on the site varies, ranging from approximately 107 meters above the Australian Height Datum (AHD) on the northeast corner to around 67 meters AHD on the southwest side of the site. To depict the onsite slope angles, a contour map was generated using QGIS software and Southeast 2019 LiDAR data (refer to Figure 5).

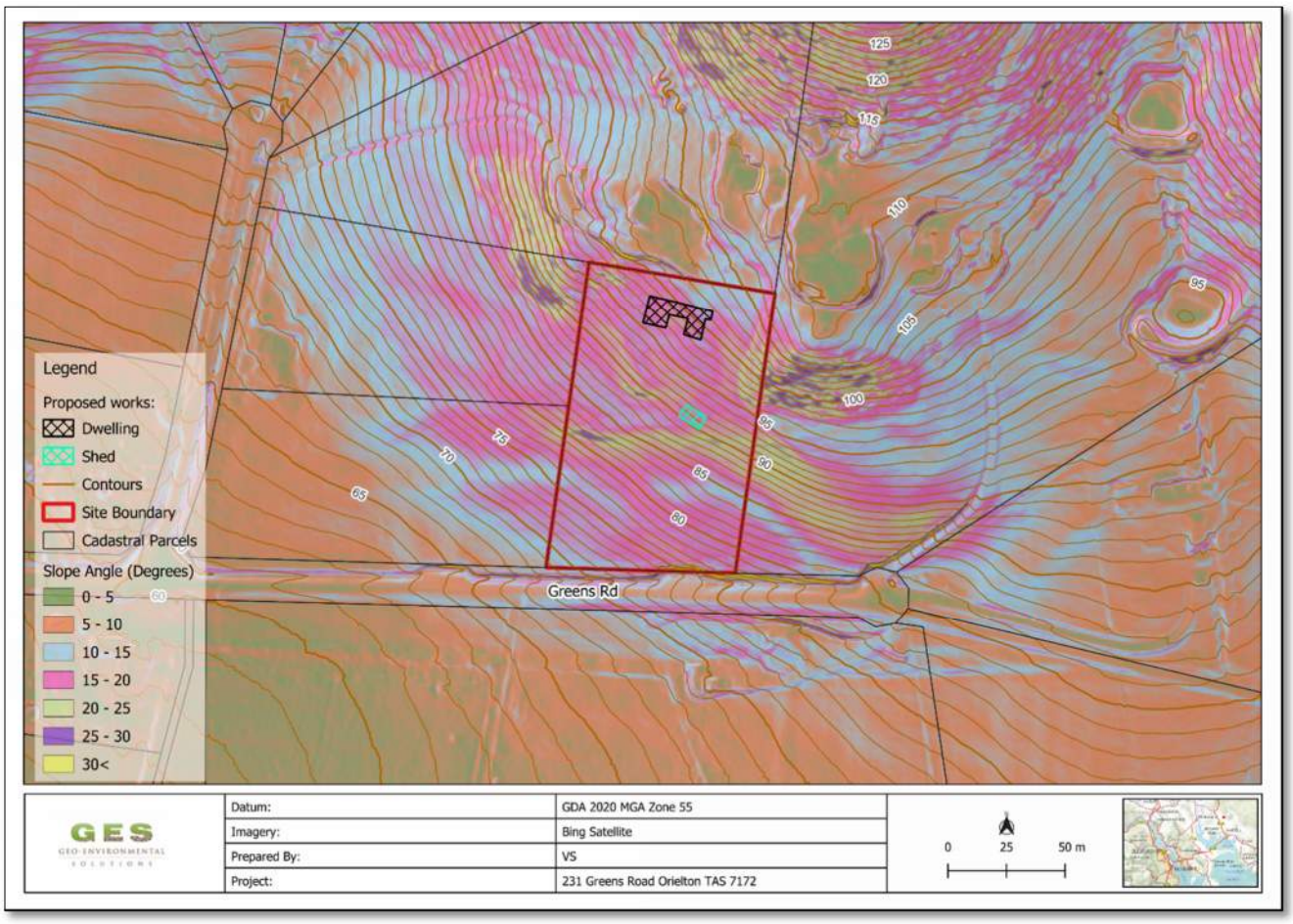

Figure 5 - Slope angle model developed from Southeast 2019 LiDAR data.

4.3 Field Investigation and Site Observation

The site inspection was carried out by GES on 25th of March 2025 to assess the subsurface ground conditions around the proposed residential development. The soil depth in the proposed building area is greater than 2.00m and the soil contains a significant amount of fill. The fill is of various size fractions and is likely to have variable bearing capacity and should not be used as a founding substrate Table 1 provides a summary of the ground conditions encountered within the dwelling footprint.

Table 1 Site Soil Bore Logs

BH 1 Depth (m)	BH 2 Depth (m)	USCS	Description
0.00-2.40	0.00-1.70	GC	**FILL: Clayey GRAVEL:** pale brown, slightly moist, very dense,
2.40-2.90	1.70-2.20	CI	**FILL: Silty CLAY:** with gravels, medium plasticity, grey, dark grey, slightly moist, stiff
2.90-3.00		ML	**Clayey SILT**: low plasticity, black, slightly moist, stiff
3.00-3.50		ML	**Gravelly SILT**: low to medium plasticity, dark grey, pale grey, slightly moist, stiff
3.50-3.80		CH	**Silty CLAY**: with gravels, medium to high plasticity, dark grey, slightly moist, stiff,
3.80-5.00+	2.20-3.00+	CL	**Gravelly CLAY**: medium plasticity, pink, red, green, slightly moist, stiff, no refusal

4.3.1 Site Classification

The site has been classified as **Class P** with soils on site exhibiting high plasticity and highly reactive characteristics. The site has been classified as **Class P** - see 'Site Classification' above. All foundations must penetrate through any fill material & topsoil and into the residual soil/gravel below with bearing capacities >100kPa.

5 Landslip Hazard Analysis

5.1 Landslip Characteristics

Based on the slope characteristics including site geology, slope geometry and slope angles, MRT Landslip mapping/inventory and site observations, the following scenarios have been identified as potential slope failure mechanisms for the site:

- **Scenario 1** – Shallow translational slide within shallow residual soils in cuttings above the proposed dwelling, caused by oversteepening of natural soil slopes, with no allowance for drainage.
- **Scenario 2 -** Shallow slide failure in fill batters immediately below the proposed dwelling with potential regression.

5.1.1 Frequency Analysis

Table 2 presents the frequency analysis for the identified slope failure mechanisms. Terminology used is in accordance with the Australian Geomechanics Society (AGS) guidelines for Landslip risk management (2007a,b,c,d).

Table 2 Frequency analysis for Landslip hazards Scenario 1 - 2

Scenario	Failure Mechanism	Unit Affected	Observed in the field	Potential Size	Potential Speed	Water Content	Likelihood
Scenario 1	Shallow translational slide	Residual Soils	No	Small	Slow to Rapid	Wet to Saturated	Unlikely
Scenario 2	Shallow slide failure within natural soils beneath, or immediately downslope of the proposed building area	Natural soils and potential fill material	No	Small to Medium	Very slow to moderate	Wet and saturated	Rare

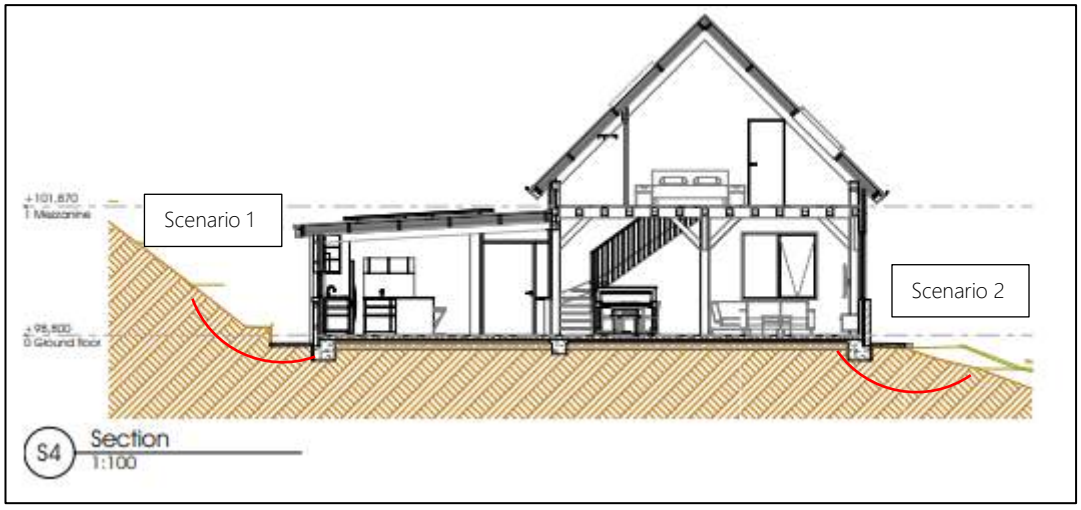

Figure 6 – Typical Cross Section of a dwelling constructed on a cut and fill area

5.2 Risk Analysis

5.2.1 Risk to Property

There is currently low risk to property assuming no risk management is carried out. Treated risk may be reduced to low (Table 3).

Table 3 Consequence analysis for Landslip hazards – Property

Scenario	Issue	Current Risks			Landslip Risk Management	Treated Risks
		Likelihood of occurrence	Consequence to property	Level of risk to property		Level of risk to property
Scenario 1	Shallow translational slide	Possible	Minor	Moderate	• The proposed dwelling foundations should not be placed within the fill and no certification of concrete slabs on the fill can be made. All foundations must penetrate through any fill material & topsoil and into the residual soil/gravel below with bearing capacities >100kPa. • It is recommended cut and fill surfaces to be protected from erosion using an erosion control blanket, top-dressed with topsoil and revegetated to improve soil stability. • Cut slopes to the north of the development should be constructed using the following slope angles: Cuts in soils (including existing cuts) o Up to a maximum height of 1.0m should have slope angles not exceeding 1V:2H o In exceedance of 1.0m should be benched with 1.0m wide terrace at every 2.0m depth of cutting maintaining a minimum batter slope of 1V:2H. If this is not achievable on site, batters to be retained using suitably engineered retaining wall. • All cuttings should include a cut-off v-drain above the cutting and a graded toe drain immediately below the cutting face. • All construction and earthworks on site should be adequately designed in accordance with the good hillside construction practices as outlined in the Australian Geomechanics Society (AGS) Geoguide LR8.	Low
Scenario 2	Shallow Slide Failure	Possible	Medium	Moderate	• The proposed dwelling foundations should not be placed within the fill and no certification of concrete slabs on the fill can be made. All foundations must penetrate through any fill material & topsoil and into the residual soil/gravel below with bearing capacities >100kPa. • Any proposed fill pad placement works for the dwelling requires keying/benching into the natural hillslope (preferably to underlying natural soils with bearing capacity>100kPa) and adequately compacted to ensure fill stability. Fill is to be free-draining and graded to prevent the occurrence of surface water ponding. • All earthworks on site must comply with AS3798-2007 and a sediment and erosion control plan should be implemented on site during and after construction. • It is recommended cut and fill surfaces to be protected from erosion using an erosion control blanket, top-dressed with topsoil and revegetated to improve soil stability. • All construction and earthworks on site should be adequately designed in accordance with the good hillside construction practices as outlined in the Australian Geomechanics Society (AGS) Geoguide LR8.	Low

5.2.1 Risk to Life

Risk to life is considered acceptable following the recommended hazard treatment in Table 4 given the likelihood and consequence of a shallow slide failures within the soils and or fill, or within cutting (Table 4).

