Bushfire Hazard Report

13 Nielson Drive
Montrose

Performance Solution

Tasmanian Planning Scheme

Property ID 7765305 Title Reference 46375/1

New construction

D Graham

August 2024

Roger Fenwick Bush Fire Consultant
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0411 609 906
Accreditation No. BFP - 162

2311DAV.MON.NIE1.0

Table of Contents

Executive summary

I am an Accredited person permitted to assess bushfire hazards and to define Hazard Management Areas and to prepare appropriate plans for their ongoing management. A summary of my *curriculum vitae* is Annexure A.

This report concerns proposed construction of a single family dwelling in a bushfire-prone area within a Tasmanian Planning Scheme area, assessed under the provisions of the *Director's Determination Bushfire Hazard Areas v 1.2 (*DDBHA).

Vegetation on slopes exceeding 20^{o} necessitates preparation of a Performance Solution.

Roger Fenwick BFP 162 Scope 1, 2, 3A, 3B

View to NE from previously cleared house site

Purpose

I have been engaged to undertake a Bushfire Hazard Report for proposed construction of a single-family dwelling located at 13 Nielson Drive, Montrose known as Property ID 7765305, Title Reference 46375/1.

This report provides an assessment of the bushfire risk as required by the provisions of the *Director's Determination Bushfire Hazard Areas v 1.2 (*DDBHA). The proximity of the building area to unmanaged vegetation on land with a gradient exceeding 20° necessitates a Performance Solution.

Methodology

The assessment protocol relies on definitions and specifications in the Australian Standard *Construction of buildings in bushfire-prone area 2018* (AS 3959), *Nash Standard – Steel Framed Construction in Bushfire Areas*, vegetation classification by Specht 1970, and in particular, State variations defined in the DDBHA. Those variations specify additional requirements for access, water supply, and a Hazard Management Area (HMA) plan.
For defined vegetation classes, litter and other flammable vegetation component standard values have been determined. These, slope values and standard weather conditions are used to calculate bushfire behaviour, including rate of forward spread, radiant heat output and flame height. When considered in conjunction with the distance between the edge of the fire and the point of measurement (eg the wall of a house), they show the intensity of the fire exposure.

Those combined values are expressed as a Bushfire Attack Level (BAL) plus a number which expresses the radiant heat output in kilowatts per square metre (kWm^{-2}). The BAL rating determines the required construction standard. As the setback distance increases, the BAL rating decreases.

Proximity to vegetation growing on slopes exceeding 20° exceeds the range of values in the Deemed to Satisfy (DtS) table in AS 3959. This requires a Performance Solution involving calculations by Method 2, as outlined in the Standard. The intention is to apply M2 to all exposures, in order to minimise the necessary clearing, and limit the necessary tree removal on a skyline type exposure with visibility from far and wide of the edges of this site. The proposed solution will specify the extent of a Hazard Management Area and construction standard combination appropriate to the site.

The Performance-Based Design Brief, defining how compliance with specified fire safety outcomes will be achieved, has been accepted by TFS and the Building Surveyor.

Proposal

Plans showing the site and proposed development are attached at Annexure E.

The application is to build a BAL-29 specification house plus the required access road.

General site description

This 1.4ha site is located on a minor promontory overlooking Islet Rivulet to the north and Elwick Bay in the Derwent estuary to the NE.

Site vegetation

The vegetation type present is incorrectly shown on Tasveg mapping as Dry eucalypt forest & woodland dominated by *E pulchella*. In fact it is *A verticillata*, She-oak.

Fuel loads associated with that species were described by Marsden-Smedley et al[1]. In SE Tas it was typified by a surface/near-surface fuel load of 12.7tha^{-1} (Table 4). Adding 1tha^{-1} for bark, as per the same paper, and the standard 10tha^{-1} for canopy fuels, gives overall fuel load values of w = 13.7 & W = 23.7. I have used those values, which exceed the SE Tas average for Dry forest & Woodland, in the Method 2 assessment.

Typical retained vegetation below building area, and part-formed access road – site to right.

Topography

The area in the immediate vicinity of the house site is more or less flat and level. The site surrounds slope generally down to the north and northeast. Vegetated gradients affecting construction on the hilltop setting are downslopes of 6° to the ENE, 18° to the north, 24° to the northwest in the area of the proposed access road, 12° to the west and 3° to the southwest. All other exposures are to level or upslope land, most of which is already managed or supports only minor scrubby vegetation on the site.

[1] *Fuel in Tasmanian Dry Eucalypt Forests,* Marsden-Smedley, Anderson & Pyrke 2022, mdpi.com/journal/fire, Fire, 5, 103 Table 4.

Fire history

The LIST records bushfire over the site in 1997.

Bushfire Context

A bushfire prone area is defined as land so mapped, and land within 100m of bushfire prone vegetation equal to or exceeding 1 hectare in area. Bushfire prone vegetation includes areas of grasses and shrubs other than defined exceptions such as maintained lawns, gardens, some horticultural land and the like.

The slope used in Deemed to Satisfy bushfire assessments based on the Tables in AS 3959 is the gradient beneath unmanaged adjoining vegetation able to support fire movement towards structures. It varies from Upslope and Level (both defined as 0°) to groups of Downslope in 5° increments, maxing out at 20°. Downslope means that fire is travelling uphill when moving towards the structure. Specific slope values can be applied, by Method 2 as specified in AS 3959. When dealing with slopes exceeding 20°, method 2 has to be applied.

Setbacks are defined as the plan view (horizontal) distance between the edge of unmanaged vegetation and the nearest part of a structure subject to the assessment. This means to the nearest wall, or if there is no wall, to the nearest supporting post or column of a carport, deck, veranda, landing, stairs or ramps. Eaves and overhangs, tanks, chimneys, unroofed pergolas and sun blinds are excluded.

For planning purposes, it is assumed that the McArthur Forest Fire Danger Index (FDI) is 50. This defined FDI may not cover the worst case exposure at a site, and even strict adherence to the mandatory and other recommended specifications will not guarantee that structures will not be ignited by bushfire.

Performance-Based Analysis

Objective

The intention is to ensure that adequate setback distances from fire in nearby unmanaged vegetation are provided so as to reduce the likelihood of ignition to an acceptable level, and ensure a tolerable risk to occupants and firefighters.

Table 2.6 in AS 3959 provides specifications for recognised vegetation types and slope classes, showing the combinations of setback distance and construction level generally regarded as providing acceptable levels of fire resistance. The Standard also specifies the methodology by which site-specific calculations can be made, mirroring that used to generate the Tables shown in the DtS section of the Standard.

The approved PBD protocol requires that the relevant stakeholders agree on the required outcome and the means by which proposed solutions will be assessed.

Relevant stakeholders

The relevant stakeholders in this case include the property owner, the building designer/planner (design firm idw), the building surveyor (Freestone), the Tasmania Fire Service and the bushfire practitioner.

Agreed input data

Nearby vegetation types were assessed by inspection, and found to be *A verticillata* – not the published *E pulchella*. The relevant inputs are values of w = 13.7 & W = 23.7, from

Marsden-Smedley et al (*ibid*) and I have used them as shown in the attached spreadsheet. Slopes as measured on site have been applied to each exposure calculated per Method 2.

DtS departures and relevant Performance Requirements

The applicable requirements are provided in the *Director's Determination Bushfire Hazard Areas v 1.2 (*DDBHA).

DtS provision	DtS compliance	Relevant performance requirement
2.3.1 Design & Construction	Will comply with DtS	Design and construction to reduce likelihood of ignition from bushfire as appropriate to achieve tolerable risk.
2.3.2 Property Access	Design will comply with DtS	-
2.3.3 Water Supply	Design will comply with DtS	-
2.3.4 Hazard Management Area	HMA will not comply with DtS where slopes exceed the Table data range.	The setbacks required to correspond to an appropriate Design and Construction specification
2.3.5 Emergency Plan	Not required	-

Assessment Methods

In accordance with A2G2(1)(a) the Performance Solution demonstrates compliance with the Performance Requirements.

The relevant NCC Assessment Method under A2G2(2)(b)(ii) involves:

- Other Verification Method, being Method 2 in the Standard.

Acceptance Criteria

The proposed Acceptance Criteria are

- Construction standards, and
- Siting (the extent of the Hazard Management Area)

provide an acceptable standard of safety for occupants and firefighters

Not all of the works can comply with DtS provisions, which do not apply to vegetation growing on slopes exceeding 20^{o}, and no meaningful DtS comparison can be made. Method 2 calculations have been applied to every exposure, in order minimise aesthetically sensitive vegetation removal. Under A2G2(2) the applicable Assessment Method is Other Verification Method.

Compliance with BAL-29 specifications is proposed as the acceptable standard.

Documentation and evidence to be provided

The following documentation will be provided to the building surveyor:

- Bushfire hazard management plan;
- Bushfire hazard report that includes:
  - DtS assessment;
  - Method 2 assessment.
- Design documentation demonstrating compliance with the design BAL (to be provided by the designer).

BAL ratings

The combined assessment defines the extent of the HMA necessary to permit, and require, construction to BAL-29.

Access

Direct property access is from Nielson Drive, a locally 6m wide sealed cul-de-sac with an adequate, non-complying, turning area at its end. The house access is greater than 200m long and therefore must comply with the provisions of DDBHA Table 2 C.

Water

No reticulated water supply currently exists, but the owner intends to extend the existing supply from the end of the cul-de-sac to the dwelling. This will not be sufficient to supply a hydrant, and stored fire-fighting water will be provided. DDBHA Table 3B will apply. A minimum 10kl capacity metal or concrete water tank and specified fittings will be provided within 3m of hardstanding and between 6m & 90m of the dwelling.

Environmental & other constraints

Landslip, Priority vegetation, Scenic protection and Floodprone overlays cover parts of the site, although recent works have eliminated the cause of the Floodprone issue. Vegetation management will not require removal of any more hilltop tree canopy, limiting the visual impact of the proposal to creation of the access roadway.

The Landslip Hazard overlay covers part of the access road. Advice has been sought regarding soil stability both as a result of road construction and ongoing vegetation management on steep slopes.

Assessment

Hazard Management Area

The HMA to the specifications in DDBHA Table 4 is shown on the plan at Annexure B. Within the area outlined only paved areas, managed lawn or garden, occasional garden shrubs and scattered trees to the management regime shown at Annexure C are permitted.

Direction & slope	DtS 29	M2 29
North down 18°	37m	20m
NW down 24°	>37m	28m
West down 12°	30m	16m
SW down 3°	19m	11m
S, SE level	16m	9m
East down 6°	24m	12m
NE down 10°	24m	14m

Construction specification

All works must be to BAL-29 specifications.

In addition to the specifications within AS 3959, I recommend that non-combustible leaf guard be fitted to every roof gutter capable of collecting leaves.

Property access

DDBHA Table 2 C specifies a 4m wide 20 tonne capacity all-weather, 2-wheel drive carriageway, to the hardstanding within 3m of the water outlet, and to the turning area. The distance from the hardstanding beside the water outlet to the furthest part of the complex

must be less than 90m. The applicant intends to create an access not less than 4m carriageway width with a 20m x 6m wide passing bay at about the half-way mark. The proposal complies.

Water supply

10kl of water reserved for fire fighting will be provided in an above-ground metal tank fitted with a ball or gate valve and a 65mm Storz coupling plus captive cap, within 3m of a hardstanding area beside the access, not within 6m of the dwelling, and readily accessible to a tanker. Standard signage (Annexure C) will be fitted in a location clearly visible to approaching vehicles. Water supply will meet the requirements of DDBHA Table 3 B.

Conclusion

The hazard separation distances to be achieved **and maintained** in accordance with the plan for the Hazard Management Area, combined with construction to the recommended specifications, will result in what I regard as an acceptably protected structure against the anticipated exposure to bushfire attack. Under bushfire weather conditions that exceed the design criteria, the probable survival of structures is less likely.

This report complies with the provisions of NCC Clause A2G2(4)(d)

Summary of requirements

Initial checklist

1. Install and fill the 10kl capacity fire-fighting water tank, outlet and signage (as prescribed in Annexure C) next to the hardstanding beside the access driveway.
2. Complete all construction to BAL-29 specifications in s3 & s7 of AS 3959-2018
3. Create the Hazard Management Area as prescribed in Annexure C, to the dimensions shown in Annexure B.

Annual checklist

1. Maintain the Hazard Management Area as prescribed in Annexure C, to the dimensions shown in Annexure B.
2. Check that the fire fighting water tank is full and all fittings are in proper working order prior to each fire season.

Annexure A Curriculum vitae

Qualifications

Graduate Certificate in Bushfire Protection, UWS, 2013

Bachelor of Science (Forestry), ANU, 1969

Work Experience

Self-employed consultant – 1988 to present

ACT Bush Fire Council

Chief Fire Control Officer – 1986 to 1987

Secretary – 1985

Chief Fire Control Officer -1976 to 1978

Deputy Chief Fire Control Officer – 1972 to 1975

Assistant to Chief Fire Control Officer - 1970 to 1971

CSIRO

Experimental Officer, Project Aquarius 1982 to 1984

Chemonics Industries USA 1979 to 1981

Field Service Representative, chemical fire retardants

Project Experience

- Responsible for all aspects of staff administration, finance, bush fire safety planning, fire management, training, and fire control operations in the ACT.
- Attended approximately 2000 wildfires, experimental fires and controlled burns.
- Attended to an additional approximately 1000 wildfires.
- Personally prepared approximately 2800 compliance reports to accompany Development Applications for subdivisions, Special Purpose structures, houses, industrial buildings and Defence complexes.
- Prepared assessments for 31 schools in the Nation-Building Program for the Dept of Education, Employment & Workplace Relations.
- Gave evidence in the Land & Environment Court on contested DA matters.
- Prepared Vegetation Management Plans for large (primarily Defence) estates throughout Australia.
- Prepared training plans and the Bushfire Response Action Plan for Puckapunyal Base, Dept of Defence.
- Provided studies of bush fire behaviour to assist planning and risk management by plantation insurance companies, Councils and other land management agencies.
- As an Expert Witness, investigated, reported on and gave evidence in 47 matters involving fire causation and fire management activities, mainly in connection with civil litigation.
- As Senior Research Officer, assisted in the experiment design and data analysis and responsible for all field operations for Project Aquarius, the major study of large aircraft assisted bush fire control by CSIRO Division of Forestry Research.
- As a field representative for Chemonics Industries in the USA, maintained and oversaw the operation of all of the US Forest Service air tanker bases in Washington & Oregon, and introduced the use of fire retardants by ground application for fire management in the western states.
- Lectured in bush fire behaviour and control principles at the ANU and the Canberra College of Advanced Education (now University of Canberra).
- Wrote the bush fire training module for the ACT Fire Brigade.
- Prepared the first urban-rural interface bush fire protection planning guidelines in the ACT for the National Capital Development Commission.

Annexure B Bushfire Hazard Management Plan

BUSHFIRE HAZARD MANAGEMENT PLAN

13 Nielson Drive, Montrose

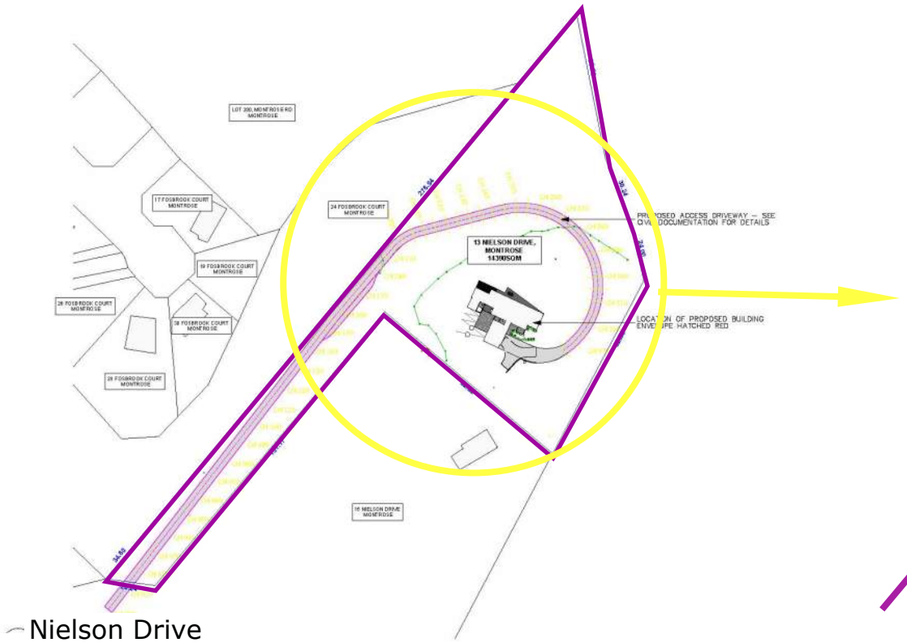
Property ID 7765305 Title 46375/1

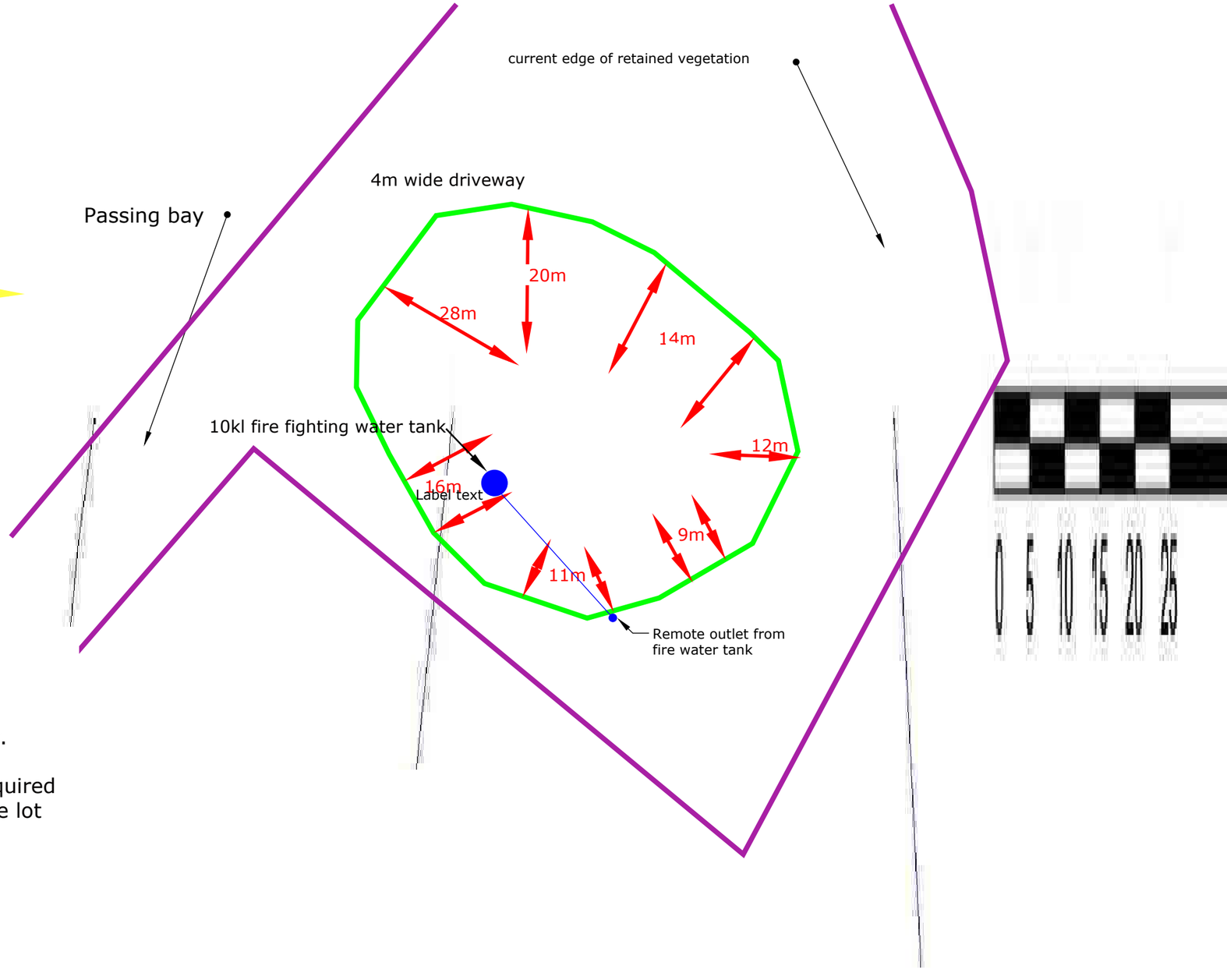
Report 2311DAV.MON.NIE1.0
Roger Fenwick BFP 162 Scope 1, 2, 3A, 3B

August 2024

The Hazard Management Area covers all land within the green line

Within the HMA maintain lawn to 25mm, kept green if possible, or garden with only isolated trees and scattered shrubs at least 2m from walls & 5m from windows. Do not store exposed combustible rubbish or firewood within the HMA. All construction to BAL-29. Refer to the Report for full specifications and details of the firefighting water storage, outlet and signage requirements. Hardstanding and adequate turning capability is to be maintained beside the 10kl fire fighting water tank.





Reticulated water is supplied to the site but no hydrant within 120m requires 10kl of stored water reserved for fire fighting on site at least 6m from the dwelling, within 90m of all parts of the dwelling, and with tanker access to within 3m of the outlet from the metal or concrete tank.

A passing bay with a width of 6m and length of 20m is required at not more than a 200m interval between the entry to the lot from Nielson Drive and the turning point near the house.

Annexure C Management specifications

Hazard Management Areas

The intent is to maintain the Hazard Management Area in a condition that will not allow the development or passage of fire able to ignite structures through radiant heat or flame contact. In addition, providing protection against ember attack is highly desirable. Much of the aim is to limit the intensity of the approaching fire to a level which can be absorbed without damage by the passive protection measures included in the house construction. The materials used have been chosen to (probably) not be ignited (eg walls) or be sufficiently heat-affected to break (eg windows) during the passage of the fire. It is assumed that nobody will necessarily be present during the passage of the fire, so that the structure will hopefully survive by itself. Heat from the head of the approaching fire will probably be at its peak for around 5 minutes, but embers, smoke and uncomfortably high heat will continue for around an hour or so. Attendance by suitably clothed, trained, fit and able-bodied people with appropriate equipment immediately after passage of the fire increases the likelihood of the structure surviving, particularly if small local patches have ignited.

Fire must be kept far enough away to limit the radiant heat which will threaten both structures and anyone (homeowners, fire-fighters) in the path of the fire. Basically, fire spreads rapidly in surface litter and low grassy growth, and develops tall flames in the shrub layer. That makes things difficult for fire-fighters trying to work the fire edge. With enough heat generated by vigorous fire in the shrubs and sapling (understorey) layers, the fire flame height will increase, and involve the crowns of the overstorey trees. Flames also run up the bark of many fibrous-barked eucalypt species, adding to the overall heat output but primarily creating showers of embers

Limiting fire behaviour is achieved by separating the various vegetation components both vertically and horizontally. Less surface litter will result in a slightly slower-moving fire, putting out less heat and therefore slower to ignite the shrub layer. Partial removal of the shrub layer significantly reduces the low-level flame height, making it easier for fire-fighters to work near the fire edge, and becoming less likely to ignite the sapling layer. Keeping the shrub and sapling layer fire intensity low means that fire is unlikely to move into the canopy of the overstorey. That is a crown fire, and is completely uncontrollable by any means.

Limiting ember production is best achieved by not having rough-barked species nearby, or by removing the loose outer bark layer before fire gets near. That can be done by intentionally (with appropriate permissions, after taking proper precautions, and under experienced supervision, and **not** during the fire season!) setting fire to the bark and having it run up the stem. That will leave a blackened stem for maybe 4 -5 years, but should dramatically reduce ember production for 15-20 years, depending on the species.

Protecting against ember attack relies largely on proper construction material selection and design that will not trap embers or the litter on which they may land and ignite. Properly screened openings are essential, but good plant selection and layout can create an ember shield, to deflect or trap embers approaching the house. Remember that embers will also accumulate in the sheltered side, in the eddy zone behind the house. Anywhere leaves accumulate, so will embers.

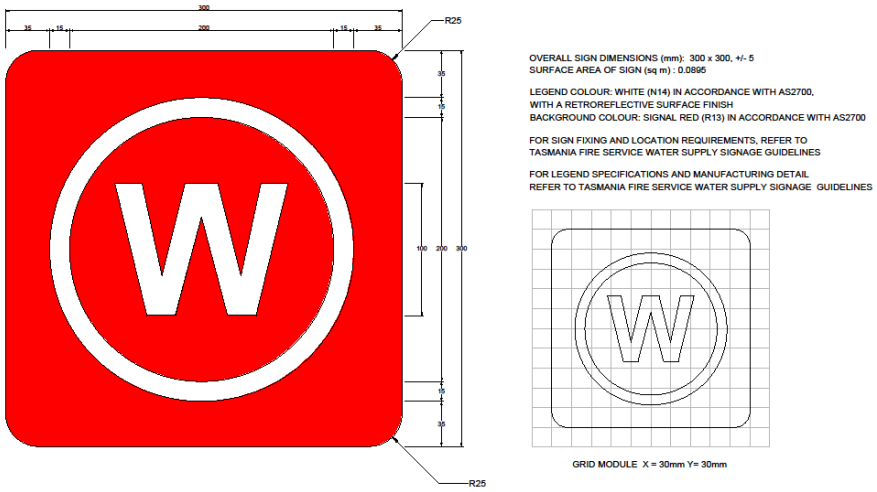
It is essential to keep even low creeping flames from contacting walls of the house. Maintain a path at least 30cm wide completely clear of all flammable material immediately between the garden/ lawn area – a concrete or gravel path, bare soil, whatever – and the house.

The HMA is to be kept in a substantially cleared condition, with a minimum of flammable material and plants.

Within the HMA, mown lawn and only occasional scattered low-flammability ornamental shrubs, garden plants and the like, plus the mature trees indicated for retention should be allowed.

- Immediately beside the house there must be a strip not less than 30cm wide which is kept bare of any combustible material.
- Grass must be kept mown to not more than 25mm in height, and should be kept watered and green within 5m of a wall.
- Shrubs should not be located within 2m of a wall, or within 5m of a window.
- Avoid using combustible mulch within 2m of a window and within 1m of a wall – use pebbles instead in these settings.
- Trees are to be kept well-spaced, with one crown diameter between canopy crowns, and one shrub (or shrub cluster to 5m diameter) between shrubs or shrub clusters. (If trees have a 10m diameter canopy, there should be 10m between their canopies, ie 20m between trunks. Similarly, a 2m diameter cluster of shrubs should not be within 2m of other shrubs.
- Favour smooth-barked over rough-barked trees, and low-flammability species.
- Prune all tree branches to a height of 2m.
- Shrubs should not be located directly under trees.
- Don't have open woodpiles or locate rubbish heaps within the HMA.

Water tank signage meeting the requirements of AS 2304-2011 or as per the design below, is required. The sign must be within 1m of the location of the outlet, at least 400mm above ground level, located to be visible from an approaching vehicle, and not obstruct access to the outlet.



All above-ground components must be metal, or lagged with non-combustible material. Buried components must be not less than 300mm deep.

The (not less than 50mm bore) outlet and ball or gate valve must be

- on the water storage tank, or
- beside an approved remote takeoff point located in a protected position, 450-600mm above ground and supplied by a pipe not less than 50mm internal diameter,

so that all parts of the building are within 90m of the outlet.

Water takeoff points must be fitted with a Storz 65mm coupling and suction washer, plus a blank cap on a chain at least 220mm long. They must not be within a parking area, and must be accessible from a hardstanding area located within 3m of the take-off point and not closer than 6m to the building.

The hardstanding area must be at least 3m in width, and connected to the general access driveway, and be constructed so that when occupied by a tanker, the tanker will not obstruct the passage of other vehicles. A tanker must have direct access from the hardstanding to a turning area.

Annexure D Form 55 Certificate

CERTIFICATE OF QUALIFIED PERSON – ASSESSABLE ITEM

Section 321

To: D Graham *Owner /Agent*

15 Riverview Pde *Address*

Rosetta 7010 *Suburb/postcode*

Form **55**

Qualified person details:

Qualified person: Roger Fenwick

Address: PO Box 86B

Kettering 7155

Phone No: 0411 609 906

Fax No:

Licence No: BFP-162

Email address: roger@bushfire-consultant.com.au

Qualifications and Insurance details: Accredited No 162 under the Fire Service Act 1979
Professional Indemnity & Public Liability insurance by Lloyd's

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

Speciality area of expertise: Analysis of hazards in bushfire-prone areas

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

Details of work:

Address: 13 Nielson Drive

Montrose Tas 7010

Lot No: 1

Certificate of title No: 46375

The assessable item related to this certificate: Assessment of bushfire attack level for new construction - Class 1a

Work involving a Performance Solution must be approved by TFS via a Form 47.

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

Certificate details:

Certificate type: Bushfire hazard assessment

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

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

☒ building work, plumbing work or plumbing installation or demolition work

OR

☐ a building, temporary structure or plumbing installation

In issuing this certificate the following matters are relevant –

Documents:	Bushfire Hazard Assessment Report dated August 2024 including Bushfire Hazard Management Plan dated August 2024 AS 3959-2018 *Construction of buildings in bushfire-prone areas* Plans by idw Architects
Relevant calculations:	Shown in above documents
References:	N/A

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

A bushfire assessment and management plan for proposed new construction, in accordance with BAL-29 construction standard of AS 3959-2018.

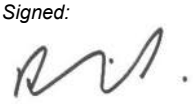
Approval of Performance Solution components requires a Form 47 from the TFS.

Scope and/or Limitations

A Bushfire Hazard Assessment was commissioned by the owner to identify the potential bushfire risk and BAL rating, and to recommend appropriate compliance and protection measures.

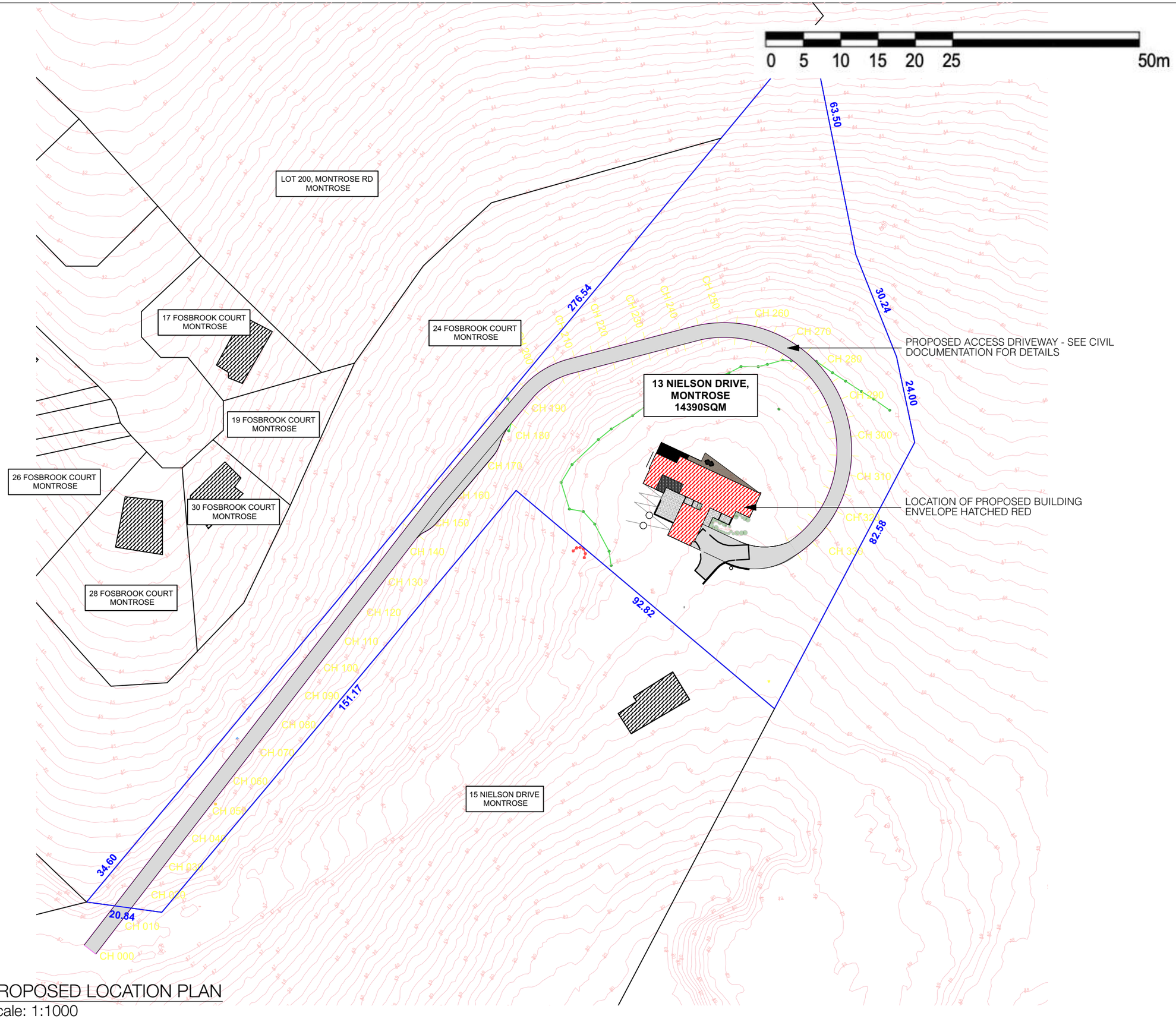
Limitations: The proposed measures comply with the guidelines. Full compliance with the requirements in this report and/or AS 3959-2018 does not guarantee survival of structures or persons.

I certify the matters described in this certificate.

