City of HOBART

6 July 2018

MEMORANDUM: GENERAL MANAGER

REQUEST TO GRANT LAND OWNER CONSENT TO LODGE A PLANNING APPLICATION

Site Address:	**Pipeline Track below 34 Grays Road, Fern Tree**
Description of Proposal:	**Upgrading stormwater infrastructure**
Applicant Name:	**James Wilson**
PLN:	**PLN-17-1060**

A request for landlord consent has been received for stormwater works as part of a planning application for a single dwelling on 34 Grays Road, Fern Tree. Much of the undeveloped space on the lot will be required for an on-site waste-water system. Stormwater cannot be retained on site. An existing stormwater pipe under the Pipeline Track is proposed to be upgraded for the stormwater to connect to an existing watercourse between 787 and 785 Huon Road.

The Pipeline Track is listed as a place of historic heritage significance in code E13.0 of the Hobart Interim Planning Scheme. All works on the track are to be carried out in accordance with the *Design Guidelines – Hobart Mountain Water Supply System* as endorsed by Council in 2013.

Although detailed and final engineering drawings have not been provided, the landlord consent drawing note states that the grated pit and headwall will be in accordance with the *Design Guidelines – Hobart Mountain Water Supply System.*

An Environmental Management, Revegetation and Communication Plan for the stormwater infrastructure work will also be required to be submitted and approved by the Director of Parks and City Amenity once a planning permit has been issued, ensuring minimum disruption will occur for public access to the track, and to minimise physical impact of the works.

RECOMMENDATION

That pursuant to Section 52 of the *Land Use Planning and Approvals Act 1993*, the General Manager grant consent on behalf of the Hobart City Council as the owner/administrator of the above land to allow the applicant to make application to the City for a planning permit for the development described above and as per the attached documents.

(Jill Hickie)
SENIOR PARK PLANNER

ENDORSED:

(Glenn Doyle)
DIRECTOR PARKS AND CITY AMENITY

~~Approved~~ / **Not Approved**

(N D Heath)
GENERAL MANAGER

Date: 9/8/18

City of HOBART

Enquiries to: Jill Hickie
☎: (03) 6238 2887
✉: coh@hobartcity.com.au
Our Ref:

6 July 2018

Via Email: **james@fieldlabs.com.au**

Dear James,

NOTICE OF LAND OWNER CONSENT TO LODGE A PLANNING APPLICATION

Site Address:	**Pipeline Track below 34 Grays Road, Fern Tree**
Description of Proposal:	**Upgrading stormwater infrastructure**
Applicant Name:	**James Wilson**
PLN	**PLN-17-1060**

I write to advise that pursuant to Section 52 of the *Land Use Planning and Approvals Act 1993*, I grant my consent on behalf of the Hobart City Council as the owner/administrator of the above land for you to make application to the City for a planning permit for the development described above and as per the attached documents.

Please note that the granting of the consent is only for the making of the application and in no way should such consent be seen as prejudicing any decision the Council is required to make as the statutory planning authority or as the owner/administrator of the land.

Yours faithfully

(N D Heath)
GENERAL MANAGER

Attachment: Land Owner Consent

City of HOBART

LAND OWNER CONSENT TO LODGE A PLANNING APPLICATION

Site Address:	**Pipeline Track below 34 Grays Road, Fern Tree**
Description of Proposal:	**Upgrading stormwater infrastructure**
Applicant Name:	**James Wilson**
PLN:	**PLN-17-1060**

The land indicated above is owned or is administered by the Hobart City Council.

The applicant proposes to lodge an application for a permit, pursuant to the *Land Use Planning and Approvals Act 1993,* in respect to the proposal described above.

Part or all of the application proposes use and/or development on land owned or administered by the City located at (as shown on the attached plans).
Being and as General Manager of the Hobart City Council, I provide written permission to the making of the application pursuant to Section 52(1B)(b) of the *Land Use Planning and Approvals Act 1993.*

(N D Heath)
GENERAL MANAGER

Date: 9/7/18

This consent is for the making of a planning application only, and does not constitute landlord consent for the development to occur.