Table 4 Consequence analysis for Landslip hazards 1 – 2 – Life – Post Treatment

Hazard	Scenario 1	Scenario 2
Factor	Shallow Slide Failure	Shallow Slide Failure
Likelihood	Unlikely	Unlikely
Indicative Annual Probability	0.001	0.001
Use of Affected Structure/Site	Cut batter	Fill Batter
Probability of Spatial Impact	Very minor damage anticipated = 0.05	Areas of dwelling adjacent to cut and/or fill batters. = 0.03
Proportion of Time	Estimated 12 hours a day. = 0.5	Estimated 12 hours a day. = 0.5
Probability of Not Evacuating	Soils around should exhibit signs of stress (cracking) allowing time to evacuate. = 0.3	Fill should exhibit signs of stress (cracking) allowing time to evacuate. = 0.2
Vulnerability	Building unlikely to collapse = 0.1	Building unlikely to collapse. = 0.1
Risk for Person Most at Risk	7.5×10^{-8}	3×10^{-8}
Risk Evaluation	Acceptable	Acceptable

5.2.2 Societal Risk

The Societal Risk Graph plot presented in Figure 7 showing the estimated individual risks for scenarios 1 and 2 as presented in Figure 6 (outlined in the AGS 'Landslide Risk Management Concepts and Guidelines', 2000). The risks are estimated based on people in the structure spending up to 12 hours per day in internal areas the property.

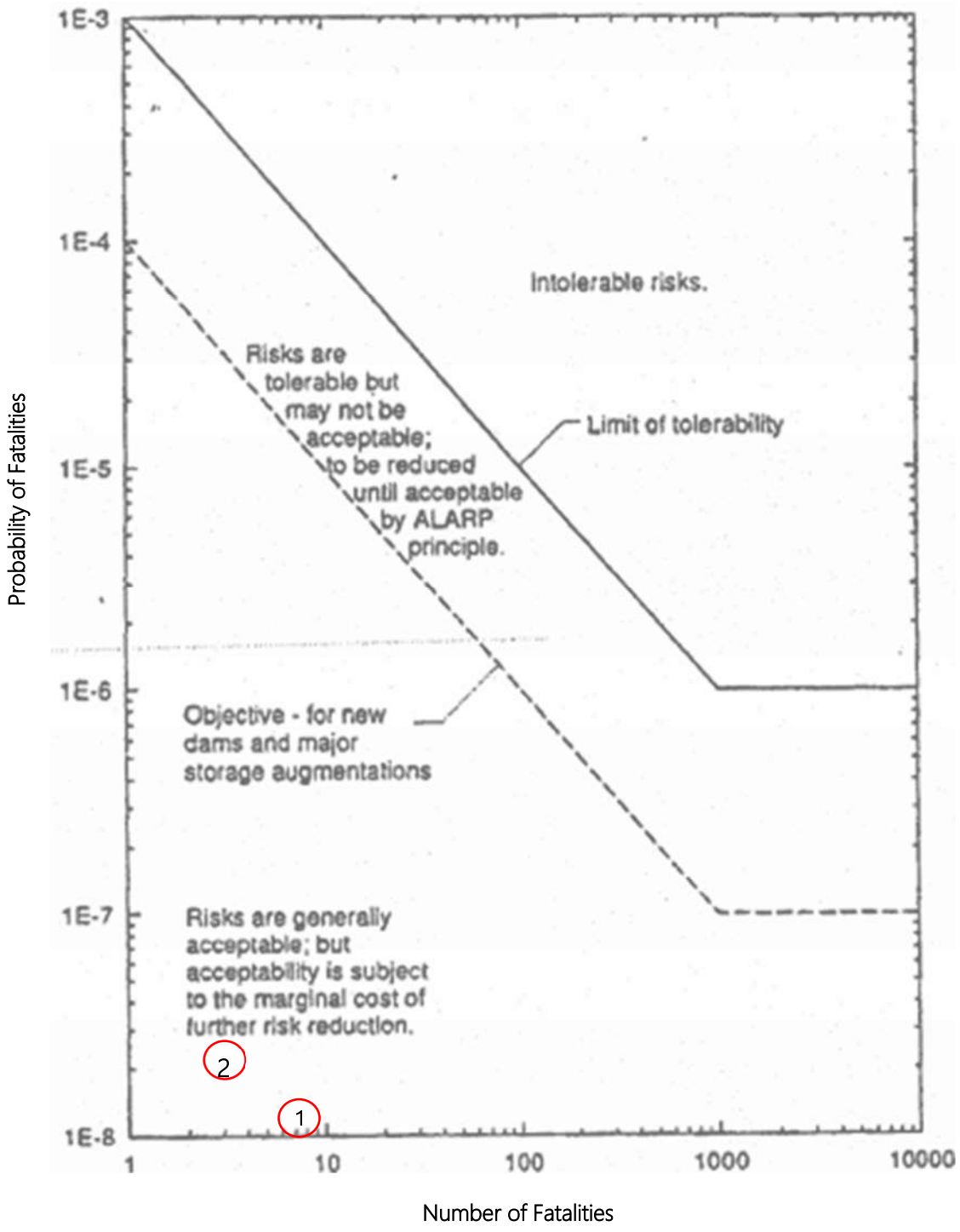

Figure 7 - Societal Risk Graph of Probability of Fatalities vs Number of Fatalities (ANCOLD 1998)

6 Conclusions and Recommendations

Based on the observations made during the site visit and the outcome of the slope stability and hazard analysis and risk assessment, the following conclusions are made:

- The proposed dwelling foundations should not be placed within the fill and no certification of concrete slabs on the fill can be made. All foundations must penetrate through any fill material & topsoil and into the residual soil/gravel below with bearing capacities >100kPa.
- The cutting should include a cut-off v-drain above the cutting and a graded toe drain immediately below the cutting face to prevent water ponding.
- Any proposed fill pad placement works for the development requires keying/benching into the natural hillslope (preferably to underlying bedrock) and adequately compacted to ensure fill stability. Fill is to be free-draining and graded to prevent the occurrence of surface water ponding.
- Non engineered fill on site should have slope angles not exceeding 1V:2H and must not be used for foundation construction.
- Fill batters should be covered with geotextile cloth and suitably vegetated with lightweight species as soon as practicable to prevent riling and erosion.
- Cut slopes should be constructed using the following slope angles:

  Cuts in soils (including existing cuts)
  - Up to a maximum height of 1.0m should have slope angles not exceeding 1V:2H
  - In exceedance of 1.0m should be benched with 1.0m wide terrace at every 2.0m depth of cutting maintaining a minimum batter slope of 1V:2H. If this is not achievable on site, batters to be retained using suitably engineered retaining wall.
- All cuttings should include a cut-off v-drain above the cutting and a graded toe drain immediately below the cutting face.
- Cut batters should be covered with geotextile cloth and suitably vegetated with lightweight species as soon as practicable to prevent riling and erosion.
- Non engineered fill on site should have slope angles not exceeding 1V:2H, must not exceed depth of 2.0m and must not be used for foundation construction.
- All earthworks on site must comply with AS3798-2007 and a sediment and erosion control plan should be implemented on site during and after construction.
- Good hillside construction practices should be adopted as per Australian Geoguide LR8;
- The proposed works will not cause or contribute to landslip on the site, adjacent land, or on public infrastructure if the recommendations are followed.
- With the implementation of all following recommendations the proposed works satisfies the performance criteria and is considered as it represents a tolerable risk for the life of the use and development with Code (E3) as per Tasmanian Planning Scheme - Sorell.

GES should be contacted immediately should conditions greatly differ to that which are stated in this report.

7 LIMITATIONS STATEMENT

This Assessment Report has been prepared in accordance with the scope of services between Geo-Environmental Solutions Pty. Ltd. (GES) and Josiah Huppatz (the Client). To the best of GES's knowledge, the information presented herein represents the Client's requirements at the time of printing of the Report. However, the passage of time, manifestation of latent conditions or impacts of future events may result in findings differing from that discussed in this Report. In preparing this Report, GES has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations referenced herein. Except as otherwise stated in this Report, GES has not verified the accuracy or completeness of such data, surveys, analyses, designs, plans and other information.

8 REFERENCES

AGS (2007a). Guideline for Landslip Susceptibility, Hazard and Risk Zoning. Australian Geomechanics, Vol 42 No 1 March 2007

AGS (2007b). Commentary on Guideline for Landslip Susceptibility, Hazard and Risk Zoning. Australian Geomechanics, Vol 42 No 1 March 2007

AGS (2007c). Practice Notes Guidelines for Landslip Risk Management. Australian Geomechanics Vol 42 No 1 March 2007

AGS (2007d). Commentary on Practice Notes Guidelines for Landslip Risk Management. Australian Geomechanics Vol 42 No 1 March 2007

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APPENDIX 1 – Acceptable Solutions

Landslip Code Areas

C15.6 Development Standards for Buildings and Works

C15.6.1 Building and works within a landslip hazard area

Objective:	That building and works on land within a landslip hazard area can: (a) minimise the likelihood of triggering a landslip event; and (b) achieve and maintain a tolerable risk from a landslip.

Acceptable Solutions	**Performance Criteria**
A1 No Acceptable Solution.	**P1.1** Building and works within a landslip hazard area must minimise the likelihood of triggering a landslip event and achieve and maintain a tolerable risk from landslip, having regard to: (a) the type, form, scale and intended duration of the development; (b) whether any increase in the level of risk from a landslip requires any specific hazard reduction or protection measures; (c) any advice from a State authority, regulated entity or a council; and (d) the advice contained in a landslip hazard report. **P1.2** A landslip hazard report also demonstrates that the buildings and works do not cause or contribute to landslip on the site, on adjacent land or public infrastructure. **P1.3** If landslip reduction or protection measures are required beyond the boundary of the site the consent in writing of the owner of that land must be provided for that land to be managed in accordance with the specific hazard reduction or protection measures.

APPENDIX 2 – Qualitative Risk Assessment Tables

Likelihood & Consequence Index

QUALITATIVE MEASURES OF LIKELIHOOD

Approximate Annual Probability		Implied Indicative Landslide Recurrence Interval		Description	Descriptor	Level
Indicative Value	Notional Boundary					
10^{-1}	$5x10^{-2}$	10 years	20 years	The event is expected to occur over the design life.	ALMOST CERTAIN	A
10^{-2}	$5x10^{-3}$	100 years	200 years	The event will probably occur under adverse conditions over the design life.	LIKELY	B
10^{-3}	$5x10^{-4}$	1000 years	2000 years	The event could occur under adverse conditions over the design life.	POSSIBLE	C
10^{-4}	$5x10^{-5}$	10,000 years	20,000 years	The event might occur under very adverse circumstances over the design life.	UNLIKELY	D
10^{-5}	$5x10^{-6}$	100,000 years	200,000 years	The event is conceivable but only under exceptional circumstances over the design life.	RARE	E
10^{-6}		1,000,000 years		The event is inconceivable or fanciful over the design life.	BARELY CREDIBLE	F

Note: (1) The table should be used from left to right; use Approximate Annual Probability or Description to assign Descriptor, not *vice versa*.