Signed:	*Certificate No:*	*Date:*
	2311DAV.MOM.NIE1.0	8 August 2024

Qualified person:

Annexure E Site plans



PROPOSED LOCATION PLAN
Scale: 1:1000

north

NOT FOR CONSTRUCTION

DO NOT SCALE OFF DRAWINGS

Drawings are to be read in conjunction with all associated specifications, consultants' drawings, geotechnical report and any other written instructions

All works are to comply with the Building Code of Australia, relevant Australian Standards, local and any other relevant authority regulations and by-laws

Contractors are to verify all dimensions on site prioir to commencing any work or producing shop drawings

All dimensions are in millimetres unless otherwise noted

Report all discrepancies to IDW

Rev
NO. DATE NOTE

Client
Alison Magill and David Graham

Address
13 Nielson Drive, Montrose

Project
New Dwelling

Drawing
Proposed Location Plan

Dwg No.
DA02

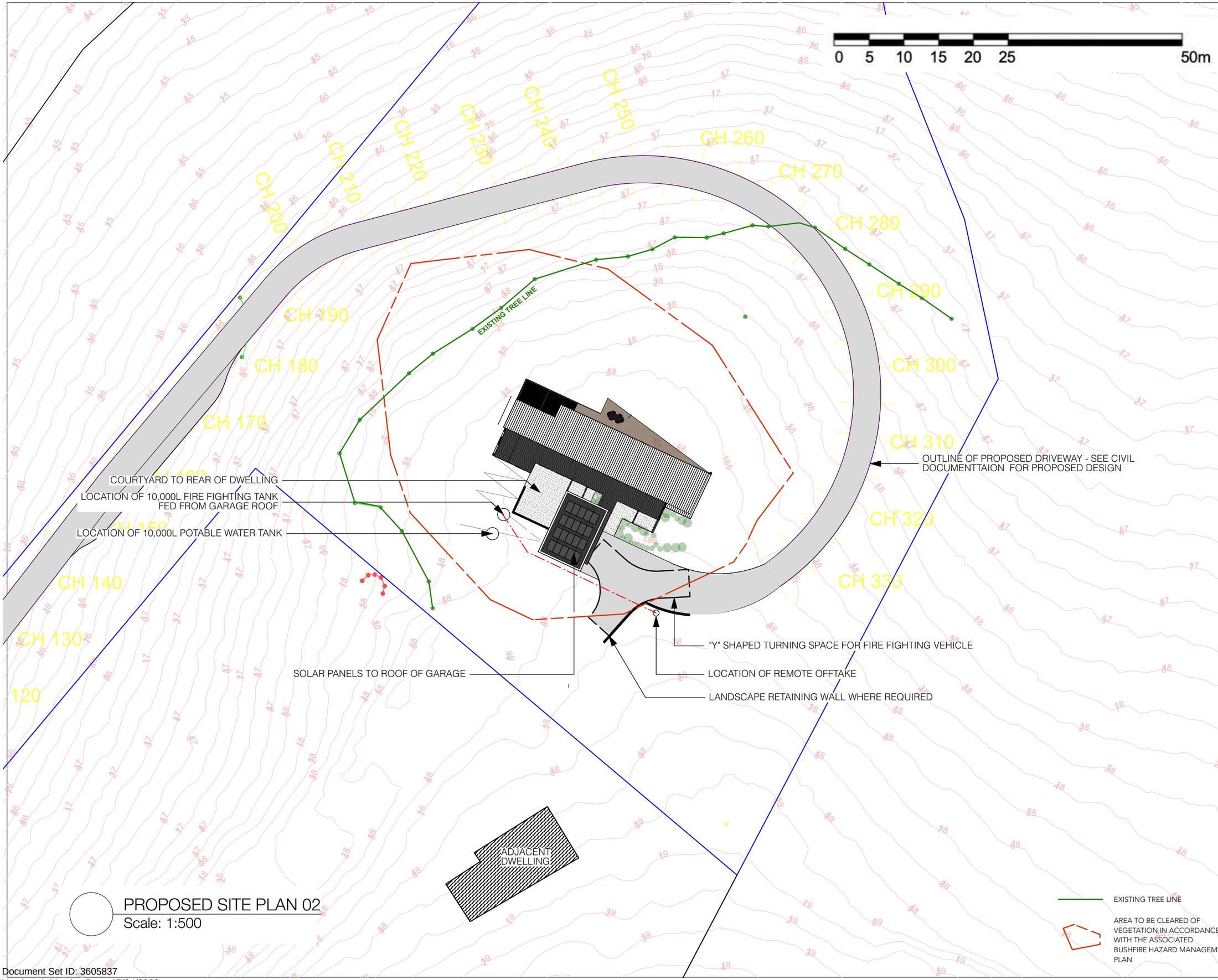
Scale
1:1000

Date
14/5/2024

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2318

idw. architecture + interiors
4/147 Liverpool St Hobart TAS 7000
T (03) 6234 5644
E info@idwarchitecture.com.au
W idwarchitecture.com.au
Acc No CC980Y



PROPOSED SITE PLAN 02

Scale: 1:500

EXISTING TREE LINE

AREA TO BE CLEARED OF VEGETATION IN ACCORDANCE WITH THE ASSOCIATED BUSHFIRE HAZARD MANAGEMENT PLAN

NOT FOR CONSTRUCTION

DO NOT SCALE OFF DRAWINGS

Drawings are to be read in conjunction with all associated specifications, consultants' drawings, geotechnical report and any other written instructions

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Report all discrepancies to IDW

Rev

NO.	DATE	NOTE

Client
Alison Magill and David Graham

Address
13 Nielson Drive, Montrose

Project
New Dwelling

Drawing
Proposed Site Plan 02

Dwg No.
DA04

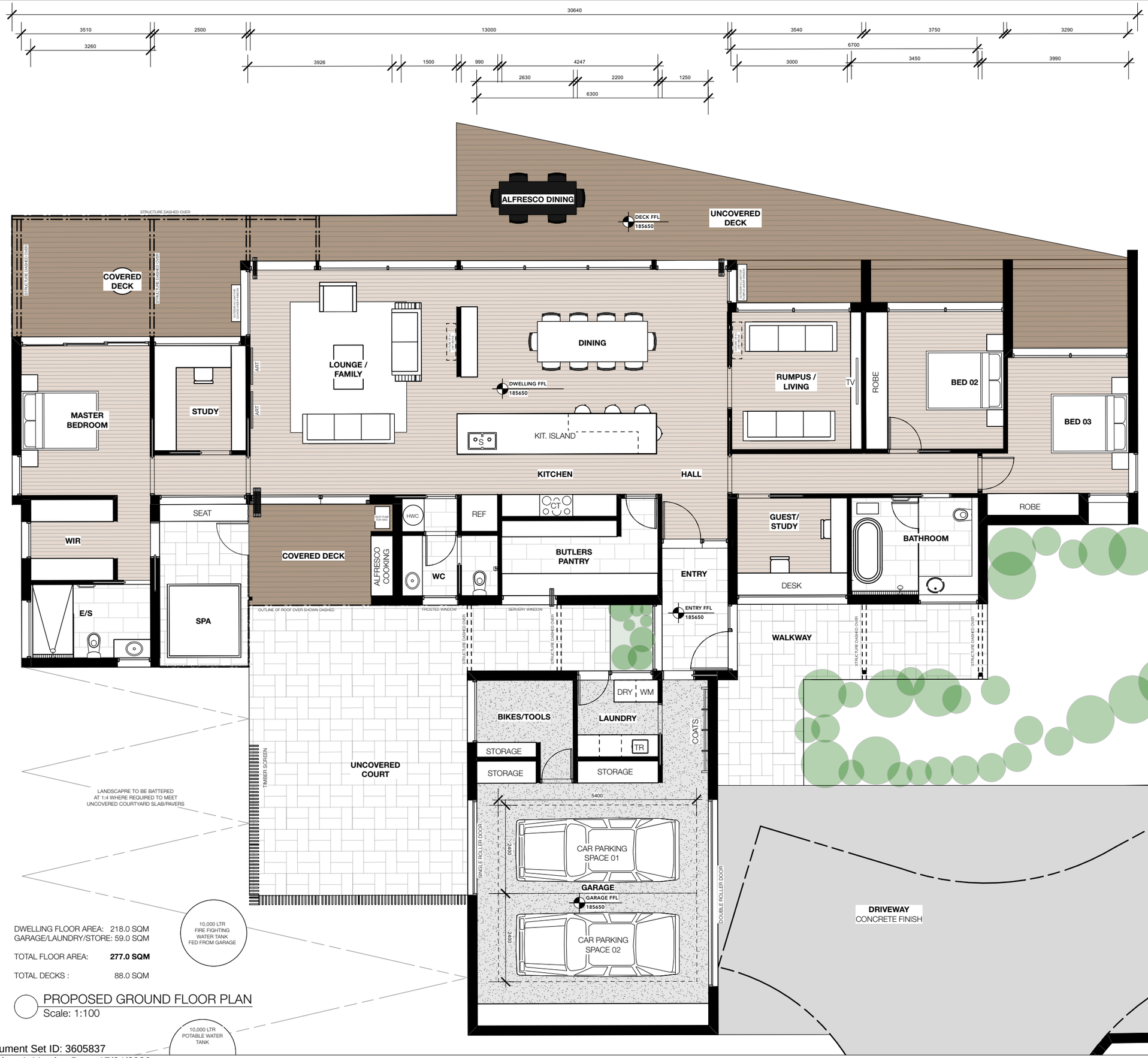
Scale
1:500

Date
14/5/2024

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2318

idw. architecture + interiors
4/147 Liverpool St Hobart TAS 7000
T (03) 6234 5644
E info@idwarchitecture.com.au
W idwarchitecture.com.au
Acc No CC980Y



DWELLING FLOOR AREA: 218.0 SQM
GARAGE/LAUNDRY/STORE: 59.0 SQM

TOTAL FLOOR AREA: **277.0 SQM**

TOTAL DECKS : 88.0 SQM

PROPOSED GROUND FLOOR PLAN
Scale: 1:100

north

NOT FOR CONSTRUCTION

DO NOT SCALE OFF DRAWINGS

Drawings are to be read in conjunction with all associated specifications, consultants' drawings, geotechnical report and any other written instructions

All works are to comply with the Building Code of Australia, relevant Australian Standards, local and any other relevant authority regulations and by-laws

Contractors are to verify all dimensions on site priorir to commencing any work or producing shop drawings

All dimensions are in millimetres unless otherwise noted

Report all discrepancies to IDW

Rev
NO. DATE NOTE

Client
Alison Magill and David Graham

Address
13 Nielson Drive, Montrose

Project
New Dwelling

Drawing
Proposed Ground Floor Plan

Dwg No.
DA05

Scale
1:100

Date
14/5/2024

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2318

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Acc No CC980Y

AS 3959 Method 2 calculations								
Address	**13 Nielson Drive, Montrose**							
PID	**7765305**		**Title ref**	**46375/1**				
	Inputs	derived figures	outputs					
FDI	50	w	ros					
Vegetation	D	13.7	0.8					
Veg Slope		derived figures		degrees	10	Forest	F	
HMA slope	0.087266463	23.7	F length	degrees	5	Dry Tasmanian Forest	D	
HMA width	14	R slope	13.5			Rainforest	R	
		1.6	13.5	Elevation receiver	2	Woodland	W	
Flame width	100	W	13.5			Low heath	L	Shrubland
		23.7	13.5			Heath	H	Scrub
			13.5			Grass	G	
			13.5			forest wetland	fw	
			13.5					
			13.5					
		R (slope)	F length	Intensity		Radiation	28.54	kWm^{-2}
Forest & Woodland		1.64	13.50	20068				
Shrub, Heath, Scrub		1.64	5.4	10065		temp (1090, 1200)	1090	
Grass		1.64	5.3	20068				
flame angle	60					**NORTHEAST**		
The variable inputs to this spreadsheet appear in the yellow-highlighted boxes.								
The derived values w and W are as they appear in AS 3959, apart from individually allocated figures for D vegetation types,								
taken from Marsden-Smedley *et al*, Fuel in Tasmanian Dry Eucalypt Forests, Fire 2022, 5, 103. Table 4								
The usual output is Radiation in kWm^{-2} but the program can be forced to find input values matching a desired outcome.								
Simulations of the shielding effect of fences are made by manually adjusting the F length value								
If that is done, the first column of F length values will show mis-matching numbers								

AS 3959 Method 2 calculations								
Address	**13 Nielson Drive, Montrose**							
PID	**7765305**		**Title ref**	**46375/1**				
	Inputs	derived figures	outputs					
FDI	50	w	ros					
Vegetation	D	13.7	0.8					
Veg Slope		derived figures		degrees	6	Forest	F	
HMA slope	0.087266463	23.7	F length	degrees	5	Dry Tasmanian Forest	D	
HMA width	12	R slope	10.9			Rainforest	R	
		1.2	10.9	Elevation receiver	2	Woodland	W	
Flame width	100	W	10.9			Low heath	L	Shrubland
		23.7	10.9			Heath	H	Scrub
			10.9			Grass	G	
			10.9			forest wetland	fw	
			10.9					
			10.9					
		R (slope)	F length	Intensity		Radiation	27.79	kWm^{-2}
Forest & Woodland		1.24	10.93	15227				
Shrub, Heath, Scrub		1.24	5.4	10065		temp (1090, 1200)	1090	
Grass		1.24	4.7	15227				
flame angle	65					**EAST**		
The variable inputs to this spreadsheet appear in the yellow-highlighted boxes.								
The derived values w and W are as they appear in AS 3959, apart from individually allocated figures for D vegetation types,								
taken from Marsden-Smedley *et al*, Fuel in Tasmanian Dry Eucalypt Forests, Fire 2022, 5, 103. Table 4								
The usual output is Radiation in kWm^{-2} but the program can be forced to find input values matching a desired outcome.								
Simulations of the shielding effect of fences are made by manually adjusting the F length value								
If that is done, the first column of F length values will show mis-matching numbers								

AS 3959 Method 2 calculations								
Address	**13 Nielson Drive, Montrose**							
PID	**7765305**		**Title ref**	**46375/1**				
	Inputs	derived figures	outputs					
FDI	50	w	ros					
Vegetation	D	13.7	0.8					
Veg Slope		derived figures		degrees	0	Forest	F	
HMA slope	0	23.7	F length	degrees	0	Dry Tasmanian Forest	D	
HMA width	9	R slope	8.2			Rainforest	R	
		0.8	8.2	Elevation receiver	2	Woodland	W	
Flame width	100	W	8.2			Low heath	L	Shrubland
		23.7	8.2			Heath	H	Scrub
			8.2			Grass	G	
			8.2			forest wetland	fw	
			8.2					
			8.2					
		R (slope)	F length	Intensity		Radiation	28.64	kWm^{-2}
Forest & Woodland		0.82	8.19	10065				
Shrub, Heath, Scrub		0.82	5.4	10065		temp (1090, 1200)	1090	
Grass		0.82	3.8	10065				
flame angle	65					**SOUTH, SE**		
The variable inputs to this spreadsheet appear in the yellow-highlighted boxes.								
The derived values w and W are as they appear in AS 3959, apart from individually allocated figures for D vegetation types,								
taken from Marsden-Smedley *et al*, Fuel in Tasmanian Dry Eucalypt Forests, Fire 2022, 5, 103. Table 4								
The usual output is Radiation in kWm^{-2} but the program can be forced to find input values matching a desired outcome.								
Simulations of the shielding effect of fences are made by manually adjusting the F length value								
If that is done, the first column of F length values will show mis-matching numbers								

AS 3959 Method 2 calculations								
Address	**13 Nielson Drive, Montrose**							
PID	**7765305**		**Title ref**	**46375/1**				
	Inputs	derived figures	outputs					
FDI	50	w	ros					
Vegetation	D	13.7	0.8					
Veg Slope		derived figures		degrees	3	Forest	F	
HMA slope	0	23.7	F length	degrees	0	Dry Tasmanian Forest	D	
HMA width	11	R slope	9.4			Rainforest	R	
		1.0	9.4	Elevation receiver	2	Woodland	W	
Flame width	100	W	9.4			Low heath	L	Shrubland
		23.7	9.4			Heath	H	Scrub
			9.4			Grass	G	
			9.4			forest wetland	fw	
			9.4					
			9.4					
		R (slope)	F length	Intensity		Radiation	26.54	kWm^{-2}
Forest & Woodland		1.01	9.42	12380				
Shrub, Heath, Scrub		1.01	5.4	10065		temp (1090, 1200)	1090	
Grass		1.01	4.2	12380				
flame angle	60					**SOUTHWEST**		
The variable inputs to this spreadsheet appear in the yellow-highlighted boxes.								
The derived values w and W are as they appear in AS 3959, apart from individually allocated figures for D vegetation types,								
taken from Marsden-Smedley *et al*, Fuel in Tasmanian Dry Eucalypt Forests, Fire 2022, 5, 103. Table 4								
The usual output is Radiation in kWm^{-2} but the program can be forced to find input values matching a desired outcome.								
Simulations of the shielding effect of fences are made by manually adjusting the F length value								
If that is done, the first column of F length values will show mis-matching numbers								

AS 3959 Method 2 calculations								
Address	**13 Nielson Drive, Montrose**							
PID	**7765305**		**Title ref**	**46375/1**				
	Inputs	derived figures	outputs					
FDI	50	w	ros					
Vegetation	D	13.7	0.8					
Veg Slope		derived figures		degrees	12	Forest	F	
HMA slope	0.087266463	23.7	F length	degrees	5	Dry Tasmanian Forest	D	
HMA width	16	R slope	15.1			Rainforest	R	
		1.9	15.1	Elevation receiver	2	Woodland	W	
Flame width	100	W	15.1			Low heath	L	Shrubland
		23.7	15.1			Heath	H	Scrub
			15.1			Grass	G	
			15.1			forest wetland	fw	
			15.1					
			15.1					
		R (slope)	F length	Intensity		Radiation	27.41	kWm^{-2}
Forest & Woodland		1.88	15.07	23037				
Shrub, Heath, Scrub		1.88	5.4	10065		temp (1090, 1200)	1090	
Grass		1.88	5.7	23037				
flame angle	65					**WEST**		
The variable inputs to this spreadsheet appear in the yellow-highlighted boxes.								
The derived values w and W are as they appear in AS 3959, apart from individually allocated figures for D vegetation types,								
taken from Marsden-Smedley *et al*, Fuel in Tasmanian Dry Eucalypt Forests, Fire 2022, 5, 103. Table 4								
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If that is done, the first column of F length values will show mis-matching numbers								

AS 3959 Method 2 calculations								
Address	**13 Nielson Drive, Montrose**							
PID	**7765305**		**Title ref**	**46375/1**				
	Inputs	derived figures	outputs					
FDI	50	w	ros					
Vegetation	D	13.7	0.8					
Veg Slope		derived figures		degrees	24	Forest	F	
HMA slope	0.087266463	23.7	F length	degrees	5	Dry Tasmanian Forest	D	
HMA width	28	R slope	30.8			Rainforest	R	
		4.3	30.8	Elevation receiver	2	Woodland	W	
Flame width	100	W	30.8			Low heath	L	Shrubland
		23.7	30.8			Heath	H	Scrub
			30.8			Grass	G	
			30.8			forest wetland	fw	
			30.8					
			30.8					
		R (slope)	F length	Intensity		Radiation	27.50	kWm^{-2}
Forest & Woodland		4.31	30.83	52726				
Shrub, Heath, Scrub		4.31	5.4	10065		temp (1090, 1200)	1090	
Grass		4.31	8.7	52726				
flame angle	65					**NORTHWEST**		
The variable inputs to this spreadsheet appear in the yellow-highlighted boxes.								
The derived values w and W are as they appear in AS 3959, apart from individually allocated figures for D vegetation types,								
taken from Marsden-Smedley *et al*, Fuel in Tasmanian Dry Eucalypt Forests, Fire 2022, 5, 103. Table 4								
The usual output is Radiation in kWm^{-2} but the program can be forced to find input values matching a desired outcome.								
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AS 3959 Method 2 calculations								
Address	**13 Nielson Drive, Montrose**							
PID	**7765305**		**Title ref**	**46375/1**				
	Inputs	derived figures	outputs					
FDI	50	w	ros					
Vegetation	D	13.7	0.8					
Veg Slope		derived figures		degrees	18	Forest	F	
HMA slope	0.087266463	23.7	F length	degrees	5	Dry Tasmanian Forest	D	
HMA width	20	R slope	21.3			Rainforest	R	
		2.8	21.3	Elevation receiver	2	Woodland	W	
Flame width	100	W	21.3			Low heath	L	Shrubland
		23.7	21.3			Heath	H	Scrub
			21.3			Grass	G	
			21.3			forest wetland	fw	
			21.3					
			21.3					
		R (slope)	F length	Intensity		Radiation	28.88	kWm^{-2}
Forest & Woodland		2.85	21.34	34852				
Shrub, Heath, Scrub		2.85	5.4	10065		temp (1090, 1200)	1090	
Grass		2.85	7.0	34852				
flame angle	65					**NORTH**		
The variable inputs to this spreadsheet appear in the yellow-highlighted boxes.								
The derived values w and W are as they appear in AS 3959, apart from individually allocated figures for D vegetation types,								
taken from Marsden-Smedley *et al*, Fuel in Tasmanian Dry Eucalypt Forests, Fire 2022, 5, 103. Table 4								
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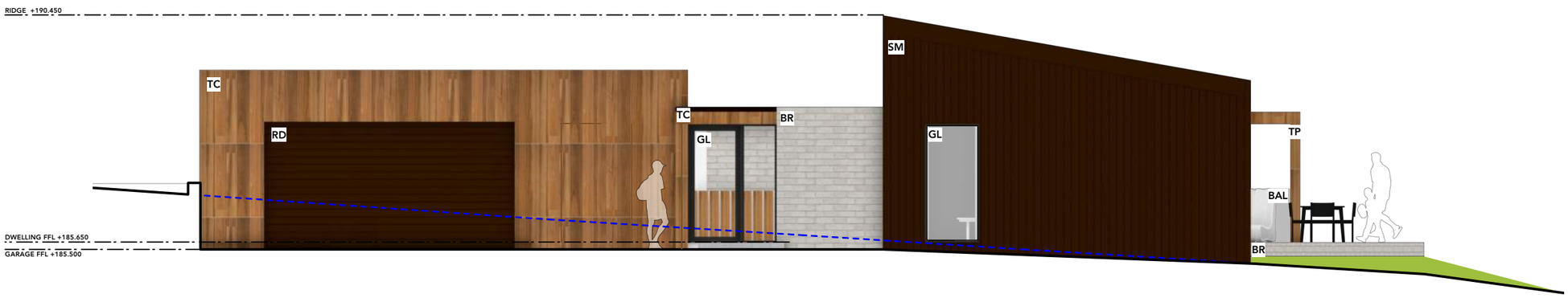
If that is done, the first column of F length values will show mis-matching numbers								

PROPOSED NORTH-EAST ELEVATION
Scale: 1:100



PROPOSED SOUTH EAST ELEVATION
Scale: 1:100

MATERIAL KEY

TC - VERTICAL TIMBER CLADDING, SPOTTED GUM OR SIMILAR

BAL - TOUGHENED GLASS BALUSTRADE

GL - POWDERCOATED ALUMINIUM FRAME, DOUBLE GLAZED PANES

SM - VERTICAL STANDING SEAM STEEL CLADDING, COLOUR BRUSHED COPPER OR SIMILAR

RS - COLOURBOND STANDING SEAM STEEL ROOF SHEETING , COLOUR TO BE BRUSHED COPPER OR SIMILAR

BR - BRICK VENEER, LIGHT GREY OR SIMILAR

BK - CONCRETE BLOCKWORK, PAINTED COLOUR TBC

SP - TIMBER POST

RD - ROLLER DOOR TO MATCH RS

NOTES

ALL DOWN PIPES, GUTTERS, FLASHINGS, VENTS, FLUES TO MATCH RS

NATURAL GROUND LINE

NB - ALL MATERIALS TO COMPLY WITH BAL 29 CONSTRUCTION REQUIREMENTS

north

NOT FOR CONSTRUCTION

DO NOT SCALE OFF DRAWINGS

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Rev
NO. DATE NOTE

Client
Alison Magill and David Graham

Address
13 Nielson Drive, Montrose

Project
New Dwelling

Drawing
Proposed Elevations 01

Dwg No.
DA07

Scale
1:100

Date
14/5/2024

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2318

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W idwarchitecture.com.au
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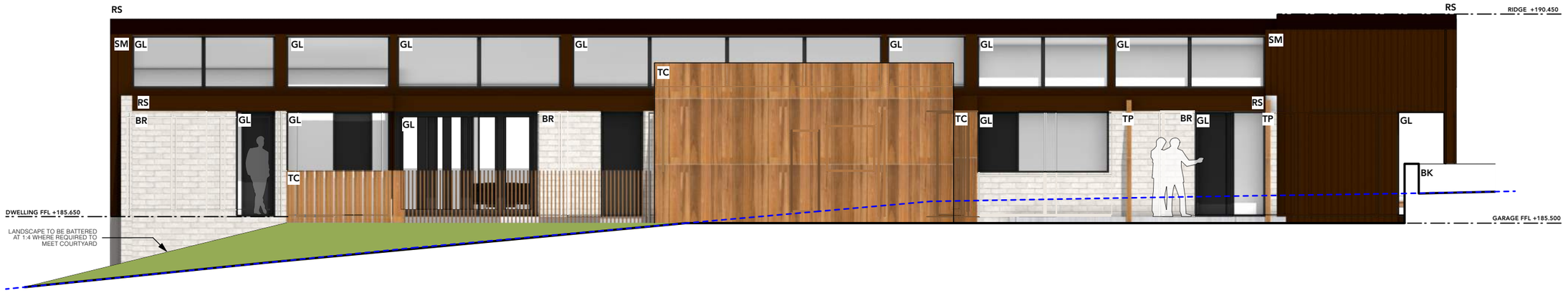

PROPOSED SOUTH WEST ELEVATION
Scale: 1:100

PROPOSED NORTH WEST ELEVATION
Scale: 1:100

NATURAL GROUND LINE

MATERIAL KEY

TC - VERTICAL TIMBER CLADDING, SPOTTED GUM OR SIMILAR

BAL - TOUGHENED GLASS BALUSTRADE

GL - POWDERCOATED ALUMINIUM FRAME, DOUBLE GLAZED PANES

SM - VERTICAL STANDING SEAM STEEL CLADDING, COLOUR BRUSHED COPPER OR SIMILAR

RS - COLOURBOND STANDING SEAM STEEL ROOF SHEETING , COLOUR TO BE BRUSHED COPPER OR SIMILAR

BR - BRICK VENEER, LIGHT GREY OR SIMILAR

BK - CONCRETE BLOCKWORK, PAINTED COLOUR TBC

SP - TIMBER POST

RD - ROLLER DOOR TO MATCH RS

NOTES

ALL DOWN PIPES, GUTTERS, FLASHINGS, VENTS, FLUES TO MATCH RS

NATURAL GROUND LINE

NB - ALL MATERIALS TO COMPLY WITH BAL 29 CONSTRUCTION REQUIREMENTS

north

NOT FOR CONSTRUCTION

DO NOT SCALE OFF DRAWINGS

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Rev
NO. DATE NOTE

Client
Alison Magill and David Graham

Address
13 Nielson Drive, Montrose

Project
New Dwelling

Drawing
Proposed Elevations 02

Dwg No.
DA08

Scale
1:100

Date
14/5/2024

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2318

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ABN 93 844 683 471

55 Leonard Avenue
Moonah TAS 7009

Telephone: 0499 498 337
Email: statewidegeo@gmail.com

14th July 2024

Our Ref SI116

David Graham and Alison Magill
13 Nielson Drive
Montrose TAS 7010
via email: david.graham@unswalumni.com
No hard copy to follow

Re: Geotechnical Investigation and Landslide Risk Assessment – Proposed Access Road and Dwelling 13 Nielson Drive, Montrose

Dear David and Alison

1 INTRODUCTION

I refer to your earlier request to undertake a geotechnical investigation and provide an assessment of landslide hazard risk at 13 Nielson Drive in Montrose (Title Reference 46375/1, Property ID 7765305), with respect to a development application to Glenorchy City Council ('Council') to demonstrate compliance with the Building Regulations 2016 (Tas.) and the Landslide Code of the *Tasmanian Planning Scheme*, specifically clauses C15.5.1 – '*Use Within a Landslip Hazard Area*' and C15.6.1 – '*Buildings and Works Within a Landslip Hazard Area*', for a proposed residential development comprising the construction of a new dwelling and associated access works ('The Development').

The Landslip Hazard Code is applicable to the site due to areas of the property being indicated as 'Low' to 'Medium' risk landslide hazard as shown on Mineral Resources Tasmania ('MRT') Landslide Hazard Band and the Tasmanian Planning Scheme Landslide Hazard Overlay maps.

Under C15.3 of the Landslide Code I am a "suitably qualified person" for landslide hazard risk assessments. I am an Engineering Geologist with a background in general geological and slope stability assessments. I am happy to discuss my suitability further with a representative from the planning authority if required.

The purpose of this report is twofold; primarily, to provide an assessment of landslide risk at the property in general accordance with the *Australian Geomechanics Society Practice Note on Landslide Risk Management, 2007*, to satisfy the provisions of the *Tasmanian Planning Scheme* and, secondly, to gain an understanding of the subsurface conditions to furnish the design and construction phases of the proposed development.

2 BACKGROUND INFORMATION

2.1 Scope of Work

Our scope of work for this investigation and assessment comprised the following:

- Review of information provided by the client, including photographs and details of test pits, plans, design drawings, sections and technical details for the proposed development;
- Review of maps and both published and unpublished reports in the public domain, including but not limited to Mineral Resources Tasmania ('MRT') records;
- Review of historical aerial photographs to check for topographic features and changes in the landscape over time;
- Carrying out a detailed walkover of the site and immediate surrounds, with particular focus on the route of the proposed access driveway and dwelling, and including an inspection of natural and man-made exposures of prevailing geological units, noting geological and geomorphological features;
- Drilling of eight boreholes at the site, and in particular the area of the proposed dwelling, for the purpose of assessing subsurface conditions;
- Developing a geotechnical model for the site based on MRT data, site observations and the results of the investigation boreholes;
- Assessing the stability of the site and surrounds for the current condition, and for the proposed development; and
- Providing recommendations to maintain or improve the stability of the site, along with comments and recommendations on excavations, allowable bearing capacities and pavements relevant to the proposed development.

2.2 Information from Client

To aid in the preparation of this report, the client provided the following information:

- Access driveway design drawings and technical specifications, including photos, a long section and cross-sections, prepared by the client and dated 12/6/23 (12 pages);
- Architectural drawing package for DA submission, prepared by IDW Architecture & Interiors P/L and dated 14/5/24 (8 pages);
- Services concept plan, 1:500 scale, prepared by the client and dated 16/4/24 (1 page);
- Services concept plan, unscaled, prepared by the client and dated 12/6/23 (1 page);
- LISTmap printout indicating the footprint of the proposed dwelling, prepared by the client and dated 12/6/24 (1 page);
- KML file indicating the outline of the proposed dwelling, prepared by the client;
- Road alignment concept plan indicating scree area, 1:500 scale, prepared by the client and dated 12/6/23 (1 page);
- Road alignment concept plan indicating test pit locations, 1:500 scale, prepared by the client and dated 12/6/23 (1 page); and

- Photographs of Test Pit 1 and Test Pit 2 excavated by the client, dated 14.4.24, along with details of the materials encountered therein conveyed by email received 15.4.24 (11 pages).

Copies of the above documents are provided herein for reference in Appendix A.

2.3 Implications of Landslide Hazard Zones

Development and/or use within a landslide hazard area is prescribed by the *Building Regulations 2016 (Tas.)* and the *Tasmanian Planning Scheme*.

2.3.1 Building Regulations 2016

Section 61 of *Building Regulations 2016 (Tas.)* provides that significant works in landslip areas includes:

a) excavation equal to or greater than one metre in depth, including temporary excavations for the installation or maintenance of services and pipes;

b) excavation or depositing of material greater than 100 cubic metres, whether or not the material is sourced on the site or imported;

c) felling, or removal, of vegetation, over a contiguous area greater than 1 000 square metres;

d) the collection, pooling or storage of water in a dam, pond, tank or swimming pool with a volume greater than 45 000 litres;

e) removal, redirection or introduction of drainage for surface water or subsoil water; and

f) discharge of stormwater, sewage, water storage overflow or other wastewater.

The proposed works fall within the definition of “significant works” as the works require excavation to greater than one metre depth, excavation and depositing of material greater than 100 cubic metres and discharge of stormwater, sewage and water storage overflow.

2.3.2 Tasmanian Planning Scheme

The purpose of the Landslip Hazard Code is to ensure that a tolerable risk can be achieved and maintained for the type, scale and intensity and intended life of use or development on land within a landslip hazard area.

The objective of Clause 15.5.1 *Use within a landslip hazard area* is to ensure “That uses, including critical, hazardous or vulnerable use, can achieve and maintain a tolerable risk from exposure to a landslip for the nature and intended duration of the use. There is no Acceptable Solution. The Performance Criteria P1.1 provides that “A use, including a critical use, hazardous use, or vulnerable use, within a landslip hazard area achieve and maintain a tolerable risk from exposure to landslip, having regard to: (a) the type, form and duration of the use; and (b) a landslip hazard report that demonstrates that: (i) any increase in the level of risk from landslip does not require any specific hazard reduction or protection measure; or (ii) the use can achieve and maintain a tolerable risk for the intended life of the use”.

The objective of Clause 15.6.1 *Building and works within a landslip hazard area* is to ensure “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”. There is no Acceptable Solution. The Performance Criteria P1.1 provides that “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”.

2.4 Regional Setting

Montrose is a well developed, older suburb on the foothills of Goat Hills, the upper reaches of which are characterised by moderate to steep vegetated slopes and the more densely populated area below characterised by low slopes to flat ground down to the western shore of the Derwent River. The general trend of slopes across the locality is to the east and northeast.

2.5 Site Details

The subject site is known as 13 Nielson Drive, Montrose and carries the Title Reference 46375/1 and Property ID 7765305. The site comprises an elongate, 14,400m^2 internal parcel of undeveloped, moderately to steeply northwest to northeast-sloping bushland accessed off the termination of Nielson Drive, upslope of Montrose Road, via a partially completed unsealed access driveway.

The location of the site is shown on Figure 1 below.

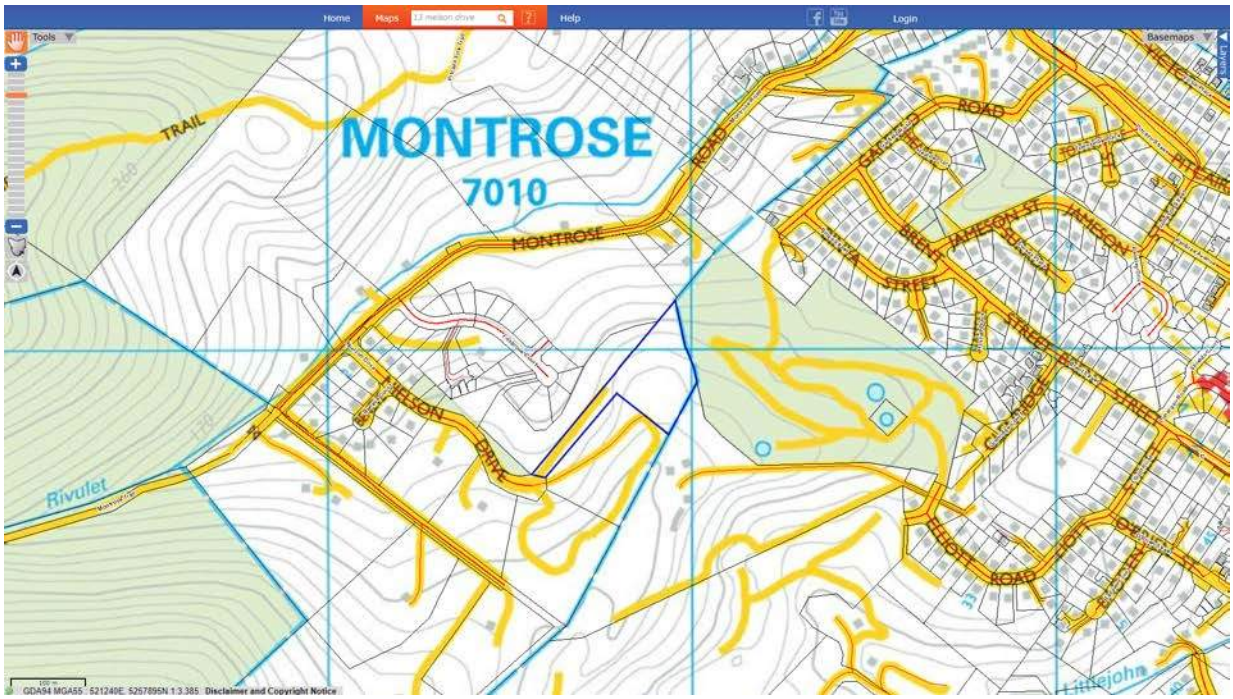


Figure 1 Site location (Source: Tasmap)

2.6 Site History

The property is a greenfield site with no history of development or modification, with the exception of the driveway access that was constructed at the time of subdivision, between 1990 and 1992, consistent with the creation of the roadway and adjoining lots in Nielson Drive.

Several aerial photo images obtained from flyovers of the Hobart area undertaken between 1947 and the present day were reviewed online using the LISTmap website. Early (pre-1970s) photographs were found to be generally of insufficient scale and clarity to permit identification of small-scale changes in the landscape. Later, post-1970s photographs of generally increased scale and resolution show continued residential development across the local area, however the amount of vegetation present on the site and surrounds precludes detailed examination of the ground surface and possible identification of landforms and features indicative of landslide-related movement.

A selection of aerial images of the site and surrounds taken between 1947 and the present time are presented in Figures 2-1 to 2-4 below, sourced from the Department of Natural Resources and Environment Tasmania's online database.

Figure 2-1 1947 Aerial photograph

Figure 2-2 1990 Aerial photograph

Figure 2-3 1992 Aerial photograph

Figure 2-4 Current aerial photograph

2.7 Geology

Higher elevations across the locality are dominated by Jurassic dolerite which has intruded older, Permian to Triassic age rocks comprising mostly interbedded sandstone, siltstone, mudstone and limestone. These materials outcrop across the lower slopes, with areas of flatter ground down to the river tending to be underlain by a variety of younger, Tertiary to Quaternary units commonly including basalt, dolerite colluvium and alluvial deposits.

The 1:25,000 scale digital geology map of the Glenorchy area, published by Mineral Resources Tasmania ('MRT'), shows the subject site and surrounding land to the north, south and west to be underlain by Jurassic dolerite, whilst Permian age interbedded sandstone, siltstone and limestone are mapped to the east. Quaternary deposits occur at lower elevations in the vicinity of Montrose Road, some of which is indicated as being dolerite-derived and broadly described as "*talus consisting dominantly of dolerite boulders*".

An extract from the 1:25,000 scale Glenorchy area geology map showing the mapped surface geology of the site and immediate surrounds is presented in Figure 2.

Figure 2 Site Geology – Jd – Jurassic dolerite, Puo/Pff/Pln = Triassic interbedded, Q/Qa/Qptd = Quaternary deposits (Source: LISTmap)

2.8 Landslide Inventory

In 2010, MRT published the *Tasmanian Landslide Hazard Series* maps which includes several maps covering the Glenorchy and Hobart region that includes the subject site and surrounds.

The map indicates no landslide features within an approximately 500m radius of the site. Several landslide features are shown further to the east and north at lower elevations, however these are all in significantly different geological settings to that of the subject site.

An extract from the MRT landslide inventory map is shown in Figure 3 below.

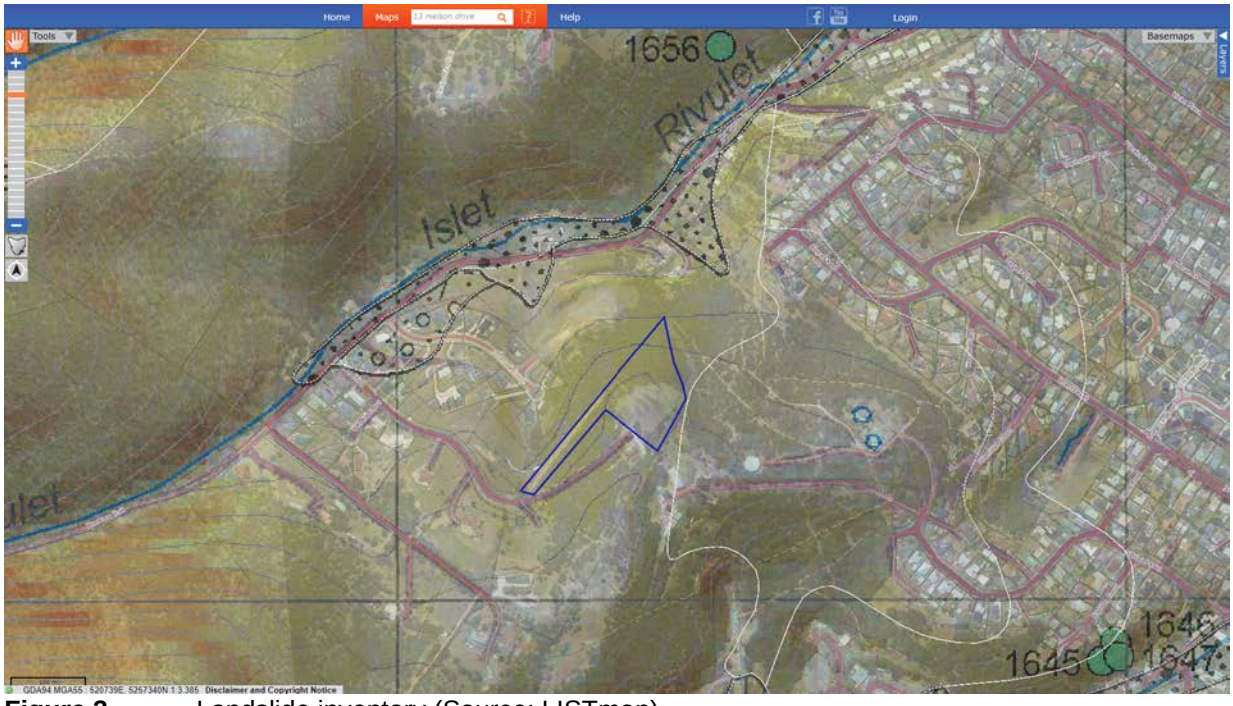


Figure 3 Landslide inventory (Source: LISTmap)

2.9 Landslide Susceptibility Mapping

Landslide susceptibility maps developed by MRT for the Tasmanian land area prescribe three types of landslide:

- Deep-seated rotational landslides;
- Shallow slides and debris flows; and
- Rockall hazard.