Attachments/Plans:

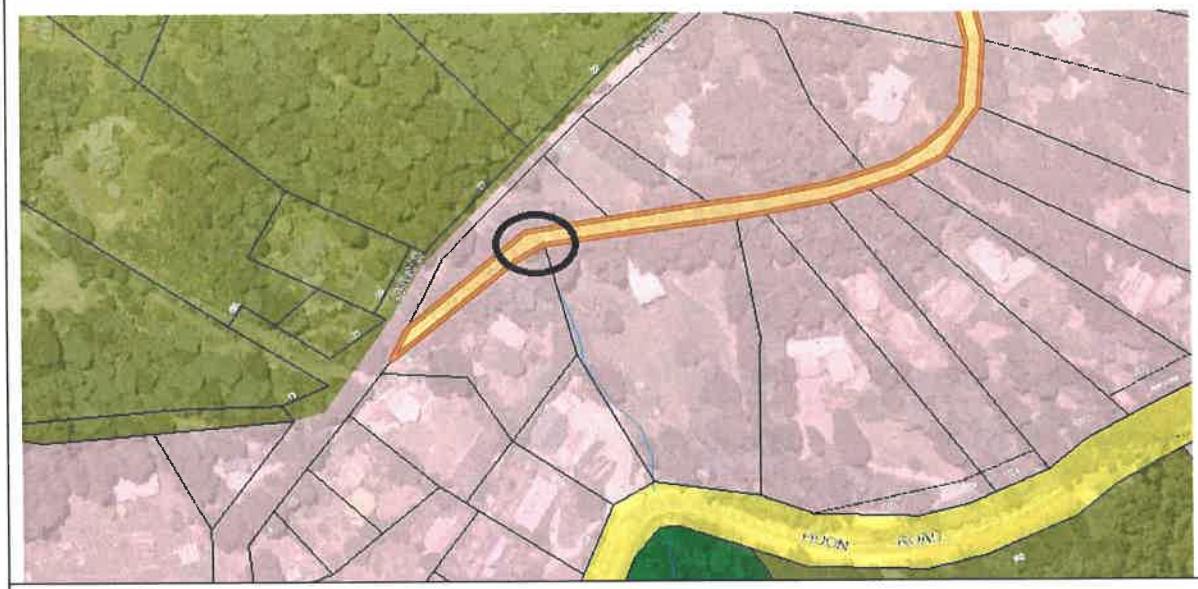

Figure 1. 34 Grays road is the triangular lot above the black circle which indicates vicinity of stormwater works proposed across pipeline track.

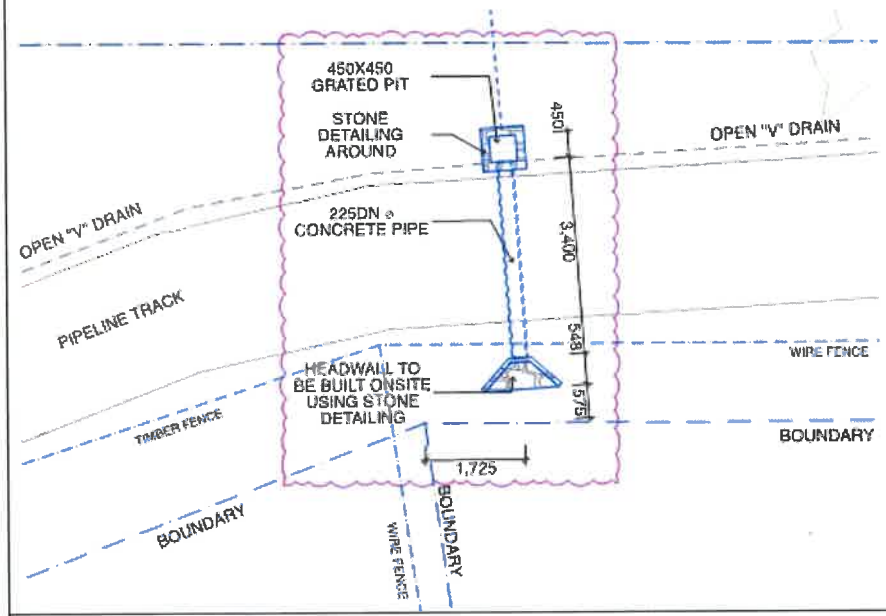

Figure 2. Excerpt from drawing Site-Stormwater – SK103 Rev D dated 3/7/2018.

Tasmanian Heritage Council

Tasmanian Heritage Council
GPO Box 618 Hobart Tasmania 7000
Level 3, 200 Collins St, Hobart Tasmania 7000
Tel: 1300 850 332
enquiries@heritage.tas.gov.au
www.heritage.tas.gov.au

PLANNING REF:	PLN-17-1060
THC WORKS REF:	5662
REGISTERED PLACE NO:	953
FILE NO:	15-15-53 THC
APPLICANT:	James Wilson
DATE:	20 August 2018

NOTICE OF HERITAGE DECISION

(*Historic Cultural Heritage Act 1995*)

The Place:	Hobart Mountain Water Supply System, Huon Rd, Fern Tree
Proposed Works:	Stormwater management at 30-34 Grays Road, Fern Tree

Under section 39(6)(b) of the *Historic Cultural Heritage Act 1995*, the Heritage Council gives notice that it consents to the discretionary permit being granted in accordance with the documentation submitted with Development Application 17-1060, advertised on 02/08/2018, subject to the following conditions:

1. **Plans submitted for a plumbing permit must include a section detail showing the proposed new stormwater culvert relative to the depth and alignment of the historic pipeline(s). A copy of this plan must be provided to Heritage Tasmania by the applicant prior to the commencement of works.**

Reason for condition
To ensure that the heritage values of the HMWSS may be properly considered and protected.