QUALITATIVE MEASURES OF CONSEQUENCES TO PROPERTY

Approximate Cost of Damage		Description	Descriptor	Level
Indicative Value	Notional Boundary			
200%	100%	Structure(s) completely destroyed and/or large scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequence damage.	CATASTROPHIC	1
60%	40%	Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequence damage.	MAJOR	2
20%	10%	Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequence damage.	MEDIUM	3
5%	1%	Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works.	MINOR	4
0.5%		Little damage. (Note for high probability event (Almost Certain), this category may be subdivided at a notional boundary of 0.1%. See Risk Matrix.)	INSIGNIFICANT	5

Notes: (2) The Approximate Cost of Damage is expressed as a percentage of market value, being the cost of the improved value of the unaffected property which includes the land plus the unaffected structures.

(3) The Approximate Cost is to be an estimate of the direct cost of the damage, such as the cost of reinstatement of the damaged portion of the property (land plus structures), stabilisation works required to render the site to tolerable risk level for the landslide which has occurred and professional design fees, and consequential costs such as legal fees, temporary accommodation. It does not include additional stabilisation works to address other landslides which may affect the property.

(4) The table should be used from left to right; use Approximate Cost of Damage or Description to assign Descriptor, not vice versa

Qualitative Risk Matrix

QUALITATIVE RISK ANALYSIS MATRIX – LEVEL OF RISK TO PROPERTY

LIKELIHOOD		CONSEQUENCES TO PROPERTY (With Indicative Approximate Cost of Damage)				
	Indicative Value of Approximate Annual Probability	1: CATASTROPHIC 200%	2: MAJOR 60%	3: MEDIUM 20%	4: MINOR 5%	5: INSIGNIFICANT 0.5%
A – ALMOST CERTAIN	10^{-1}	VH	VH	VH	H	M or L (5)
B - LIKELY	10^{-2}	VH	VH	H	M	L
C - POSSIBLE	10^{-3}	VH	H	M	M	VL
D - UNLIKELY	10^{-4}	H	M	L	L	VL
E - RARE	10^{-5}	M	L	L	VL	VL
F - BARELY CREDIBLE	10^{-6}	L	VL	VL	VL	VL

Notes: (5) For Cell A5, may be subdivided such that a consequence of less than 0.1% is Low Risk.

(6) When considering a risk assessment it must be clearly stated whether it is for existing conditions or with risk control measures which may not be implemented at the current time.

RISK LEVEL IMPLICATIONS

Risk Level		Example Implications (7)
VH	VERY HIGH RISK	Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to Low; may be too expensive and not practical. Work likely to cost more than value of the property.
H	HIGH RISK	Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low. Work would cost a substantial sum in relation to the value of the property.
M	MODERATE RISK	May be tolerated in certain circumstances (subject to regulator's approval) but requires investigation, planning and implementation of treatment options to reduce the risk to Low. Treatment options to reduce to Low risk should be implemented as soon as practicable.
L	LOW RISK	Usually acceptable to regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.
VL	VERY LOW RISK	Acceptable. Manage by normal slope maintenance procedures.

Note: (7) The implications for a particular situation are to be determined by all parties to the risk assessment and may depend on the nature of the property at risk; these are only given as a general guide.

Performance Criteria C15.6.1 That building and works on land within a landslip hazard area can: (a) minimise the likelihood of triggering a landslip event; and (b) achieve and maintain a tolerable risk from a landslip:	Relevance	Management Options	Managed (treated) Risk Assessment			Further Assessment Required
			Consequence	Likelihood	Risk	
P1.1 Building and works within a landslip hazard area must minimise the likelihood of triggering a landslip event and achieve and maintain a tolerable risk from landslip, having regard to: (a) the type, form, scale and intended duration of the development; (b) whether any increase in the level of risk from a landslip requires any specific hazard reduction or protection measures; (c) any advice from a State authority, regulated entity or a council; and (d) the advice contained in a landslip hazard report.	Achieve and maintain a tolerable risk	Refer to recommendations	Minor Medium	Rare	Very Low	N/A
P1.2 A landslip hazard report also demonstrates that the buildings and works do not cause or contribute to landslip on the site, on adjacent land or public infrastructure.	Works not likely to cause or contribute to landslip on site, or adjacent land or public infrastructure	Refer to recommendations	Minor Medium	Rare	Very Low	N/A
P1.3 If landslip reduction or protection measures are required beyond the boundary of the site the consent in writing of the owner of that land must be provided for that land to be managed in accordance with the specific hazard reduction or protection measures.	No reduction or protection required beyond the site boundary		Minor Medium	Rare	Very Low	N/A

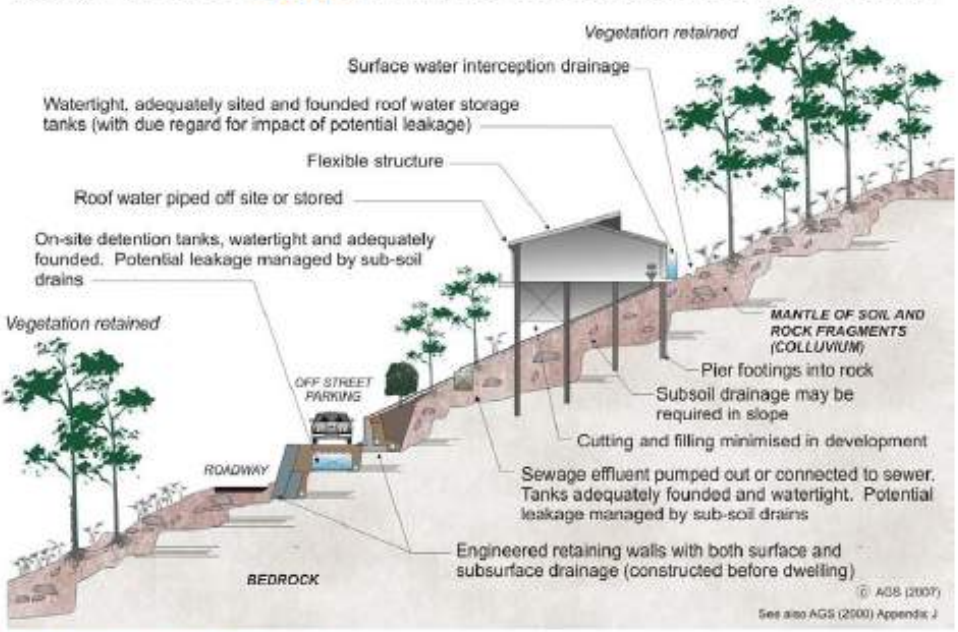
APPENDIX 3 - Australian Geomechanics Society (AGS) Landslip Risk

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

HILLSIDE CONSTRUCTION PRACTICE

Sensible development practices are required when building on hillsides, particularly if the hillside has more than a low risk of instability (GeoGuide LR7). Only building techniques intended to maintain, or reduce, the overall level of landslide risk should be considered. Examples of good hillside construction practice are illustrated below.

EXAMPLES OF GOOD HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES GOOD?

Roadways and parking areas - are paved and incorporate kerbs which prevent water discharging straight into the hillside (GeoGuide LR5).

Cuttings - are supported by retaining walls (GeoGuide LR6).

Retaining walls - are engineer designed to withstand the lateral earth pressures and surcharges expected, and include drains to prevent water pressures developing in the backfill. Where the ground slopes steeply down towards the high side of a retaining wall, the disturbing force (see GeoGuide LR6) can be two or more times that in level ground. Retaining walls must be designed taking these forces into account.

Sewage - whether treated or not is either taken away in pipes or contained in properly founded tanks so it cannot soak into the ground.

Surface water - from roofs and other hard surfaces is piped away to a suitable discharge point rather than being allowed to infiltrate into the ground. Preferably, the discharge point will be in a natural creek where ground water exits, rather than enters, the ground. Shallow, lined, drains on the surface can fulfil the same purpose (GeoGuide LR5).

Surface loads - are minimised. No fill embankments have been built. The house is a lightweight structure. Foundation loads have been taken down below the level at which a landslide is likely to occur and, preferably, to rock. This sort of construction is probably not applicable to soil slopes (GeoGuide LR3). If you are uncertain whether your site has rock near the surface, or is essentially a soil slope, you should engage a geotechnical practitioner to find out.

Flexible structures - have been used because they can tolerate a certain amount of movement with minimal signs of distress and maintain their functionality.

Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing can result in a rise in water table with a consequent increase in the likelihood of a landslide (GeoGuide LR5). An exception may have to be made to this rule on steep rock slopes where trees have little effect on the water table, but their roots pose a landslide hazard by dislodging boulders.

Possible effects of ignoring good construction practices are illustrated on page 2. Unfortunately, these poor construction practices are not as unusual as you might think and are often chosen because, on the face of it, they will save the developer, or owner, money. You should not lose sight of the fact that the cost and anguish associated with any one of the disasters illustrated, is likely to more than wipe out any apparent savings at the outset.

ADOPT GOOD PRACTICE ON HILLSIDE SITES

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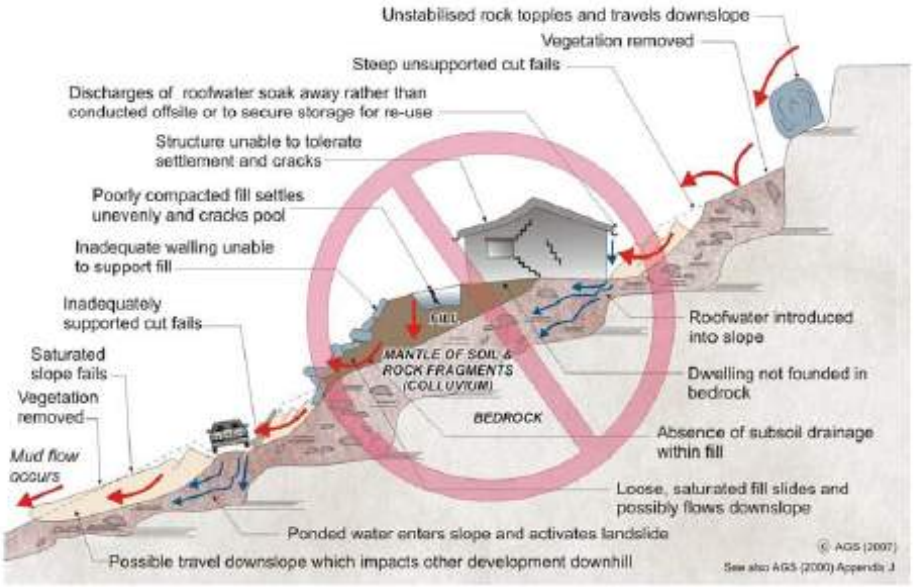
AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

EXAMPLES OF POOR HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES POOR?