The 2004 Glenorchy area landslide susceptibility map indicates that there are no deep-seated or shallow slide/debris flow hazards present at the site or in the immediately surrounding area, however portions of steeply-sloping ground in close to the northwestern property boundary are mapped as being susceptible to rockfall hazard.

Rockfall is defined by MRT as "…the independent movement of rock or soil fragments through freefall, bouncing, rolling and sliding…usually sourced from cliff or steep slopes and are a fast-moving type of landslide". Based on the results of field studies of dolerite talus slopes across Tasmania, MRT prescribes the following zones of rockfall hazard as a function of slope angle:

- Source area (slope angle greater than or equal to 42°);
- Runout area (upper bound travel angle 34°); and
- Runout area (lower bound travel angle 30°).

The extent of the mapped rockfall source and runout areas at the site are shown on Figure 4 below.

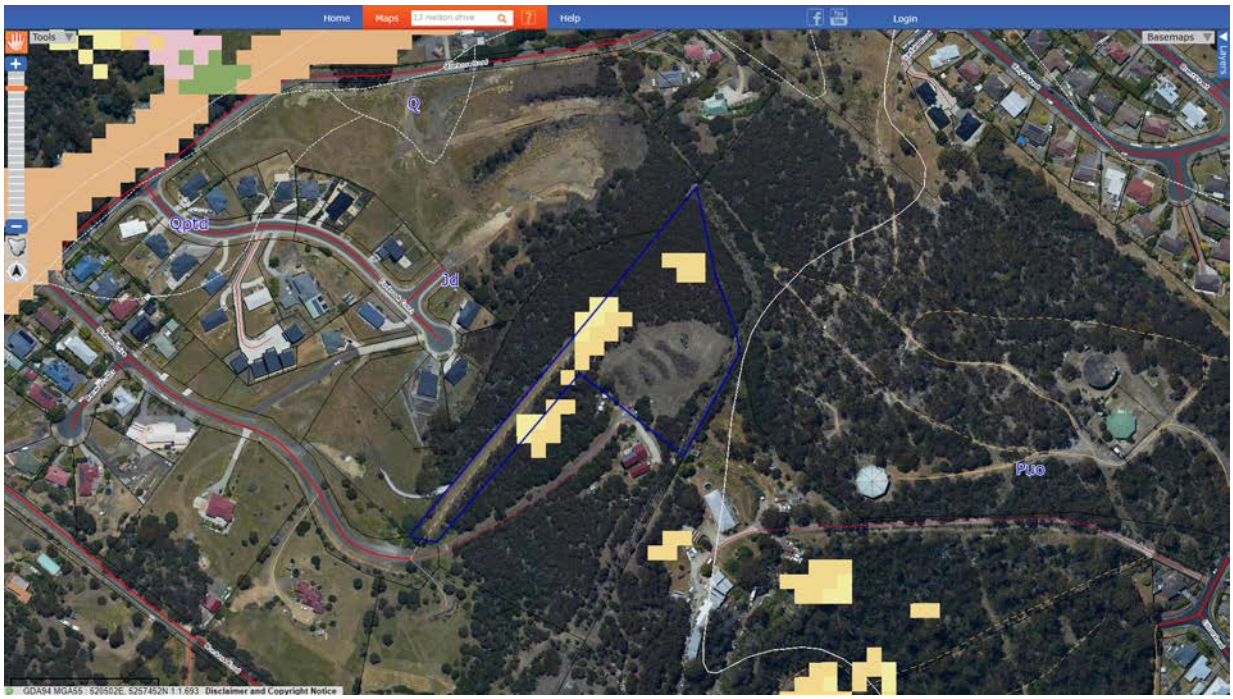


Figure 4 Rockfall susceptibility – pale yellow = lower bound runout area 30°, dark yellow area = source and upper bound runout area 34° (Source: LISTmap)

2.10 Landslide Hazard Bands

The later series of landslide hazard band maps produced by MRT for the Tasmanian land area, which for all intents and purposes superseded the earlier landslide susceptibility maps, show the source and upper bound runout area as an area of “Medium” risk landslide hazard, whilst the area of lower bound runout is indicated as “Low” risk hazard. Both of these areas are described as having “…no known active landslides, however [they have] been identified as being susceptible to landslide by Mineral Resources Tasmania (MRT).”

An excerpt from the MRT landslide hazard band map showing the areas of “Low” and “Medium” landslide hazard is shown on Figure 5 below.

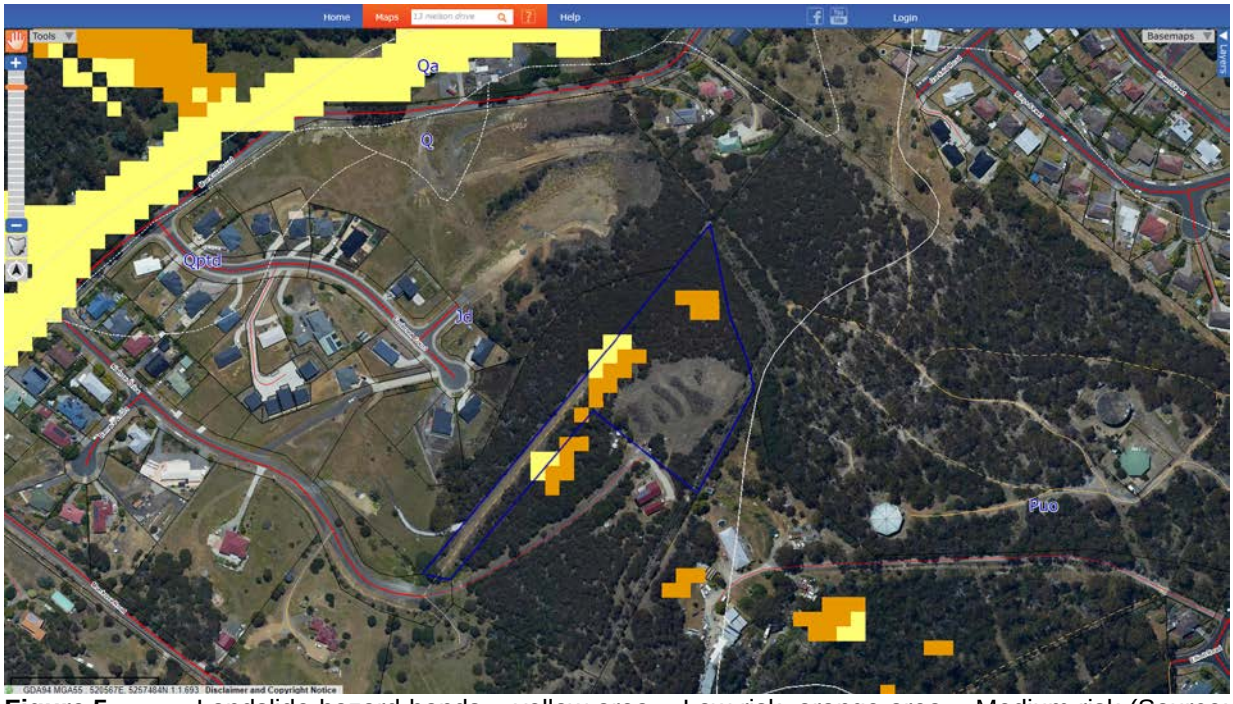


Figure 5 Landslide hazard bands – yellow area = Low risk, orange area = Medium risk (Source: LISTmap)

2.11 LiDAR Imagery

Hillshade mapping based on MRT LiDAR elevation data indicates that the ground surface across the site and immediate surrounds is generally featureless and unremarkable, with natural surface features and excavations, particularly the excavation for the access driveway, being the only features evident. No features consistent with landslide movement such as surface slumping or landslide headscarps, benches or toes are evident.

A subtle, dark-shaded feature is visible above the current termination of the access driveway, approximately 30m long and extending upslope of the formation approximately 15m. The nature of this feature is unclear but roughly coincident with the area of talus or “scree” indicated on the driveway access plans provided by the client and may reflect the higher surface texture of this material in comparison to the surrounding ground surface.

An extract from the MRT LiDAR image is provided in Figure 6, with the margin of the shaded feature indicated. A closeup view of the feature is shown in Figure 7.

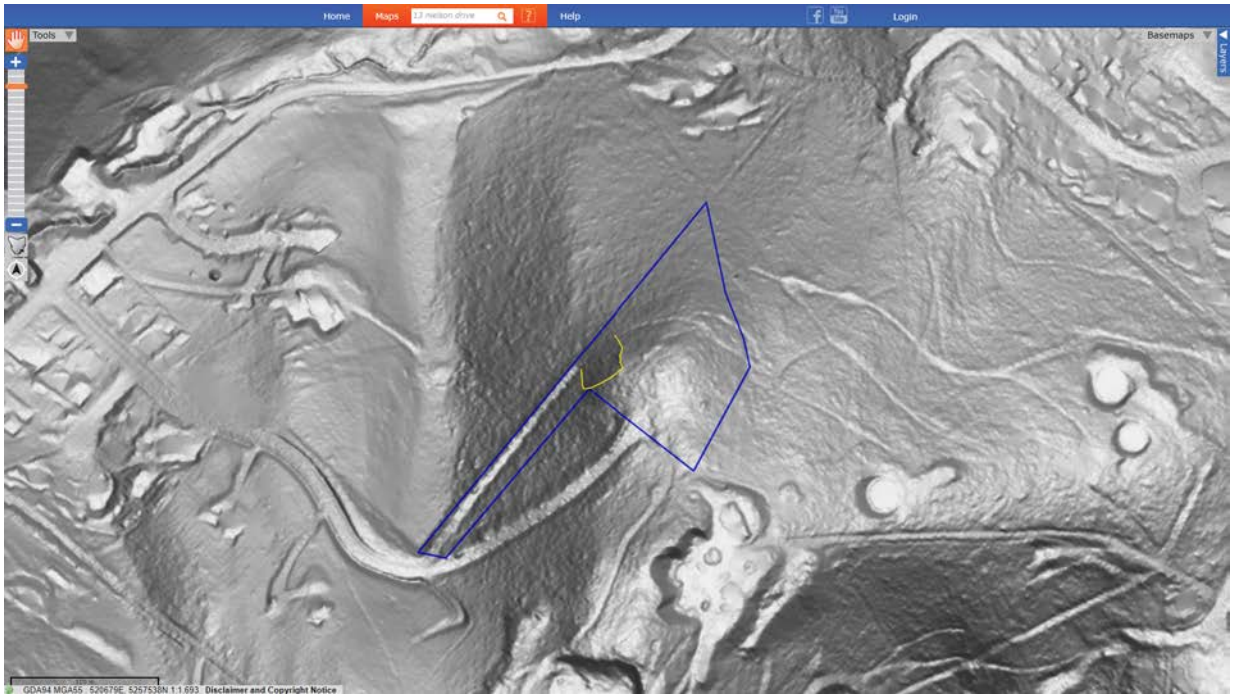


Figure 6 LiDAR image, grey basemap, with talus feature highlighted (Source: LISTmap)

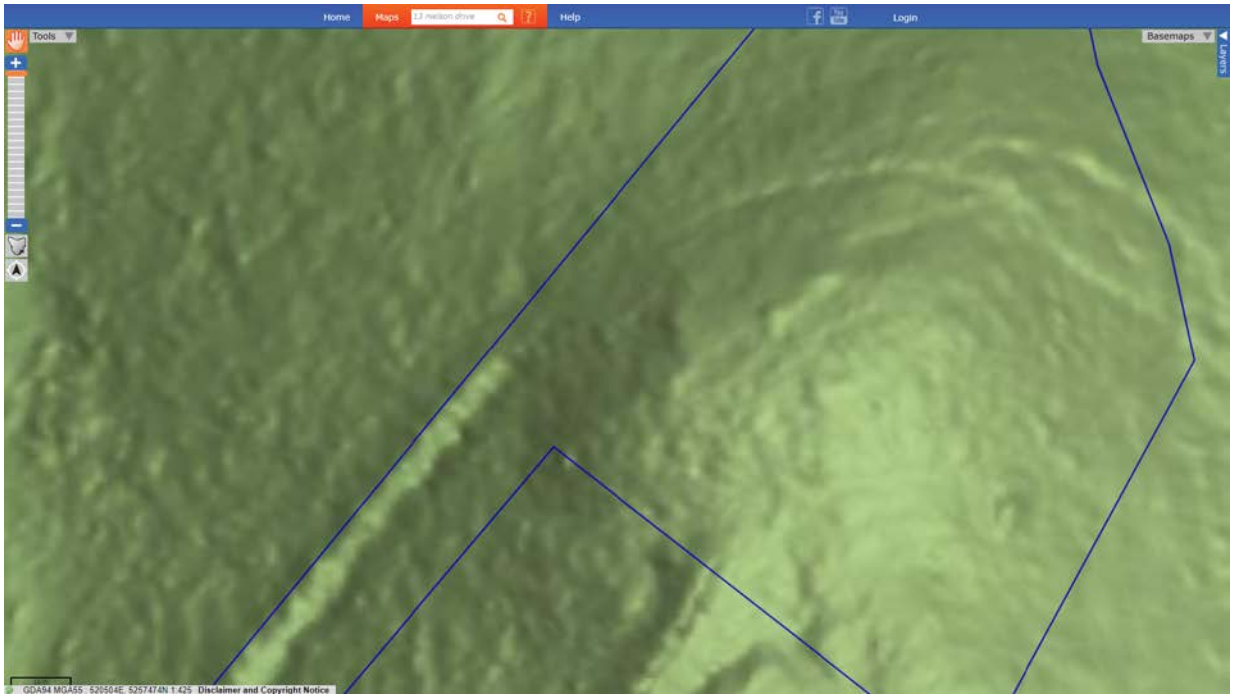


Figure 7 LiDAR image, colour basemap, closeup of talus feature (Source: LISTmap)

2.12 Groundwater

A search of MRT's online database found no information relating to groundwater in the vicinity of the subject site, nor are there records of any groundwater bores or monitoring wells having been established in the area.

Based on observations of deep excavations and the results of drilling investigations undertaken in the local area, it is postulated that groundwater occurs at significant depth below the site.

2.13 Previous Investigations

There are no previous geotechnical, environmental or other subsurface investigation reports known for the site or immediately surrounding land.

A search of MRT's online database found no information specifically relating to the subject site or immediately surrounding land.

2.14 Proposed Development

The plans and other information provided by the client show the proposed development to comprise the following:

- Excavation of a 25m long, 2m wide parking bay with a 3.5% cross slope and table drain at the northern extent of the 180m section of already formed unsealed access driveway;

- Excavation of a new 155m long section of 4m wide driveway access and table drain to match the existing profile, curving around the slope to the southeast from the termination of the existing access to the site of the proposed dwelling at the head of the slope and rising from RL166.2m to RL182.2m elevation. The estimated volumes are 220m^3 cut, 40m^3 fill and 180m^3 spoils to be reused on site. Design cross sections indicate that the section will be formed mostly in cut to a maximum depth of 2.1m and benched at 1m height intervals, with only minimal filling to a maximum of 0.6m depth required along the downslope side of the formation. The technical specification for embankment slopes and cut batters in rock provides as follows:

    - Solid rock: cutting 1.00V:0.25H; and

    - Loose rock: embankment 1.00V:2.00H, cutting 1.00V:1.33H.

    It is understood that clearing and grubbing will be taken to an overall width of 5m along the route to facilitate construction; and

- Construction of a 277m^2 single-storey dwelling positioned on an approximately NW-SE alignment at on flatter ground at the head of the slope, requiring minimal excavations up to approximately 1m in depth. Architectural drawings indicate the dwelling will be founded on an infill slab with a masonry perimeter.

The layout of the proposed development is shown on Figure 8 below.

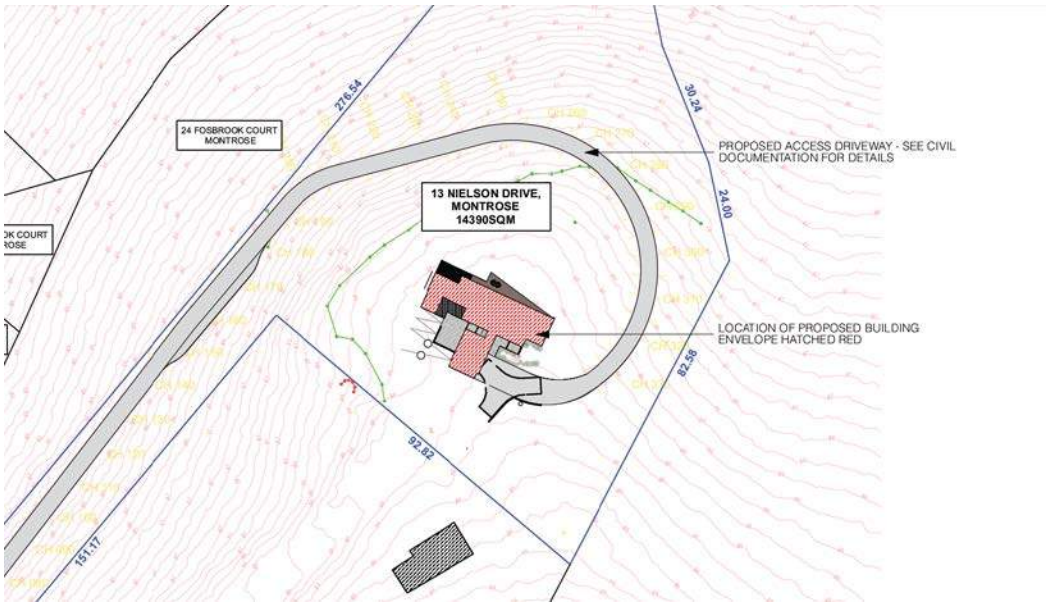


Figure 8 Proposed Layout, extract from IDW P/L drawing package

Several photographs of the proposed development area are presented as Figures 9-1 to 9-6 below

Figure 9-1 Existing access, Ch170m

Figure 9-2 Proposed access, Ch180-210m

Figure 9-3 Proposed access, Ch210-270m

Figure 9-4 Prop. access, Ch270-300m

Figure 9-5 Prop. access, Ch300-335m

Figure 9-6 Proposed house site

3 FIELD INVESTIGATION

The field investigation component of this assessment was carried out by an Engineering Geologist from Statewide Geotechnics between June and July 2024 and involved the following:

- Carrying out a site walkover of the existing access and immediate surrounds, noting surface features and rock outcrops relevant to the investigation;

- Carrying out a site inspection and walkover of the route of the proposed access works and house site, similarly noting surface features, drainage conditions and rock outcrops, including an inspection of the locations and findings of the test pits previously undertaken by the client; and

- Drilling of eight boreholes at the site where access permitted, all of which met with shallow refusal on either floating near-surface clasts or insitu dolerite rock. The holes were established with a Proline drilling rig fitted with 100mm solid augers. Each of the boreholes were logged and, where possible, sampled to permit subsequent analysis.

The approximate locations of the investigation boreholes and a tabulated summary of the results is presented in Section 4.2 below.

4 RESULTS

4.1 Surface Conditions

The site falls from an elevation of 190mASL at the southeast rear corner of the property to approximately 135mASL at the northeast corner. Slopes vary from sub-5° above 185m elevation in the area of the proposed house, becoming progressively steeper towards the north and northwest, commonly ranging between 25° and 30° and up to 20° to the northeast. Some locally steeper areas up to 40° occur mid-slope and in the vicinity of the driveway access. The range of slope angles measured on site are consistent with those indicated on Figure 9 below.

The existing access is approximately 4m wide and 180m long and has been created by cut/fill excavation of the generally steeply sloping ground along the northwestern property boundary. The depth of cut and fill in this area varies up to 2m, with the cut face for the most part having been formed at an angle approaching 1V:1H. The formation shows no signs of settlement or general instability, nor are any seepages evident.

The surface of the site is characterised by abundant angular dolerite clasts ranging up to boulder size with a matrix of residual clay interspersed with lesser areas of dolerite subcrop and outcrop, of a generally moderately to slightly weathered and well jointed nature. The cut face of the driveway access has exposed this dolerite material to a depth of up to 2m and shows the surface layer of boulders and clay to be highly variable in thickness.

The area of dolerite talus or “scree” sampled by the client above the termination of the current access, extending some 30m along the slope from Ch180m to 210m of the proposed access route, similarly comprises large angular dolerite clasts up to 1m in size but generally sub-0.5m size. The origin of this material is unusual for the locality and does not outwardly appear to be natural runout from a rockfall. This tends to be evidenced by the absence of the deposit and similar talus deposits from the published geology map, an apparent absence of a natural source and unusual fining of the material with depth, possibly coincident with material sourced from excavations historically undertaken on the property, or properties, upslope of the site.

Vegetation across the site comprises a moderate covering of mature eucalypt trees with an understorey of smaller sheoaks and other species interspersed by grass and patches of bare, rocky soil. Much of the upper slope above 180m in the area of the proposed dwelling, comprising approximately 4000m^2 or 30% of the total land area, has been cleared in recent years by the former property owner. This cleared vegetation has been combined placed in a series of low stockpiles across the approximate centre of the cleared area.

The site walkover found no evidence of any recent or historic landslide movement at the site, nor were any typical indicators of ground movement such as creep, leaning trees or seepages, etc observed on the site or in the immediately surrounding area. These factors, combined with the apparent good performance of roads and other infrastructure in the vicinity of the site suggests that the site is stable.

A recent aerial image showing the layout of the subject property with salient features indicated is shown on Figure 10, whilst the range of slopes present at the site and surrounding area are shown in Figure 11 below.

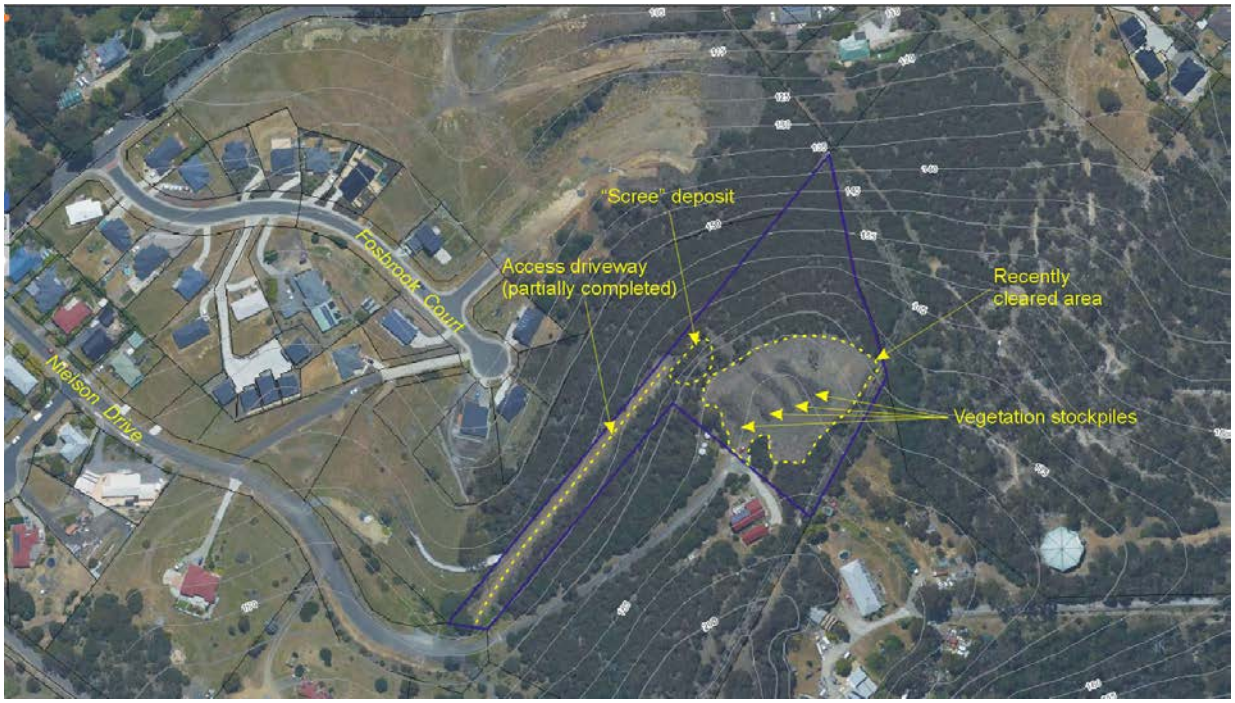


Figure 10 Site layout with salient features indicated (Source: LISTmap)

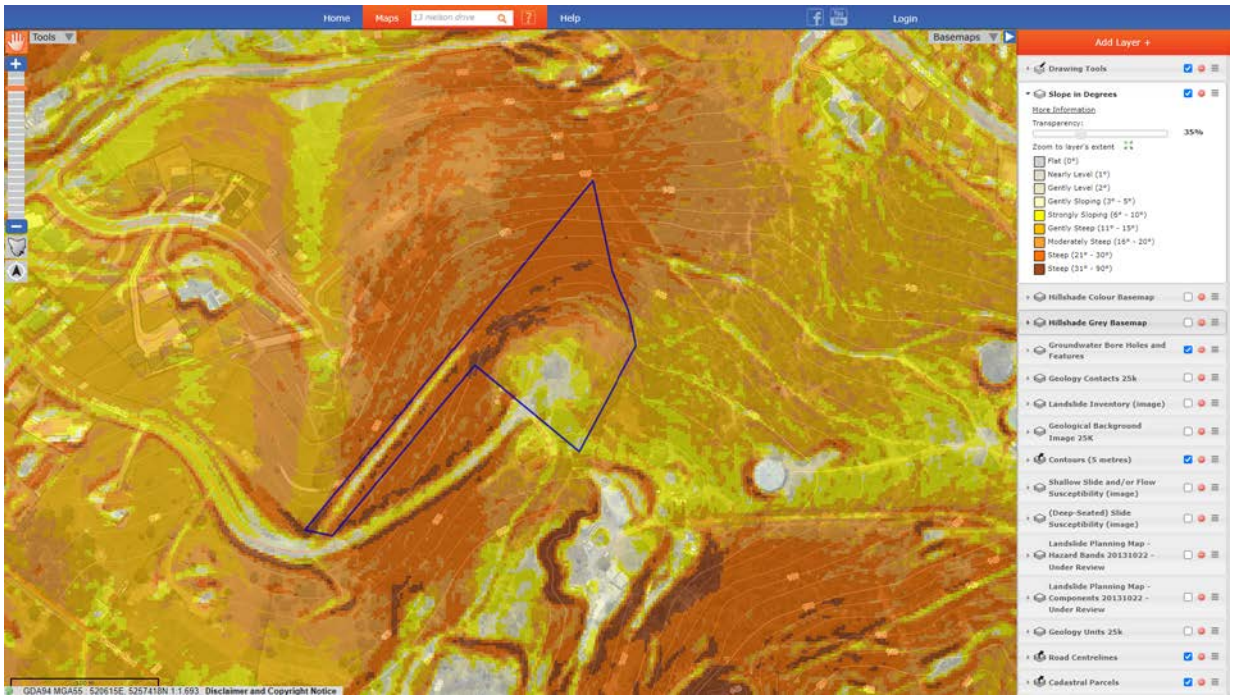


Figure 11 Site slope angles (Source: LISTmap)

4.2 Subsurface Conditions

The investigation boreholes revealed consistent subsurface conditions across the site in the area of the proposed dwelling, in general agreement with surface observations, the findings of test pits excavated by the client, and both the geology map of the area and the findings of investigations previously undertaken in the local area.

Seven of the eight boreholes met with refusal on floating near-surface dolerite clasts at depths of between 0.20m and 0.60m, whilst only one hole, BH1, located off the northwest corner of the proposed house footprint, was able to be advanced to material interpreted to be insitu dolerite rock with a thin weathering profile at a depth of 0.50m below ground level, whereupon the equipment met with refusal.

All of the boreholes were noted to be in a moist state on completion, with no free water evident.

The investigation borehole data is summarised in Table 1 below, whilst the approximate locations of the investigation boreholes in relation to the proposed building footprint are shown on Figure 12 below

Table 1 – Summary of Borehole Data

BH	Location	Subsurface Layers	Depth (m)	Notes
BH1	520433E, 5257445N	Residual CLAY, some gravel, brown, moist, stiff Sandy CLAY, gravelly, low plasticity, yellow-brown, very stiff to hard	0.00 – 0.40 0.40 – 0.50 (Refusal)	Residual dolerite clay XW/HW dolerite, refusal on possible insitu rock
BH2	520437E, 5257438N	Residual CLAY with COBBLES and BOULDERS, medium plasticity, brown, moist, stiff	0.00 – 0.30 (Refusal)	Refusal on dolerite clast
BH3	520441E, 5257431N	Residual CLAY with COBBLES and BOULDERS, medium plasticity, brown, moist, stiff	0.0 – 0.60 (Refusal)	Refusal on dolerite clast
BH4	520441E, 5257449N	Residual CLAY with COBBLES and BOULDERS, medium plasticity, brown, moist, stiff	0.0 – 0.50 (Refusal)	Refusal on dolerite clast
BH5	5204447E, 5257444N	Residual CLAY with COBBLES and BOULDERS, medium plasticity, brown, moist, stiff	0.0 – 0.30 (Refusal)	Refusal on dolerite clast
BH6	520435E, 5257435N	Residual CLAY with COBBLES and BOULDERS, medium plasticity, brown, moist, stiff	0.0 – 0.20 (Refusal)	Refusal on dolerite clast
BH7	520458E, 5257448N	Residual CLAY with COBBLES and BOULDERS, medium plasticity, brown, moist, stiff	0.0 – 0.20 (Refusal)	Refusal on dolerite clast
BH8	520462E, 5257440N	Residual CLAY with COBBLES and BOULDERS, medium plasticity, brown, moist, stiff	0.0 – 0.40 (Refusal)	Refusal on dolerite clast

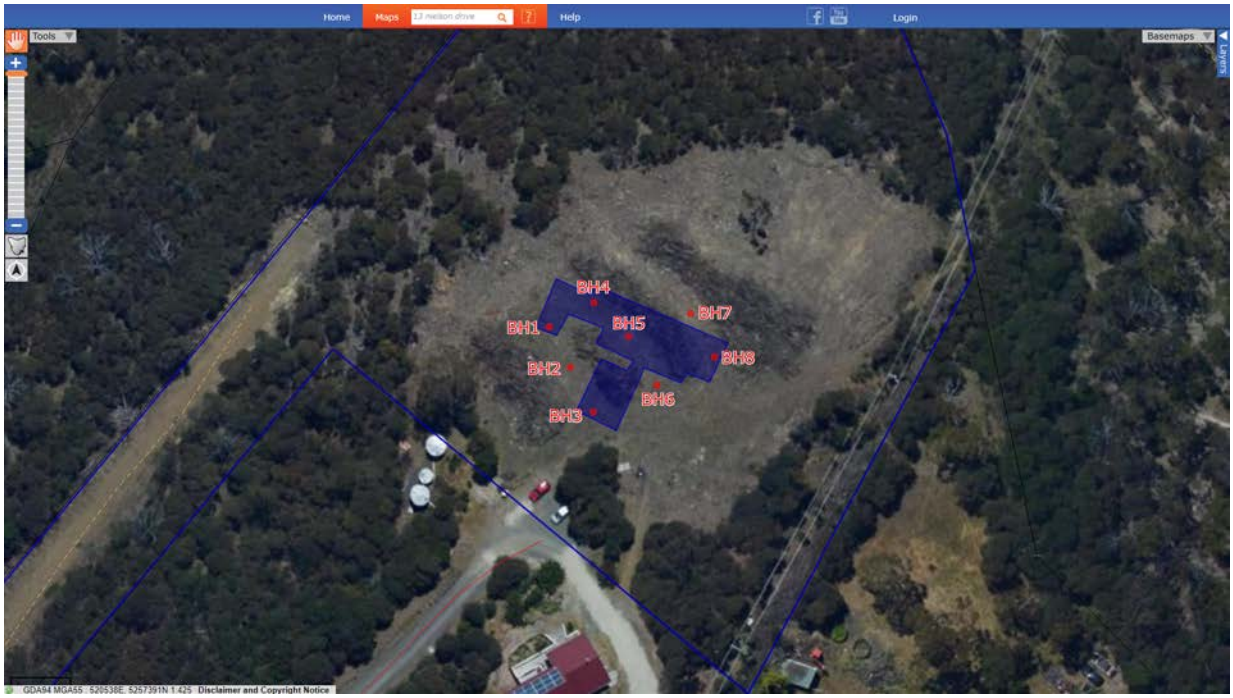


Figure 12 Borehole locations

5 LANDSLIDE RISK ASSESSMENT

5.1 General

Risk assessment and management principles applied to slopes can be interpreted as answering the following question:

- What might happen? (HAZARD IDENTIFICATION)'
- How likely is it? (LIKELIHOOD);
- What damage or injury might result? (CONSEQUENCE);
- How important is it? (RISK EVALUATION); and
- What can be done about it? (RISK TREATMENT).

The risk is a combination of the likelihood and the consequences for the hazard in question, and therefore both likelihood and consequences are taken into account when evaluating risk and determining whether treatment is required.

The quantitative likelihood, consequence and risk terms used in this report in the determination of risk to property are given in Appendix B and are based on the Landslide Risk Management Guidelines published by the Australian Geomechanics Society (AGS, 2007). The risk terms are defined by a matrix that integrates different combinations of likelihood and consequence. Risk matrices help to communicate the results of risk assessment, rank risks, set priorities and develop approaches to decision making.

5.2 Geotechnical Model

The field observations and testing indicates that the site is underlain by well jointed, moderately weathered or better quality dolerite rock that likely extends to considerable depth. The dolerite is mantled by an irregular but thin layer of residual clay containing abundant angular dolerite clasts to boulder size. Both units have no inherent history of instability.

Slope angles are generally less than 30° across the site with some locally steeper areas to the north and in the area of the existing access ranging up to 40°.

A deposit of talus occurs immediately upslope of the current termination of the access driveway, encompassing an area some 30m in length and extending up the slope approximately 15m. It is likely that this material has resulted from nearby excavations and does not represent a natural deposit. The angular clasts range in size up to 1m and are loosely interlocking. Despite the slope being close to the threshold angle of 42° for failures known to occur in dolerite talus deposits, the material appears stable in its current state.

There are no seepages or springs evident on the site and drainage conditions are good.

Groundwater is likely to occur at significant depth (i.e. >50m) below the site.

5.3 Potential Rockfall Hazard

The likelihood of rock falls is a function of geology, slope angle, degree of vegetation cover and rock size and shape. There is presently no evidence of rock fall occurring or having occurred at the site in the past. There are two possible failure scenarios:

- Rockfall on natural slopes, the likelihood of which is assessed to be Rare; and
- Rockfall on cut slopes and talus slopes, the likelihood of which is assessed to be Unlikely.

The identification of the potential hazards considers both the site and immediately adjacent land, and is necessary to address stability issues that may negatively impact upon the site and influence the risk to property.

5.4 Risk to Property

Based on a review of all available information and the results of the desktop study, site observations and field investigation, the qualitative risk to property for future landslide movement in the is assessed to be as follows:

- Rockfall on natural slopes: Very Low, based on the assessed likelihood of Rare and a consequence of Minor with an indicative value of up to 10%, broadly described as "*limited damage to part of structure and/or part of site requiring some stabilisation works"*; and

- Rockfall on cut slopes and talus slopes: Low, based on the assessed likelihood of Unlikely and a consequence of Minor with an indicative value of up to 10%, broadly described as "*limited damage to part of structure and/or part of site requiring some stabilisation works"*.

An assessed risk of 'Low' is usually acceptable to regulators.

A copy of the risk matrix used in the above assessment of landslide risk is presented in Appendix C.

5.5 Risk to Life

Based on the assessed risk to property and a review of all available information including the results of the desktop study, site observations and field investigation, the qualitative risk to life for future landslide movement is assessed to be Acceptable.

6 Site Classification and Bearing Capacity

The default site classification for the site in accordance with AS2870-2011 '*Residential Slabs and Footings*' would be Class P, due to the site being located within a landslide hazard area. Notwithstanding this, and based on an assessment of the characteristics of the prevailing dolerite rock that occurs at the site, foundations should be proportioned for a Class A site.

Specific attention and consideration should be given to the design of footings as required by AS2870-2011.

In addition to the normal founding requirements arising from the above classification, particular conditions at the site determine that the founding medium for all footings should be as follows:

- Insitu dolerite ROCK, moderately weathered or better quality, encountered at or near existing ground level

The nature of the prevailing dolerite rock suggests that it is capable of providing an allowable bearing capacity far in excess of any likely design requirements for the dwelling and access works.