2. **The proposed work must be carried out in such a way that any excavation and/or the use of machinery that could impact on the historic pipeline must be monitored by a suitably qualified heritage consultant, familiar with the historic values of the Hobart Mountain Water Supply System.**

Reason for condition
To ensure that the heritage values of the HMWSS are properly considered and protected.

Please ensure the details of this notice, including conditions, are included in any permit issued, and forward a copy of the permit or decision of refusal to the Heritage Council for our records.

Please contact Russell Dobie on 1300 850 332 if you require clarification of any matters contained in this notice.

Ian Boersma
Works Manager – Heritage Tasmania
Under delegation of the Tasmanian Heritage Council

Bushfire Hazard Report

For proposed dwelling at 34 Grays Road, Fern Tree

Client: R. James

Prepared by: Andrew Welling (BFP-135) and Sarah Bunce (BFP-Prov.)

Date of Assessment: September 2017

Date of Report: December 2017

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Level 1, 2 Edward Street, Glebe – andy.welling@enviro-dynamics.com.au

Contents

Executive Summary

The following Bushfire Attack Level (BAL) assessment for 34 Grays Road, Fern Tree (Title Reference: 146945/1 and 2) has been carried out to accompany a building permit application for a new dwelling.

An assessment of the land was undertaken to determine if the site is 'Bushfire Prone' as defined under Construction of buildings in Bushfire-Prone Areas, AS3959-2009.

Under the 'Determination – Requirements for Building in a Bushfire-Prone Area' *Building Act 2000*, a Bushfire Attack Level (BAL) assessment for a new dwelling is required at the building application stage. This report includes a Bushfire Hazard Management Plan (BHMP) which is also a requirement under the 'Determination – Requirements for building in Bushfire-Prone Areas' *Building Act 2000* and the Building Regulations 2014.

The site assessment has been undertaken in consideration of the Hobart Interim Planning Scheme 2015 and the AS3959-2009 Construction of Buildings in Bushfire-Prone Areas.

The 0.25 ha property is located at 34 Grays Road, Fern Tree. It is on a south-east facing slope, approximately 480 m above sea level. The property lies between the Pipeline Track on its southeast boundary and Grays Road on its northwest boundary. The lot is surrounded by small to large residential lots within rural and environmental living zones. The northern portion of the lot, including the building envelope is cleared land, while the southern portion supports a patch of wet Eucalypt forest.

In accordance with the 'Requirements for Building in a Bushfire-Prone Area', the dwelling should be built to BAL 29 with a hazard management area (HMA) which achieves BAL 29 separation distances. Due to the small lot, the slope and the proximity of forest, a BAL-29 solution cannot be achieved through reliance on the Method 1 BAL assessment. In its place, a BAL-29 solution can be achieved with a performance solution under the Method 2 BAL assessment under AS 3959-2009.

In the absence of being able to achieve BAL 29 based on Deemed-to-Satisfy Requirements, the Tasmania Fire Service (TFS) assessed the fuel loads directly south of the site (the narrow strip along the Pipeline Track) using the Overall Fuel Hazard Assessment Guide. The TFS assessment confirmed heavily modified surface fuel loads and established that the likely radiant heat flux associated with the southern exposure is <29kW/sqm based on a Method 2 BAL assessment.

As a result of the fuel load assessment, TFS confirmed (in correspondence dated 22/11/2017) that the dwelling be built to BAL 29 and the following performance criteria be met:

- Minimum separation distances required between the proposed habitable building and classified vegetation are: 16 m to the northwest and northeast (forest upslope); and to the property boundaries to the southeast and southwest (forest downslope >15-20^{o}). These distances are the basis of the minimum hazard management area designated around the perimeter of the new dwelling as indicated in Table 1;
- New dwelling will need to comply with construction standards for BAL 29 as defined in AS3959-2009 (Sections 3 and 7) which will ensure a suitably defendable building; and
- Reticulated fire-fighting water will need to be installed to specifications described in Table 4.3A of the 'Requirements for Building in Bushfire-Prone Areas'; and

- Access which is less than 30 m long has no design and construction specifications as per Table 4.2 Element A of the 'Requirements for Building in Bushfire-Prone Areas'.