Roadways and parking areas - are unsurfaced and lack proper table drains (gutters) causing surface water to pond and soak into the ground.

Cut and fill - has been used to balance earthworks quantities and level the site leaving unstable cut faces and added large surface loads to the ground. Failure to compact the fill properly has led to settlement, which will probably continue for several years after completion. The house and pool have been built on the fill and have settled with it and cracked. Leakage from the cracked pool and the applied surface loads from the fill have combined to cause landslides.

Retaining walls - have been avoided, to minimise cost, and hand placed rock walls used instead. Without applying engineering design principles, the walls have failed to provide the required support to the ground and have failed, creating a very dangerous situation.

A heavy, rigid, house - has been built on shallow, conventional, footings. Not only has the brickwork cracked because of the resulting ground movements, but it has also become involved in a man-made landslide.

Soak-away drainage - has been used for sewage and surface water run-off from roofs and pavements. This water soaks into the ground and raises the water table (GeoGuide LR5). Subsoil drains that run along the contours should be avoided for the same reason. If felt necessary, subsoil drains should run steeply downhill in a chevron, or herring bone, pattern. This may conflict with the requirements for effluent and surface water disposal (GeoGuide LR9) and if so, you will need to seek professional advice.

Rock debris - from landslides higher up on the slope seems likely to pass through the site. Such locations are often referred to by geotechnical practitioners as "debris flow paths". Rock is normally even denser than ordinary fill, so even quite modest boulders are likely to weigh many tonnes and do a lot of damage once they start to roll. Boulders have been known to travel hundreds of metres downhill leaving behind a trail of destruction.

Vegetation - has been completely cleared, leading to a possible rise in the water table and increased landslide risk (GeoGuide LR5).

DON'T CUT CORNERS ON HILLSIDE SITES - OBTAIN ADVICE FROM A GEOTECHNICAL PRACTITIONER

More information relevant to your particular situation may be found in other Australian GeoGuides:

- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR9 - Effluent & Surface Water Disposal
- GeoGuide LR10 - Coastal Landslides
- GeoGuide LR11 - Record Keeping

The Australian GeoGuides (LR series) are a set of publications intended for property owners; local councils; planning authorities; developers; insurers; lawyers and, in fact, anyone who lives with, or has an interest in, a natural or engineered slope, a cutting, or an excavation. They are intended to help you understand why slopes and retaining structures can be a hazard and what can be done with appropriate professional advice and local council approval (if required) to remove, reduce, or minimise the risk they represent. The GeoGuides have been prepared by the Australian Geomechanics Society, a specialist technical society within Engineers Australia, the national peak body for all engineering disciplines in Australia, whose members are professional geotechnical engineers and engineering geologists with a particular interest in ground engineering. The GeoGuides have been funded under the Australian governments' National Disaster Mitigation Program.

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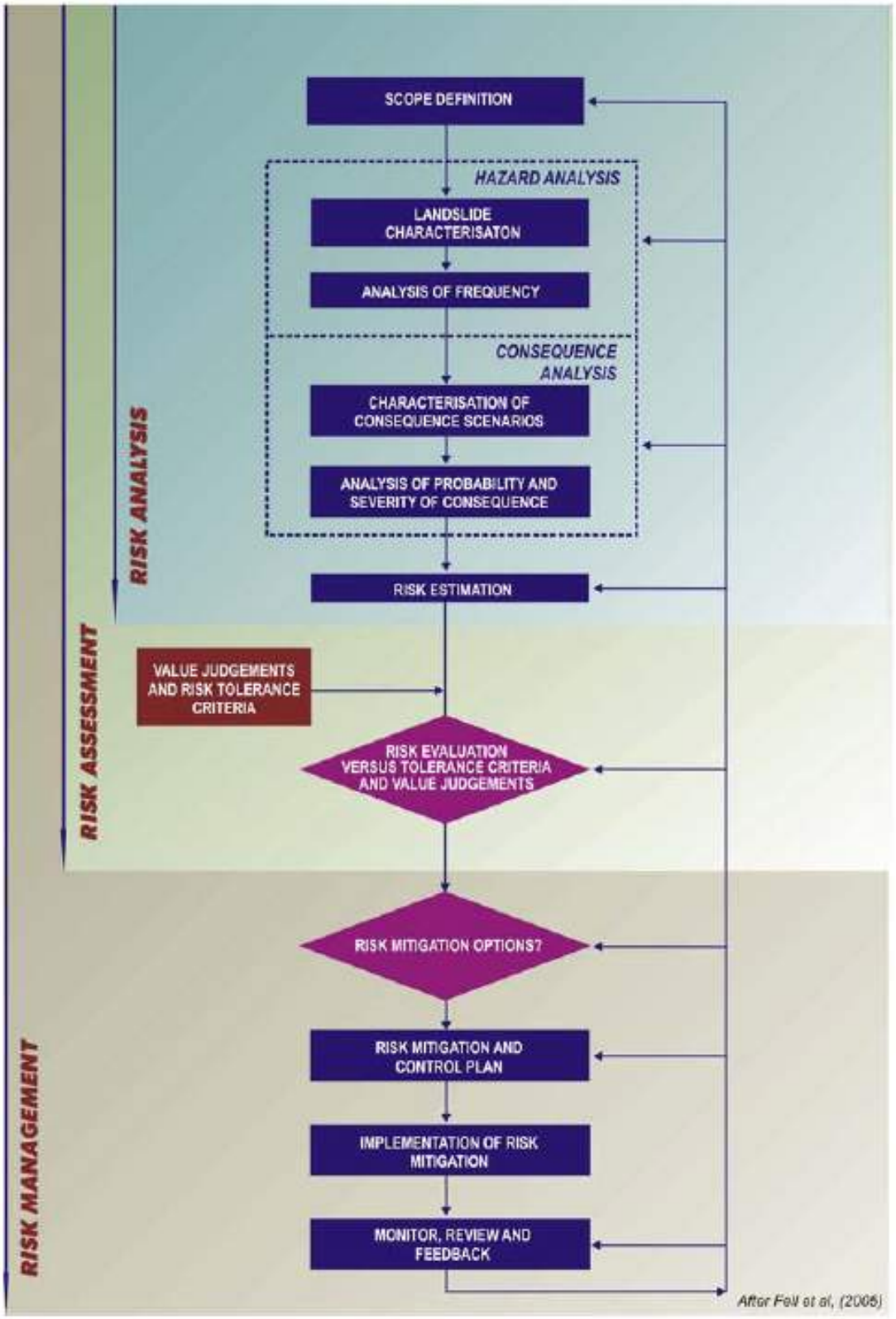
PRACTICE NOTE GUIDELINES FOR LANDSLIDE RISK MANAGEMENT 2007

APPENDIX G - SOME GUIDELINES FOR HILLSIDE CONSTRUCTION

	GOOD ENGINEERING PRACTICE	*POOR ENGINEERING PRACTICE*
ADVICE		
GEOTECHNICAL ASSESSMENT	Obtain advice from a qualified, experienced geotechnical practitioner at early stage of planning and before site works.	Prepare detailed plan and start site works before geotechnical advice.
PLANNING		
SITE PLANNING	Having obtained geotechnical advice, plan the development with the risk arising from the identified hazards and consequences in mind.	Plan development without regard for the Risk.
DESIGN AND CONSTRUCTION		
HOUSE DESIGN	Use flexible structures which incorporate properly designed brickwork, timber or steel frames, timber or panel cladding. Consider use of split levels. Use decks for recreational areas where appropriate.	Floor plans which require extensive cutting and filling. Movement intolerant structures.
SITE CLEARING	Retain natural vegetation wherever practicable.	Indiscriminately clear the site.
ACCESS & DRIVEWAYS	Satisfy requirements below for cuts, fills, retaining walls and drainage. Council specifications for grades may need to be modified. Driveways and parking areas may need to be fully supported on piers.	Excavate and fill for site access before geotechnical advice.
EARTHWORKS	Retain natural contours wherever possible.	Indiscriminatory bulk earthworks.
CUTS	Minimise depth. Support with engineered retaining walls or batter to appropriate slope. Provide drainage measures and erosion control.	Large scale cuts and benching. Unsupported cuts. Ignore drainage requirements
FILLS	Minimise height. Strip vegetation and topsoil and key into natural slopes prior to filling. Use clean fill materials and compact to engineering standards. Batter to appropriate slope or support with engineered retaining wall. Provide surface drainage and appropriate subsurface drainage.	Loose or poorly compacted fill, which if it fails, may flow a considerable distance including onto property below. Block natural drainage lines. Fill over existing vegetation and topsoil. Include stumps, trees, vegetation, topsoil, boulders, building rubble etc in fill.
ROCK OUTCROPS & BOULDERS	Remove or stabilise boulders which may have unacceptable risk. Support rock faces where necessary.	Disturb or undercut detached blocks or boulders.
RETAINING WALLS	Engineer design to resist applied soil and water forces. Found on rock where practicable. Provide subsurface drainage within wall backfill and surface drainage on slope above. Construct wall as soon as possible after cut/fill operation.	Construct a structurally inadequate wall such as sandstone flagging, brick or unreinforced blockwork. Lack of subsurface drains and weepholes.
FOOTINGS	Found within rock where practicable. Use rows of piers or strip footings oriented up and down slope. Design for lateral creep pressures if necessary. Backfill footing excavations to exclude ingress of surface water.	Found on topsoil, loose fill, detached boulders or undercut cliffs.
SWIMMING POOLS	Engineer designed. Support on piers to rock where practicable. Provide with under-drainage and gravity drain outlet where practicable. Design for high soil pressures which may develop on uphill side whilst there may be little or no lateral support on downhill side.	
DRAINAGE		
SURFACE	Provide at tops of cut and fill slopes. Discharge to street drainage or natural water courses. Provide general falls to prevent blockage by siltation and incorporate silt traps. Line to minimise infiltration and make flexible where possible. Special structures to dissipate energy at changes of slope and/or direction.	Discharge at top of fills and cuts. Allow water to pond on bench areas.
SUBSURFACE	Provide filter around subsurface drain. Provide drain behind retaining walls. Use flexible pipelines with access for maintenance. Prevent inflow of surface water.	Discharge roof runoff into absorption trenches.
SEPTIC & SULLAGE	Usually requires pump-out or mains sewer systems; absorption trenches may be possible in some areas if risk is acceptable. Storage tanks should be water-tight and adequately founded.	Discharge sullage directly onto and into slopes. Use absorption trenches without consideration of landslide risk.
EROSION CONTROL & LANDSCAPING	Control erosion as this may lead to instability. Revegetate cleared area.	Failure to observe earthworks and drainage recommendations when landscaping.
DRAWINGS AND SITE VISITS DURING CONSTRUCTION		
DRAWINGS	Building Application drawings should be viewed by geotechnical consultant	
SITE VISITS	Site Visits by consultant may be appropriate during construction/	
INSPECTION AND MAINTENANCE BY OWNER		
OWNER'S RESPONSIBILITY	Clean drainage systems; repair broken joints in drains and leaks in supply pipes. Where structural distress is evident see advice. If seepage observed, determine causes or seek advice on consequences.	