7 Discussion and Conclusions

It is our assessment that the proposed works are not likely to negatively impact the stability of the site or that of surrounding properties, and that the proposed works satisfy the requirements of both Clause 5.5.1 and 15.6.1 of the Landslide Code by being able achieve and maintain a tolerable level of risk, particularly given that:

- The site mostly has an Unclassified level of risk and the identified areas of Low to Medium risk landslide hazard are small and appear to have resulted mainly from past construction activities, namely the formation of the current access and the possible placement of coarse rock fill. In this way, the identified hazard is not truly reflective of the site's inherently low natural risk of landslide activity;

- There is no known history of instability at the site; there are no known published or unpublished geotechnical or other reports relating specifically to the site or adjacent land;
- Slope angles across the site are consistently below the angle at which rockfall failures are known to occur in dolerite terrain;
- The site walkover and field investigation found no evidence of historic or recent landslide movement at the site or on adjacent land, nor were any typical indicators of landslide-prone terrain observed;
- The apparent good performance of road assets and other infrastructure in the vicinity of the site;
- The proposed works have been designed sympathetically so as to limit site disturbance in accordance with the general principles of good hillside practice and prevailing geological conditions, and
- The landslide risk associated with the proposed works is an acceptable risk and is assessed as a Very Low to Low risk of landslide activity occurring at the site in the future.

Based on the above, it is our assessment that no specific management measures are required to address landslide hazard at the subject property, beyond recommending the following:

- Ensuring that the works are constructed in strict accordance with the design drawings and specifications reviewed and presented herein;
- All earthworks be undertaken in accordance with AS3798–2007 '*Guidelines on Earthworks for Commercial and Residential Structures*';
- Trimming back any oversteepned sections of the existing access and selectively removing loose boulders as deemed necessary;
- Minimising vegetation removal on steeper slopes so as to maintain the soil-binding effect and thus the stability of these areas;
- Minimizing the use of vibratory equipment in the vicinity of the talus slope between Ch180-210m during construction of the passing bay and new access driveway so as to minimise the risk of inducing instability;
- Good hillside construction practices should be followed. A copy of Some Guidelines for Hillside Construction are presented in Appendix C

To this end, there outwardly appears to be no compelling reason to undertake further geotechnical assessment to support the proposed development unless the development plans change significantly from those assessed herein.

The site classification presented in Section 6 assumes that the natural drainage and infiltration conditions at the site will not be significantly affected for the proposed development work on the site. The client must take care to ensure that surface water is not permitted to collect adjacent to the structure and that significant changes to seasonal soil moisture equilibria do not develop as a result of service trench construction or tree root action. The client's attention is drawn to Appendix B of AS2870 and CSIRO Building Technical File BTF18-2011 'Foundation Maintenance and Footing Performance: A Homeowner's Guide' as a guide to maintenance requirements for the proposed structure on the Site.

Excavations in natural materials are expected to encounter well-jointed, moderately weathered or better quality dolerite rock with lesser residual clay. Based on the degree of weathering and joint spacing evident in exposures of this material, it is likely that excavations may be similarly accomplished with conventional excavation equipment, possibly requiring ripping, without needing to be blasted.

Excavations undertaken in the residual clay and dolerite rock may yield material suitable for use as engineered fill. If use of this material is to be contemplated, oversized particles greater than 150mm in size would need to be selectively removed, and sampling and testing by an accredited testing agency undertaken to determine, as a minimum, California Bearing Ratio (CBR) and Standard Compaction in accordance with AS1289-2003 - '*Methods of Testing Soils for Engineering Purposes*' to check suitability of use for backfill under foundations and pavements. Where possible, approved imported material should be used in construction of engineered fill.

Any retaining walls over 1m in height should be specialist engineer designed to resist the lateral load imposed by the retained materials and be provided with adequate subsoil drainage.

By way of a disclaimer, it should be noted that variations in subsurface conditions may occur in areas of the site not specifically covered by the field investigation. Should conditions significantly different from those reported herein be encountered, Statewide Geotechnics should be notified to arrange an inspection and initiate further program of testing as required.

Should you require further clarification, or if we can be of further assistance, please contact the undersigned.

For and on behalf of Statewide Geotechnics

Drew Bedelph
Engineering Geologist
Statewide Geotechnics

References

- Mineral Resources Tasmania – Tasmania Landslide Hazard Map series;
- Mineral Resources Tasmania – Glenorchy Landslide Susceptibility Map
- Mineral Resources Tasmania – Glenorchy Geology Map;
- Tas Dept. Premier & Cabinet – Landslide Planning Report V5, 2013;
- Australian Geomechanics Society Practice Note on Landslide Risk Management, 2007;
- AS2870-2011: '*Residential Slabs and Footings*';
- CSIRO Building Technical File BTF18-2011 'Foundation Maintenance and Footing Performance: A Homeowner's Guide
- AS1289-2003 - '*Methods of Testing Soils for Engineering Purposes*
- AS3798-2007 '*Guidelines on Earthworks for Commercial and Residential Structures*';
- Building Regulations 2016 (Tas.)
- Tasmanian Planning Scheme – Landslide Code
- LISTmap website (*www.thelist.tas.gov.au*)

Appendices

- Appendix A – Information from Client
- Appendix B – Landslide Risk Assessment Matrix
- Appendix C – Some Guidelines for Hillside Construction

APPENDIX A

Information from Client

13 NIELSON DRIVE, MONTROSE
ACCESS DRIVEWAY FORMATION

DRAWINGS	
0001–101A	COVER PAGE
0001–102A	SCOPE OF WORK
0001–103A	TECHNICAL SPECIFICATION
0001–104A	PHOTOGRAPHS
0001–105A	LAYOUT
0001–106A	PULLOVER BAY
0001–107A	LONGSECTION
0001–108A	CROSS SECTIONS 1 / 4
0001–109A	CROSS SECTIONS 2 / 4
0001–110A	CROSS SECTIONS 3 / 4
0001–111A	CROSS SECTIONS 4 / 4

Notes:

1.

REV:	DESCRIPTION:	BY:	DATE:
STATUS:	IFC		

CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

ARCHITECT:

SITE: 13 NIELSON DRIVE
MONTROSE

TITLE: ACCESS DRIVEWAY
COVER PAGE

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
	12/6/2023	DG	DG

PROJECT NO:	DRAWING NO:	REVISION:
0001	101	A

CH000 – CH180
DRIVEWAY ALREADY FORMED

CH180 – CH335
CLEAR AND GRUB 5m WIDE AND FORM 4m WIDE ACCESS DRIVEWAY IN ACCORDANCE WITH DRAWINGS AND TECHNICAL SPECIFICATION

ESTIMATED VOLUMES:
- CUT: 220 M3 (125 M3 ROCK)
- FILL: 40 M3
- SPOIL: 180 M3

RELOCATE ROCKS AT START OF ACCESS DRIVEWAY

CH150 – CH175
WIDEN DRIVEWAY TO 6m FOR PULL–OVER BAY IN ACCORDANCE WITH DRAWINGS AND TECHNICAL SPECIFICATION

Notes:

1.

REV:	DESCRIPTION:	BY:	DATE:
STATUS:	IFC		

CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

ARCHITECT:

SITE: 13 NIELSON DRIVE
MONTROSE

TITLE: ACCESS DRIVEWAY
SCOPE OF WORK

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	12/6/2023	DG	DG

PROJECT NO:	DRAWING NO:	REVISION:
0001	102	A

TECHNICAL SPECIFICATION:

1. Embankment slopes and cut batters to be judged onsite and to be generally in accordance with TABLE 1

2. Any cut–side batters in excess of 1.0m high to be benched at approx ~1.0m high intervals in accordance with DETAIL A

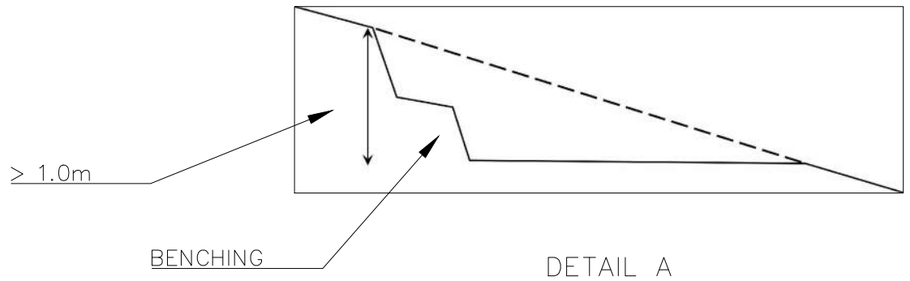
3. Where the cross slope of the natural surface is steeper than 1 vertical in 3 horizontal, the base of the entire embankment are to be benched horizontally to sufficient width to allow filling in horizontal layers across the whole width of the embankment in accordance with DETAIL B

4. Any fill depths in excess of 0.3m to be compacted by excavator in layers of no greater than 0.3m

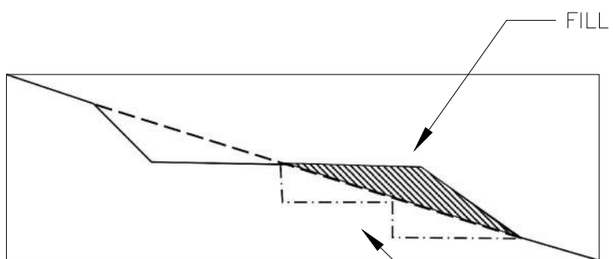
5. Any excess spoil can be disposed of onsite on the downslope side of CH290

SOIL / ROCK TYPE	EMBANKMENT		CUTTING	
	Vertical	Horizontal	Vertical	Horizontal
Solid Rock	–	–	1.00	0.25
Loose Rock	1.00	2.00	1.00	1.33
Sand	1.00	3.00	1.00	3.00
Stiff Clay	1.00	1.00	1.00	1.00
Soft Clay	1.00	3.00	1.00	1.50

TABLE 1



DETAIL A



DETAIL B

Notes:

1.

REV:	DESCRIPTION:	BY:	DATE:
STATUS:	IFC		

CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

ARCHITECT:

SITE: 13 NIELSON DRIVE
MONTROSE

TITLE: ACCESS DRIVEWAY
TECHNICAL SPECIFICATION

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	12/6/2023	DG	DG

PROJECT NO:	DRAWING NO:	REVISION:
0001	103	A

CH170 LOOKING TOWARD CH000
PULLOVER BAY LOCATION

CH180 TO CH220
ROCK SECTION

CH220 TO CH270
PARTIALLY FORMED SECTION

CH270 TO CH300
CLEARED SECTION

CH300 TO CH335
CLEARED SECTION

Notes:

1.

REV:	DESCRIPTION:	BY:	DATE:
STATUS:	IFC		

CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

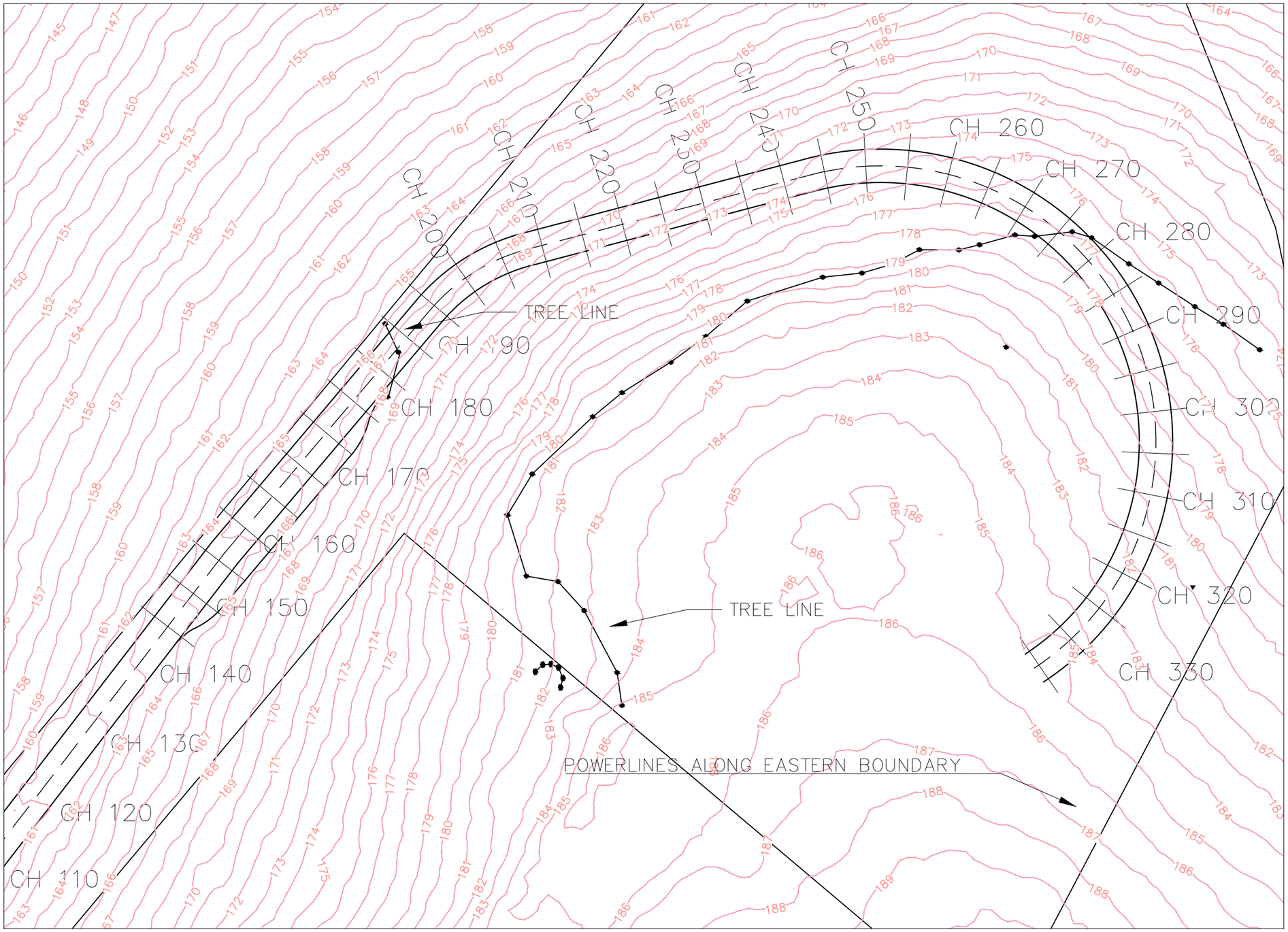
ARCHITECT:

SITE: 13 NIELSON DRIVE
MONTROSE

TITLE: ACCESS DRIVEWAY
PHOTOS

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	12/6/2023	DG	DG

PROJECT NO:	DRAWING NO:	REVISION:
0001	104	A



Notes:

1.

REV:	DESCRIPTION:	BY:	DATE:
STATUS:	IFC		

CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

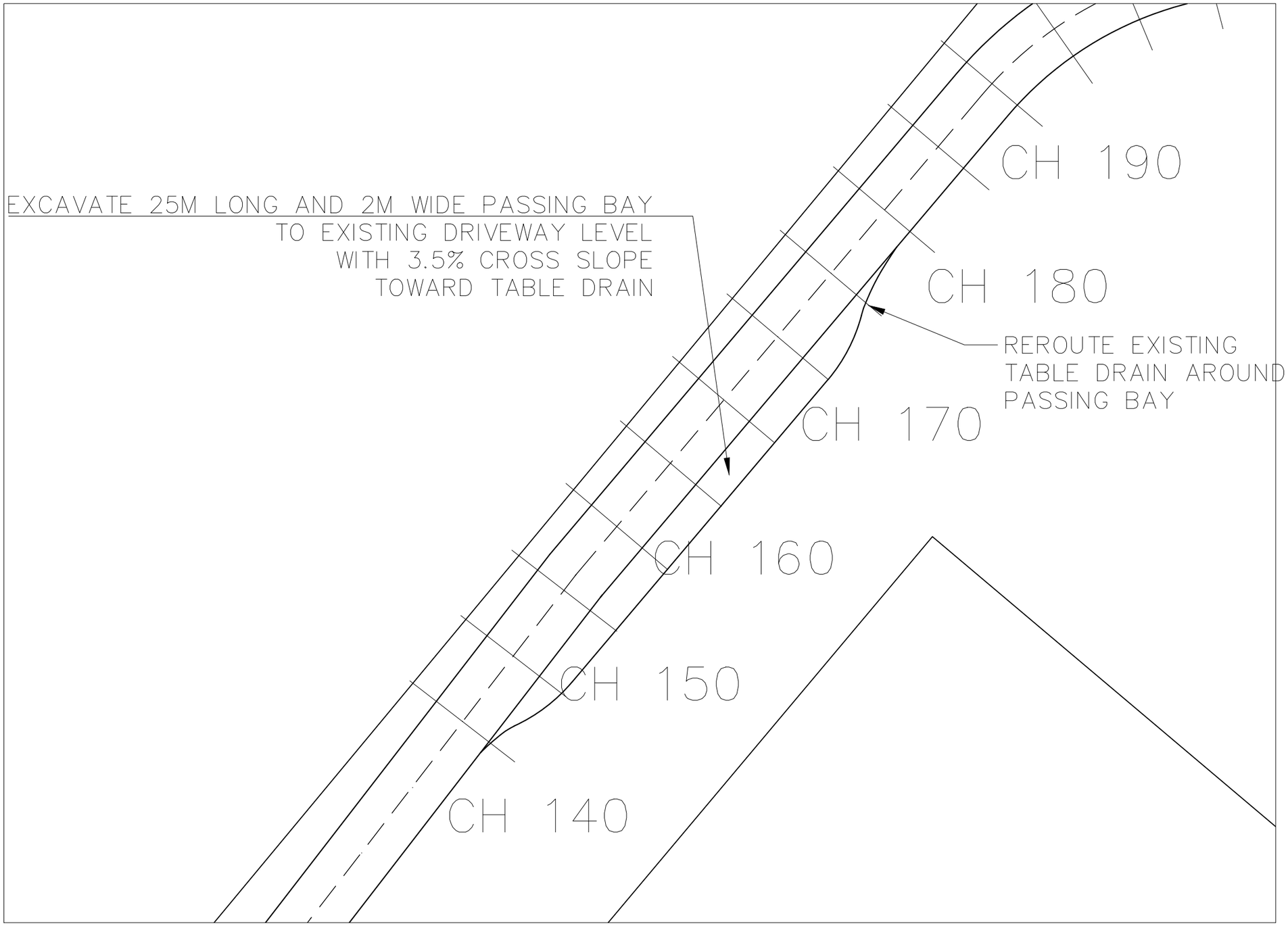
ARCHITECT:

SITE: 13 NIELSON DRIVE
MONTROSE

TITLE: ACCESS DRIVEWAY
LAYOUT

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:500	12/6/2023	DG	DG

PROJECT NO:	DRAWING NO:	REVISION:
0001	105	A



Notes:

1.

REV:	DESCRIPTION:	BY:	DATE:
STATUS:	IFC		

CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

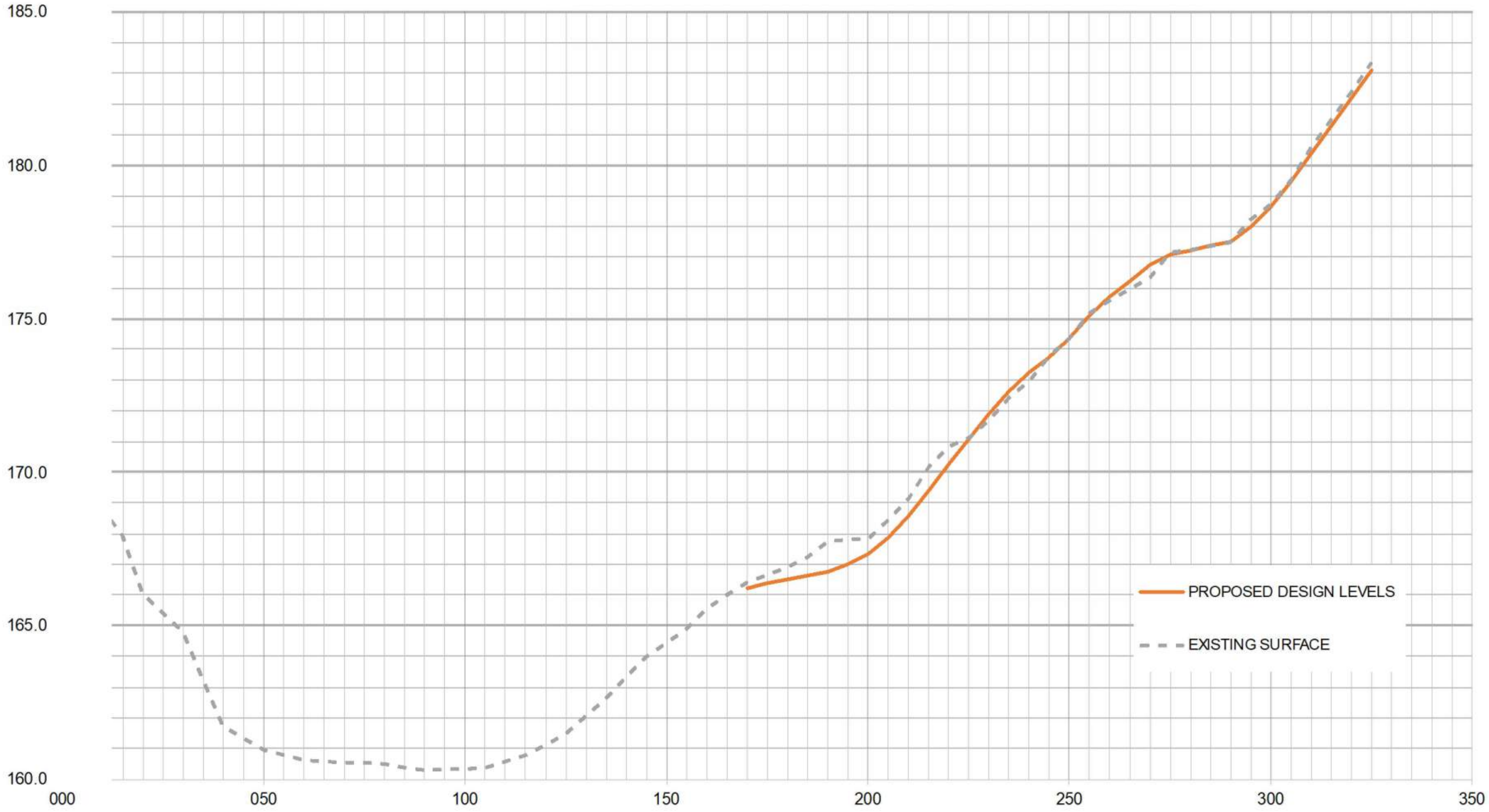
ARCHITECT:

SITE: 13 NIELSON DRIVE
MONTROSE

TITLE: ACCESS DRIVEWAY
PULL-OVER BAY

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:250	12/6/2023	DG	DG

PROJECT NO:	DRAWING NO:	REVISION:
0001	106	A



	CH000	CH005	CH010	CH015	CH020	CH025	CH030	CH035	CH040	CH045	CH050	CH055	CH060	CH065	CH070	CH075	CH080
EXISTING	170.090	169.450	168.810	167.912	166.035	165.412	164.790	163.245	161.721	161.332	160.944	160.779	160.614	160.582	160.551	160.521	160.491
DESIGN RL																	
CHAINAGE	CH000	CH005	CH010	CH015	CH020	CH025	CH030	CH035	CH040	CH045	CH050	CH055	CH060	CH065	CH070	CH075	CH080

	CH085	CH090	CH095	CH100	CH105	CH110	CH115	CH120	CH125	CH130	CH135	CH140	CH145	CH150	CH155	CH160	CH165
EXISTING	160.392	160.293	160.317	160.342	160.367	160.573	160.778	161.130	161.481	162.060	162.640	163.311	163.982	164.426	164.869	165.552	165.983
DESIGN RL																	
CHAINAGE	CH085	CH090	CH095	CH100	CH105	CH110	CH115	CH120	CH125	CH130	CH135	CH140	CH145	CH150	CH155	CH160	CH165

	CH170	CH175	CH180	CH185	CH190	CH195	CH200	CH205	CH210	CH215	CH220	CH225	CH230	CH235	CH240	CH245	CH250
EXISTING	166.414	166.649	166.884	167.242	167.777	167.788	167.849	168.446	169.155	170.172	170.840	171.143	171.686	172.450	172.966	173.811	174.389
DESIGN RL	166.233	166.375	166.518	166.618	166.761	167.011	167.344	167.844	168.559	169.392	170.225	171.059	171.892	172.606	173.231	173.731	174.356
CHAINAGE	CH170	CH175	CH180	CH185	CH190	CH195	CH200	CH205	CH210	CH215	CH220	CH225	CH230	CH235	CH240	CH245	CH250

	CH255	CH260	CH265	CH270	CH275	CH280	CH285	CH290	CH295	CH300	CH305	CH310	CH315	CH320	CH325	CH330	CH335
EXISTING	175.171	175.605	175.970	176.354	177.165	177.259	177.358	177.485	178.212	178.726	179.478	180.583	181.452	182.384	183.311	184.249	185.574
DESIGN RL	175.071	175.696	176.251	176.751	177.084	177.227	177.370	177.513	178.013	178.638	179.471	180.380	181.290	182.199	183.108	184.017	184.926
CHAINAGE	CH255	CH260	CH265	CH270	CH275	CH280	CH285	CH290	CH295	CH300	CH305	CH310	CH315	CH320	CH325	CH330	CH335

Notes:

1.

REV:	DESCRIPTION:	BY:	DATE:

STATUS: IFC

CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

ARCHITECT:

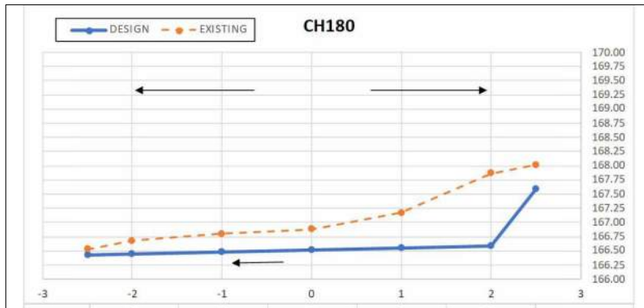
SITE: 13 NIELSON DRIVE
MONTROSE

TITLE: ACCESS DRIVEWAY
LONGSECTION

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	12/6/2023	DG	DG

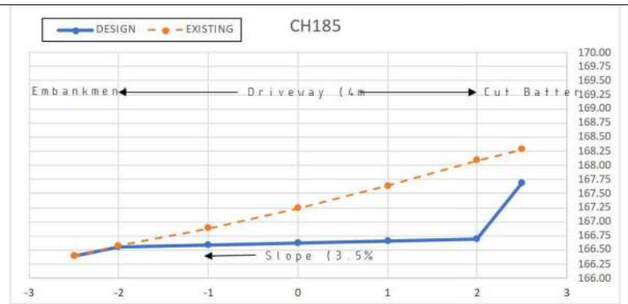
PROJECT NO:	DRAWING NO:	REVISION:
0001	107	A

CH180



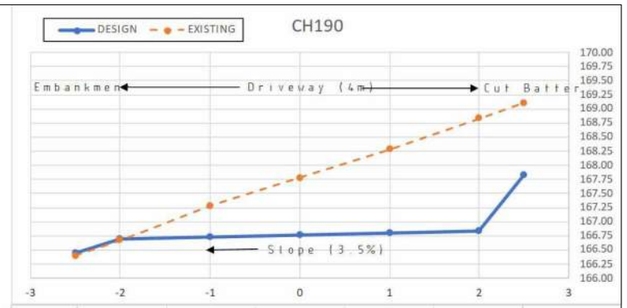
	-3	-2	-1	0	1	2	3
DESIGN		166.448	166.483	166.518	166.553	166.588	
EXISTING		166.677	166.797	166.884	167.167	167.865	
CUT(-)/FILL(+)		-0.229	-0.314	-0.366	-0.614	-1.277	

CH185



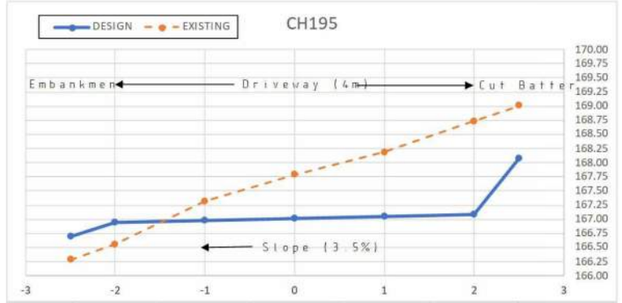
	-3	-2	-1	0	1	2	3
DESIGN		166.548	166.583	166.618	166.653	166.688	
EXISTING		166.578	166.883	167.242	167.638	168.092	
CUT(-)/FILL(+)		-0.030	-0.300	-0.624	-0.985	-1.404	

CH190



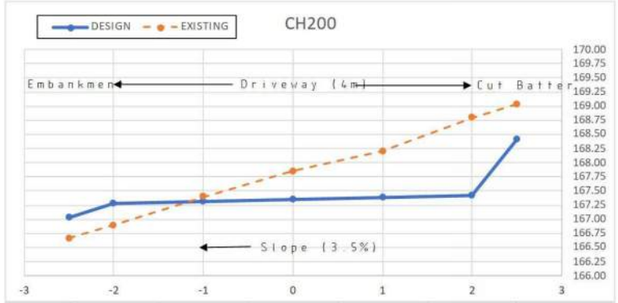
	-3	-2	-1	0	1	2	3
DESIGN		166.691	166.726	166.761	166.796	166.831	
EXISTING		166.670	167.304	167.777	168.278	168.832	
CUT(-)/FILL(+)		0.021	-0.578	-1.016	-1.482	-2.001	

CH195



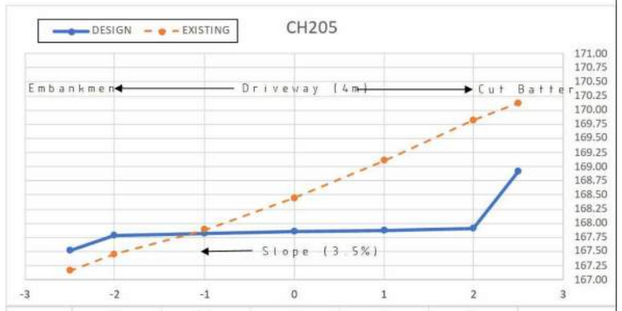
	-3	-2	-1	0	1	2	3
DESIGN		166.941	166.976	167.011	167.046	167.081	
EXISTING		166.555	167.317	167.788	168.186	168.735	
CUT(-)/FILL(+)		0.386	-0.341	-0.777	-1.140	-1.654	

CH200



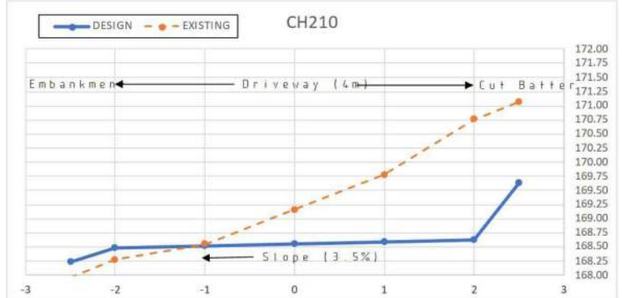
	-3	-2	-1	0	1	2	3
DESIGN		167.274	167.309	167.344	167.379	167.414	
EXISTING		166.897	167.394	167.849	168.206	168.797	
CUT(-)/FILL(+)		0.377	-0.085	-0.505	-0.827	-1.383	

CH205



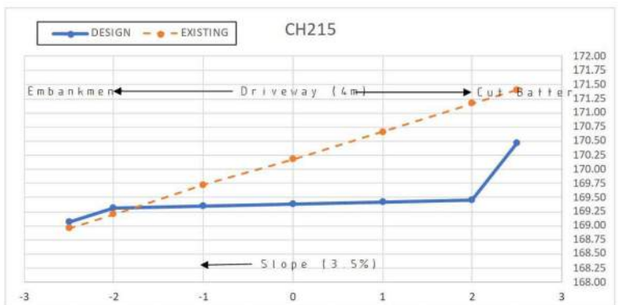
	-3	-2	-1	0	1	2	3
DESIGN		167.774	167.809	167.844	167.879	167.914	
EXISTING		167.453	167.880	168.446	169.106	169.823	
CUT(-)/FILL(+)		0.321	-0.071	-0.602	-1.227	-1.909	

CH210



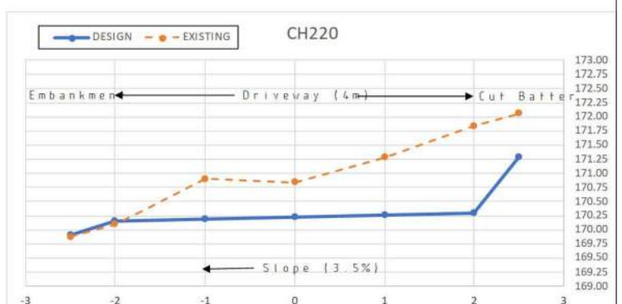
	-3	-2	-1	0	1	2	3
DESIGN		168.489	168.524	168.559	168.594	168.629	
EXISTING		168.277	168.550	169.155	169.776	170.756	
CUT(-)/FILL(+)		0.212	-0.026	-0.596	-1.182	-2.127	

CH215



	-3	-2	-1	0	1	2	3
DESIGN		169.322	169.357	169.392	169.427	169.462	
EXISTING		169.203	169.721	170.172	170.662	171.163	
CUT(-)/FILL(+)		0.119	-0.364	-0.780	-1.235	-1.701	

CH220



	-3	-2	-1	0	1	2	3
DESIGN		170.155	170.190	170.225	170.260	170.295	
EXISTING		170.094	170.898	170.840	171.278	171.839	
CUT(-)/FILL(+)		0.061	-0.708	-0.615	-1.018	-1.544	

Notes:

1.EMBANKMENT AND CUT BATTERS ARE INDICATIVE ONLY; REFER TECHNICAL SPECIFICATION

REV:	DESCRIPTION:	BY:	DATE:
STATUS:	IFC		

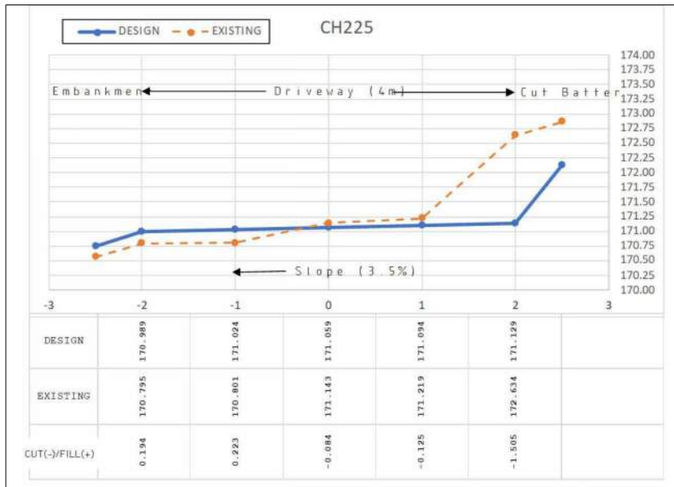
CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

ARCHITECT:

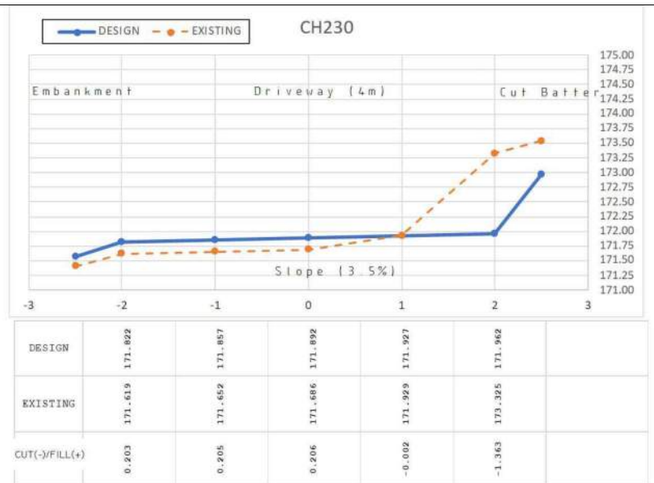
SITE: 13 NIELSON DRIVE
MONTROSE

TITLE: ACCESS DRIVEWAY
CROSS-SECTIONS (1/4)

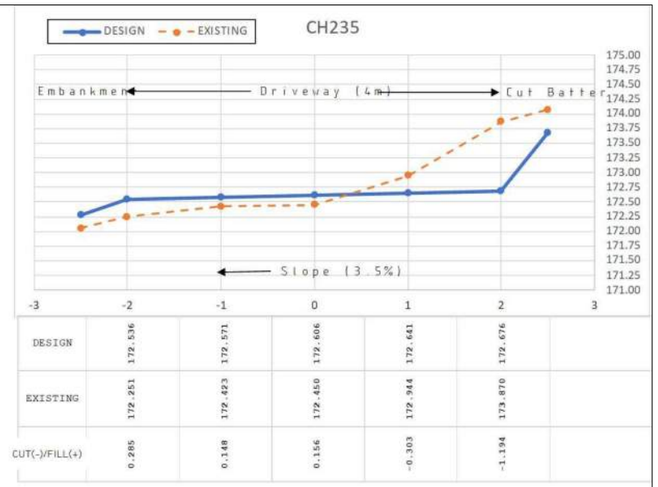
SCALE AT A3:	DATE:	DRAWN:	CHECKED:
nts	12/6/2023	DG	DG
PROJECT NO:	DRAWING NO:		REVISION:
0001	108		A