By building to BAL 29 and achieving the performance criteria, the construction requirements are appropriate for this restrictive building block.

Disclaimer

The assessor has taken all reasonable steps to ensure that the information provided in this assessment is accurate and reflects the conditions on and around the site and allotment on the date of this assessment. Whilst measures outlined in this report are designed to reduce the bushfire risk to the dwelling, due to the unpredictable nature of wildfires and impacts of extreme weather conditions the survival of the structure during a fire event cannot be guaranteed.

1. Introduction

The following Bushfire Attack Level (BAL) Assessment Report for 34 Grays Road (Title Reference 146945/1 and 2) has been carried out to accompany a residential building application which is within a bushfire-prone area due to classified vegetation within 100 m.

Under the 'Determination – Requirements for Building in a Bushfire-Prone Area' *Building Act 2000* (March 2016) and Building Regulations 2014, a Bushfire Attack Level (BAL) assessment and Bushfire Hazard Management Plan (BHMP) for a new dwelling are required at the building application stage.

This report provides an assessment of the BAL and recommends performance criteria to be incorporated into the BHMP as the site is unable to comply with HMA requirements as per the 'Determination – Requirements for Building in a Bushfire-Prone Area' *Building Act 2000* (March 2016) and AS3959-2009 Construction of Buildings in Bushfire-Prone Areas, National Construction Code (Vol. 2) and the Tasmania Fire Service publication: Guidelines for Development in Bushfire-Prone Areas 2005.

Site Details

Landowner: R. James

Location: 34 Grays Road, Fern Tree

Title ref: 146945/1 and 2 PID: 7581530

Municipality: Hobart City Council

Zoning: Rural Living – Hobart Interim Planning Scheme 2015

Planning Scheme Overlays: Biodiversity Protection Area, Fern Tree Cultural Landscape

Type of Building: New Class 1a building – 3-story residence

Date of Assessment: 27/09/2017

Assessment Number: ED1757

Site Description

The 0.25 ha property is located at 34 Grays Road, Fern Tree. It is on a south-east facing slope, approximately 480 m above sea level (Figure 1). The property is a triangular shape which lies between the Pipeline Track along its southeast boundary and Grays Road on its northwest boundary and a private property on the northeast boundary. It is surrounded by small to large residential lots within Rural and Environmental Living zones. The northern portion of the lot, including the building envelope is cleared land, while the southern portion is covered by wet Eucalypt forest. The underlying geology is Jurassic dolerite.

The lot is accessed off the south side of Grays Road. The lot has power and reticulated water. A fire hydrant is located approximately 30 m from the proposed dwelling site on the pipeline

track and a second fire hydrant is located on Grays Road approximately 100 m to the southwest of the proposed dwelling site.

Under the *Hobart Interim Planning Scheme* 2015 the property is zoned Rural Living. The lot contains a Biodiversity Protection Area across the whole lot and the Fern Tree Cultural Landscape overlay is across the southern portion of the lot and parallel to the pipeline track.

Building Proposal

The proposal is for the construction of a 3-story residence (New Class 1 building) with a deck in the north-east corner of the lot. The dwelling will be accessed off Grays Road by a less than 30 m long driveway to a carport on the northwest side of the building.

The bushfire assessment is based on site drawings and the building footprint of the proposed dwelling provided by Field Labs (Base drawing in Appendix 1).