FRAMEWORK FOR LANDSLIDE RISK MANAGEMENT



APPENDIX B - LANDSLIDE TERMINOLOGY

The following provides a summary of landslide terminology which should (for uniformity of practice) be adopted when classifying and describing a landslide. It has been based on Cruden & Varnes (1996) and the reader is recommended to refer to the original documents for a more detailed discussion, other terminology and further examples of landslide types and processes.

Landslide

The term *landslide* denotes "the movement of a mass of rock, debris or earth down a slope". The phenomena described as landslides are not limited to either the "land" or to "sliding", and usage of the word has implied a much more extensive meaning than its component parts suggest. Ground subsidence and collapse are excluded.

Classification of Landslides

Landslide classification is based on Varnes (1978) system which has two terms: the first term describes the material type and the second term describes the type of movement.

The material types are ***Rock***, ***Earth*** and ***Debris***, being classified as follows:-

The material is either rock or soil.

- ***Rock***: is "a hard or firm mass that was intact and in its natural place before the initiation of movement."
- ***Soil:*** is "an aggregate of solid particles, generally of minerals and rocks, that either was transported or was formed by the weathering of rock in place. Gases or liquids filling the pores of the soil form part of the soil."
- ***Earth***: "describes material in which 80% or more of the particles are smaller than 2 mm, the upper limit of sand sized particles."
- ***Debris***: "contains a significant proportion of coarse material; 20% to 80% of the particles are larger than 2 mm and the remainder are less than 2 mm."

The terms used should describe the displaced material in the landslide before it was displaced.

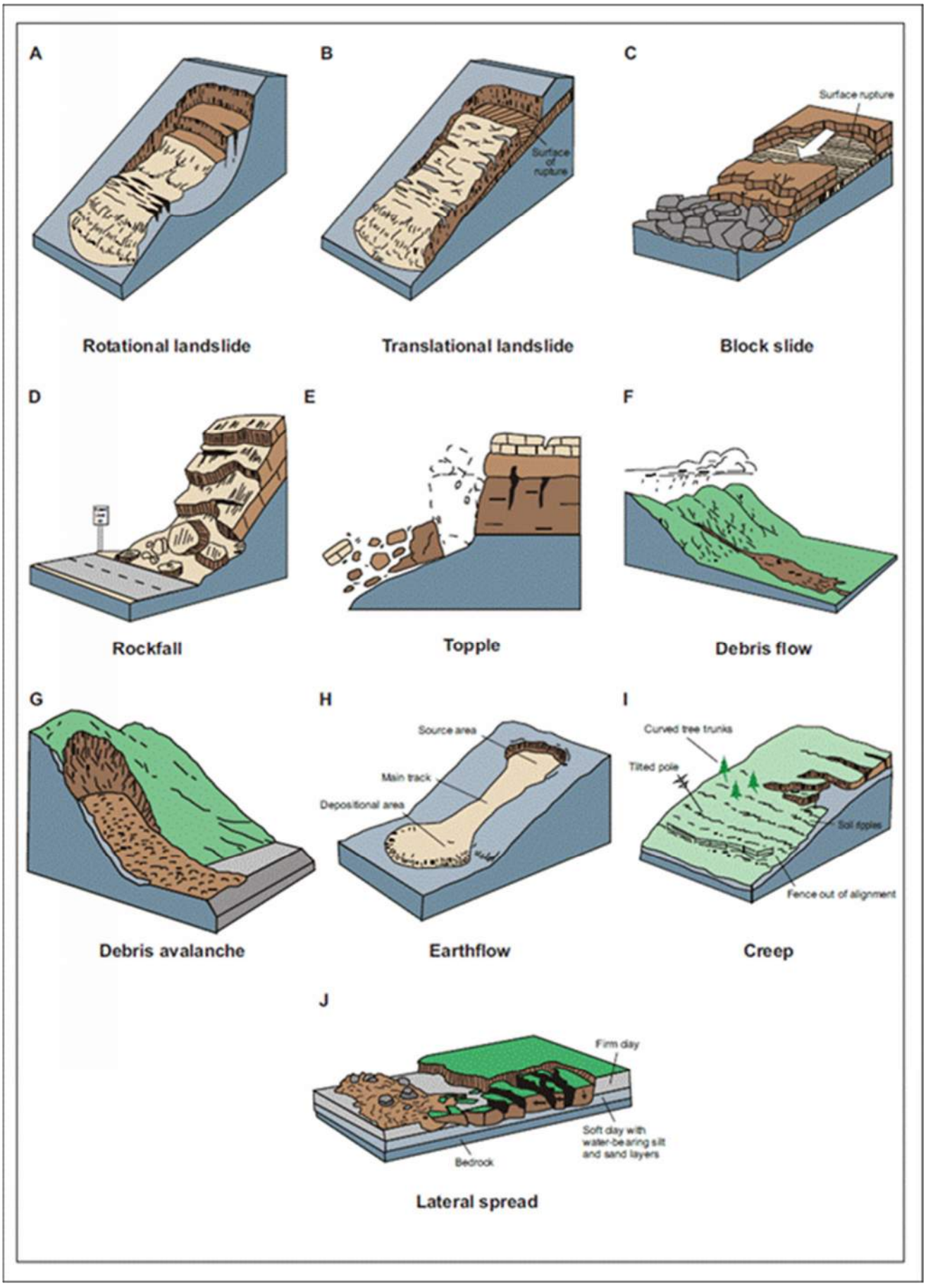
The types of movement describe how the landslide movement is distributed through the displaced mass. The five kinematically distinct types of movement are described in the sequence ***fall***, ***topple***, ***slide***, ***spread*** and ***flow***.

The following table shows how the two terms are combined to give the landslide type:

Table B1: Major types of landslides. Abbreviated version of Varnes' classification of slope movements (Varnes, 1978).

TYPE OF MOVEMENT		TYPE OF MATERIAL		
		BEDROCK	ENGINEERING SOILS	
			Predominantly Coarse	Predominantly Fine
FALLS		Rock fall	Debris fall	Earth fall
TOPPLES		Rock topple	Debris topple	Earth topple
SLIDES	ROTATIONAL	Rock slide	Debris slide	Earth slide
	TRANSLATIONAL			
LATERAL SPREADS		Rock spread	Debris spread	Earth spread
FLOWS		Rock flow (Deep creep)	Debris flow (Soil creep)	Earth flow
COMPLEX	Combination of two or more principle types of movement			

Figure B1 gives schematics to illustrate the major types of landslide movement. Further information and photographs of landslides are available on the USGS website at http://landslides.usgs.gov.


A
Rotational landslide
B
Surface of rupture
Translational landslide
C
Surface rupture
Block slide
D
Rockfall
E
Topple
F
Debris flow
G
Debris avalanche
H
Source area
Main track
Depositional area
Earthflow
I
Curved tree trunks
Tilted pole
Soil ripples
Fence out of alignment
Creep
J
Firm clay
Soft clay with water-bearing silt and sand layers
Bedrock
Lateral spread

Appendix 4 Site Photos

DRAWING INDEX

Dwg.No.	Drawing name	Scales
DA01	Index, views	
DA02	Site plan, location	1:10000, 1:7...
DA03	Ground floor	1:100
DA04	Roof plan	1:100
DA05	Sections	1:100
DA06	Sections	1:100
DA07	Elevations	1:100
DA08	Elevations	1:100
DA09	Shed	1:100

view from SW

view from SE

New residence, shed + secondary dwelling
at 231 Greens Rd Orielton TAS 7172
for Josiah+Aaron Huppatz