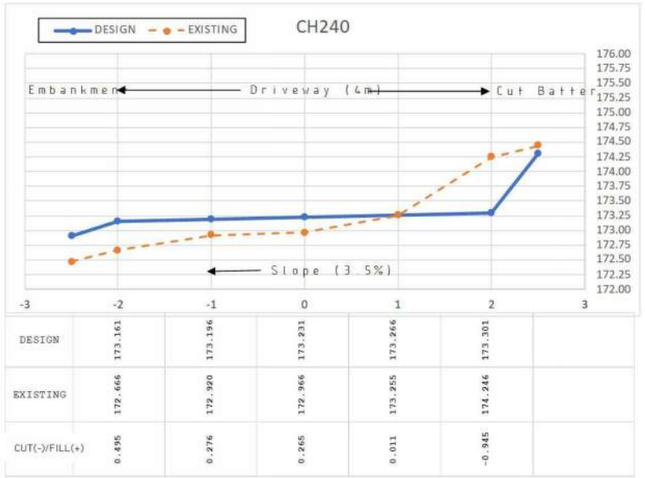
	-3	-2	-1	0	1	2	3
DESIGN	170.989	171.024	171.059	171.094	171.129		
EXISTING	170.795	170.801	171.143	171.219	172.634		
CUT(-)/FILL(+)	0.194	0.223	-0.084	-0.125	-1.505		



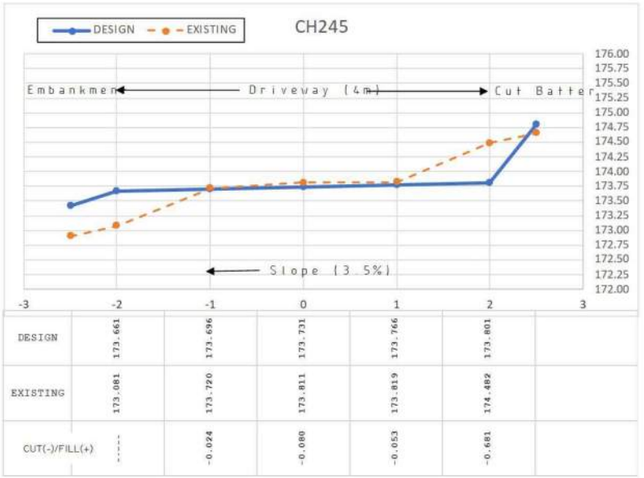
	-3	-2	-1	0	1	2	3
DESIGN	171.822	171.857	171.892	171.927	171.962		
EXISTING	171.619	171.652	171.686	171.999	173.325		
CUT(-)/FILL(+)	0.203	0.205	0.206	-0.002	-1.363		



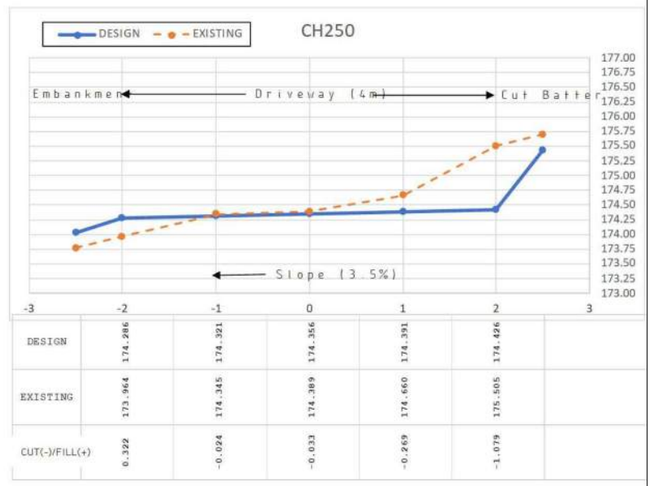
	-3	-2	-1	0	1	2	3
DESIGN	172.536	172.571	172.606	172.641	172.676		
EXISTING	172.251	172.423	172.450	172.944	173.870		
CUT(-)/FILL(+)	0.285	0.148	0.156	-0.303	-1.194		



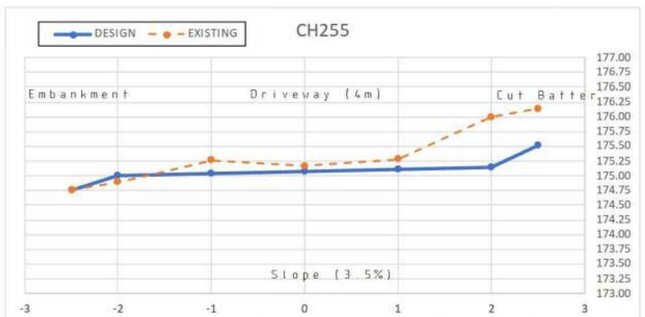
	-3	-2	-1	0	1	2	3
DESIGN	173.161	173.196	173.231	173.266	173.301		
EXISTING	172.666	172.920	172.966	173.255	174.246		
CUT(-)/FILL(+)	0.495	0.276	0.265	0.011	-0.945		



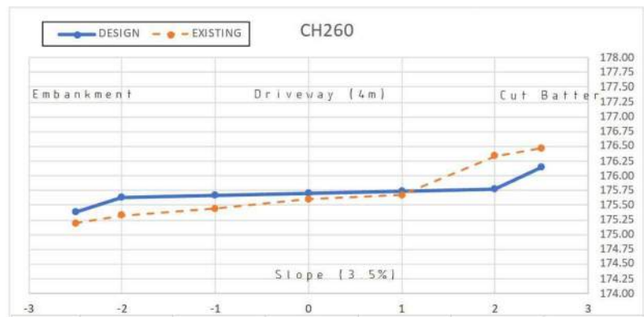
	-3	-2	-1	0	1	2	3
DESIGN	173.661	173.696	173.731	173.766	173.801		
EXISTING	173.081	173.720	173.811	173.819	174.482		
CUT(-)/FILL(+)	-----	-0.024	-0.080	-0.053	-0.681		



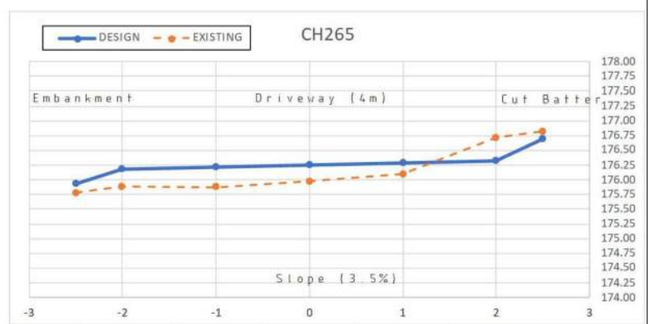
	-3	-2	-1	0	1	2	3
DESIGN	174.286	174.321	174.356	174.391	174.426		
EXISTING	173.964	174.345	174.389	174.660	175.505		
CUT(-)/FILL(+)	0.322	-0.024	-0.033	-0.269	-1.079		



	-3	-2	-1	0	1	2	3
DESIGN	175.001	175.036	175.071	175.106	175.141		
EXISTING	174.895	175.263	175.171	175.279	176.003		
CUT(-)/FILL(+)	0.106	-0.227	-0.100	-0.173	-0.862		



	-3	-2	-1	0	1	2	3
DESIGN	175.626	175.661	175.696	175.731	175.766		
EXISTING	175.324	175.443	175.605	175.672	176.338		
CUT(-)/FILL(+)	0.302	0.218	0.091	0.059	-0.572		



	-3	-2	-1	0	1	2	3
DESIGN	176.181	176.216	176.251	176.286	176.321		
EXISTING	175.886	175.874	175.970	176.095	176.716		
CUT(-)/FILL(+)	0.295	0.342	0.281	0.191	-0.395		

Notes:

1.1.EMBANKMENT AND CUT BATTERS ARE INDICATIVE ONLY; REFER TECHNICAL SPECIFICATION

REV:	DESCRIPTION:	BY:	DATE:
STATUS:	IFC		

CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

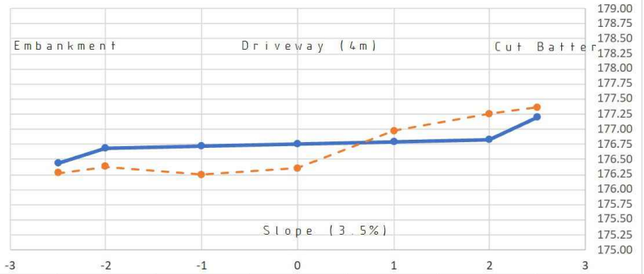
ARCHITECT:

SITE: 13 NIELSON DRIVE
MONTROSE

TITLE: ACCESS DRIVEWAY
CROSS-SECTIONS (2/4)

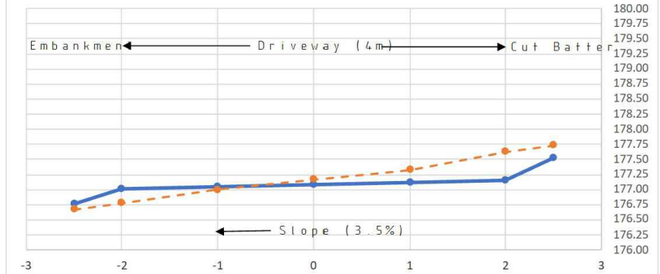
SCALE AT A3:	DATE:	DRAWN:	CHECKED:
nts	12/6/2023	DG	DG
PROJECT NO:	DRAWING NO:		REVISION:
0001	109		A

CH270



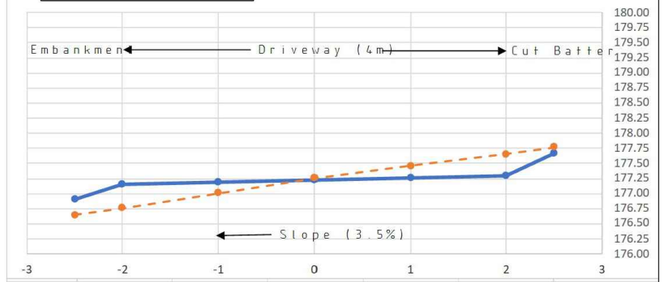
	-3	-2	-1	0	1	2	3
DESIGN		176.681	176.716	176.751	176.786	176.821	
EXISTING		176.383	176.248	176.354	176.969	177.253	
CUT(-)/FILL(+)		0.298	0.468	0.397	-0.183	-0.432	

CH275



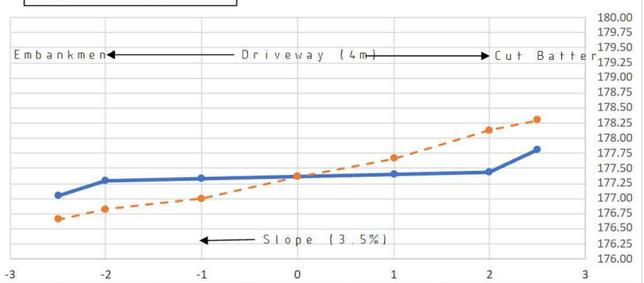
	-3	-2	-1	0	1	2	3
DESIGN		177.014	177.049	177.084	177.119	177.154	
EXISTING		176.779	176.997	177.165	177.323	177.626	
CUT(-)/FILL(+)		0.235	0.052	-0.081	-0.204	-0.472	

CH280



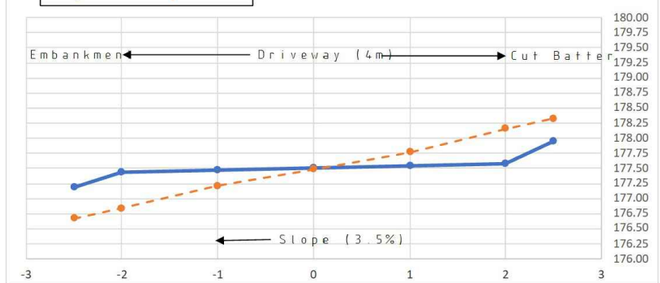
	-3	-2	-1	0	1	2	3
DESIGN		177.157	177.192	177.227	177.262	177.297	
EXISTING		176.761	177.010	177.259	177.459	177.658	
CUT(-)/FILL(+)		0.396	0.182	-0.032	-0.196	-0.361	

CH285



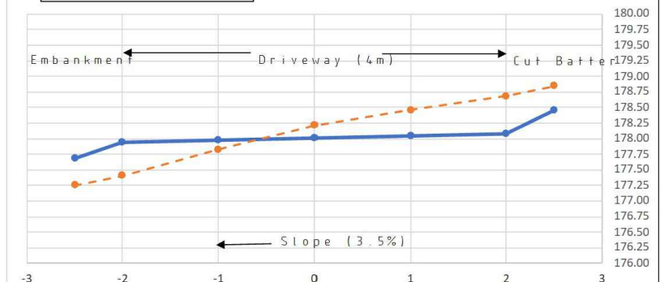
	-3	-2	-1	0	1	2	3
DESIGN		177.300	177.335	177.370	177.405	177.440	
EXISTING		176.822	176.996	177.358	177.659	178.133	
CUT(-)/FILL(+)		0.478	0.339	0.012	-0.254	-0.693	

CH290



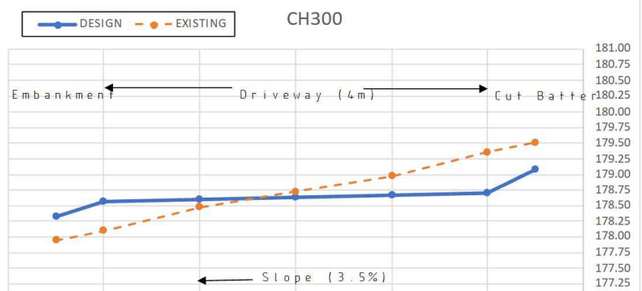
	-3	-2	-1	0	1	2	3
DESIGN		177.443	177.478	177.513	177.548	177.583	
EXISTING		176.839	177.210	177.485	177.766	178.158	
CUT(-)/FILL(+)		0.604	0.268	0.028	-0.218	-0.575	

CH295



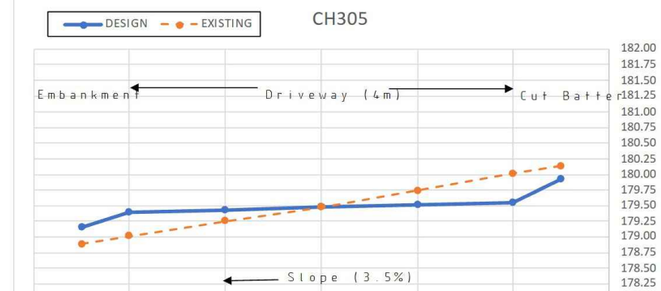
	-3	-2	-1	0	1	2	3
DESIGN		177.943	177.978	178.013	178.048	178.083	
EXISTING		177.409	177.825	178.212	178.461	178.684	
CUT(-)/FILL(+)		0.534	0.153	-0.199	-0.413	-0.601	

CH300



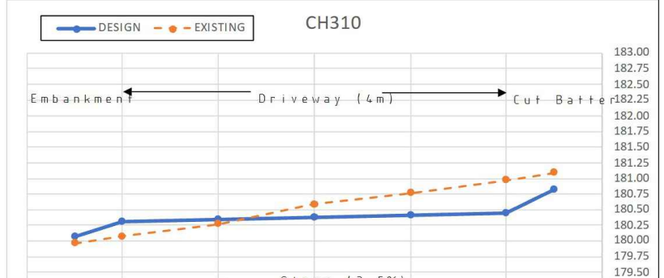
	-3	-2	-1	0	1	2	3
DESIGN		178.568	178.603	178.638	178.673	178.708	
EXISTING		178.102	178.479	178.726	178.975	179.357	
CUT(-)/FILL(+)		0.466	0.124	-0.088	-0.302	-0.649	

CH305



	-3	-2	-1	0	1	2	3
DESIGN		179.401	179.436	179.471	179.506	179.541	
EXISTING		179.009	179.255	179.478	179.744	180.012	
CUT(-)/FILL(+)		0.392	0.181	-0.007	-0.238	-0.471	

CH310



	-3	-2	-1	0	1	2	3
DESIGN		180.310	180.345	180.380	180.415	180.450	
EXISTING		180.074	180.267	180.583	180.762	180.975	
CUT(-)/FILL(+)		0.236	0.078	-0.203	-0.347	-0.525	

Notes:

1.1.EMBANKMENT AND CUT BATTERS ARE INDICATIVE ONLY; REFER TECHNICAL SPECIFICATION

REV:	DESCRIPTION:	BY:	DATE:
STATUS:	IFC		

CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

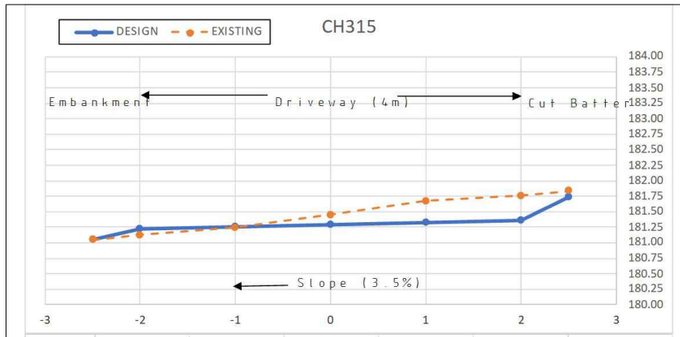
ARCHITECT:

SITE: 13 NIELSON DRIVE
MONTROSE

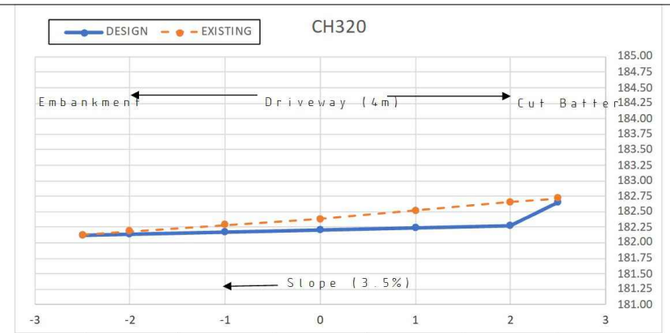
TITLE: ACCESS DRIVEWAY
CROSS-SECTIONS (3/4)

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	12/6/2023	DG	DG

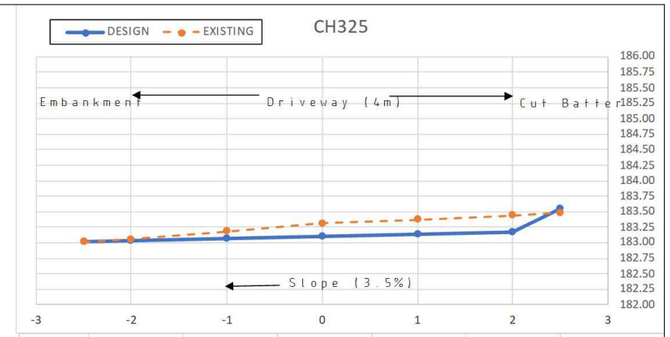
PROJECT NO:	DRAWING NO:	REVISION:
0001	110	A



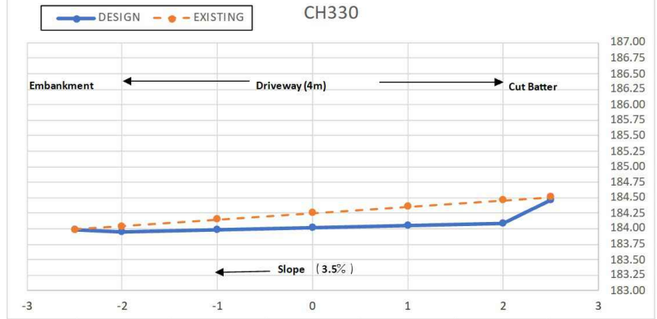
DESIGN	181.220	181.255	181.290	181.325	181.360	
EXISTING	181.122	181.247	181.452	181.673	181.757	
CUT(-)/FILL(+)	0.098	0.008	-0.162	-0.348	-0.397	



DESIGN	182.129	182.164	182.199	182.234	182.269	
EXISTING	182.181	182.283	182.384	182.519	182.653	
CUT(-)/FILL(+)	-0.052	-0.119	-0.185	-0.285	-0.384	



DESIGN	183.038	183.073	183.108	183.143	183.178	
EXISTING	183.059	183.185	183.311	183.375	183.438	
CUT(-)/FILL(+)	-0.021	-0.112	-0.203	-0.232	-0.260	



DESIGN	183.947	183.982	184.017	184.052	184.087	
EXISTING	184.042	184.146	184.249	184.355	184.461	
CUT(-)/FILL(+)	-0.095	-0.164	-0.232	-0.303	-0.374	

DESIGN	184.856	184.891	184.926	184.961	184.996	
EXISTING	185.351	185.463	185.574	185.407	185.239	
CUT(-)/FILL(+)	-0.495	-0.572	-0.648	-0.446	-0.243	

Notes:

1.1.EMBANKMENT AND CUT BATTERS ARE INDICATIVE ONLY; REFER TECHNICAL SPECIFICATION

REV:	DESCRIPTION:	BY:	DATE:
STATUS:	IFC		

CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

ARCHITECT:

SITE: 13 NIELSON DRIVE
MONTROSE

TITLE: ACCESS DRIVEWAY
CROSS-SECTIONS (4/4)

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	12/6/2023	DG	DG

PROJECT NO:	DRAWING NO:	REVISION:
0001	111	A

CHAINAGE	DESIGN CL CUT	DESIGN L CUT	DESIGN R CUT
170	-0.181	-0.051	-0.311
175	-0.273	-0.077	-0.470
180	-0.366	-0.229	-1.277
185	-0.624	-0.030	-1.404
190	-1.016	0.021	-2.001
195	-0.777	0.386	-1.654
200	-0.505	0.377	-1.383
205	-0.602	0.321	-1.909
210	-0.596	0.212	-2.127
215	-0.780	0.119	-1.701
220	-0.615	0.061	-1.544
225	-0.084	0.194	-1.505
230	0.206	0.203	-1.363
235	0.156	0.285	-1.194
240	0.265	0.495	-0.945
245	-0.080	0.580	-0.681
250	-0.033	0.322	-1.079
255	-0.100	0.106	-0.862
260	0.091	0.302	-0.572
265	0.281	0.295	-0.395
270	0.397	0.298	-0.432
275	-0.081	0.235	-0.472
280	-0.032	0.396	-0.361
285	0.012	0.478	-0.693
290	0.028	0.604	-0.575
295	-0.199	0.534	-0.601
300	-0.088	0.466	-0.649
305	-0.007	0.392	-0.471
310	-0.203	0.236	-0.525
315	-0.162	0.098	-0.397
320	-0.185	-0.052	-0.384
325	-0.203	-0.021	-0.260
330	-0.232	-0.095	-0.374
335	-0.648	-0.495	-0.243

DRAWING INDEX DA01

Development Application Set:

dwg no:	dwg title:	scale:	rev:	date:	by:
DA01	Title Page		None	13/5/2024	EON
DA02	Proposed Location Plan	1:1000	None	14/5/2024	EON
DA03	Proposed Site Plan 01	1:500	None	14/5/2024	EON
DA04	Proposed Site Plan 02	1:500	None	14/5/2024	EON
DA05	Proposed Ground Floor Plan	1:100	None	14/5/2024	EON
DA06	Proposed Roof Plan	1:100	None	14/5/2024	EON
DA07	Proposed Elevations 01	1:100	None	14/5/2024	EON
DA08	Proposed Elevations 02	1:100	None	14/5/2024	EON

PROJECT DETAILS

SITE INFORMATION

TOTAL SITE AREA:	14390m²
BUILD AREA FOOTPRINT:	330m²
HOUSE FLOOR AREA:	218m²
GARAGE/LAUNDRY/STORE FLOOR AREA:	59m²
TOTAL FLOOR AREA: (EXCLUDES DECKS)	**277m²**
DECK AREA:	88m²
PAVED AREA:	90.2m²
TOTAL SITE COVERAGE:	**2.3%**

Title Reference	**Vol. - 46375**
	Folio - 1
Wind Classification	
Soil Classification	
Climate Zone	**7 (refer BCA)**
Corrosion Enviroment	**-**
BAL	**- 29**

New Dwelling
2318

Alison Magill and David Graham

13 Nielson Drive, Montrose

Tasmania 7010

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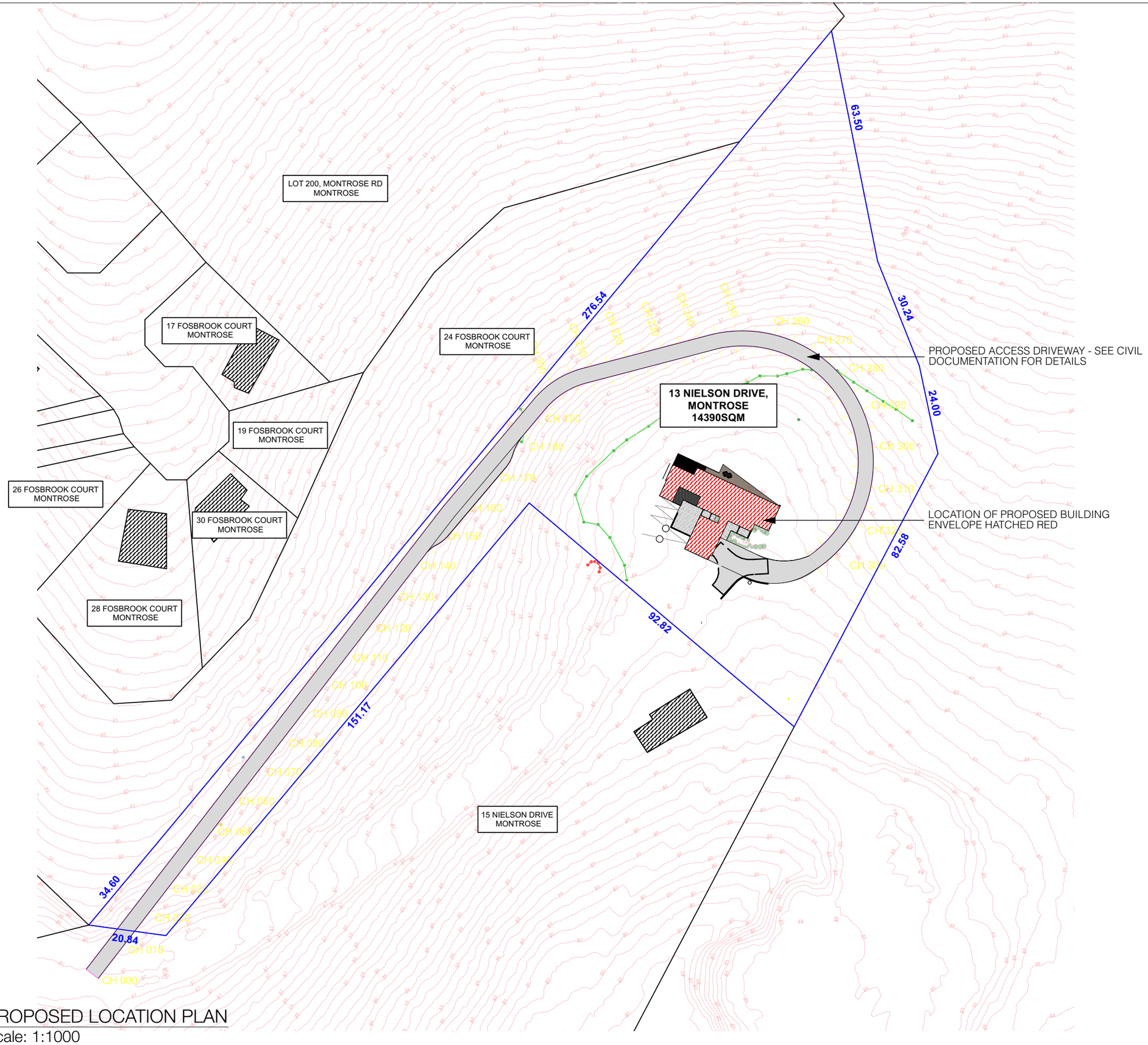
architecture + interiors
ACC NO. CC980Y



PROPOSED LOCATION PLAN
Scale: 1:1000

north

NOT FOR CONSTRUCTION

DO NOT SCALE OFF DRAWINGS

Drawings are to be read in conjunction with all associated specifications, consultants' drawings, geotechnical report and any other written instructions

All works are to comply with the Building Code of Australia, relevant Australian Standards, local and any other relevant authority regulations and by-laws

Contractors are to verify all dimensions on site prioir to commencing any work or producing shop drawings

All dimensions are in millimetres unless otherwise noted

Report all discrepancies to IDW

Rev
NO. DATE NOTE

Client
Alison Magill and David Graham

Address
13 Nielson Drive, Montrose

Project
New Dwelling

Drawing
Proposed Location Plan

Dwg No.
DA02

Scale
1:1000

Date
14/5/2024

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2318

idw. architecture + interiors
4/147 Liverpool St Hobart TAS 7000
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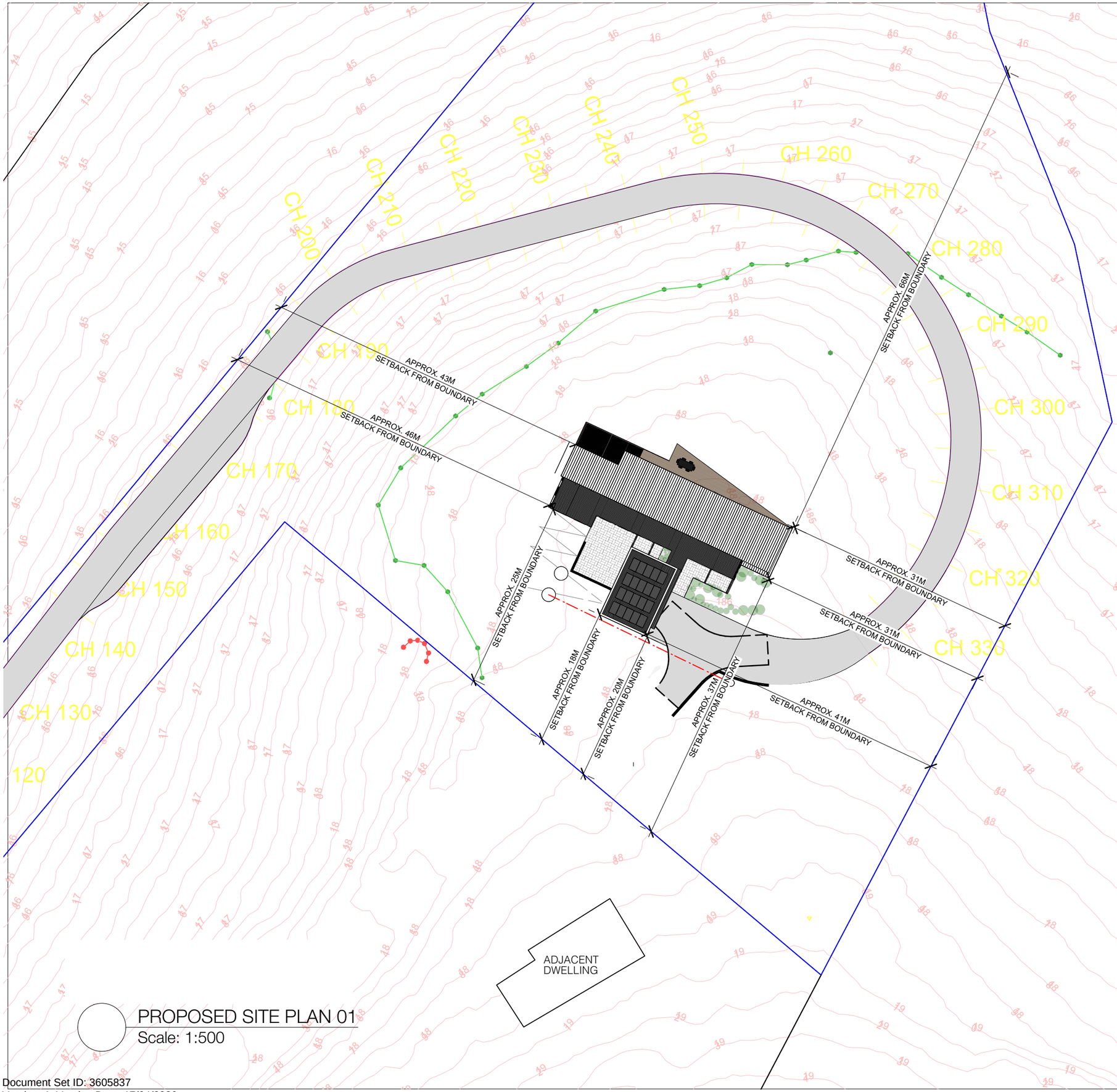
E info@idwarchitecture.com.au
W idwarchitecture.com.au
Acc No CC980Y



PROPOSED SITE PLAN 01
Scale: 1:500

north

NOT FOR CONSTRUCTION

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Rev
NO. DATE NOTE

Client
Alison Magill and David Graham

Address
13 Nielson Drive, Montrose

Project
New Dwelling

Drawing
Proposed Site Plan 01

Dwg No.
DA03

Scale
1:500

Date
14/5/2024

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2318

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W idwarchitecture.com.au
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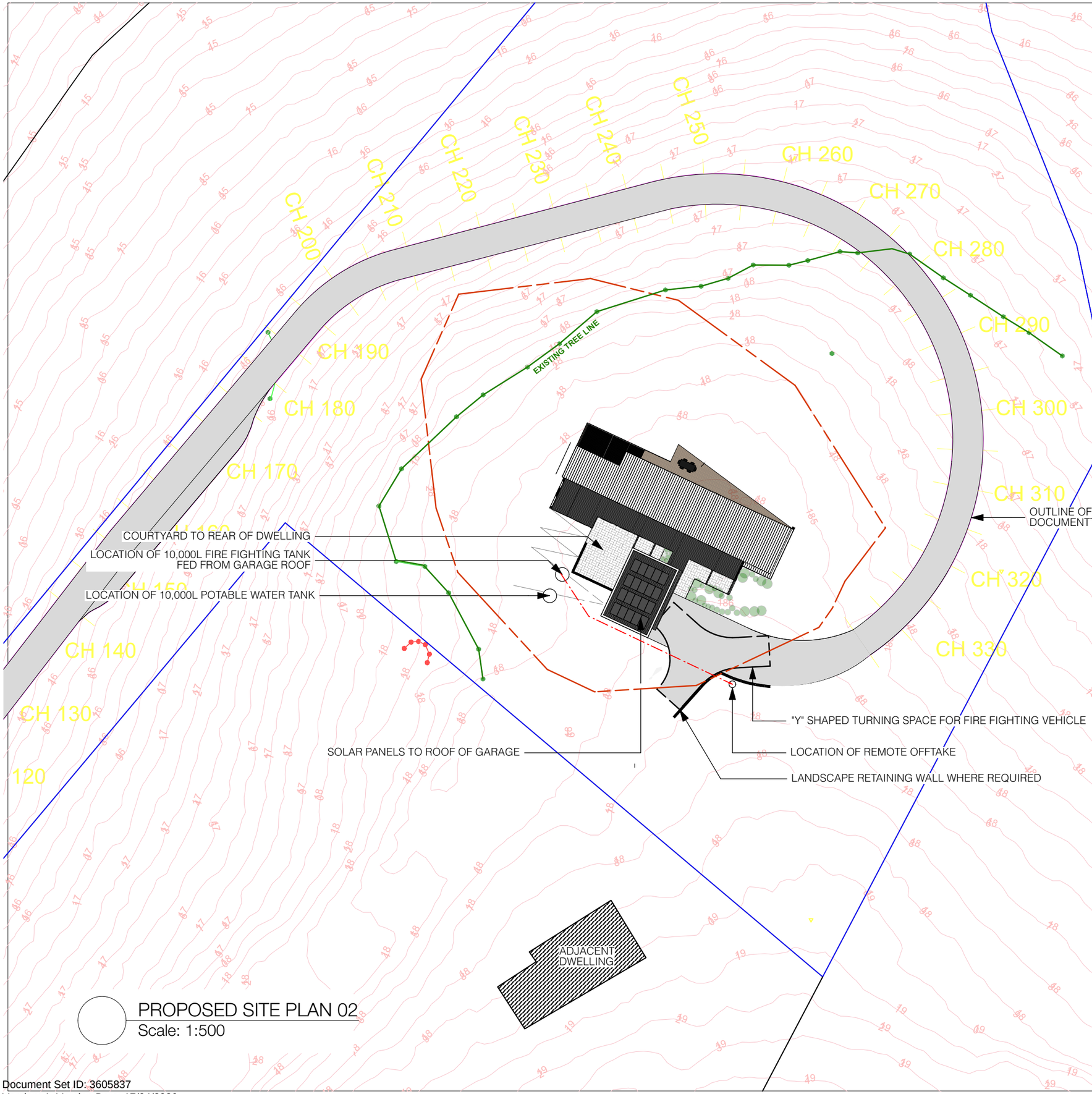

PROPOSED SITE PLAN 02
Scale: 1:500

EXISTING TREE LINE

AREA TO BE CLEARED OF VEGETATION IN ACCORDANCE WITH THE ASSOCIATED BUSHFIRE HAZARD MANAGEMENT PLAN

north

NOT FOR CONSTRUCTION

DO NOT SCALE OFF DRAWINGS

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Report all discrepancies to IDW