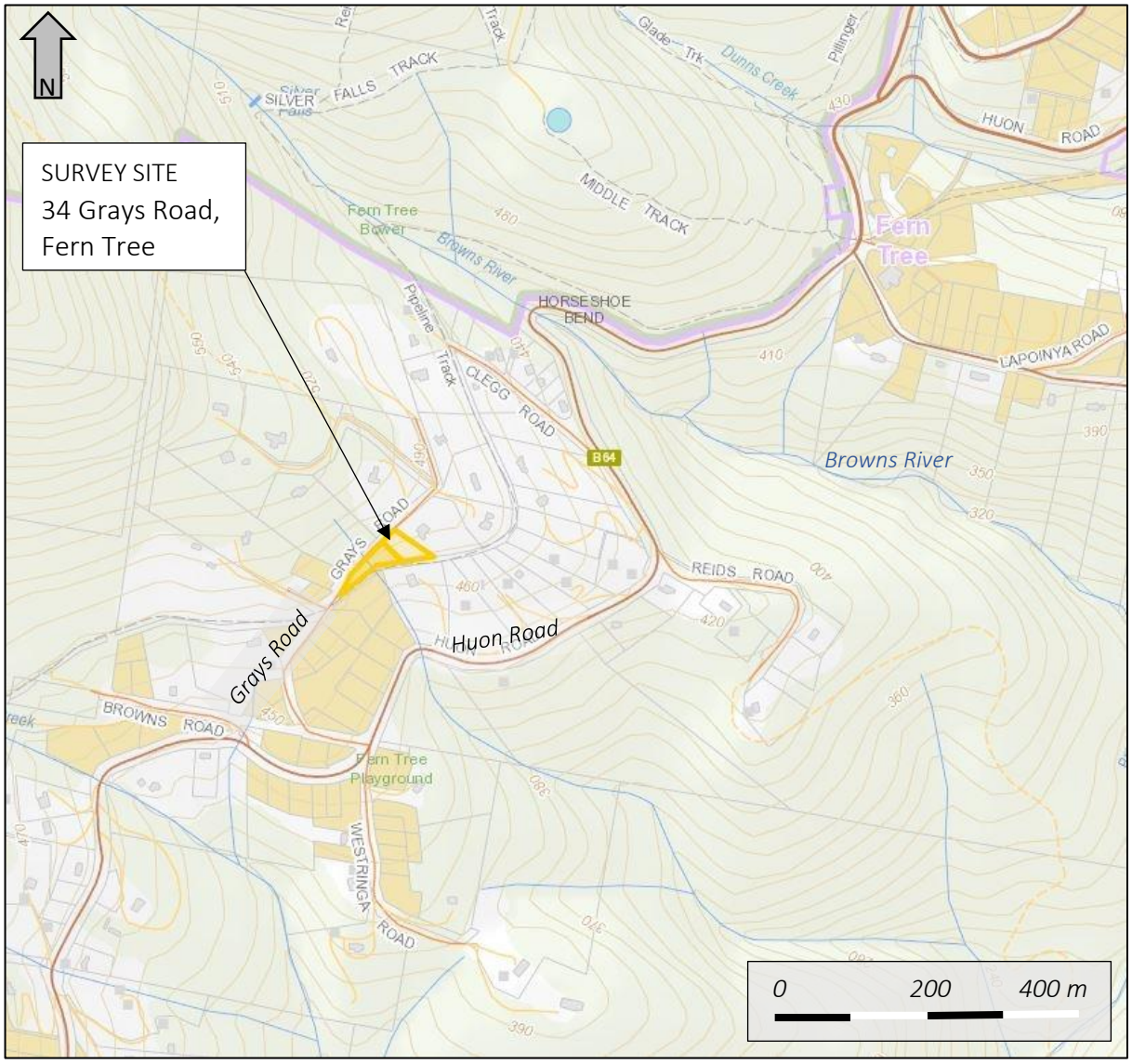


Figure 1 – Site Location Plan (Image source: TheList 2017)

2. Bushfire Attack Level Assessment

The following is a summary of the bushfire risk at the property.

Bushfire Hazard: Slope and forest vegetation.

Bushfire Attack Mechanisms: Radiant heat, ember attack, wind, direct flame and smoke.

Bushfire Threat Direction: The highest bushfire threat to the proposed residence is from ember attack from the forest vegetation upslope to the north. However, if fire was to sweep around the mountain, fire may also approach from downslope to the southeast and southwest.

Fire history in the area indicates the lot burned during the 1967 fires. The next closest bushfire occurred during the 1985-86 bushfire season and burned 50 ha to the southwest of the lot.

The Tasmania Fire Service (TFS) inspected the site to assess the fuel loads directly south of the site in the narrow strip along the Pipeline Track. Using the Overall Fuel Hazard Assessment Guide, TFS confirmed heavily modified surface fuel loads (4-10 t/ha as opposed to 25 t/ha assumed in AS 3959-2009). This has informed a Method 2 BAL assessment that has confirmed the likely radiant heat flux associated with the southern exposure is <29 kW/sqm.

Fire Danger Index: FDI 50 (this index applies across Tasmania).

Vegetation & Slope: Forest – *Eucalyptus regnans* forest (WRE)

Due to the position of the lot, on a steep (>15-20 ^{o}) south facing slope, adjacent to classified forest greater than 1 ha in area, the potential for bushfire to gain speed and travel through the forest crown poses increased risk to the proposed dwelling. This potential may be reduced by the fact that the steep slope is south facing and under a mixture of grassland, managed land and forest.

Significant Natural Values: No threatened flora species are recorded on the site (as per TheList and vegetation survey (Enviro-dynamics 2017).