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2402-DA01

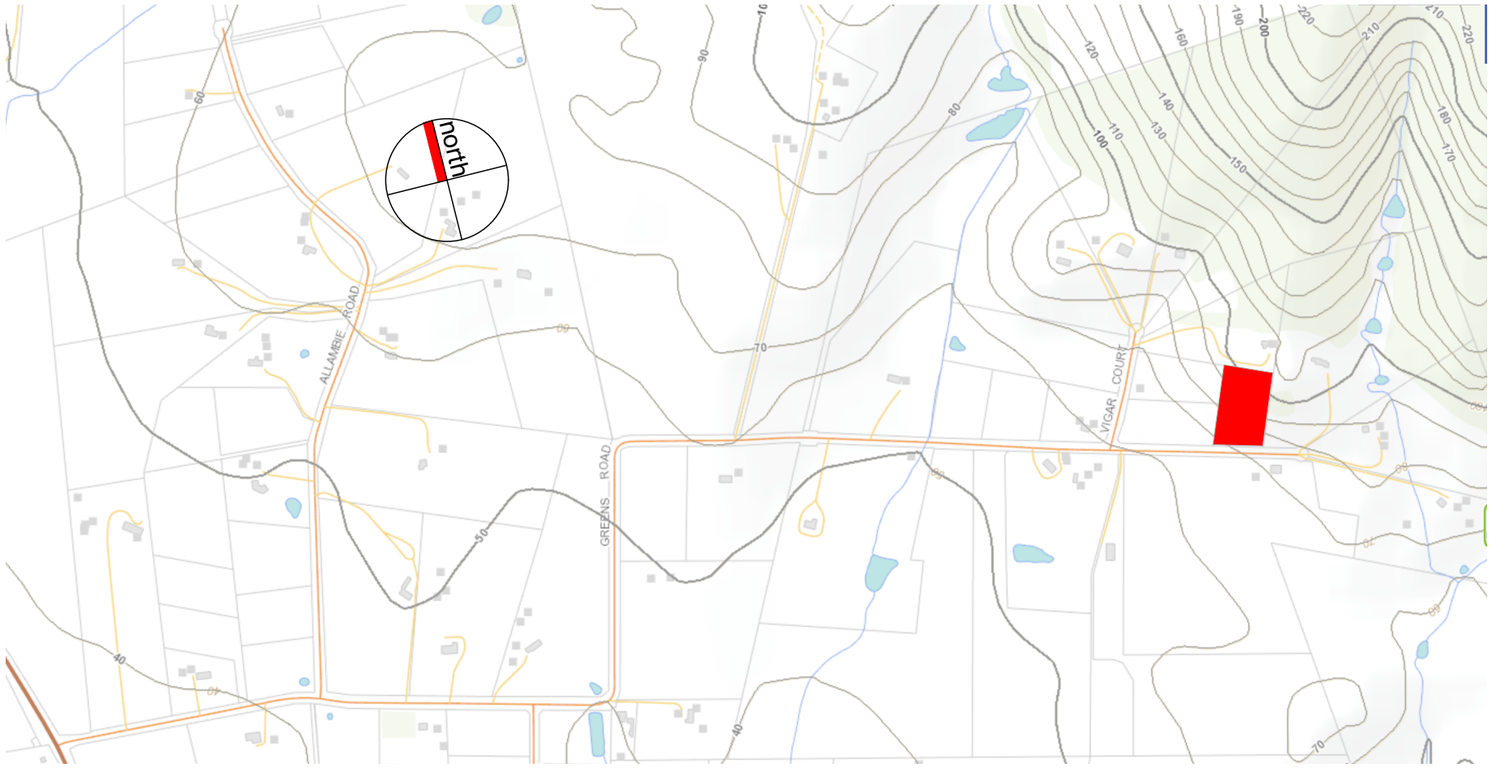
2025-05-11

PROPERTY DESCRIPTION
Vol / Folio: 180600 / 4
City of Clarence

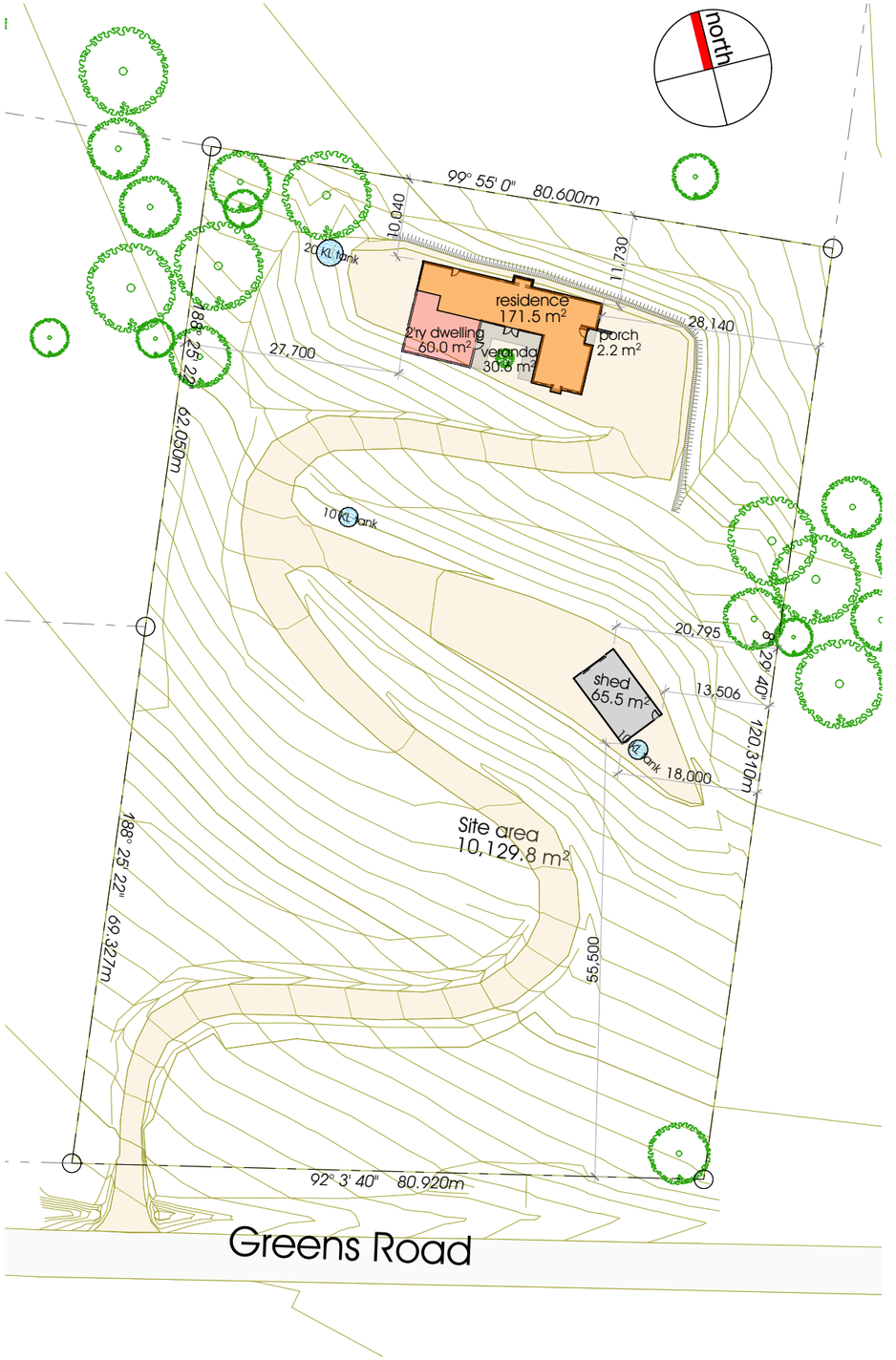
Sorell Council
Development Application: 5.2024.295.1 - Response to Request For Information - 231 Greens Road, Orielton - P2.pdf
Plans Reference: P2
Date Received: 13/05/2025

AREA CALCULATIONS

Residence	171.5m²
2'ry dwelling	60m²
Shed	65.5m²
Total floor area	297.0m²
Veranda	30.6m²
Porch	2.2m²
Site area	10 130m²
Site cover	329.8m²
Plot Ratio	3.25%



1 Location plan
1:10000



2 Site Plan
1:750

rev	date	by	details
K	250426	DL	floor area reduced, shed moved east
J	241222	DL	floor area changes, 2'ry dwelling defined
G	241031	DL	floor area change
E	240926	DL	tanks shown
D	240826	DL	floor area change
C	240802	DL	floor area, plan, positioning changes
B	240616	DL	floor area, plan, positioning changes, site updated from survey info
L	250510	DL	fireplace changed
A	240414	DL	floor area, plan changes

New residence, shed + secondary dwelling
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Design drawings
Site plan, location

scale 1:10000, 1:750
date drawn 2024-03-25
by DL
2402-DA02
drawing No.
2025-05-11
printing date
M
rev.

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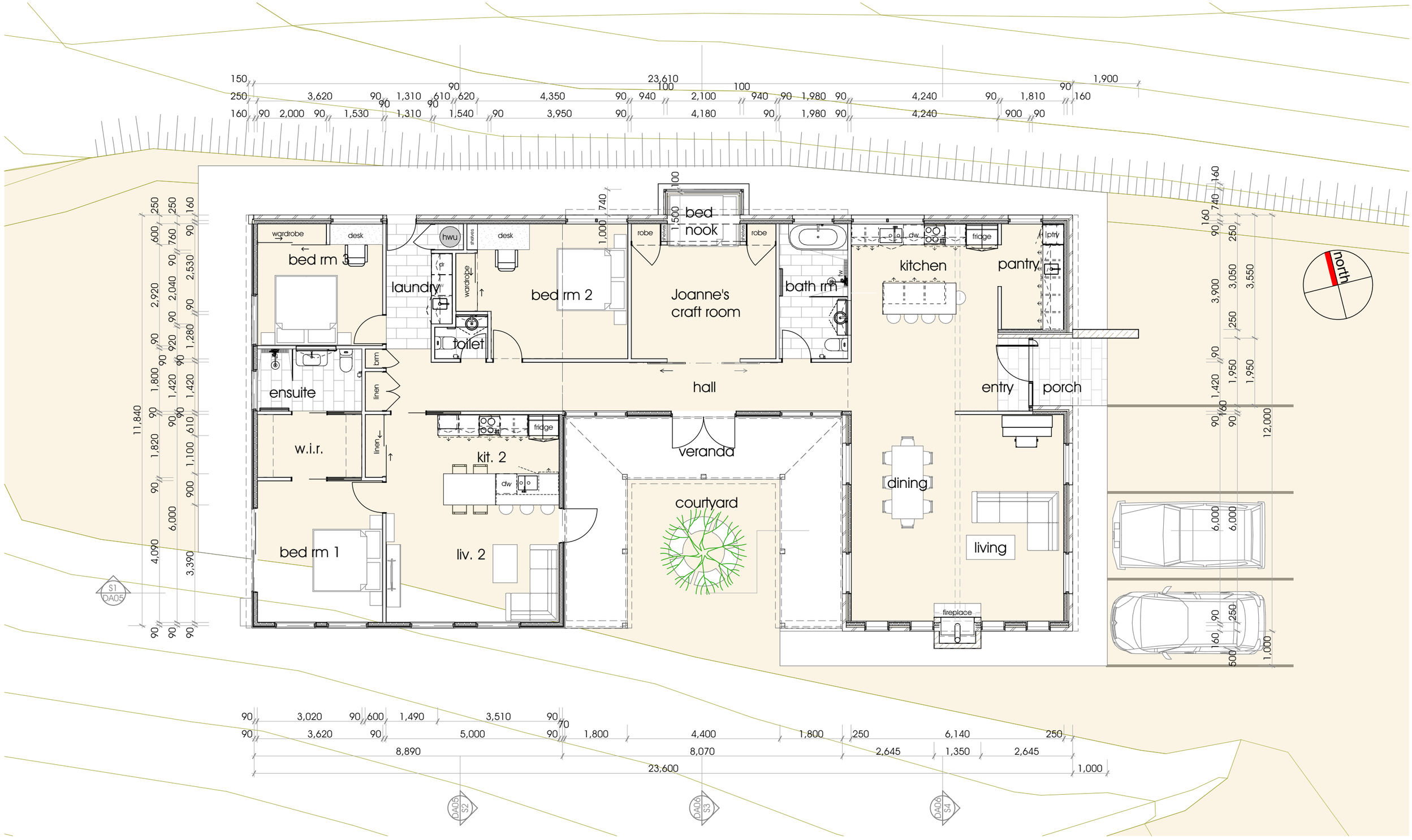

0. Ground Floor
1:100

Sorell Council

Development Application: 5.2024.295.1 - Response to Request For Information - 231 Greens Road, Orielton - P2.pdf
Plans Reference: P2
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rev	date	by	details
M	250511	DL	living rm south windows changed
L	250510	DL	fireplace, windows changed, sl.door deleted
K	250426	DL	floor area reduced, central heater deleted, fireplace added, mezzanine deleted
J	241222	DL	2'ry dwelling reduced, ext. walls changed
H	241116	DL	dimensions adjusted

New residence, shed + secondary dwelling
at 231 Greens Rd Orielton
TAS 7172
for Josiah+Aaron Huppatz

Design drawings
Ground floor

scale 1:100
date drawn 2025-05-11
by DL

2402-DA03
drawing No.
printing date
M
rev.

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2. Roof plan
1:100

rev	date	by	details
L	250510	DL	fireplace changed
K	250426	DL	mezzanine deleted, roof changed
J	241222	DL	trussed roof area reduced
H	241116	DL	minor roof+fascia changes
E	240926	DL	trussed roof extended
D	240826	DL	skylights added
C	240802	DL	floor area, plan, positioning changes
B	240616	DL	floor area, plan, positioning changes, site updated from survey info
A	240414	DL	plan changes

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Design drawings
Roof plan

scale	1:100	2402-DA04	
date drawn	2024-03-25	drawing No.	M
by	DL	2025-05-11 printing date	rev.