Rev

NO.	DATE	NOTE

Client
Alison Magill and David Graham

Address
13 Nielson Drive, Montrose

Project
New Dwelling

Drawing
Proposed Site Plan 02

Dwg No.
DA04

Scale
1:500

Date
14/5/2024

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2318

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W idwarchitecture.com.au
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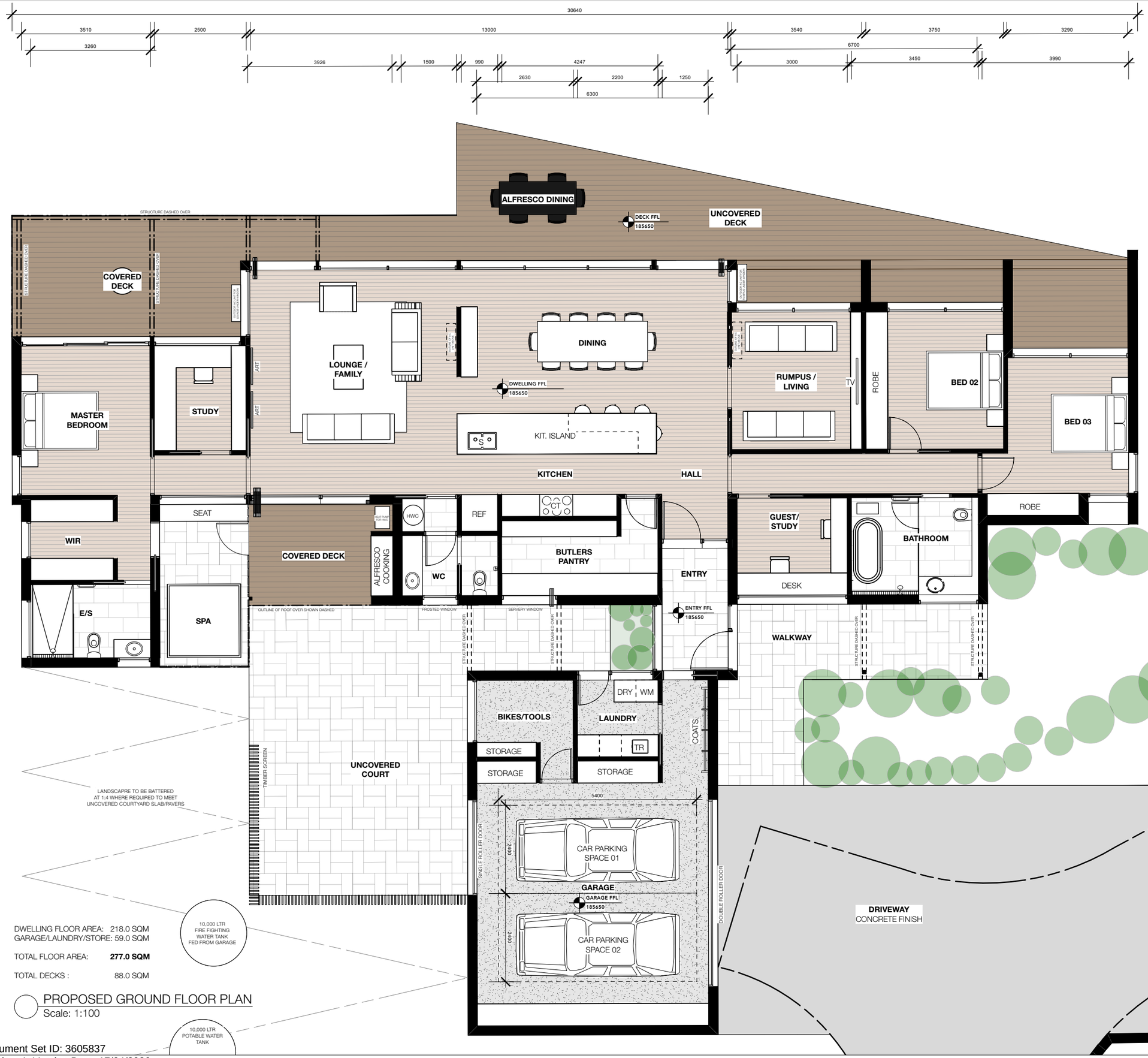

DWELLING FLOOR AREA: 218.0 SQM
GARAGE/LAUNDRY/STORE: 59.0 SQM

TOTAL FLOOR AREA: **277.0 SQM**

TOTAL DECKS : 88.0 SQM

PROPOSED GROUND FLOOR PLAN
Scale: 1:100

north

NOT FOR CONSTRUCTION

DO NOT SCALE OFF DRAWINGS

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All dimensions are in millimetres unless otherwise noted

Report all discrepancies to IDW

Rev
NO. DATE NOTE

Client
Alison Magill and David Graham

Address
13 Nielson Drive, Montrose

Project
New Dwelling

Drawing
Proposed Ground Floor Plan

Dwg No.
DA05

Scale
1:100

Date
14/5/2024

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2318

idw.
architecture + interiors
4/147 Liverpool St Hobart TAS 7000
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W idwarchitecture.com.au
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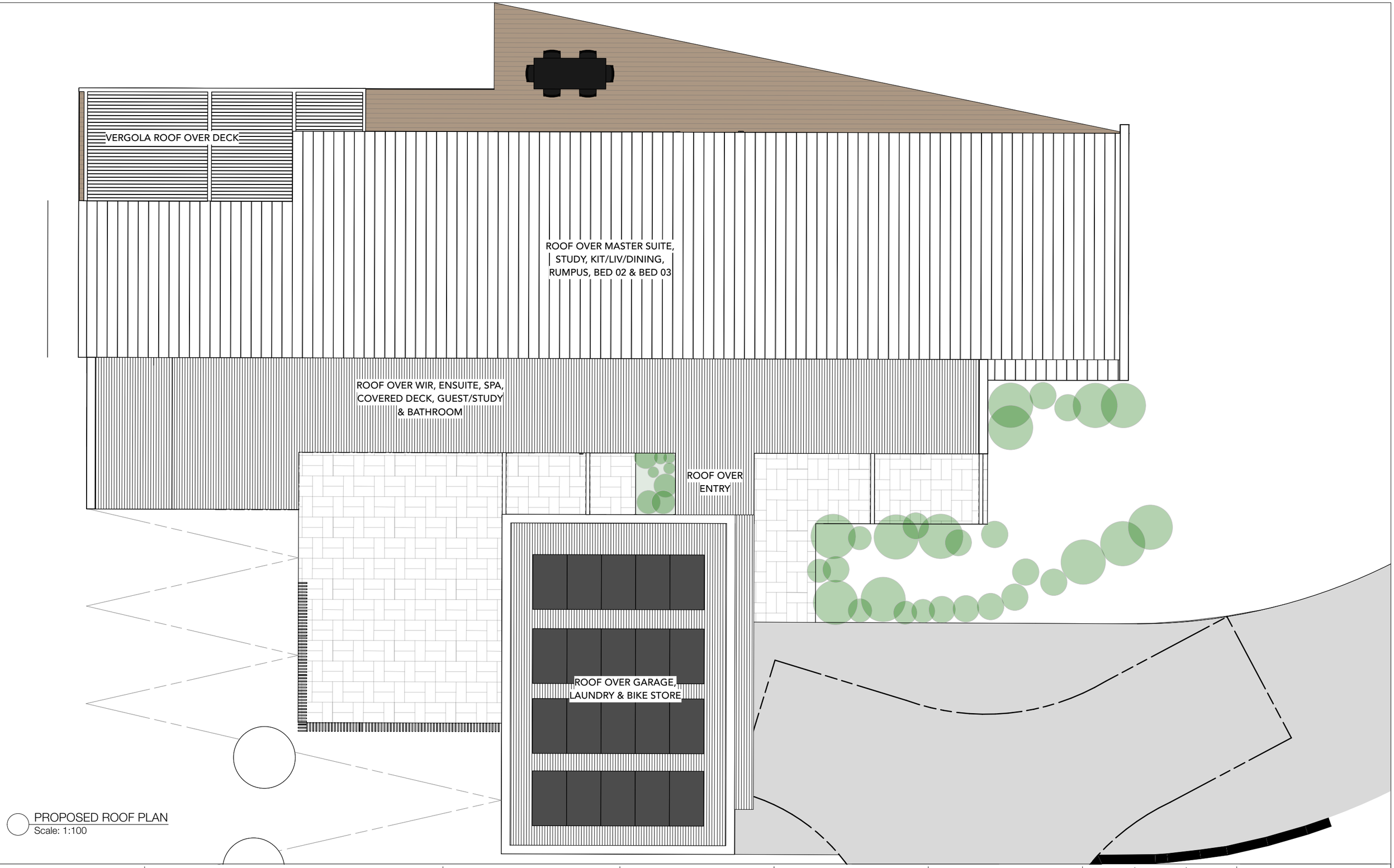

PROPOSED ROOF PLAN
Scale: 1:100

idw.
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4/147 Liverpool St Hobart TAS 7000
T (03) 6234 5644
E info@idwarchitecture.com.au
W idwarchitecture.com.au
Acc No CC980Y

DO NOT SCALE OFF DRAWINGS
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Contractors are to verify all dimensions on site prioir to commencing any work or producing shop drawings
All dimensions are in millimetres unless otherwise noted
Report all discrepancies to IDW

NOT FOR CONSTRUCTION

north

NO. DATE NOTE
Rev

New Dwelling
Project

Alison Magill and David Graham
Client

13 Nielson Drive, Montrose
Address

DA
Status

2318
Job No.

Rev	EON	AW
	Drawn	**Checked**

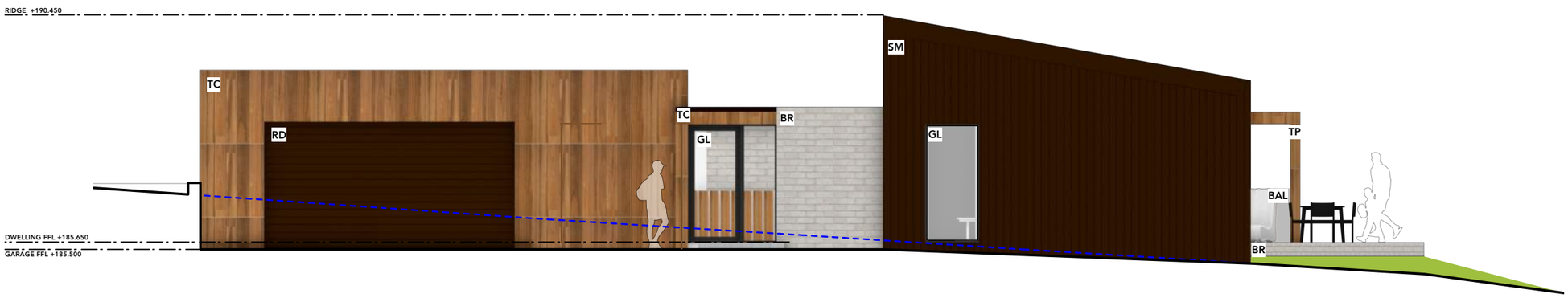
14/5/2024
Date

1:100
Scale

Proposed Roof Plan
Drawing

DA06
Dwg No.

PROPOSED NORTH-EAST ELEVATION
Scale: 1:100



PROPOSED SOUTH EAST ELEVATION
Scale: 1:100

MATERIAL KEY

TC - VERTICAL TIMBER CLADDING, SPOTTED GUM OR SIMILAR

BAL - TOUGHENED GLASS BALUSTRADE

GL - POWDERCOATED ALUMINIUM FRAME, DOUBLE GLAZED PANES

SM - VERTICAL STANDING SEAM STEEL CLADDING, COLOUR BRUSHED COPPER OR SIMILAR

RS - COLOURBOND STANDING SEAM STEEL ROOF SHEETING , COLOUR TO BE BRUSHED COPPER OR SIMILAR

BR - BRICK VENEER, LIGHT GREY OR SIMILAR

BK - CONCRETE BLOCKWORK, PAINTED COLOUR TBC

SP - TIMBER POST

RD - ROLLER DOOR TO MATCH RS

NOTES

ALL DOWN PIPES, GUTTERS, FLASHINGS, VENTS, FLUES TO MATCH RS

NATURAL GROUND LINE

NB - ALL MATERIALS TO COMPLY WITH BAL 29 CONSTRUCTION REQUIREMENTS

north

NOT FOR CONSTRUCTION

DO NOT SCALE OFF DRAWINGS

Drawings are to be read in conjunction with all associated specifications, consultants' drawings, geotechnical report and any other written instructions

All works are to comply with the Building Code of Australia, relevant Australian Standards, local and any other relevant authority regulations and by-laws

Contractors are to verify all dimensions on site priorir to commencing any work or producing shop drawings

All dimensions are in millimetres unless otherwise noted

Report all discrepancies to IDW

Rev
NO. DATE NOTE

Client
Alison Magill and David Graham

Address
13 Nielson Drive, Montrose

Project
New Dwelling

Drawing
Proposed Elevations 01

Dwg No.
DA07

Scale
1:100

Date
14/5/2024

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2318

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4/147 Liverpool St Hobart TAS 7000
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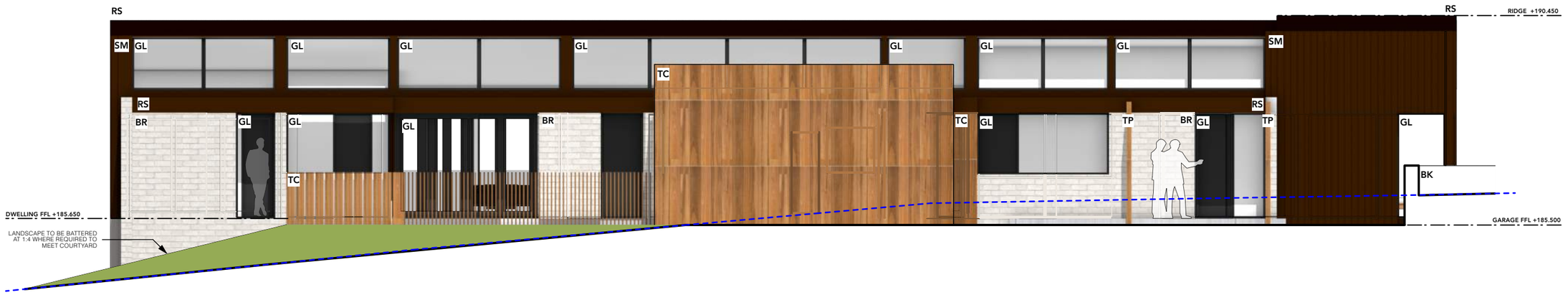
W idwarchitecture.com.au
Acc No CC980Y



PROPOSED SOUTH WEST ELEVATION
Scale: 1:100

PROPOSED NORTH WEST ELEVATION
Scale: 1:100

NATURAL GROUND LINE

MATERIAL KEY

TC - VERTICAL TIMBER CLADDING, SPOTTED GUM OR SIMILAR

BAL - TOUGHENED GLASS BALUSTRADE

GL - POWDERCOATED ALUMINIUM FRAME, DOUBLE GLAZED PANES

SM - VERTICAL STANDING SEAM STEEL CLADDING, COLOUR BRUSHED COPPER OR SIMILAR

RS - COLOURBOND STANDING SEAM STEEL ROOF SHEETING , COLOUR TO BE BRUSHED COPPER OR SIMILAR

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BK - CONCRETE BLOCKWORK, PAINTED COLOUR TBC

SP - TIMBER POST

RD - ROLLER DOOR TO MATCH RS

NOTES

ALL DOWN PIPES, GUTTERS, FLASHINGS, VENTS, FLUES TO MATCH RS

NATURAL GROUND LINE

NB - ALL MATERIALS TO COMPLY WITH BAL 29 CONSTRUCTION REQUIREMENTS

north

NOT FOR CONSTRUCTION

DO NOT SCALE OFF DRAWINGS

Drawings are to be read in conjunction with all associated specifications, consultants' drawings, geotechnical report and any other written instructions

All works are to comply with the Building Code of Australia, relevant Australian Standards, local and any other relevant authority regulations and by-laws

Contractors are to verify all dimensions on site prior to commencing any work or producing shop drawings

All dimensions are in millimetres unless otherwise noted

Report all discrepancies to IDW

Rev
NO. DATE NOTE

Client
Alison Magill and David Graham

Address
13 Nielson Drive, Montrose

Project
New Dwelling

Drawing
Proposed Elevations 02

Dwg No.
DA08

Scale
1:100

Date
14/5/2024

Rev	Drawn	Checked
	EON	AW

Status	Job No.
DA	2318

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4/147 Liverpool St Hobart TAS 7000
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Acc No CC980Y

CH000 – CH180
DRIVEWAY ALREADY FORMED

CH180 – CH335
CLEAR AND GRUB 5m WIDE AND FORM 4m WIDE ACCESS DRIVEWAY IN ACCORDANCE WITH DRAWINGS AND TECHNICAL SPECIFICATION

CONNECTION TO PUBLIC C/WATER SYSTEM

CONNECTION TO PROPOSED TASWATER SEWER NETWORK.

EXISTING S/WATER CULVERT

TASWATER NETWORK EXTENSION

RELOCATE ROCKS AT START OF ACCESS DRIVEWAY

CH150 – CH175
WIDEN DRIVEWAY TO 6m FOR PULL-OVER BAY IN ACCORDANCE WITH DRAWINGS AND TECHNICAL SPECIFICATION

ESTIMATED VOLUMES:
- CUT: 220 M3 (125 M3 ROCK)
- FILL: 40 M3
- SPOIL: 180 M3

SERVICES CONCEPT PLAN

Notes:
1.

REV:	DESCRIPTION:	BY:	DATE:
STATUS:	IFC		

CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

ARCHITECT:

SITE: 13 NIELSON DRIVE
MONTROSE

TITLE: ACCESS DRIVEWAY
SCOPE OF WORK

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	12/6/2023	DG	DG
PROJECT NO:	DRAWING NO:		REVISION:
0001	102		A

CONNECTION TO PUBLIC S/WATER SYSTEM ON ADJACENT LOT.

CONNECTION TO TASWATER SEWER NETWORK ON ADJACENT LOT.

S/WATER TABLE DRAIN
S/WATER RETICULATION
POTABLE WATER RETICULATION
SEWER RETICULATION

CONNECT TO EXTENDED TASWATER RETIC

OVERFLOW

COURTYARD TO REAR OF DWELLING

LOCATION OF 10,000L FIRE FIGHTING TANK FED FROM GARAGE ROOF

LOCATION OF 10,000L POTABLE WATER TANK

SOLAR PANELS TO ROOF OF GARAGE

"Y" SHAPED TURNING SPACE FOR FIRE FIGHTING VEHICLE

OUTLINE OF APPROVED DRIVEWAY

EXTENSION TO PROPOSED DRIVEWAY TO LINK WITH ADJACENT SITE SHOWN GREY

LOCATION OF REMOTE OFFTAKE

CONNECTION TO PUBLIC S/WATER SYSTEM VIA EXISTING CULVERT.

ADJACENT DWELLING

PROPOSED SITE PLAN
Scale: 1:500

SERVICES CONCEPT PLAN

north

NOT FOR CONSTRUCTION

DO NOT SCALE OFF DRAWINGS

Drawings are to be read in conjunction with all associated specifications, consultants' drawings, geotechnical report and any other written instructions

All works are to comply with the Building Code of Australia, relevant Australian Standards, local and any other relevant authority regulations and by-laws

Contractors are to verify all dimensions on site prioir to commencing any work or producing shop drawings

All dimensions are in millimetres unless otherwise noted

Report all discrepancies to IDW

Rev
NO. DATE NOTE

Client
Alison and David

Address
13 Nielson Drive, Montrose

Project
New Dwelling

Drawing
Proposed Site Plan

Dwg No.
SK02

Scale
1:500

Date
16/4/24

Rev	Drawn	Checked
	EON	AW

Status	Job No.
SK	2318

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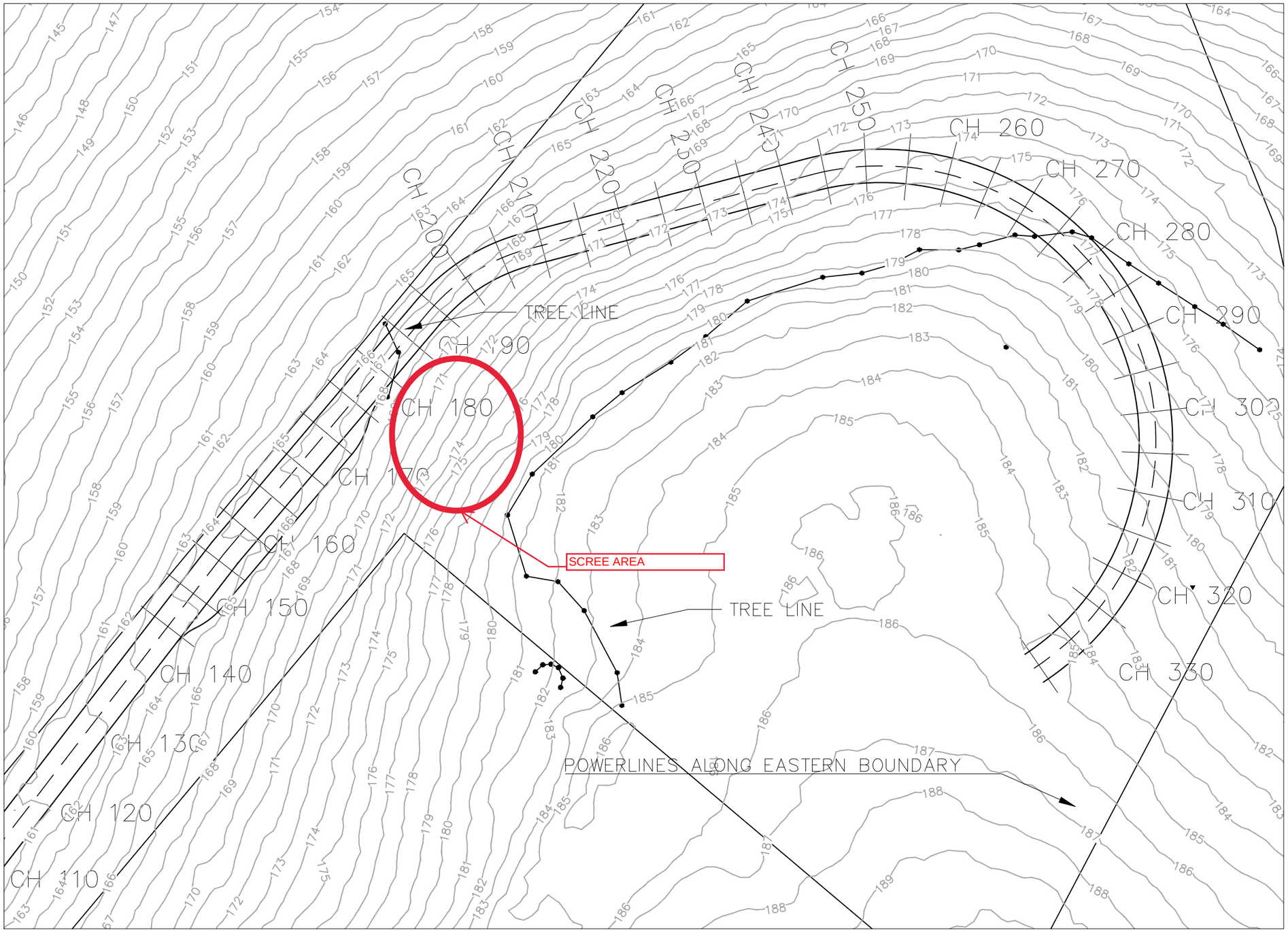


Notes:

1.

REV:	DESCRIPTION:	BY:	DATE:
STATUS:	IFC		

CLIENT: DAVID GRAHAM
15 RIVERVIEW PARADE
ROSETTA
TASMANIA 7010

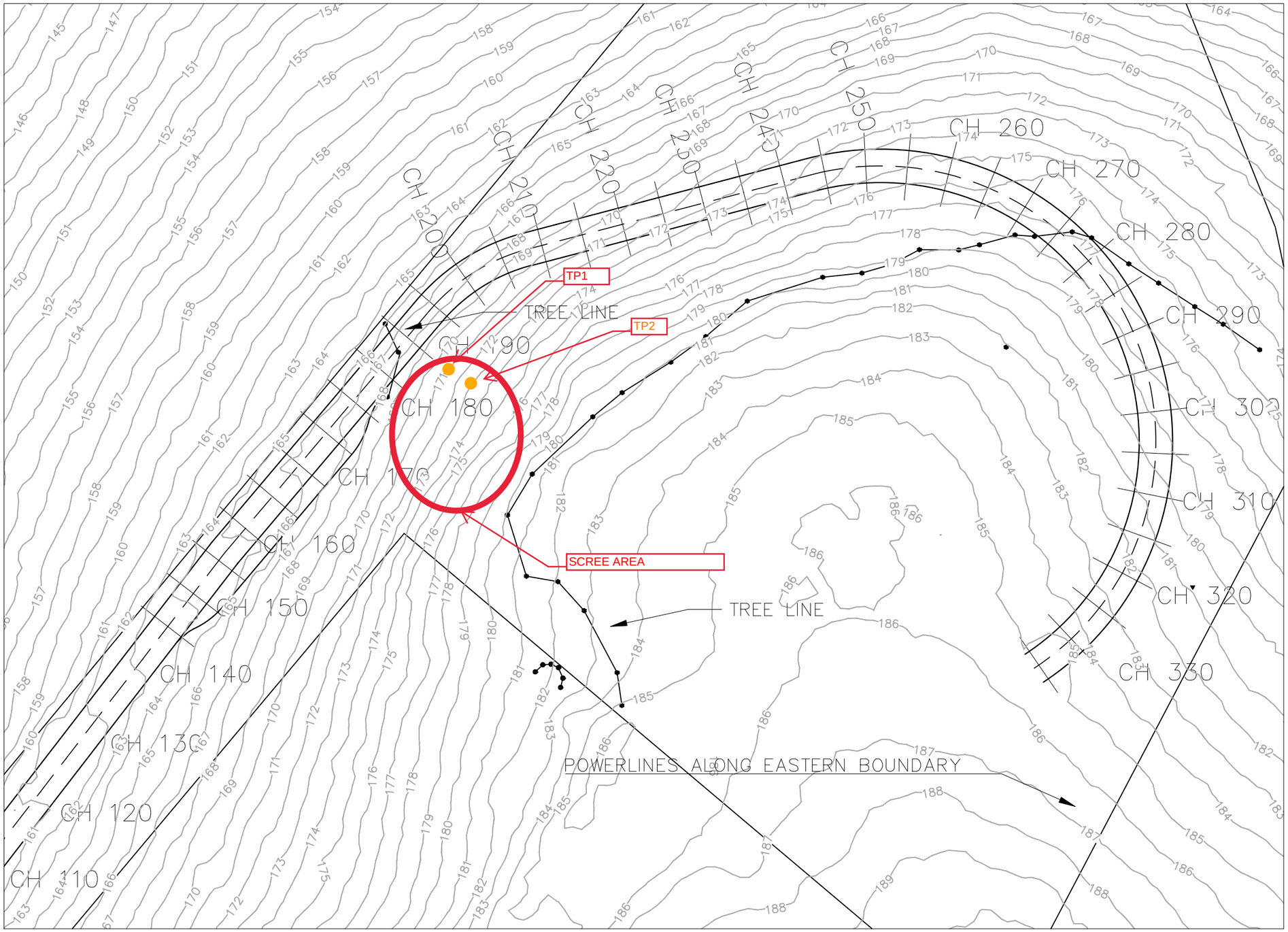
ARCHITECT:

SITE: 13 NIELSON DRIVE
MONTROSE

TITLE: ACCESS DRIVEWAY
LAYOUT

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:500	12/6/2023	DG	DG

PROJECT NO:	DRAWING NO:	REVISION:
0001	105	A



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1:500	12/6/2023	DG	DG

PROJECT NO:	DRAWING NO:	REVISION:
0001	105	A

TEST PIT 1

TEST PIT 2

APPENDIX B

Landslide Risk Assessment Matrix

QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY

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), stabilization 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 TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY (CONTINUED)

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

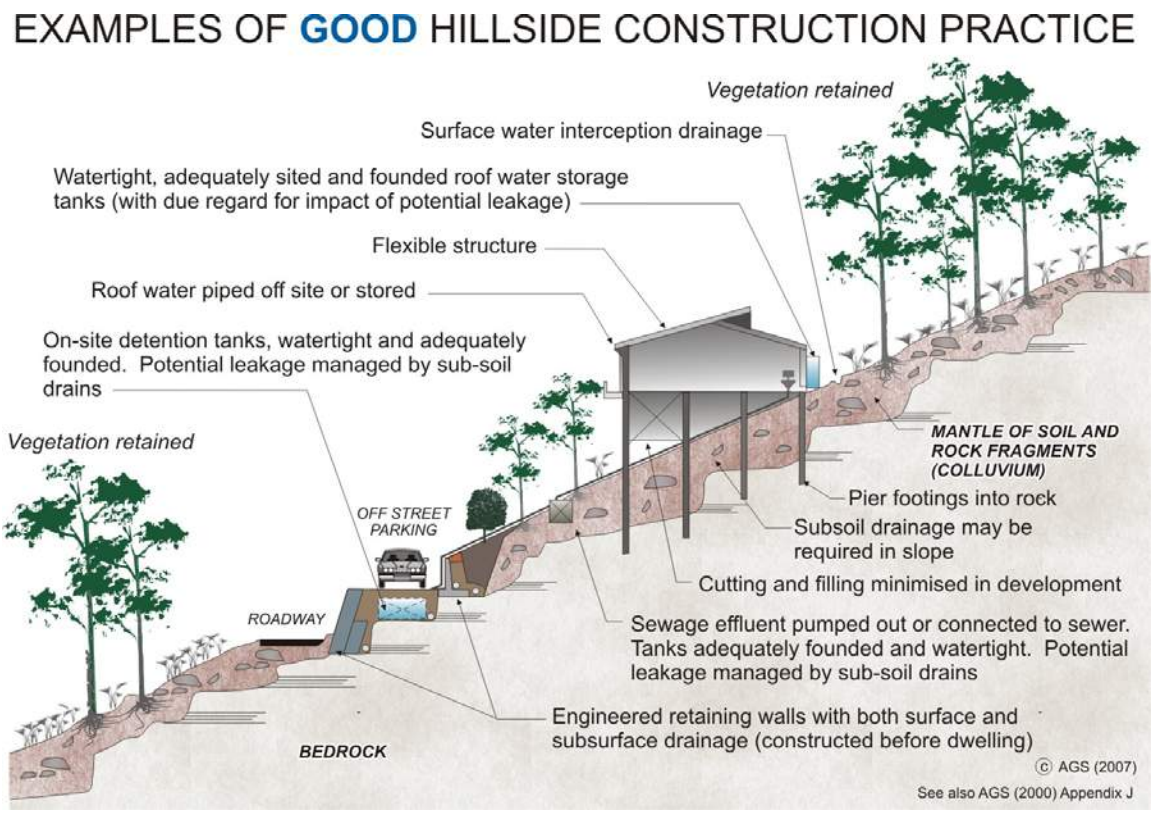
APPENDIX C

Some Guidelines for Hillside Construction

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.



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.

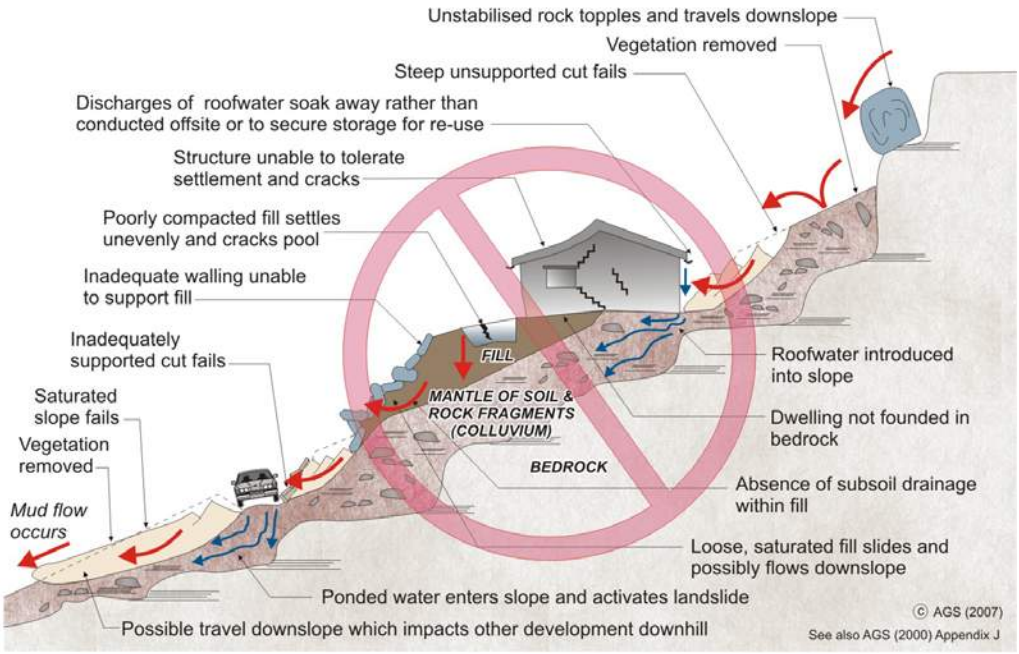
Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing 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

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.

8 December 2024

Stormwater Management Report

13 Nielson Drive, Montrose

Revision 1.0: Development Application Submission

Prepared By:
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1 Introduction

1.1. Purpose

This report has been prepared to support a planning application for construction of a driveway access and residential dwelling at 13 Nielson Drive Montrose Glenorchy (the Project).

The report provides conceptual detail for the development and considers the Project against the relevant planning scheme requirements, specifically identifying where the Project complies with acceptable solutions or relies on performance criteria.

1.2. Project Site

The proposed Project will be located at 13 Nielson Drive, Montrose (CT46375 Fol 1; PID 7765305). The site is 1.6 Ha in area, with a 0.43 Ha cleared area at the elevated part of the site.

Figure 1: Project Site

1.3. Project Description

The Project is the construction of a partial driveway access and residential dwelling at 13 Nielson Drive, Montrose. The driveway access is proposed to follow an alignment from the end of Nielson Drive to the proposed building envelope.

The total driveway access is 340m in length, with the first 190m already formed and cleared (by previous owners). The subsequent 90m is largely formed, but not cleared, whilst the final 60m is unformed, but largely cleared.

The width of the access is to be 4m, with a total minimum width of 5m cleared to meet the deemed-to-comply requirements under the *Building for Bushfires – Property Access* guideline. To meet an

additional requirement of the guideline, a deemed-to-comply passing bay will also be constructed (at chainage CH160).

The residential dwelling proposed for the lot is oriented approximately east to west on a relatively flat area centred around the 186 mAHD contour. The proposed dwelling is a single-storey construction with a floor area of 277 square metres.

2 Current Site (Pre-Development)

2.1. Access Way

The current site has a fully formed access way from Nielson Drive until a chainage of 190m. The access way is surfaced with red gravel and has a table drain of approximately 1.2m width and 0.4m depth that runs along the 'cut' side of the formed access way.

Figure 2: FORMED DRIVEWAY: CH000 – CH190

2.2. Development Site

The upper part of the lot (at around 186mAHD), proposed for the construction of the dwelling, has been cleared and is generally a mix of rock and loamy soil.

Figure 3: PREVIOUSLY CLEARED AREA

2.3. Remainder of Lot

The remainder of the lot is largely covered in sheoak (Casuarina sp.), with no undergrowth aside from a covering of pine needle detritus from the abundant sheoak.

Figure 4: REPRESENTATIVE IMAGE OF ALLOCASUARINA SPECIES

2.4. Existing Stormwater Infrastructure

The existing table drain on the cut side of the access way drains under gravity to the Council public stormwater system via a single property connection through an existing culvert. The remainder of the lot has no formal or natural stormwater conveyance features.

Figure 5: Existing Stormwater Infrastructure

2.5. Existing Catchment

For the purposes of determining the differential between pre-development and post-development stormwater flows, the impervious and pervious areas of the current catchment that will be impacted by the development are shown in the figures below.