The building envelope is situated within an existing cleared area classified as Urban land (FUR) under TASVEG 3.0. This area is largely covered by moss and introduced species. There are several large mountain ash (*Eucalyptus regnans*) around the eastern edge of clearing, along with scattered silver wattle, Tasmanian blanketleaf, cheesewood and shield fern. This forest vegetation is classified as *E. regnans* forest (WRE) which is not listed as a threatened vegetation community under Schedule 3A of the *Nature Conservation Act 2002*.

Refer to Table 1 for the summary of the BAL Assessment and Figure 2 for the BAL Site Assessment Area.

Table 1 – Summary of Bushfire Site Assessment

Direction of slope	Northwest	Northeast	Southeast	Southwest
Vegetation Type*	Forest	Forest	Forest (Grassland)	Forest (Managed land)
Distance to classified veg.	15 m	6 m	15 m (30 m)	10 m (58 m)
Effective slope under veg.	Upslope	Upslope	>15-20°	>15-20°
Current BAL value	BAL 40	BAL FZ	BAL FZ	BAL FZ
Width of HMA BAL 40	12-<16 m	12-<16 m	28-<37 m	28-<37 m
Width of HMA BAL 29	16-<23 m	16-<23 m	37-<51 m	37-<51 m

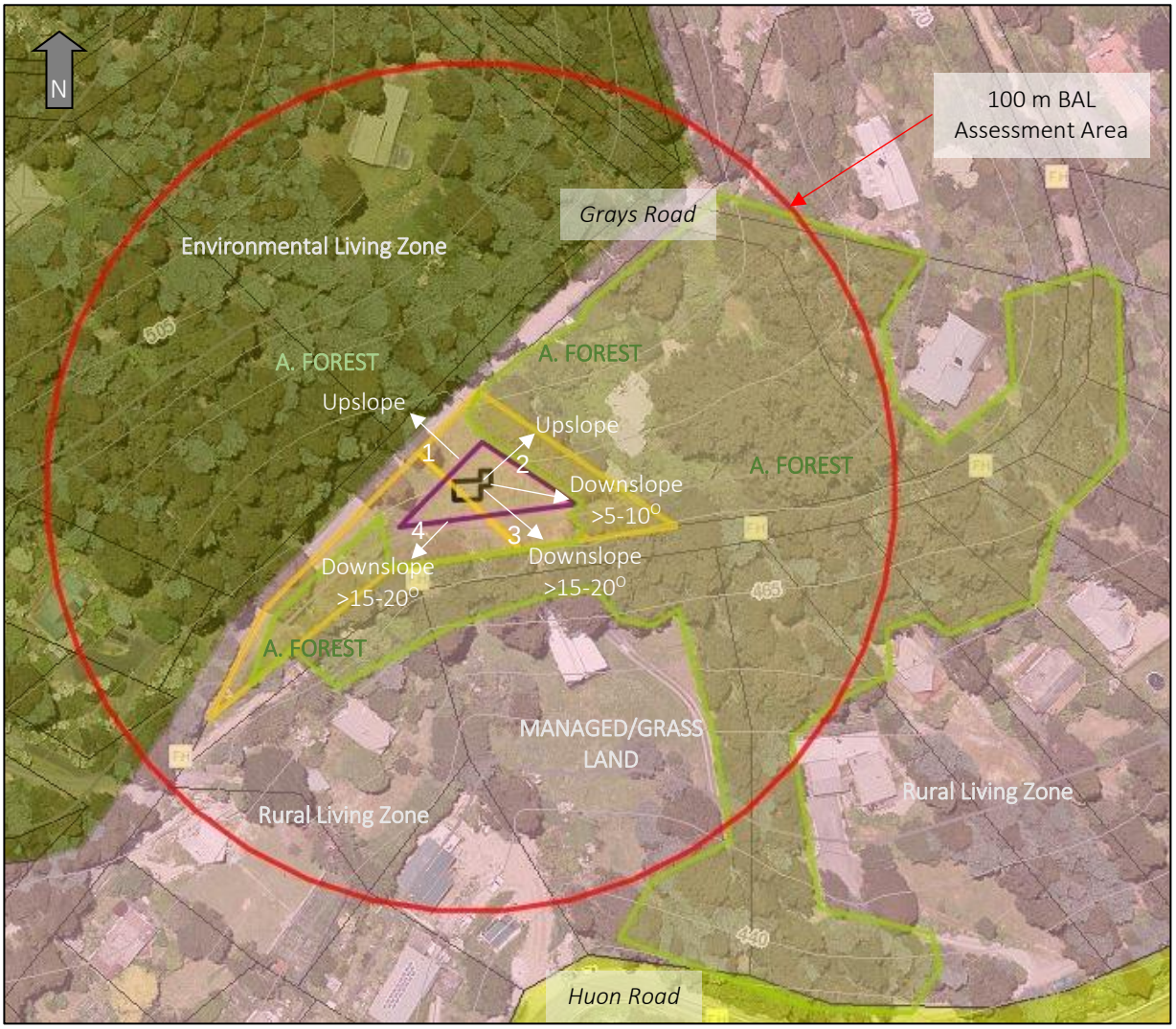


Figure 2: 100m radius BAL Assessment area showing surrounding vegetation, planning zones, slopes, direction of photos from proposed house site and Planning Zones (Appendix 2) (Image source: TheList 2017).

3. Bushfire Protection Measures

The site is within a defined Bushfire-Prone Area as it is within 100 m of contiguous native vegetation (forest) as defined under the 'Director's Determination Requirements for Building in Bushfire-Prone Areas' (2017). As such, to construct a "new building on a lot not provided with a BAL at the time of subdivision", minimum building standards must be met. The applicable standards are set out under clause 4 and Tables 4.1 to 4.4 of the 'Requirements for Building in Bushfire-Prone Areas'.

The proposal does not comply with the Deemed-to-Satisfy requirements of Clause 4.4 and Element B of Table 4.4 which require 'hazard management areas' with widths equal to or greater than the separation distances required for BAL 29 as per Table 2.4.4 of AS3959 – 2009 Construction of buildings in bushfire-prone areas.

However, the proposal demonstrates compliance with the Performance Requirements Clause 3, 1d of the 'Requirements for Building in Bushfire-Prone Areas' via a performance solution which applies the Method 2 BAL assessment based on the evaluation of the fuel loads downslope of the proposed dwelling. Using the Overall Fuel Hazard Assessment Guide, TFS confirmed heavily modified surface fuel loads (4-10 t/ha as opposed to 25 t/ha assumed in AS 3959-2009). This has informed the Method 2 BAL assessment that has confirmed the likely radiant heat flux associated with the southern exposure is <29 kW/sqm.