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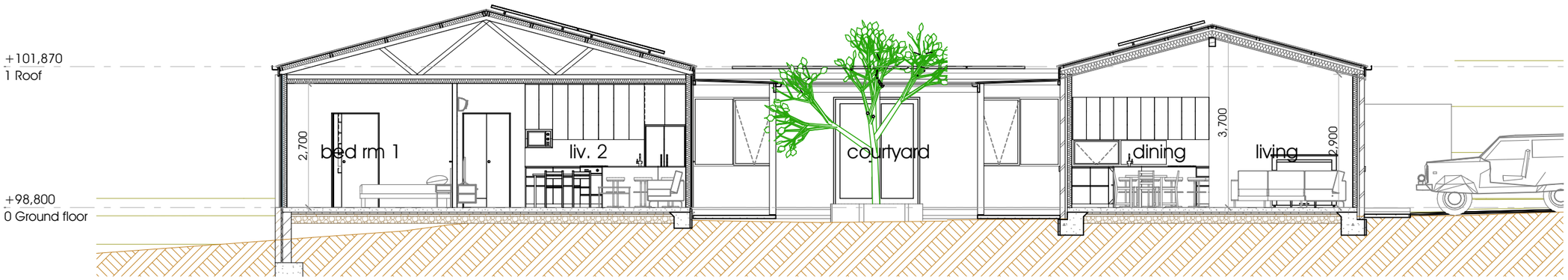
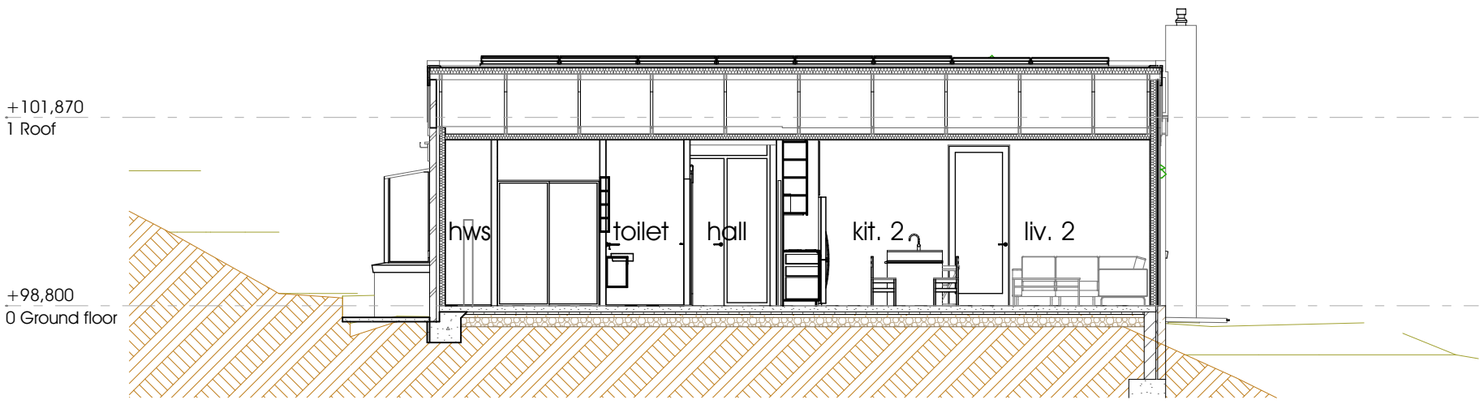


S1 Section
1:100



S2 Section
1:100

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Plans Reference: P2
Date Received: 13/05/2025

rev	date	by	details
L	250510	DL	fireplace changed
K	250426	DL	mezzanine deleted, roof changed
J	241222	DL	2'ry dwelling reduced, ext. walls changed
H	241116	DL	minor roof+fascia changes
G	241031	DL	roof construction changes
F	241008	DL	plan chgs. at l'dry/bath2/utility/bed2, trussed roof raised 90mm, win.chgs. to liv2+bed3
E	240926	DL	window changes, trussed roof extended
D	240826	DL	skylights added, trussed roof to granny flat, wall type changes, eaves
C	240802	DL	floor area, plan, positioning changes
B	240616	DL	floor area, plan, positioning changes, site updated from survey info
A	240414	DL	plan changes, loft over granny flat deleted

New residence, shed + secondary dwelling
at 231 Greens Rd Orielton TAS 7172
for Josiah+Aaron Huppatz

Design drawings
Sections

scale 1:100
date drawn 2024-03-25
by DL

2402-DA05
drawing No.
2025-05-11
printing date
M
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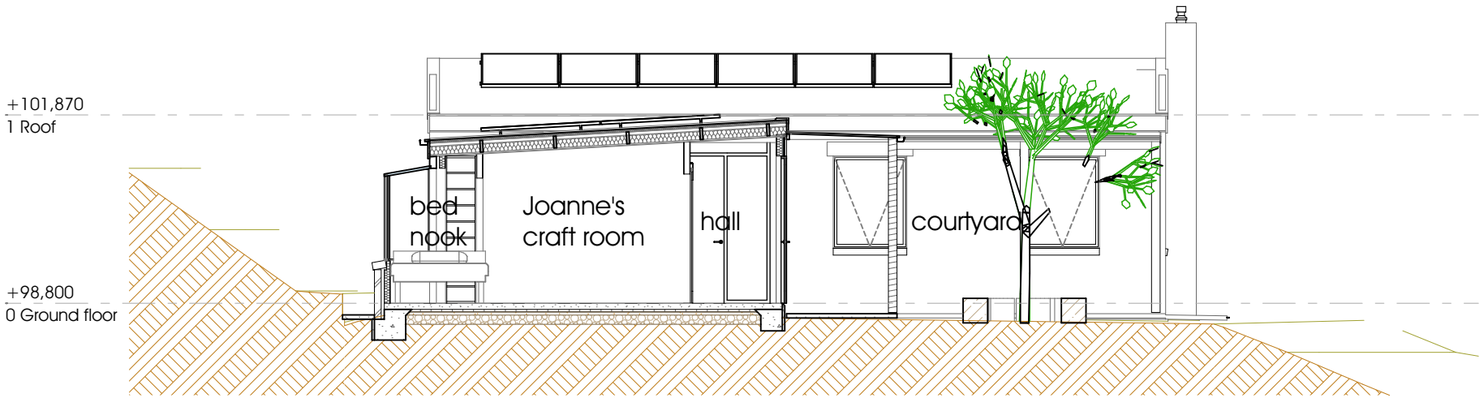

S3 Section
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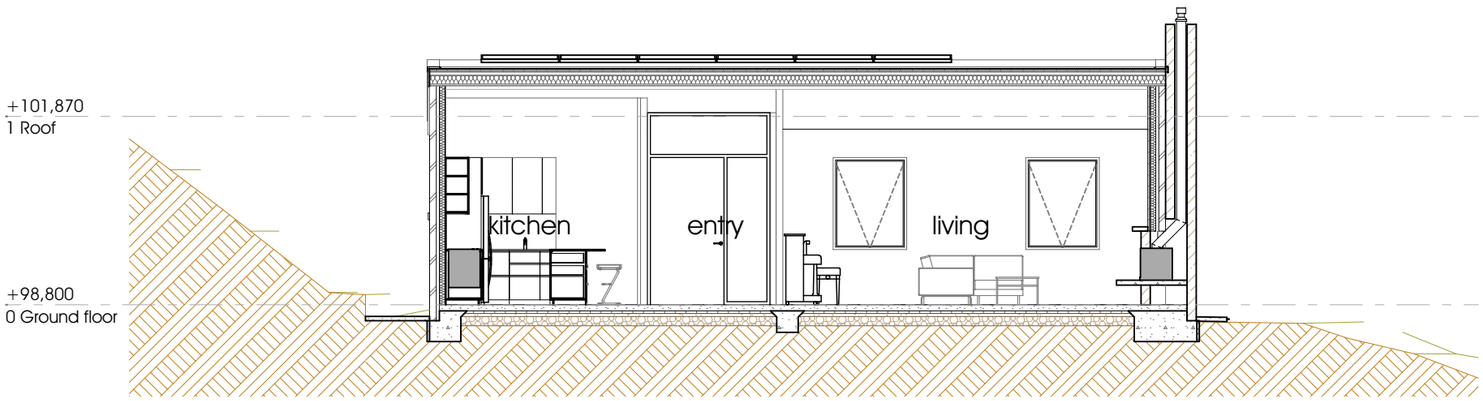

S4 Section
1:100

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Development Application: 5.2024.295.1 - Response to Request For Information - 231 Greens Road, Orielton - P2.pdf
Plans Reference: P2
Date Received: 13/05/2025

rev	date	by	details
L	250510	DL	fireplace, windows changed
K	250426	DL	fireplace added, mezzanine deleted
H	241116	DL	minor roof+fascia changes
G	241031	DL	roof construction changes
E	240926	DL	door+win. changes, skillion roof lowered
D	240826	DL	eaves+skylights added, wall type changes
C	240802	DL	floor area, plan, positioning changes
B	240616	DL	floor area, plan, positioning changes, site updated from survey info
A	240414	DL	plan changes, loft over granny flat deleted sections added

New residence, shed + secondary dwelling
at 231 Greens Rd Orielton TAS 7172
for Josiah+Aaron Huppatz

Design drawings
Sections

scale 1:100
date drawn 2024-03-25
by DL

2402-DA06
drawing No.
2025-05-11 printing date
M rev.

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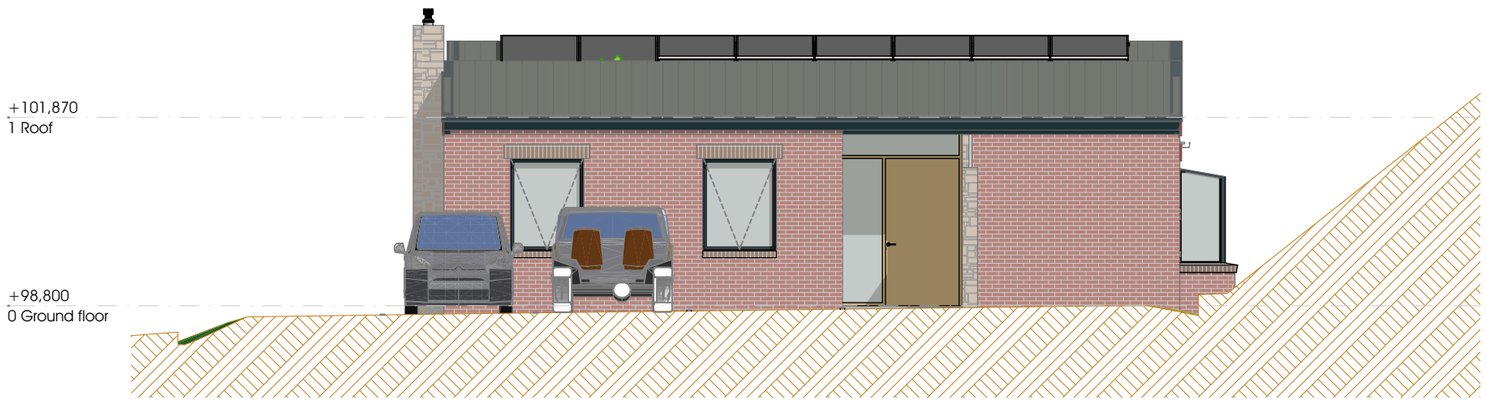
S Elevation
1:100



E Elevation
1:100

rev	date	by	details
M	250511	DL	living rm south windows changed
L	250510	DL	fireplace, windows changed
K	250426	DL	fireplace added, mezzanine deleted, roof, cladding, windows, changed
J	241222	DL	2'ry dwelling reduced, ext. walls changed
G	241031	DL	fascias+bargeboards shown
F	241008	DL	plan chgs. at l'dry/bath2/utility/bed2, trussed roof raised 90mm, win.chgs. to liv2+bed3
E	240926	DL	door+win. changes, skillion roof lowered, trussed roof extended, stone base to c'yd wall
D	240826	DL	eaves+skylights added, wall+window chg
C	240802	DL	floor area, plan, positioning changes
B	240616	DL	floor area, plan, positioning changes, site updated from survey info
A	240414	DL	plan changes, loft over granny flat deleted, masonry end walls to rear wing, window chgs.