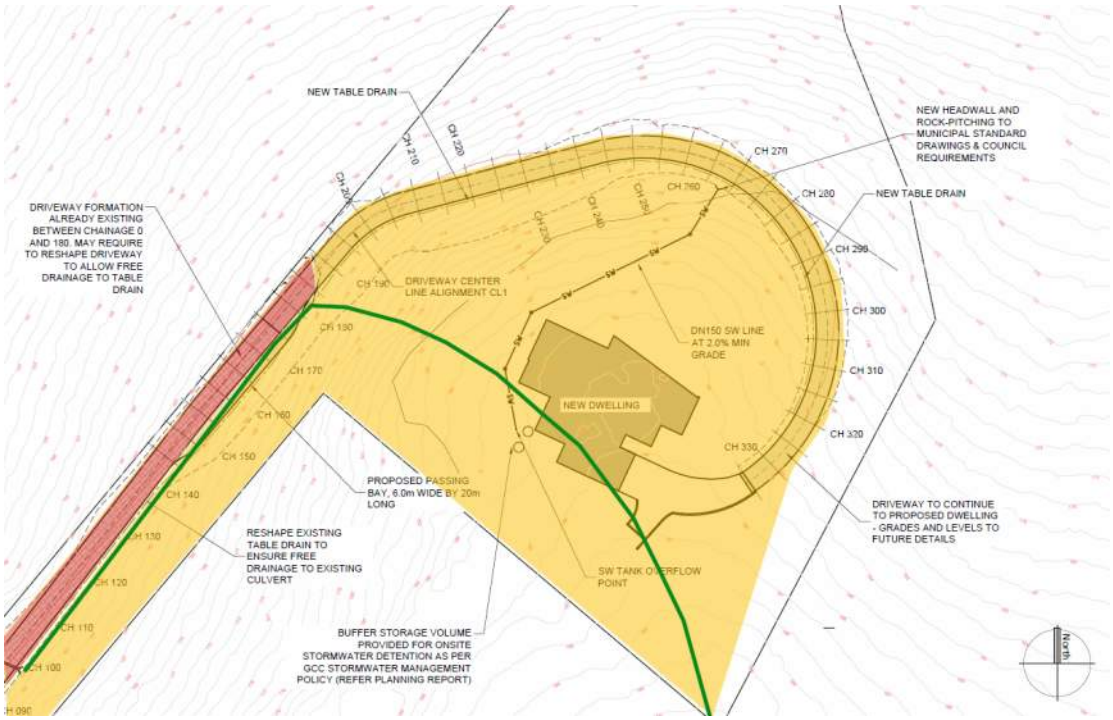

Figure 6: Catchment Areas of Northern Part of Lot (impervious red, pervious yellow), with time of concentration flow path indicated in green

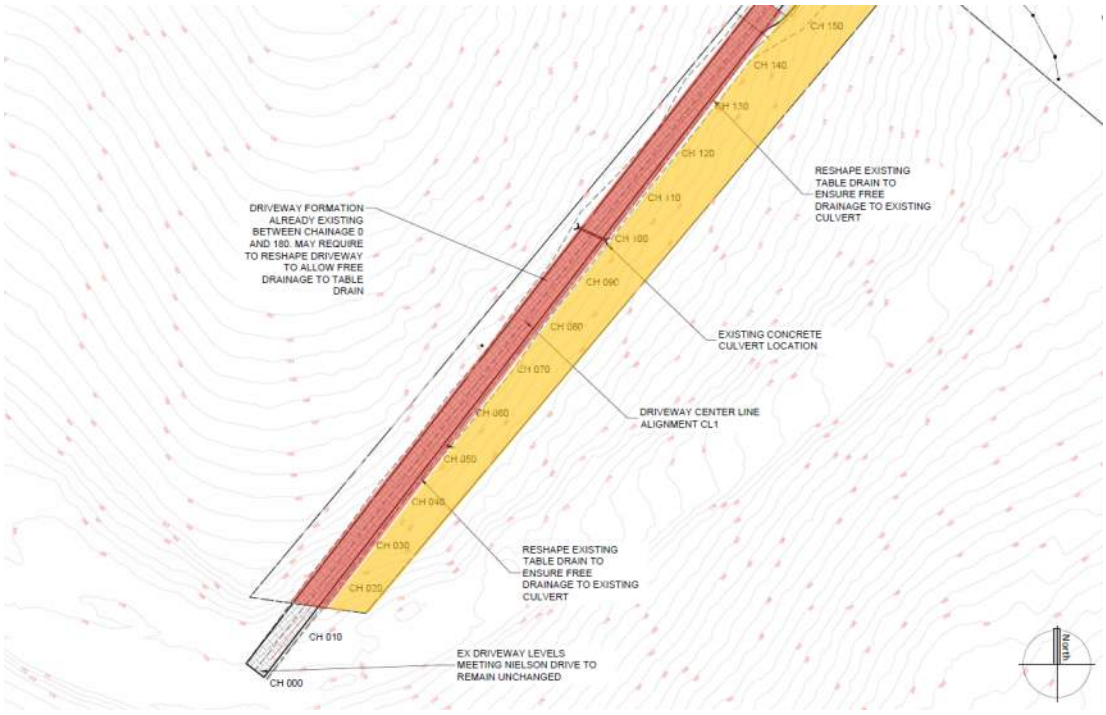

Figure 7: Catchment Areas of Southern Part of Lot (impervious red, pervious yellow)

2.6. Pre-development Critical Time

Glenorchy City Council have advised that they do not provide Permissible Site Discharge (PSD) information. Instead they have recommended a time of concentration (Tc) of 30 minutes to calculate the PSD or the use of the kinematic wave equation. Given the steep slope of the site and the lack of any significant undergrowth (with the site dominated by eroded soil and rock), the kinematic wave equation has been used to estimate the time of concentration.

Table 1: Pre-Development Kinematic Wave Equation Determination of Time of Concentration

Detail	Variable	Value	Units	Comments
Sheet Flow Path Length	L	200	m	Refer Figure 5
Surface Slope	S	0.15	m/m	191 mAHD to 161mAHD over 200m (15%)
Surface Roughness	n	0.09	dimensionless	Conservative estimate given the Bar Clay-Loam Soil (eroded) 0.012-0.033 and sparse vegetation 0.053-0.130 from Innovyze
Rainfall Intensity	I	53	mm/hr	5% AEP. Solved iteratively along with overland travel time
Overland Travel Time	Tc	14.5	min	Solved iteratively along with rainfall intensity

The resulting Overland Travel Time is seen as conservative as the second half of travel is within an existing table drain running parallel to the existing access way rather than overland flow.

Table 2: Pre-Development Kinematic Wave Equation Determination of Time of Concentration

Annual Exceedance Probability (AEP)	AEP		Rainfall (mm/h)				
Duration	**63.20%**	**50%#**	**20%***	**10%**	**5%**	**2%**	**1%**
1 min	60.7	69	96.8	117	139	169	195
2 min	52.3	59.1	80.7	95.8	111	130	145
3 min	46.3	52.3	71.9	85.8	99.8	118	132
4 min	41.7	47.2	65.4	78.4	91.8	110	124
5 min	38.1	43.2	60.2	72.5	85.3	103	117
10 min	27.5	31.3	44.2	53.8	63.9	78.7	91
15 min	22.3	25.4	35.8	43.6	51.9	64.1	74.2
20 min	19.1	21.7	30.6	37.2	44.2	54.4	62.9
25 min	16.9	19.2	26.9	32.7	38.8	47.6	54.8
30 min	15.3	17.3	24.3	29.4	34.8	42.5	48.8
45 min	12.2	13.8	19.2	23.2	27.2	32.8	37.4
1 hour	10.4	11.8	16.3	19.6	22.9	27.4	30.9
1.5 hour	8.35	9.47	13	15.5	18	21.3	23.9
2 hour	7.16	8.12	11.2	13.2	15.3	18	20
3 hour	5.77	6.56	9.01	10.6	12.2	14.3	15.9
4.5 hour	4.65	5.3	7.3	8.63	9.91	11.6	12.8
6 hour	3.97	4.54	6.29	7.45	8.55	10	11.1
9 hour	3.16	3.63	5.07	6.03	6.95	8.19	9.14
12 hour	2.67	3.07	4.32	5.16	5.97	7.08	7.93
18 hour	2.07	2.39	3.39	4.08	4.76	5.69	6.42
24 hour	1.71	1.97	2.82	3.4	3.99	4.8	5.44
30 hour	1.46	1.69	2.41	2.93	3.44	4.15	4.72
36 hour	1.28	1.47	2.11	2.57	3.03	3.66	4.17
48 hour	1.02	1.18	1.69	2.06	2.44	2.95	3.37
72 hour	0.739	0.849	1.21	1.47	1.74	2.1	2.39
96 hour	0.582	0.666	0.943	1.14	1.35	1.62	1.83
120 hour	0.483	0.552	0.775	0.934	1.09	1.31	1.48
144 hour	0.416	0.474	0.661	0.792	0.923	1.1	1.24
168 hour	0.367	0.418	0.579	0.69	0.8	0.948	1.06

Council's Stormwater Policy allows for a maximum peak discharge rate for the site equivalent to or less than an assumed runoff coefficient for the entire site of 0.55, with PSD calculated on this basis.

Applying the Rational Equation as per below.

Table 3: Pre-Development Permissible Site Discharge Calculation

Detail	Variable	Value	Units	Comments
Catchment Response	C	0.55	dimensionless	Guidance from GCC
Rainfall Intensity	I	53	mm/hr	Based on the kinematic wave equation
Catchment Area	A	0.87	Ha	Comprising 7800m2 pervious and 900m2 impervious (existing access way)
Resulting Flow (PSD)	Q	0.070	m3/s	Maximum allowable discharge flow rate
	Q	70	L/s	Maximum allowable discharge flow rate

3 Proposed Stormwater Management Strategy

3.1. Proposed Development Catchment Areas

For the purposes of determining the differential between pre-development and post-development stormwater flows, the impervious and pervious areas of the current catchment that will be impacted by the development are shown in the figures below. Coefficients of run-off have adopted the conservative values for calculation of peak runoff from the Council Stormwater Policy.

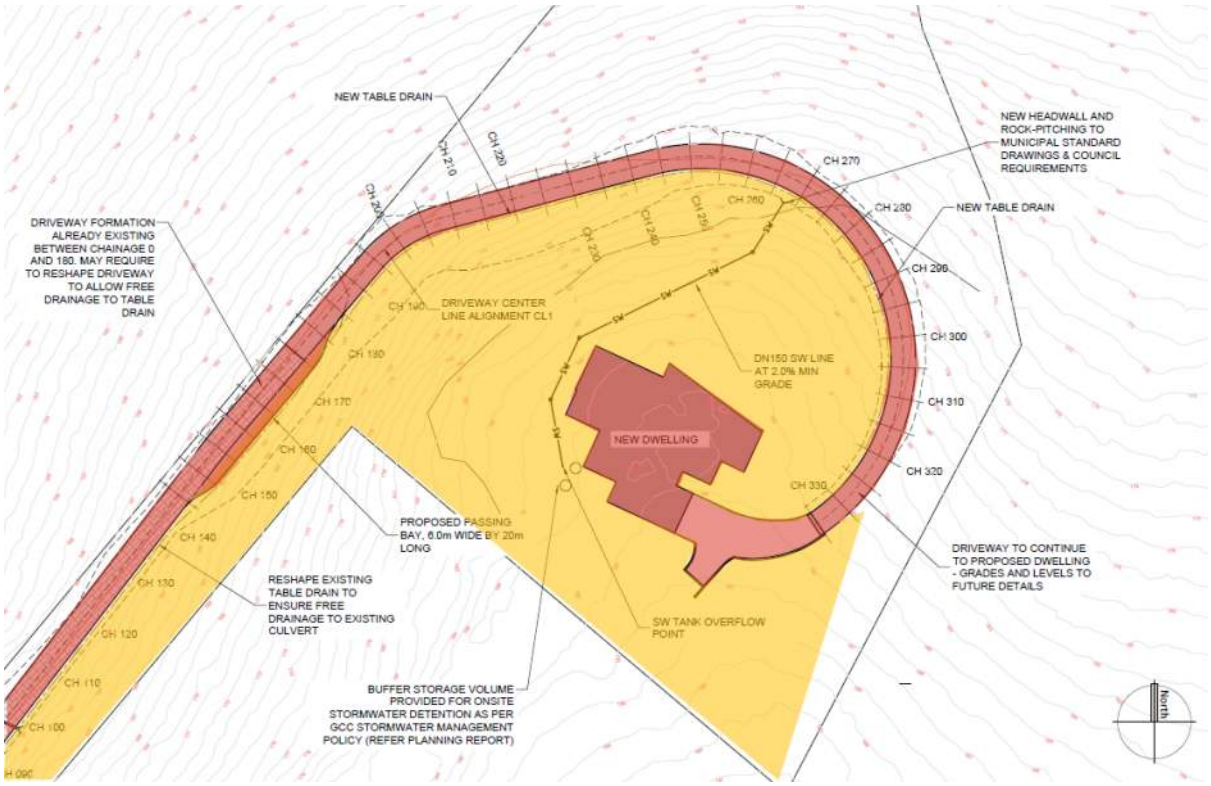

Figure 8: Post-Development Catchment Areas of Lot (impervious red, pervious yellow)

Table 4: Post-Development Area Calculation

Detail	Variable	Value	Units	Comments
Roof	A_{roof}	350	m2	Assume C=0.9 (100% Impervious)
Dwelling Hardstand	$A_{hardstand}$	140	m2	Assume C=0.9 (100% Impervious)
Access Way	$A_{accessway}$	1800	m2	Assume C=0.9 (100% Impervious)
Bushland	$A_{bushland}$	6410	m2	Assume C=0.4 (pervious)

3.2. Detailed Stormwater Management Strategy

The stormwater management strategy for the proposed development includes a number of stormwater conveyance features, including:

- The dwelling roof catchment (350m2) will be conveyed and captured within an onsite 20kL multipurpose tank that quarantines the lower 10kL to meet the bushfire hazard management plan requirements, with the upper portion utilised for rainwater storage for onsite use.

Overflow from the multipurpose tank would occur through a DN150 PVC stormwater main than discharges to the proposed accessway table drain at approximately CH270.

- The hardstand areas on the western side of the dwelling would drain via a stormwater pit, for entry into the DN150 PVC stormwater main described above
- The kerbed hardstand areas on the eastern side of the dwelling would drain to the table drain at CH330 via a trench box grate running across the width of the access way
- Drainage of the accessway along the full length would occur through extension of the existing cut-side table drain from CH180 to CH330. The accessway would be sloped toward the table drain across the entire cross-sectional width
- Any overland run-off from pervious areas on the upslope of the table drain would drain to the table drain and be conveyed to the existing public stormwater connection point

3.3. Compliance with GCC Stormwater Management Strategy

The following section addresses the Policy Statement requirements within the Glenorchy City Council Stormwater Management Strategy.

3.3.1. Stormwater Disposal Method Requirements

With regard to the stormwater disposal method, all stormwater from the Project is proposed to discharge under gravity to the Council public stormwater system via a single property connection through an existing culvert.

3.3.2. Stormwater Quality Management Requirements

With regard to stormwater quality management, the development is a single dwelling on a single lot that will be connected to the existing public stormwater system and is therefore exempt from the further requirements 5(b) to 5(e) within the Policy Statement.

3.3.3. Stormwater Quantity Management Requirements

Any OSD required by 6(e) must cater for the difference between the Permissible Site Discharge (PSD) and the peak discharge over the period of the design storm, and the OSD shall be designed to cater for 5% AEP storm events, and ensure that the development does not detrimentally impact on downstream properties in event more severe than 5% AEP. This is covered in the next section.

4 Analysis of the Stormwater Management Strategy

4.1. Peak Discharge

Analysis of the PSD and post-development peak discharge associated with stormwater runoff under a range of 5% AEP storm based on the Rational Equation is summarised below. It should be noted that the post-development peak flow for a 5 min 1% AEP event (117 mm/h) is 0.150 m3/s.

Table 5: Post-Development Peak Discharge Calculation (5%AEP)

Storm Burst	I (mm/hr)	Qpost (m3/s)	PSD (m3/s)	Comments
5 min	85.3	0.110	0.070	Exceeds PSD
10 min	63.9	0.082	0.070	Exceeds PSD
15 min	51.9	0.067	0.070	
20 min	44.2	0.057	0.070	
25 min	38.8	0.050	0.070	
30 min	34.8	0.045	0.070	
45 min	27.2	0.035	0.070	
1 hour	22.9	0.029	0.070	
1.5 hour	18	0.023	0.070	
2 hour	15.3	0.020	0.070	

The exceedance of the PSD under the 5 and 10 min storm bursts require that onsite stormwater detention be incorporated to cater for the difference between the PSD and post-development peak discharge. The volumetric requirements for the OSD against each of the storm burst durations under the 5% AEP events are summarised below.

Table 6: Post-Development Peak Discharge Calculation (5%AEP)

Storm Burst	I (mm/hr)	dQ (m3/s)	V (m3)	Comments
5 min	85.3	0.039	11.7	OSD Required
10 min	63.9	0.012	7.0	OSD Required
15 min	51.9	-0.004	< 0.0	
20 min	44.2	-0.014	< 0.0	
25 min	38.8	-0.021	< 0.0	
30 min	34.8	-0.026	< 0.0	
45 min	27.2	-0.036	< 0.0	
1 hour	22.9	-0.041	< 0.0	
1.5 hour	18	-0.047	< 0.0	
2 hour	15.3	-0.051	< 0.0	

Analysis of the roof catchment only against the 5% AEP events indicates that there is a maximum storage benefit of 2.2m3 of detention storage within the multipurpose tank at the critical storm

event. It is proposed that the remaining storage requirement (ie 9.4m3) be provided in two separate locations along the accessway to detain flows within the table drain.

4.2. Detention Assets Detail

The multipurpose tank will have a detention volume of at least 2.3m3 with discharge from the detention portion of the tank to occur via a 50mm orifice, which will restrict the flow to 3 L/s.

Table 7: Roof Catchment OSD Tank

Detail	Variable	Value	Units	Comments
Outflow	Q	3	L/s	
Volume	V	2.3	m3	minimum
Water Head	H	0.3	M	Based on 20kL total tankage
Orifice Diameter	D	50	mm	Assume Cd=0.6

The arrangement of the tank is expected to be similar to that indicated below.

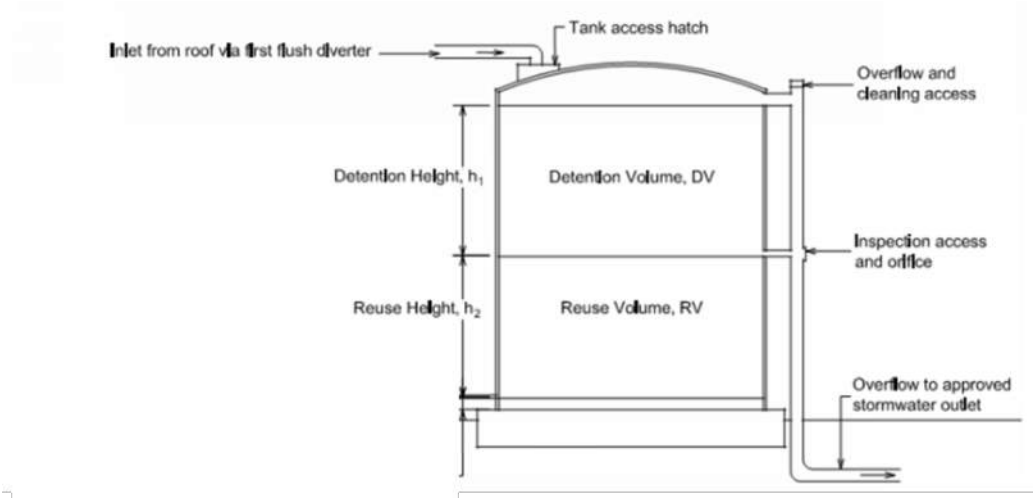

Figure 9: Typical OSD Tank Arrangement

The detention of flows along the access way table drain will be implemented through construction of two headwalls within the table drain with appropriately sized orifices to restrict flows to a low enough rate as to not exceed the PSD. It is proposed that these headwalls be constructed in proximity to low-slope (flat) areas of the access way to maximize storage of stormwater within the proposed table drain. The headwalls will be designed to allow overtopping of flows should the capacity of the storages behind the headwalls be exceeded.

Details on the proposed headwall arrangement is shown below. The catchment area has been divided into two areas, with the upstream area one half that of the downstream, with the volume and outflow of the storages sized at a similar ratio.

Table 8: Roof Catchment OSD Tank

Detail	Variable	Value	Units	Comments
CH275 Storage				
Outflow	Q	20	L/s	
Water Head	H	0.5	m	
Nozzle Diameter	D	97	mm	
Length	L	12.5	m	minimum
Slope	S	0.01	m/m	
Volume	V	3.3	m3	minimum
Weir Length	L	1.2	m	
Head on Weir	H	0.06	m	Based on broad-crested weir during overflow
CH100 Storage				
Outflow	Q	60	L/s	
Water Head	H	0.5	m	
Nozzle Diameter	D	172	mm	
Length	L	27.5	m	minimum
Slope	S	0.01	m/m	
Volume	V	6.1	m3	minimum
Weir Length	L	1.2	m	
Head on Weir	H	0.1	m	Based on broad-crested weir during overflow

The total storage provided by the multipurpose tank and the two table drain detention storages meets the overall OSD requirement of 9.4m3 at the 5% AEP event. Under a 1% AEP event both table drain storages would weir (with a maximum head of 0.15m), with the flows contained within the access way table drains at a top water level of 0.40m through the 1% sloped areas of trench based on a manning 'n' of 0.025.

4.3. Maintenance of Detention Assets

An inspection and maintenance approach for the proposed stormwater assets is provided in the below table.

Multipurpose Tank

- Routine inspection of roof and gutters every six months to ensure that they are kept relatively free of debris and leaves
- Inspection of orifice condition every twelve months
- Inspection of orifice condition following storm events
- Removal of debris from orifice if identified through inspection
- Removal of settled silt and debris from multipurpose tank every 24 months

Table Drains

- Inspection and removal of debris every twelve months and following storm events
- Inspection of any settling or erosion of batters every twelve months and rectification as required
- Inspect for evidence of ponding every twelve months and following storm events and rectification as required

Table Drain Detention Headwalls

- Inspection and removal of debris every twelve months and following storm events
- Inspection and rectification of any erosion / scour (downstream of discharge) every twelve months and following storm events

13 Nielson Drive, Montrose 7010

Natural Values Assessment

Prepared by Danielle Poirier (B.Env Sc Hons)

1.0 Introduction

1.1 Background

The proposed development at 13 Nielson Drive Montrose (the project area) will comprise a residential dwelling and associated access driveway (project footprint). This natural values assessment describes the existing natural values present in the project area. The report also provides an assessment of the potential impacts of the project on natural values and recommendations for mitigation and management measures.

1.2 Project Area

The project area, Lot 1 of Plan 46375, is 1.439 hectares, of which 0.4ha (28%) is already cleared land. The project area is located on the fringe of the urbanised suburb of Montrose. To the east of the project area is cleared residential land. The western boundary abuts vegetated land managed by TasWater and the southern boundary adjoins private residential land. Refer to Figure 1.

The topography of the project area rises steeply (gradient approximately 45%) from 136m above sea level (asl) at the northern end, up to 185m asl in the centre of the project area where the land levels off and slopes gently to 190m asl at the southern extent of the project area (gradient approximately 10%).

Fire history mapping indicates a localised bushfire event in the 1996-97 season.

The geology of the project area is Tasmanian Dolerite. Soils are mapped as ‘black soils on dolerite’ (Bld1), which are moderately well drained black soils developed on Jurassic dolerite bedrock and colluvium (DPIPWE, 2000).

1.2.1 Project Footprint

The project footprint comprises a residential dwelling (and associated bushfire setbacks) and access driveway.

The footprint of the residential dwelling will be approximately 330 m2 and is located within an area of cleared land currently supporting a ground cover of predominantly weed species.

To comply with bushfire code, a cleared setback from the residential dwelling to the vegetation is required. The following setbacks (BAL29) are required:

Southwest	11m
West	16m
Northwest	28m
North	20m
Northeast	14m
East	12m
Southeast	9m
South	9m

The total additional vegetation clearance required to meet the bushfire code is 0.0350 ha.

The access driveway to the dwelling will be 340m in length. The first 190m is cleared and formed, the next 90m is not cleared but is largely formed and the final 60m is largely cleared but unformed. Some cut and fill will be required in unformed areas and for the passing bay (to be constructed at Chainage 160). A total of 0.0850 ha (850m^2) of vegetation will be cleared to form the access driveway (including passing bay).

The total area of vegetation to be cleared for the project footprint is:

Residential dwelling	0.0350ha (allowing for BAL29 setbacks)
Access driveway	0.0850ha

TOTAL: **0.1200 ha**

Figure 1: Project area and project footprint

1.3 Method

1.3.1 Desktop assessment

The following primary sources were used to provide information on native vegetation, threatened ecological communities and threatened flora and fauna species records within and surrounding the project area:

- TASVEG version 4.0 digital layer
- Natural Values Atlas (NVA) – a report was generated to identify threatened species records within 5km of the project area. The natural values report generated for the project area is in Appendix A.
- Protected Matters Search Tool (*Environment Protection and Biodiversity Conservation Act 1999*) – a report was generated to identify Matters of National Environmental Significance (MNES) likely to occur within 5km of the project area. The report generated for the project area is in Appendix B.
- Land Information System Tasmania (LIST) database – information on the location of vegetation TASVEG 4.0 communities, including the location of threatened vegetation and fauna observations.
- Department of Natural Resources and Environment Tasmania website - for biological and ecological information on Tasmanian threatened species.

1.3.2 Field assessment

A field assessment of the project area was undertaken on 8 December 2023, 18 January 2024 and 5 February 2024. Tasks undertaken during the assessment include:

- Describe the vegetation present within the project area.
- Confirm TASVEG 4.0 communities and emergent trees within the project area.
- Assess the presence of threatened communities in accordance with the listing advice for those communities.
- Assess potential habitat for threatened flora and fauna listed under the *Threatened Species Protection Act 1995* (Tasmania) and/or *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) that may occur in the project area. While no detailed fauna surveys were conducted, anecdotal observations were recorded and opportunistic searches for burrows and tree nesting habitat were undertaken during the field assessment.
- Describe declared plant pests (weeds) listed under the *Biosecurity Act 2019* (Tasmania).

1.3.3 Limitations

The field assessment was undertaken in summer, therefore the timing of the assessment means some seasonal and ephemeral species/habitat may not have been detected or identified due to lack of flowering or lack of identifying vegetation features. However, the assessment considers all listed threatened species data generated from the Tasmanian Natural Values Atlas report and Commonwealth EPBC Act Protected Matters Search Tool report. These reports include records of all threatened species known to occur, or with the potential to occur, up to 5km from the project area. Note: The EPBC Protected Matters Search Tool also identified a number of other marine and coastal bird species as matters which may be present. This report assesses terrestrial habitats within the project area and these marine/overfly species were not assessed.

This report has been prepared for David Graham and Alison Magill and is intended only for the purposes of identifying and informing potential environmental approvals and permits associated with the proposed residential development. Information presented in this report is based on available information at the time of assessment.

2.0 Natural Values

2.1 Vegetation communities

TASVEG 4.0 mapping indicates three vegetation units in the project area:

- DPU *Eucalyptus pulchella* forest and woodland – mapped across a majority of the site, including cleared areas.
- FUM Extra-urban miscellaneous – mapped unit covers the southern corner of the project area, including cleared land, native vegetation and modified vegetation in the TasNetworks easement.
- FUR Urban areas – mapped unit covers a small area located at the start of the access driveway (south western extent of project area).

Vegetation units observed during the field assessment are shown in Figure 2 and include:

- NAV *Allocasuarina verticillata* forest – the northern and southwestern parts of the project area (mapped as DPU *Eucalyptus pulchella* forest and woodland) and southern part (mapped as FUM Extra urban miscellaneous) were observed to have characteristics of NAV.
- FUR Urban Areas – observed at the start of the access driveway (south western extent of project area) as mapped. In addition, the field assessment extended this to include existing cleared extent of the access road (mapped as DPU) as well as the cleared central part of the project area (mapped as DPU and FUM).
- FPE Permanent Easement – present as a strip of managed vegetation associated with the Tas Networks infrastructure easement (overhead powerlines).

NAV *Allocasuarina verticillata* forest (and DPU *Eucalyptus pulchella* forest and woodland, although not observed to be present) is not listed as threatened under the *Nature Conservation Act 2002*. *Allocasuarina verticillata* forest is widespread in dry areas of eastern Tasmania, with a number of stands mapped in the vicinity of the project area, fringing built up areas or at the interface with eucalypt forest/woodland communities. This community is characterised by the dominance of *Allocasuarina verticillata* (drooping sheoak) with a species-poor understorey containing scattered grasses and shrubs.

Drooping sheoak is the most drought-resistant tree in Tasmania. It usually only dominates native vegetation in places where eucalypts find it hard to grow, including slopes with shallow and rocky soils in areas receiving less than 700mm of rainfall. *Allocasuarina verticillata* forest is not a high conservation priority in Tasmania as it is well reserved, has suffered no reduction in area, and contains few threatened species (NRE Tas, 2024).

Figure 2: Vegetation units present in the project area

2.1.1 Vegetation observed within the Project Area

The portion of the site supporting the *Allocasuarina verticillata* forest adjacent the existing cleared access driveway (refer to Figure 2) comprises predominantly *Allocasuarina verticillata (*drooping sheoak*)* around 6-8m in height, with an open canopy and species-poor understorey consisting of occasional *Beyeria viscosa* (pinkwood), *Bursaria spinosa* (prickly box) and *Bedfordia salicina* (Tasmanian blanketleaf). *Eucalyptus viminalis* (white gum), *Callitris rhomboidei* (oyster bay pine) and *Acacia dealbata* (silver wattle) are occasionally present. The ground layer is predominantly leaf litter on exposed rocks with intermittent *Lomandra longifolia* (sagg) and occasional other native grasses and herbs (and weed species near the driveway edges), but generally devoid of other species.

The portion of the project area to be cleared for the access driveway (between CH180 and CH280, refer to Figure 3) is predominantly *Allocasuarina verticillata* (drooping sheoak) with little understorey except occasional emergent *Beyeria viscosa* (pinkwood) and immature *Eucalyptus viminalis* (white gum). This section is mainly on loose scree, with ground cover generally absent, noting isolated *Astroloma humifusum* (native cranberry) and one *Ozothamnus scutellifolius* (buttonleaf everlastingbush) plant were observed within the footprint.

Figure 2: Vegetation present along existing formed section of access driveway (left); *Allocasuarina verticillata* forest with sparse understorey and leaf litter ground cover with few ground species present (right).

Figure 3: *Allocasuarina verticillata* community on scree/rocky substrate with very little understorey or ground species (between CH180 and CH280).

The large portion of FUR Urban Areas in the centre of the project area (which includes the section of access driveway between CH280 and CH315 as well as the location of the dwelling footprint; refer to Figure 4) is cleared land with a ground cover of predominantly weed species and occasional native species including *Comesperma volubile* (blue lovecreeper) and *Lissanthe strigose* (peachberry heath). Larger native species include *Solanum laciniatum* (kangaroo apple), immature regrowth *Eucalyptus viminalis* (white gum) and one remnant *Eucalyptus viminalis* approximately 15m in height with a basal hollow (likely resulting from fire damage).

The portion of the project area extending south of the FUR (including area to be cleared for the access driveway between CH315 and CH335) to the managed easement is predominantly *Allocasuarina verticillata* (drooping sheoak) with a sparse understorey consisting of *Dodonaea viscosa* (broadleaf hopbush), and immature eucalypt, *Callitris rhomboidei* (oyster bay pine) and *Acacia dealbata* (silver wattle) (refer to Figure 5). The ground cover is rocky with leaf litter and sparse native vegetation including *Lomandra longifolia* (sagg), *Gahnia radula* (thatch sawsedge) and *Astroloma humifusum* (native cranberry) and intermittent annual weeds.

Native vegetation adjacent to the south eastern property boundary (near neighbouring property water tanks; Figure 6) comprises predominantly *Allocasuarina verticillata* (drooping sheoak), with three large *Eucalyptus viminalis* (white gum) 10-15m in height. Basal hollows, likely resulting from fire damage, are present in the two larger trees. Understorey species include *Bedfordia salicina* (tasmanian blanketleaf), *Solanum laciniatum* (kangaroo apple) and *Lomandra longifolia* (sagg) as well as weed species including *Chrysanthemoides moniliferaboneseed* (boneseed).

The northern portion of the site is *Allocasuarina verticillata* forest, with sparse understorey and ground cover of predominantly leaf litter overlying rock.

Figure 4: FUR Urban Areas unit within footprint of access driveway (top) and the centre of the project area with cleared vegetation piles, weeds and remnant *Eucalyptus viminalis* to be retained (bottom).

Figure 5: Area to be partially cleared for access driveway includes small number of *Allocasuarina verticillata* and *Dodonaea viscosa*.

Figure 6: Vegetation adjacent to southeastern boundary includes *Allocasuarina verticillata* (left) and *Eucalyptus viminalis* with basal hollows (right).

2.2 Threatened flora

No threatened flora species were observed in the field assessment.

Of the threatened flora species listed in the PMST and NVA reports as present or potentially present within 5km of the project area, none are considered to have more than a low likelihood of occurrence. Threatened plants listed under the TSP Act and/or EPBC Act known from within 5km or with the potential to be present are listed in Appendix A, together with a description of their preferred habitat and an assessment of their likely occurrence at the project area.

Only two species of threatened flora have been recorded within 500m of the project area and both are historical records and have low to no likelihood of being present:

- *Caladenia caudata* (tailed spider-orchid) – possible suitable habitat (*Allocasuarina* woodland) present in the project area. However the most recent observation is a single specimen dating back to 1956 approximately 410m north of the project area, therefore the likelihood of presence is low.
- *Diuris palustris* (swamp doubletail) – no suitable habitat is present in the project area.

Several of the reported species have the potential to occur based on habitat suitability, however the likelihood they are present in the project area is low. Of these, there are six species for which there are recent (within last 5 years) records within 5km of the project area:

- *Dianella amoena* (matted flax-lily)
- *Olearia hookeri* (crimson-tip daisybush)
- *Pimelea flava subsp. flava* (yellow riceflower)
- *Scleranthus fasciculatus* (spreading knawel)
- *Velleia paradoxa* (spur velleia)
- *Vittadinia muelleri* (narrowleaf new-holland daisy)

Given there is a low likelihood that these species are present within the project area, the likelihood of any being impacted by the footprint of the proposal is considered remote.

2.3 Threatened fauna

No evidence of use of the project area by threatened fauna was observed during the assessment.

Some fauna species are transient within project area generally and the *Allocasuarina* woodland, using patches for food, shelter, or as corridors to other habitats. For example, *Notamacropus rufogriseus* (Bennetts wallaby) were observed foraging in the *Allocasuarina* woodland during the site assessment.

No potential burrows were noted, and the scree substrate present in the project area, including along the access driveway, is unlikely to provide suitable denning or burrow opportunities.

There are no old growth trees and few large trees within the project area. Basal hollows were observed in two *Eucalyptus viminalis* (white gum) trees located on the south eastern boundary of the property and one *Eucalyptus viminalis* (white gum) in the centre of the project area, likely produced as a result of fire damage to the base of the trees. The basal hollows present in the project area may be used as temporary shelter by native (or introduced) fauna, but given they are in exposed areas and low to the ground they are unlikely to provide suitable nesting, roosting or breeding habitat for threatened fauna. No other hollows were observed and the trees present within the project area are not likely to provide suitable breeding/nesting habitat for threatened fauna.

Threatened fauna species previously recorded within 5km of the study area, or which may potentially occur there, are listed in Appendix A together with a description of their preferred habitat and an assessment of their likely occurrence within the project area.

Of the threatened fauna species listed in the PMST and NVA reports as present or potentially present within 5km of the project area, none are considered to have greater than a low likelihood of occurring or having potential habitat occurring within the project area (refer to Appendix A). Five of these threatened fauna species have been previously recorded within 500m of the site.

- *Lathamus discolor* (swift parrot)

  Swift parrot has been recorded approximately 200m north of the project area, however the most recent observation was from 1992.

  The *Allocasuarina* woodland does not support large hollow-bearing trees required for nesting/breeding. Three of the larger individual eucalypts present within the project area (adjacent to water tanks and in the centre of the project area) have basal hollows, which are not likely to be suitable nesting/breeding habitat given they are close to the ground and exposed. Other eucalypts within the project area are generally immature or small regrowth trees and not likely to support hollows. Further, the project area does not contain *Eucalyptus globulus* (tasmanian blue gum) or *Eucalyptus ovata* (black gum) trees that are the primary food source for the swift parrot.

  While the study area is within the potential range of the swift parrot and there are some large eucalypts on adjoining land, the presence of powerlines along the southern boundary and dwellings immediately to the west and north of the project area, and given the availability of high quality habitat within the Wellington Range to the west, the likelihood of the project area being used for foraging or shelter habitat for swift parrot is low.

- *Tyto novaehollandiae castanops* (masked owl (Tasmanian))

  Masked owl has been recorded approximately 200m north of the project area (same location as swift parrot), with the most recent observation dating back to 1991.

  The *Allocasuarina* woodland does not support large hollow-bearing trees required for nesting/roosting. As noted above, basal hollows are present in three eucalypts within the project area, however these are not likely to be utilised by birds given their proximity to the ground and exposure. Other eucalypts present within the project area are too young or not large enough to support hollows.

  While the study area is within the potential range of the masked owl and there are some large eucalypts on adjoining land with the potential to support hollows, the presence of powerlines along the southern boundary and dwellings immediately to the west and north, the likelihood of the project area being used for nesting/roosting habitat by masked owl is low.

- *Sarcophilus harrisii* (tasmanian devil)

  One devil was recorded approximately 400m north of the project area in 1976.

  The project area supports suitable prey, including wallabies (observed) and rabbits (scats) and it is possible that the species could utilise the project area for foraging to some extent. However, den sites are generally in dense vegetation, hollow logs, burrows or caves. Basal hollows in the three larger eucalypts may provide potential shelter. Other suitable denning habitat is unlikely to be present in the project area.

- *Perameles gunnii gunnii* (eastern barred bandicoot (Tasmania))

  One animal was recorded approximately 200m north of the project area in 2022.

  Although listed under the EPBC Act, in Tasmania the population is relatively stable and widespread and is not listed under state legislation.

Bandicoots prefer open grassland and grassy areas for foraging but require thick ground cover for shelter and nesting, such as sedges, grasses, prickly native vegetation and dense weeds. Within the project area there is a degree of cover provided by the *Allocasuarina* woodland and areas of weed infestations (for example near the start of the access driveway) and cleared vegetation piles, however given the lack of grassland/grassy pastures and sparse understorey, the project area is likely to provide only marginally suitable foraging habitat.

- *Hirundapus caudacutus* (white-throated needletail)

  One bird was observed in 1992 approximately 200m north of the project area.