Table 2 – Compliance with 'Requirements for Building in Bushfire-Prone Areas'

CLAUSE			ISSUE (brief summary only)
2			Application of *Requirements for Building in Bushfire-Prone Areas*
3			Performance Requirements
		1 a	*Design & construct to reduce ignition from bushfire*
		1 b	*Provided with access to assist fire-fighting and evacuation*
		1 c	*Provided with access to sufficient fire-fighting water supply at all times*
		1 d	*Provided with appropriate separation distance from bushfire hazard*
4			Deemed-to-Satisfy Requirements
	4.1		Construction Requirements
	4.2		Property Access
	4.3		Water Supply for fire-fighting
	4.4		Hazard Management Areas
	4.5		Emergency Plan

Construction Requirements

The proposed development must meet requirements of Section 4 and any appropriate Elements of Table 4.1 of 'Requirements for Building in Bushfire-Prone Areas'. By maintaining distances between the dwelling and predominant vegetation class (Forest and Grassland) as outlined in Table 1, BAL 29 separation distances cannot be achieved at the site i.e. minimum 37 m separation distance on >15-20^{o} slope to forest. However, the heavily modified surface fuel loads (4-10 t/ha as opposed to 25 t/ha assumed in AS 3959-2009) use to inform a Method

2 BAL assessment has confirmed the likely radiant heat flux associated with the southern exposure is <29 kW/sqm and the bushfire risk is reduced. As a result, it is recommended that the new building be designed and constructed for BAL 29 in accordance with AS3959 – 2009 (Sections 3 and 7) or Standard for Steel Framed Construction in Bushfire Areas (NASH) as appropriate combined with the performance criteria for the HMA identified below.

Property Access

Requirements:

There are no specified design and construction requirements (Table 4.2 Element A) for a property access that is less than 30 m long.

Current conditions:

- It is noted that Grays Road may not meet standards for roads as defined in PD5.1 Section E1.6.2 and Table E1A in terms of dead-end road width.
- The Grays Road cul-de-sac may not to meet ARRB construction standards.

Compliance:

- As noted above there are no specified design and construction access requirements for this site.
- Improvements to Grays Road are recommended to reduce the risks associated with access by fire-fighting equipment during a bushfire event. However, it is noted that such improvements are outside of the control of the landowner.

Water Supply for Fire-Fighting

An adequate, accessible and reliable water supply for fire-fighting purposes must be supplied to allow for the protection of life and property from the risks associated with bushfire.