New residence, shed + secondary dwelling
at 231 Greens Rd Orielton TAS 7172
for Josiah+Aaron Huppatz

Design drawings
Elevations

scale 1:100
date drawn 2024-03-25
by DL

2402-DA07
drawing No.
2025-05-11 M
printing date rev.

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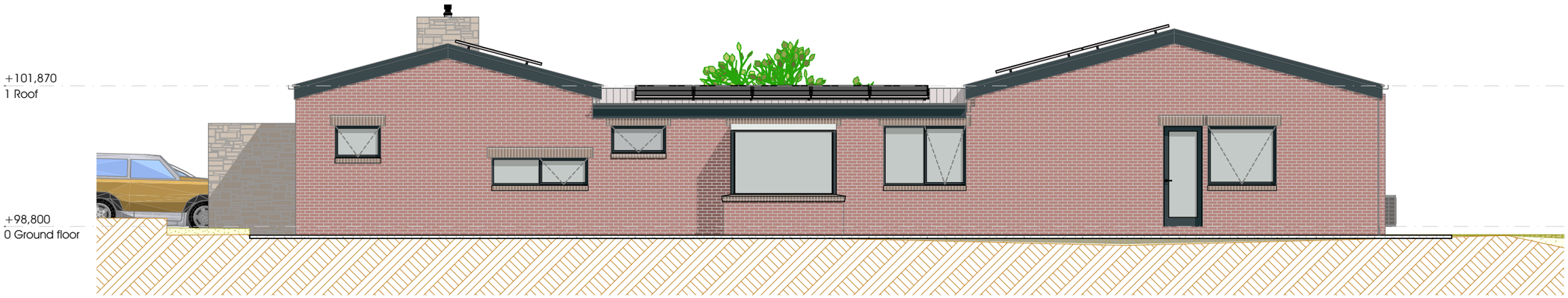
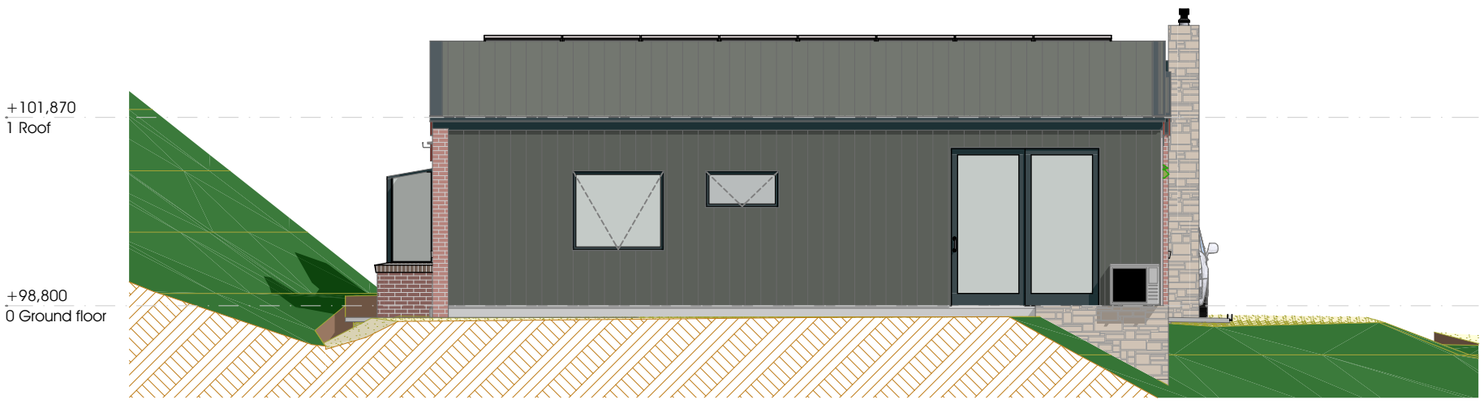


N Elevation
1:100



W Elevation
1:100

rev	date	by	details
L	250510	DL	fireplace, windows changed
K	250426	DL	fireplace added, mezzanine deleted, roof, cladding, windows, changed
J	241222	DL	2'ry dwelling reduced, ext. walls changed
H	241116	DL	minor roof+fascia changes
G	241031	DL	fascias+bargeboards shown
F	241008	DL	plan chgs. at l'dry/bath2/utility/bed2, trussed roof raised 90mm, win.chgs. to liv2+bed3
E	240926	DL	door+win. changes, skillion roof lowered, trussed roof extended
D	240826	DL	eaves+skylights added, wall+window chg
C	240802	DL	floor area, plan, positioning changes
B	240616	DL	floor area, plan, positioning changes, site updated from survey info
A	240414	DL	plan changes, loft over granny flat deleted, masonry end walls to rear wing, window chgs.

New residence, shed + secondary dwelling
at 231 Greens Rd Orielton TAS 7172
for Josiah+Aaron Huppatz

Design drawings
Elevations

scale 1:100
date drawn 2024-03-25
by DL

2402-DA08
drawing No. M
2025-05-11 printing date
rev.

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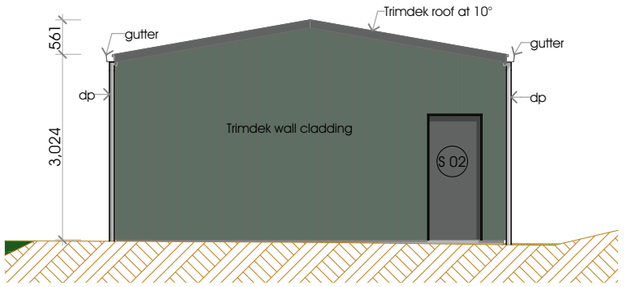
SW Elevation
1:100



SE Elevation
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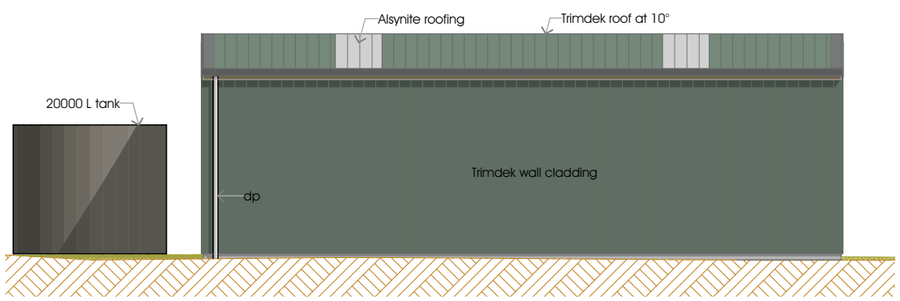
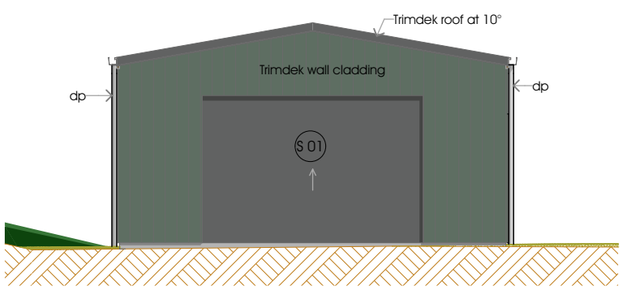
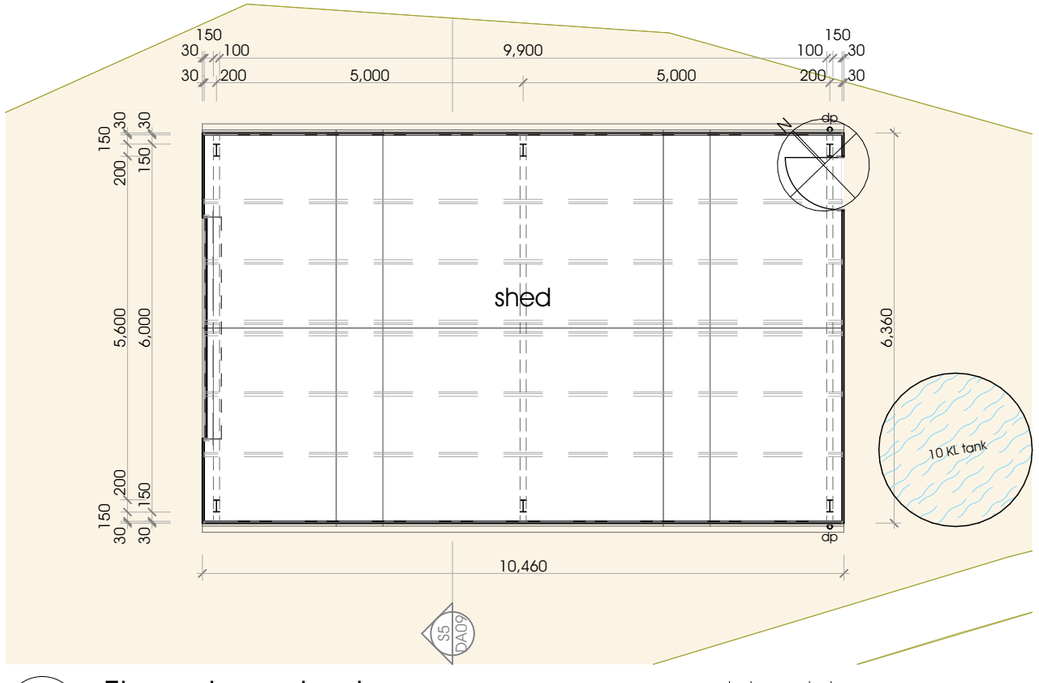


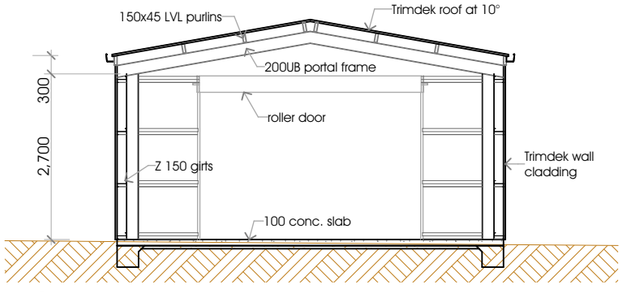
NE Elevation
1:100



NW Elevation
1:100



0. Floor plan - shed
1:100



S5 Section
1:100

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Plans Reference: P2
Date Received: 13/05/2025

rev	date	by	details
K	250426	DL	shed position changed
J	241222	DL	this drawing added

New residence, shed + secondary dwelling
at 231 Greens Rd Orielton
TAS 7172
for Josiah+Aaron Huppatz

Design drawings
Shed

scale 1:100
date drawn 2024-12-22
by DL

2402-DA09
drawing No.
2025-05-11
printing date
M
rev.

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