  This migratory species breeds in Siberia, Mongolia, northern-eastern China and northern Japan. It spends its non-breeding season in eastern Australia, including Tasmania. This species is mostly aerial, occurring over most types of habitat including wooded areas, forests, heathland and rainforests. The likelihood of this species roosting within the project area is low given roosting is generally in trees amongst dense foliage in the canopy or in suitable hollows, which are not likely to be present.

2.4 Declared weeds

A range of weeds are present on the site, predominantly occurring within cleared areas and at the interface/margin between cleared areas and native vegetation (e.g. along the access driveway). In addition to general urban/peri-urban/garden weeds, the following declared weeds were noted during the site assessment (also refer to Figure 1):

- Blackberry (*Rubus fruticosus aggregate*) – large localised patch at the start of the access driveway at the entrance to the property.
- Boneseed (*Chrysanthemoides monilifera* ssp*. monilifera*) – present in extensive patches and as individual plants throughout the disturbed areas; in the centre of the site, along the access driveway and within the *Allocasuarina* woodland adjacent to the access driveway.

3.0 Assessment of Impacts

3.1 Mitigation and Management Measures

To minimise and mitigate the risk of impacts to natural values, a number of measures will be implemented through the design and construction of the project.

3.1.1 Design

The footprint of the access driveway and residential dwelling has been minimised to limit impacts to vegetation to only that required to meet building codes (including bushfire setbacks, driveway width and passing bay, etc). Location of the residential dwelling has been sited in an already cleared area and adjusted in response to the bushfire setback requirements so as to reduce the area of native vegetation impacted

The Landscape Plan is to include planting of native vegetation to rehabilitate cleared areas of the project area where this does not impact on bushfire setbacks.

3.1.2 Construction

Protection (e.g using fencing or bunting) of two large eucalypt trees to be retained, to prevent damage or destruction during construction.

Appropriate weed and disease management will be implemented during construction, with reference to the Weed and Disease Planning and Hygiene Guidelines (DPIPWE 2015), to ensure hygiene is maintained and the potential for weed spread is limited. Removal of existing weeds during construction will provide immediate benefits of reducing the number of weeds present in the project area as well as reducing weed spread/incursion into areas of adjoining native vegetation in the long term. Proactive management of declared weeds will be ongoing after construction, to manage declared weeds onsite and prevent degradation of native vegetation from weed spread.

3.2 Impact Assessment

3.2.1 Threatened vegetation communities

No threatened vegetation communities are present on the site, therefore the project will not impact threatened vegetation communities.

Threatened vegetation communities listed under the TSP Act and/or EPBC Act known from within 5km are listed in Appendix A together with a description and an assessment of their likely occurrence in the project area.

3.2.2 Threatened flora

No threatened flora species listed under the TSP Act or EPBC Act are likely to be impacted by the project.

No threatened flora were observed during the site assessment. Only two species of threatened flora (Tailed spider-orchid and Swamp doubletail) have been recorded within 500m of the site and both are historical records and have low to no likelihood of being present on the site. There are some species for which suitable habitat may be present in the project area, however given there is a low likelihood that these species are present within the project area, the likelihood of any being impacted by the footprint of the proposal is considered remote.

3.2.3 Threatened fauna

No threatened fauna species listed under the TSP Act or EPBC Act are likely to be impacted by the project. The site assessment did not identify any suitable breeding habitat for threatened fauna and no evidence of threatened fauna was recorded during the assessment.

The project area may provide marginal foraging habitat for the eastern barred bandicoot (*Perameles gunnii*), however the project is unlikely to have a significant impact on the species. The risk of direct impacts to bandicoots during construction is negligible given the likelihood of presence is low due to the lack of suitable quality habitat within the project area; and that the species is mobile and if present could relocate to habitat in the vicinity of the project area. The indirect impact through the clearance of a small area of marginal foraging habitat from the project area is considered low and will not significantly impact the survival of this species or cause a measurable decline in the population.

The project area is unlikely to support suitable breeding./nesting habitat for threatened birds. Basal hollows, likely from fire damage, were observed in three of the larger individual *Eucalyptus viminalis* trees present within the project area, however these are not likely to provide breeding/roosting habitat for threatened birds. Irrespective, these trees will be protected during construction and retained therefore will continue to provide shelter for birds that currently use the site. Other trees within the project area to be removed by the project are generally immature or small regrowth trees that are not large enough or old enough to support hollows. The project is therefore unlikely to have a significant impact on habitat availability and will not impact the survival of threatened birds or cause a measurable decline in their populations.

3.2.4 Impacts on natural values

Table 1 sets out the potential impacts of the project on natural values assuming mitigation and management measures described in Section 3.1 are implemented.

Refer to Section 4.5.1 for discussion relating to Priority Vegetation under the Natural Assets Code.

Table 1 – potential impacts of the project on natural values

Works	Potential impact	Discussion and mitigation	Residual impact
Access Driveway (including passing bay)	Removal of native vegetation for the formation of the access driveway. • Passing bay 50m^2 – removal of *Allocasuarina* trees, two *Eucalyptus viminalis* trees and ground vegetation. • Carriageway (CH180-CH280) 780m^2 – removal of *Allocasuariina* and *Beyeria viscosa* • Carriageway (CH325-CH335) 20m^2 – removal of five *Allocasuarina trees,* one immature E*ucalyptus viminalis* and three *Dodonea viscosa shrubs.*	*Allocasuarina* trees range from 3m-6m in height with open canopy and not likely to provide nesting or foraging habitat for threatened fauna. Regrowth eucalypts are young regrowth trees, two isolated specimens (and one dead), less than 10m height, 10-15cm diameter at breast height. The eucalypts do not have hollows and would not support hollow-dependent species. There is a low likelihood that these immature trees provide foraging, nesting or shelter habitat for threatened species. Minimise clearance of vegetation to that required for the project footprint. Protect trees to be retained. Undertake weed management prior to and following construction.	Low
Residential Dwelling	Removal of native vegetation for the dwelling footprint, approximately 0m2.	The dwelling has been sited on already cleared land. Some very immature vegetation regrowing in the cleared area will be removed, however this vegetation is unlikely to support threatened flora and fauna and impact of removing this vegetation is negligible. Three larger eucalypts in the vicinity of the dwelling footprint have basal hollows which may provide ground shelter for fauna. There is a low likelihood that these trees provide foraging or nesting habitat for hollow-dependent threatened species. Further, these trees will be protected and retained. Revegetation and planting of native vegetation to be undertaken on site in accordance with the landscape plan. Protect trees to be retained. Undertake weed management prior to and following construction.	Low
Bushfire Setbacks	Removal of native vegetation to meet the requirements for bushfire protection, approximately 0.035ha.	The area to be cleared does not comprise threatened vegetation communities and is unlikely to provide significant habitat for threatened flora and fauna. No threatened flora or fauna were observed in the field assessment of areas to be cleared. *Allocasuarina verticillata* woodland to be removed is not a high conservation priority in Tasmania as it is well reserved, has suffered no reduction in area, and contains few threatened species. Vegetation to be removed abuts weedy edges of already cleared areas. Revegetation and planting of native vegetation to be undertaken on site in accordance with the landscape plan. Protect trees to be retained. Undertake weed management prior to and following construction.	Low
General construction works	Earthworks generate risk of weed spread within the project area and offsite, through physical transport as well as disturbance and or stimulation of soil-borne seeds.	Hygiene controls will be in place prior to, during and after construction to minimise weed spread. These include preliminary weed removal/control, washdown of earthmoving equipment before leaving site and follow up management. Active weed management during the project and in the long term will remove weeds and reduce the potential for further weed incursion into adjacent native vegetation.	Low

	Noise generated by plant and equipment disturbing native fauna.	Excavation works for the access driveway are expected to take approximately three weeks, during which works will be intermittent, with periods of respite provided. Works will be undertaken in daylight hours and no night works will be undertaken. Construction works for the dwelling are expected to take approximately nine months and will commence after the works for the access driveway are complete, therefore minimising cumulative noise disturbance. Noise-generating works will be undertaken in daylight hours. No noise-generating night works will be undertaken.	

4.0 Legislative Requirements

4.1 Environment Protection and Biodiversity Conservation Act 1999

In accordance with the EPBC Act, a proponent must undertake a self assessment to determine whether or not the project is considered likely to have a significant impact on Matters of National Environmental Significance and require approval from the Commonwealth.

The probability of any flora species listed under the EPBC Act occurring within the project area is considered low.

The *Allocasuarina verticillata* forest may provide marginally suitable habitat for eastern barred bandicoot (*Perameles gunnii*) and is potentially utilised by other native fauna to some degree. No potential dens were located during the survey. The project area does not support large hollow-bearing trees suitable for breeding/roosting and is unlikely to provide significant foraging habitat for threatened birds. Basal hollows in three *Eucalyptus viminalis* trees may provide potential shelter habitat for Tasmanian devil, however these trees will not be impacted by the project.

The proposal (action) is unlikely to have a significant impact on flora or fauna species (or their habitat) listed under the EPBC Act. Consequently, referral to the Commonwealth is not considered to be necessary for this proposal.

4.2 Threatened Species Protection Act 1995 (Tasmania)

Under the TSP Act, a person must not knowingly, without a permit, 'take' a species listed under the Act. To 'take' includes to kill, injure, catch, damage, destroy and/or collect threatened species or vegetation that supports threatened species. Any impact on threatened species listed under the Act requires a 'permit to take', issued by the Department of Natural Resources and Environment Tasmania.

No species listed under the TSP Act were recorded as part of the assessment, therefore a permit under this legislation is not required for this proposal.

4.3 Nature Conservation Act 2002 (Tasmania)

Threatened native vegetation communities are listed under Schedule 3A of the Act. No threatened native vegetation communities occur within the project footprint, or broader project area.

Under the *Wildlife (General) Regulations 2010,* a person must not, without a permit, take, buy, sell or have possession of any wildlife or product of wildlife listed under the Act.

Various native fauna species may utilise habitat within the project area and footprint (such as birds or small mammals). During construction works, in the event of an unanticipated discovery of a nest or den or if wildlife needs to be captured (e.g. to avoid harm), appropriate permits would need to first be sought from the Department of Natural Resources and Environment Tasmania and supervision of works undertaken by a suitably qualified person.

4.4 Biosecurity Act 2019 (Tasmania)

Under the *Biosecurity Act 2019*, declared pests and diseases (including declared weeds) are a category of pests that pose an elevated biosecurity risk. The *Biosecurity Regulations 2022* makes the release or spread of a declared weed into the environment a prescribed dealing under the *Biosecurity Act 2019*. A person is taken to be responsible for the release or spread if they are the owner of a premises that is reasonably suspected of being a carrier of the pest and they caused, allowed or failed to prevent the release, scattering or escape into the environment, from the premises, of the pest (Clause 15(2)). Put simply, it is a landholder's responsibility to manage or eradicate declared weeds on their own property.

A number of declared weeds in Tasmania have statutory management plans which classifies the weed as either Zone A or Zone B, depending on the municipality and known weed distribution. All Statutory Weed Management Plans created under the (repealed) *Weed Management Act 1999* are now termed Government Biosecurity Programs with the same meaning and effect. For weeds listed as Zone A in a given municipality, eradication is the principal management objective. Weeds listed as Zone B require control and containment.

Two species of declared weeds have been observed in the project area: blackberry and boneseed. The relevant statutory weed management plans (created under the (repealed) *Weed Management Act 1999* and now termed Government Biosecurity Programs with the same meaning and effect) define the Glenorchy City Council as a Zone B municipality for these weeds.

Under the *Biosecurity Act 2019*, Zone B municipalities are those which host moderate or large infestations of the declared weed that are not deemed eradicable because the feasibility of effective management is low. Therefore, the objective is containment of infestations. This includes preventing spread of the declared weed into properties currently free of the weed. There is also a requirement to prevent spread of the weeds to properties containing sites with significant flora, fauna and vegetation communities.

Weed management for this project will ensure the objectives of the *Biosecurity Act 2019* are met.

4.5 Land Use Planning Approvals Act 1993 (Tasmanian Planning Scheme)

The project area is within the Landscape Conservation Zone (22.0). As provided by clause C7.2.1(c), the project area is covered by the 'priority vegetation area' overlay within a Landscape Conservation Zone, therefore the Natural Assets Code (C7.0) applies to the Project.

The Scenic Protection Zone (C8.0), Flood Prone Areas Hazard Code (C12.0), Bushfire-Prone Areas Code (C13.0) and Landslip Hazard Code (C15.0) also apply however these are not considered in detail in this report.

4.5.1 Natural Assets Code

Development Standard C7.6.2 *Clearance within a priority vegetation area* is applicable to the project.

The Objectives associated with Clause C7.6.2 are that clearance of native vegetation within a priority vegetation area:

- does not result in unreasonable loss of priority vegetation;
- is appropriately managed to adequately protect identified priority vegetation; and
- minimises and appropriately manages impacts from construction and development activities.

The Natural Assets Code Fact Sheet outlines that a 'priority vegetation area' provides protection for 1) threatened native vegetation communities listed under the *Nature Conservation Act 2002*; 2) threatened flora species; 3) significant habitat for threatened fauna species; and 4) other locally important native vegetation. As outlined previously in this report, the areas to be cleared do not comprise threatened vegetation communities and are unlikely to provide significant habitat for threatened flora and fauna. No threatened flora or fauna were observed in the field assessment of areas to be cleared.

The project footprint is located in a 28ha patch of priority vegetation area, with the area to be cleared by the project only reducing the patch size by 1% and not creating new barriers to movement (i.e. no additional disconnection from surrounding vegetation as there are already roads and properties). Native vegetation to be removed can be generally categorised as *Allocasuarina verticillata* woodland, which, as noted previously, is not a high conservation priority in Tasmania as it is well reserved, has suffered no reduction in area, and contains few threatened species (NRE Tas, 2024). Vegetation to be removed is of lesser quality as it abuts weedy edges of already cleared areas. Weed management to be undertaken as part of the proposal will have long term benefits of protecting the surrounding priority vegetation area from further weed incursion.

The Acceptable Solution (A1) of Development standard C7.6.2 cannot be met as there is no building area on a sealed plan approved under this planning scheme. Therefore the development is considered against the Performance Criteria.

The project complies with P1.1(b) as it is *building and works associated with the construction of a single dwelling or an associated outbuilding*.

The project complies with P1.2 as impacts on native vegetation within a priority vegetation area will be minimised, noting:

(a) *the design and location of buildings and works and any constraints such as topography or land hazards* - the access driveway is constrained by topography and the alignment utilises existing cleared areas as far as practicable and for about 74% of its length. Native vegetation clearance will be limited to that required to meet property access requirements under the *Director's Determination for Bushfire Hazard Areas*.

The dwelling footprint has been located within an area of cleared land.

Native vegetation clearance of 0.120ha is required to meet the *Director's Determination for Bushfire Hazard Areas*. The location of the dwelling footprint has been refined during the design process so as to limit the bushfire management area and minimise impacts to native vegetation where possible. The larger individual *Eucalyptus viminalis* trees in the vicinity of the dwelling and access driveway footprints will be retained and protected during works.

(b) *any particular requirements for the buildings and works* – the access driveway has been designed to meet the width and gradient requirements within the Director's Determination for Bushfire Hazard Areas, there are no particular requirements for the dwelling (aside from the BAL29 requirements discussed below) that have impacted the requirements for vegetation clearance

(c) *minimising impacts resulting from bushfire hazard management measures through siting and fire-resistant design of habitable buildings* - As noted in (a), the dwelling footprint has been located within an area of cleared land, with the final location determined through refinements during the design process so as to limit the bushfire management area. Acceptance of the BAL29 fire resistance design measures (including windows and cladding materials) has minimised the vegetation clearance requirements.

(d) *any mitigation measures implemented to minimise the residual impacts on priority vegetation* – Siting of the dwelling footprint within the already cleared area and adjusting its location so as to minimise the bushfire management area and resultant setbacks. The landscape plan includes planting of native vegetation species and proposed revegetation of the denuded areas of the north-east of the project area. Weed management to be undertaken prior to and during construction will remove infestations of weeds and reduce the spread and incursion of weeds into adjacent areas of native vegetation.

(e) *any on-site biodiversity offsets* – no onsite biodiversity offsets are required as no threatened vegetation communities, flora or fauna or significant habitat are likely to be present on site. The Landscape plan will include revegetation with native species within the landscape.

(f) *any existing cleared areas on the site* – as noted previously, the access driveway will utilise cleared land for about 74% of its length and the dwelling footprint is also located on cleared land.

5.0 Appendix A

Species	Status EPBC	Status TSP	Habitat	Likelihood of presence in project area
Threatened Vegetation Communities likely to occur within project area				
Tasmanian white gum (*Eucalyptus viminalis*) wet forest	Critically Endangered	Threatened	Community typically grows on fertile and well-drained flats or lower slopes, often on basalt or alluvium, in the north of Tasmania. A wet sclerophyll forest with a canopy dominated by *Eucalyptus viminalis* and an understorey generally comprised of broad-leaved shrubs and ferns.	None
Alpine Sphagnum Bogs and Associated Fens	Endangered	Threatened	Found in alpine and sub-alpine regions, generally above 800m asl in Tasmania, in permanently wet areas along streams, valley edges and valley floors and waterlogged slopes.	None
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (*Eucalyptus ovata* / *E. brookeriana*)	Critically Endangered	Threatened	Tree canopy that is mostly made up of Black Gum (*Eucalyptus ovata*) and/or Brookers Gum (*Eucalyptus brookeriana*) trees, over an understorey of mostly native plant. Generally occurs on low-lying damp sites, including riverine habitats, wet and seasonally waterlogged sites, moist rocky soils, alluvial deposits near streams or gullies.	None
Threatened Flora recorded within 500m of project area				
Caladenia caudata Tailed Spider-orchid	Vulnerable	Vulnerable	Occurs in heathy and open eucalypt forest and woodland, often with sheoaks, and in heathland on sandy and loamy soils. Majority of observations are historical or support a low number of individuals. A single record of 1 specimen dates to 1956 approximately 410m north of the project area.	Low
Diuris palustris Swamp doubletail	Not listed	Endangered	Occurs in coastal areas in grassy open eucalypt forest, sedgy grassland and heathland with tea-tree and paperbark on poorly- to moderately-drained sandy peat and loams, usually in sites that are wet in winter. One NVA record, approximately 430m from centre of project area, only one specimen and dated to 1918. Habitat not present in project area.	None
Threatened Flora recorded or with potential within 5000m of project area				
Acacia ulicifolia Juniper wattle	Not listed	Rare	Found on sandy coastal heaths, open forest and woodland in the north and east of Tasmania. Record of 1 specimen in 1995.	None
Anogramma leptophylla Annual fern	Not listed	Vulnerable	Grows in shallow soil layers over rock, on exposed or semi-exposed outcrops in dry or damp sclerophyll forest. Plants are mostly found on	None

Species	Status EPBC	Status TSP	Habitat	Likelihood of presence in project area
			rock ledges, often on, or just inside, the drip line of the overhead rock-face. Record of 3 specimens in 2021 within 5000m, in Wellington Park and in 1985 in Collinsvale.	
Asperula scoparia subsp. Scoparia Prickly woodruff	Not listed	Rare	Recorded from grassy woodland and tall eucalypt forest. Record of 1 specimen in 2021 within 5000m.	None
Austrostipa blackii Crested speargrass	Not listed	Rare	Occurs in open woodlands up to an altitude of 100 metres. Record of 1 specimen in 2011.	Low
Bolboschoenus caldwellii Sea clubsedge	Not listed	Rare	Widespread in shallow, standing, sometimes brackish water, rooted in heavy black mud. Record of 3 specimens in 2010.	None
Caladenia sylvicola Forest Fingers	Critically Endangered	Endangered	Known only from one site in Hobart City bushland reserve and has not been sighted since 1997 despite regular searches in the vicinity of known sites and in other suitable habitat. No records within 5000m.	None
Carex gunniana Mountain sedge	Not listed	Rare	Record of 1 specimen in 1894.	None
Colobanthus curtisiae Curtis' Colobanth	Vulnerable	Rare	Requires bare ground for recruitment and grows in grassland and grassy woodland, from lowlands to alpine areas. No records within 5000m.	None
Dianella amoena Matted Flax-lily	Endangered	Rare	Habitat is native grasslands and grassy woodlands on fertile soils, mainly in northern and southern Midlands. Recorded in 2021.	Low
Diuris palustris Swamp doubletail	Not listed	Endangered	Occurs in coastal areas in grassy open eucalypt forest, sedgy grassland and heathland with tea-tree and paperbark on poorly- to moderately-drained sandy peat and loams, usually in sites that are wet in winter. Record of 4 specimens in 1970.	None
Epacris virgata Pretty Heath, Dan Hill Heath	Endangered	Vulnerable	Epacris virgata is restricted to sites in Beaconsfield and Kettering, where it occurs in dry sclerophyll forest. It is generally associated with grassy/heathy Eucalyptus ovata woodland/forest, but is also occasionally found in grassy/heathy Eucalyptus pulchella woodland/forest. No records within 5000m.	None
Eryngium ovinum Blue devil	Not listed	Vulnerable	Known in Tasmania from about 24 sites in the State's southeast and east, usually growing in fertile heavy soils in grasslands and grassy woodlands below about 350 m elevation. Occurs in gullies,	None

Species	Status EPBC	Status TSP	Habitat	Likelihood of presence in project area
			roadsides, Themeda grassland and open grassy woodlands, often in damp clays. Suitable habitat not present in project area. Observation of 229 specimens in 2020 in Jim Bacon Memorial Reserve in West Moonah, approximately 2.7km south east of project area.	
Eucalyptus risdonii Risdon peppermint	Not listed	Rare	Occurs on Permian mudstone from sea level to 150 metres. Habitat includes low open forest on very sunny ridges and north-west facing upper slopes. Record of 1 specimen in 2021 within 5000m.	None
Euphrasia scabra Yellow eyebright	Not listed	Endangered	Occurs in moist herb/sedge communities in grassy leads in marshes or in drier open grassy areas on hills at the headwaters of creeks. Record of 6 specimens in 2009.	None
Glycine latrobeana Clover Glycine, Purple Clover	Vulnerable	Vulnerable	Found in dry sclerophyll forest, native grassland and woodland, usually on flat sites with loose, sandy soil. It occurs on the East Coast, in the north, north-west and the Midlands. No records within 5000m.	None
Haloragis aspera Rough raspwort	Not listed	Vulnerable	Found only in wet areas in Tasmania. Last record of one specimen in 1895.	None
Hovea tasmanica Rockfield purplepea	Not listed	Rare	Usually found on dry, rocky ridges or slopes (mostly dolerite) in forest and riverine scrub. One record in 1975 within 5000m.	Low
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed	Endangered	Endangered	Native habitat is the growth suppression zone beneath large trees in grassy woodlands and grasslands. It occurs in dry, warm and fertile areas in Tasmania, on flat ground. Two plants recorded within 5000m in 1986.	None
Leucochrysum albicans subsp. Tricolor Hoary Sunray, Grassland Paper-daisy	Endangered	Endangered	Occurs in the west and on the Central Plateau and the Midlands, mostly on basalt soils. No records within 5000m.	None
Olearia hookeri Crimsontip daisybush	Not listed	Rare	Found on dry hills around Hobart, growing within eucalypt woodlands with a mixed grassy-shrubby understorey, the dominant eucalypt is Eucalyptus amygdalina, E. risdonii or E. tenuiramis. Recent records (January 2024) in Wellington Park, along Limekiln Fire Trail and Merton and Lower Merton Fire Trails in Glenorchy.	Low
Ozothamnus reflexifolius Reflexed Everlasting	Vulnerable	Vulnerable	Known from a single site in the Meehan Range northeast of Hobart, on a large dolerite rock plate, with plants occurring in either Allocasuarina verticillata (sheoak) woodland, open heath or in crevices in sheer dolerite. Listing statement indicates likelihood of additional sub populations is low. No records within 5000m.	None

Species	Status EPBC	Status TSP	Habitat	Likelihood of presence in project area
Pellaea calidirupium Hotrock fern	Not listed	Rare	Found in inland, rocky habitats in areas of low to moderate rainfall. Grows in crevices and on ledges on exposed or semi-exposed rock outcrops. Record of 2 specimens in 2021 within 5000m.	None
Pimelea curviflora var. gracilis Slender curved riceflower	Not listed	Rare	Predominantly occurs in the north of the State in wet sclerophyll forest, especially in disturbed areas. 1 specimen recorded in 1945 within 5000m.	None
Pimelea flava subsp. flava Yellow riceflower	Not listed	Rare	Prefers moderately fertile sites, such as shrubby/scrubby Eucalyptus amygdalina damp sclerophyll forest. Recent records (January 2024) in Wellington Park predominantly along fire trails including Knights Creek Track, Quarry Firetrail and Talosa Fire Trail.	Low
Pomaderris pilifera subsp. Talpicutica Moleskin Dogwood	Vulnerable	Vulnerable	Only confirmed sites at East Risdon and Boyer, both associated with skeletal soils in open heathy/shrubby woodland dominated by Eucalyptus amygdalina or E. risdonii. No records within 5000m.	None
Prasophyllum amoenum Dainty Leek-orchid	Endangered	Endangered	Known from the Snug Tiers and the western summit of Mt Wellington, where it grows in sub-alpine buttongrass moorland and alpine moorland. The habitats in the project area are unsuited to this species. No records within 5000m.	None
Prasophyllum apoxychilum Tapered Leek-orchid	Endangered	Endangered	Occurs in coastal and near-coastal areas in a variety of habitats, including open eucalypt forest with an understorey ranging from grassy to densely shrubby coastal heathland, sedgey heathland and woodland, and sedgey heathland. Soils include sandy loams, clay loams and gravelly loams. In the Hobart area this species is restricted to the Knocklofty Reserve in West Hobart. No comparable habitat in study area. No records within 5000m.	None
Prasophyllum perangustum Knocklofty Leek-orchid	Critically Endangered	Endangered	Known only from one small population in Knocklofty Park in the foothills of Mt. Wellington at about 350m asl. All records are from Knocklofty and it is unlikely to occur elsewhere. No records within 5000m.	None
Pseudocephalozia paludicola Alpine Leafy Liverwort	Vulnerable	Not listed	Species mostly occurs on permanently damp mineral soil or over peat and frequently found in moorland and sphagnous areas. Occurs on wet ground in subalpine grassland in the west of the State and on its central and eastern mountains. No records within 5000m.	None
Pterostylis squamata Ruddy greenhood	Not listed	Vulnerable	Found mainly in grassy and heathy eucalypt woodland in lowland areas in the north, east, southeast and the Midlands. Record of 1 specimen in 1966 within 5000m.	None

Species	Status EPBC	Status TSP	Habitat	Likelihood of presence in project area
Puccinellia perlaxa Spreading saltmarshgrass	Not listed	Rare	Known only from one site in Tasmania, a creek bed in a saline area of a paddock in the Midlands. Record of 1 specimen in 1923 within 5000m.	None
Scleranthus fasciculatus *Spreading knawel*	Not listed	Vulnerable	Recorded in limited locations in Midlands and south east, including Queens Domain, in tussock grassland/grassy woodland. Recent records (January 2023) in cleared land at Ancanthe Park and private land in Lenah Valley.	Low
Senecio squarrosus Leafy fireweed	Not listed	Rare	Occurs predominantly in lowland damp tussock grasslands, wet and dry forests (often grassy). Record of 33 specimens recorded in 2020 within 5000m. Habitat not present.	None
Thelymitra bracteate Leafy sun-orchid	Not listed	Endangered	Occurs in open grassy and heathy forest/woodland on sedimentary substrates such as mudstone and sandstone. Record of 1 specimen in 1970 in Lenah Valley within 5000m.	None
Tricoryne elatior Yellow rushlily	Not listed	Vulnerable	Grows in grasslands, heaths and open woodland. Record of 1 specimen in 1881.	None
Velleia paradoxa Spur velleia	Not listed	Vulnerable	Grows within forest, grassy woodlands or grasslands on dry sites. Record of 92 specimens in 2021 and in 2010 on private land in Austins Ferry, Rosetta and Glenorchy.	Low
Vittadinia cuneata var. cuneata Fuzzy new holland daisy	Not listed	Rare	Occurs in areas of low rainfall on fertile and infertile soils, predominantly in dry sclerophyll forest around Hobart, Midlands and the north-east. Record of 1 specimen in 1934 within 5000m.	Low
Vittadinia gracilis Wooly new holland daisy	Not listed	Rare	Known from dry sites on dolerite and basalt, predominantly in dry sclerophyll forest around Hobart, Midlands and the north-east. Record of 3 specimens in 2000 within 5000m.	Low
Vittadinia muelleri *Narrowleaf new-holland daisy*	Not listed	Rare	Known from Hobart to Midlands on dry and fertile soils. Records (January 2024) approximately 800m north of the project area on cleared land in Rosetta.	Low
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy	Vulnerable	Vulnerable	Grows in swampy habitats such as sedgy-heathy wetlands, wet heathlands and woodlands, usually inundated for part of the year. No records within 5000m.	None
Threatened Fauna recorded within 500m of project area				
Lathamus discolor Swift Parrot	Critically Endangered	Endangered	Spends winter on mainland and migrates to Tasmania in late winter/spring to breed. During the breeding season, nectar from Tasmanian blue gum (*Eucalyptus globulus*) and black gum (*Eucalyptus*	Low

Species	Status EPBC	Status TSP	Habitat	Likelihood of presence in project area
			ovata) flowers is the primary food source. breed in tree hollows in mature eucalypts within foraging range of a flower source. Few large eucalypt trees present in the project area and no suitable hollows observed during site assessment (two basal hollows are not likely to provide suitable habitat). There may be a number of suitable trees for nesting and foraging in the vicinity of the project area. Most recent record was in 1997 approximately 200m to the north of the project area.	
Hirundapus caudacutus White-throated Needletail	Vulnerable	Not listed	Migratory species, breeding in Siberia, Mongolia, northern-eastern China and northern Japan. spends its non-breeding season in eastern and south-eastern Australia including Tasmania. This species is almost exclusively aerial, occurring over most types of habitat with a preference to wooded areas, open forests, heathland and rainforests. Observation of one bird in 1992 approximately 200m north of the project area.	Low
Tyto novaehollandiae castanops (Tasmanian population) Masked Owl (Tasmanian)	Vulnerable	Endangered	Requires a mosaic of forest and open areas for foraging and eucalypt forest and woodlands with large old-growth hollow-bearing trees for nesting/roosting. These habitats are not present in the project area. There may be a number of suitable trees for nesting and foraging in the vicinity of the project area. There is one record of a specimen observed approximately 200m north of the project area from 1991, however there is a low likelihood of birds using the project area for foraging and no suitable trees for nesting.	Low
Perameles gunnii gunnii Eastern Barred Bandicoot (Tasmania)	Vulnerable	Not listed	Occurs in mosaic habitats of pasture and remnant native forest, often with a significant amount of cover provided by weeds such as gorse and blackberry. Prefers open grassy areas for foraging and thick vegetation cover for shelter and nesting. One animal recorded approximately 200m north of the project area in 2022. Possible that the species could utilise the project area for foraging to some extent.	Low
Sarcophilus harrisii Tasmanian Devil	Endangered	Endangered	Lives in a wide range of habitats across Tasmania, especially in landscapes with a mosaic of pasture and woodland. Den sites are generally in dense vegetation, hollow logs, burrows or caves. The general vicinity of the project area may provide suitable foraging territory, and two basal hollows may provide potential shelter, but suitable denning habitat is unlikely to be present in the project area. The last record was of one animal from 1976 approximately 400m north of the project area.	Low

Species	Status EPBC	Status TSP	Habitat	Likelihood of presence in project area
Threatened Fauna recorded within 5000m of project area				
Acanthornis magna subsp. Greeniana *KingIsland scrubtit*	Critically endangered	Endangered	Restricted to King Island, with estimated population of 200 birds. A record from 1894of one bird within 5000m of project area.	None
Accipiter novaehollandiae *Grey goshawk*	Not listed	Endangered	Nests in mature wet forest, usually in the vicinity of a watercourse. Most nests are located in the north and west of the State, but smaller breeding populations also occur in the south-east and north-east Birds can also be seen in open woodland and around urban fringes near prey habitat. Most recent record of birds in 2023.	Low
Ceyx azureus diemenensis Tasmanian Azure Kingfisher	Endangered	Endangered	found in shady and overhanging forest vegetation along the forested margins of major rivers on the south, west, north and northwest coasts.	None
Aquila audax fleayi *Tasmanian* Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian)	Endangered	Endangered	Mature birds or breeding pairs defend a large territory, nesting in patches of mature forests with sheltered aspects and large trees, typically eucalypts, throughout Tasmania. No birds recorded within 500m of [project area and no nests recorded within 5000m. Potential nesting habitat may occur in large trees in the vicinity of the project site, however the proximity to residential dwellings, urban areas and recreational use would make the area unattractive to breeding birds.	Low
Ardenna grisea *Sooty shearwater*	Vulnerable	Not listed	Forages in open ocean, breeds on islands off Tasmania.	None
Haliaeetus leucogaster *White bellied sea eagle*	Not listed	Vulnerable	occurs around the coast, and inland along larger rivers, lakes and dams. Nests in tall trees in mature forests or more rarely on sea cliffs and rock stacks. Birds will also nest in low coastal scrub where cliffs or tall trees are not available.	None
Neophema chrysostoma Blue-winged Parrot	Vulnerable	Not listed	Favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones. Records of 4 birds in 2023.	None
Pardalotus quadragintus Forty-spotted Pardalote	Endangered	Endangered	occurs in only a few small areas within the State. Restricted to forest and woodland along the east coast containing mature white gum (Eucalyptus viminalis). Feed mainly on invertebrates which they take from branches and leaves high in the canopy of eucalypts. Predominantly uses hollows and crevices in live or dead eucalypts for nest sites. There are no records of birds observed within 500m of the project area. No likelihood of breeding in the project area. Individual large eucalypts present on site may provide foraging habitat for non breeding birds.	Low

Species	Status EPBC	Status TSP	Habitat	Likelihood of presence in project area
Podiceps cristatus *Great crested grebe*	Not listed	Vulnerable	lives on rivers, lakes and estuaries but in Tasmania, are thought to breed only on Lake Dulverton near Oatlands.	None
Dasyurus viverrinus Eastern Quoll, Luaner	Endangered	Not listed	Occur in rainforest, heathland, alpine areas, and scrub, but prefer dry grassland and forest mosaics, bounded by agricultural land, particularly where pasture grubs are common. No records within 500m of project area. While there is a low potential for this species to occur at the project area, the significance of the habitat is considered low given the larger tracts of undisturbed forest and woodland surrounding the project area.	Low
Dasyurus maculatus maculatus (Tasmanian population) Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population)	Vulnerable	Rare	Habitat important to the Spotted-tailed Quoll includes large patches of forest containing adequate denning sites and high densities of mammalian prey such as rats, possums and small wallabies. No records within 500m of project area. While there is a low potential for this species to occur at the project area, the significance of the habitat is considered low given the larger tracts of undisturbed forest and woodland surrounding the project area.	Low
Tringa nebularia *Common greenshank*	Endangered	Not listed	Wading bird, recorded in 1983.	None
Eubalaena australis *Southern right whale*	Endangered	Endangered	Marine mammal.	None
Mirounga leonina subsp. Macquariensis Southern elephant seal	Vulnerble	Endangered	Marine mammal.	None
Other threatened fauna with potential within 5000m based on range boundaries only (no records)				
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog	Vulnerable	Vulnerable	In Tasmania, the species occurs in lowland areas in the south-east and north, breeding in permanent freshwater lagoons, generally with emergent vegetation. It has declined significantly (over 20%) in range and abundance over the last 10 years, having disappeared from the Midlands, Derwent Valley, and much of the Hobart region.	None
Carinascincus microlepidotus Boulder Cool-skink, Southern Snow Skink	Endangered	Not listed	Forages amongst rocks and low vegetation in Alpine areas of southern and south-western Tasmania.	None
Ammoniropa vigens Ammonite Pinwheel Snail	Critically Endangered	Endangered	Occurs only in the Hobart area, in a variety of dry and wet forest habitats but has only been found under dolerite rocks.	Low

Species	Status EPBC	Status TSP	Habitat	Likelihood of presence in project area
Antipodia chaostola leucophaea Tasmanian Chaostola Skipper, Heath-sand Skipper	Endangered	Endangered	Restricted to dry forest and woodland supporting sedges of the Gahnia genus, and occurs in isolated populations.	Low
Pseudemoia pagenstecheri *Tussock skink*	Not listed	Vulnerable	Requires dense tussock grassland, typically Poa, where trees are absent.	None
Botaurus poiciloptilus Australasian Bittern	Endangered	Not listed	Occurs mainly in shallow, vegetated freshwater or brackish wetlands. Habitat not present in project area.	None
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit	Endangered	Not listed	Coastal fauna, non-breeding migrant wader.	None
Pachyptila turtur subantarctica Fairy Prion (southern)	Vulnerable	Endangered	Marine fauna.	None
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross	Vulnerable	Not listed	Marine fauna.	None
Sternula nereis nereis Australian Fairy Tern	Vulnerable	Vulnerable	Occurs in variety of habitats including lakes, estuaries, wetlands and coasts. Nests on sheltered beaches, spits and banks above the high tide line and below vegetation. Roosts on beaches at night.	None
Diomedea antipodensis gibsoni Gibson's Albatross	Vulnerable	Not listed	Marine fauna.	None
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel	Endangered	Not listed	Marine fauna.	None
Prototroctes maraena Australian Grayling	Vulnerable	Vulnerable	Fish that migrates between fresh and marine waters.	None
Thunnus maccoyii Southern Bluefin Tuna	Conservation Dependent	Not listed	Fish found in marine waters.	None

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