Requirements:

A new building constructed in a bushfire-prone area, must be provided with a water supply dedicated for fire-fighting purposes which must meet the requirements described for reticulated or static water supply in Table 4.3.

In the case of a reticulated water supply (Table 4.3A), the water supply must be: provided from a fire hydrant; located within the specified distance from the building to be protected; and provided with a hardstand and suitable connection as per the following requirements.

- The building area to be protected must be:
  - located within 120 metres of a fire hydrant; and
  - The distance must be measured as a hose lay, between the fire-fighting water point and the furthest part of the building area.
- Fire hydrant system must be:
  - Designed and constructed in accordance with TasWater Supplement to Water Supply Code of Australia WSA 03 – 2011-3.1 MRWA Edition 2.0; and

  - Fire hydrants are not installed in parking areas.
- Hardstand area for fire appliances must be;
  - No more than 3 m from water connection point, measured as a hose-lay (including the minimum water level in dams, swimming pools and the like);
  - No closer than 6 m from the building area to be protected;
  - With a minimum width of 3 m constructed to the same standard as the carriageway; and
  - Connected to the property access by a carriageway equivalent to the standard of the property access.

In the case of a static water supply (Table 4.3B), the water supply must meet the following requirements:

- Distance between building area to be protected and water supply:
  - Building area must be within 90 m of the water connection point of a static water supply measured as a hose lay.
  - The distance between the Class 1 buildings must be measured as a hose lay, between the water connection point and the furthest part of the building area.
- Static water supply requirements:
  - May have a remotely located off-take connected to the static water supply.
  - May be a supply for combined use (fire-fighting and other uses) but the specified minimum quantity of fire-fighting water must be available at all times.
  - Must be a minimum of 10,000 litres per building area to be protected. This volume of water must not be used for any other purpose including fire-fighting sprinkler or spray systems.
  - Must be metal, concrete or lagged by non-combustible materials if above ground; and
  - If a tank can be located so it is shielded in all directions in compliance with Section 3.5 of AS 3959-2009, the tank may be constructed of any material provided that the lowest 400 mm of the tank exterior is protected by: metal; non-combustible material; or fibre-cement a minimum of 6 mm thickness.
- Fittings and pipework and accessories requirements:
  - associated with a water connection point for a static water supply must: have a minimum nominal internal dia. 50 mm;
  - fitted with a valve with a minimum nominal internal dia. of 50 mm;
  - metal or lagged by non-combustible materials if above ground;
  - where buried, have a minimum depth of 300 mm (compliant with AS/NZS 3500.1-2003 Clause 5.23);
  - provide a DIN or NEN standard forged Storz 65 mm coupling fitted with a suction washer for connection to fire-fighting equipment;
  - ensure the coupling is accessible an available for connection at all times;
  - ensure the coupling is fitted with a blank cap and securing chain (minimum 220 mm length);
  - ensure underground tanks have either an opening at the top of not less than 250 mm dia. or coupling compliant with this Table; and

  - where a remote offtake is installed, ensure the offtake is in a position is: visible; accessible to allow connection by fire-fighting equipment; at working height of 450 – 600 mm above ground level; and protected from possible damage, including damage by vehicles.
- Signage for static water connections requirements:
  - Water connection point for a static water supply must be identified by a sign permanently fixed to the exterior of the assembly in a visible location. The sign must comply with:
    - Water tank signage requirements within AS 2304-2011; or
    - the following: Mark with the letter "W" contained with a circle with the letter in upper case of not less than 100 mm in height; In fade-resistant material with white reflective lettering and circle on a red background; Be located within one metre of the water connection point in a situation which will not impede access or operation; and be no less than 400 mm above the ground.
- Hardstand area for fire appliances must be provided;
  - No more than 3 m from water connection point, measured as a hose-lay (including the minimum water level in dams, swimming pools and the like);
  - No closer than 6 m from the building area to be protected;
  - With a minimum width of 3 m constructed to the same standard as the carriageway; and
  - Connected to the property access by a carriageway equivalent to the standard of the property access.

<u>Current conditions:</u>

- Site is in a reticulated water supply area.
- A fire hydrant is located at the intersection of the Pipeline track and Grays Road which is approximately 100 m from the proposed dwelling.
- There is no existing water storage on the lot.

<u>Compliance:</u>

- Proposed dwelling must comply with static fire-fighting water supply requirements as per the requirements section above; or ensure the building area is within reach of 120 m long hose connected to a fire hydrant in areas serviced by reticulated water.

Hazard Management Areas

Defined under the 'Requirements for Building in Bushfire-Prone Areas', a HMA is 'the area, between a habitable building or building area and the bushfire-prone vegetation, which provides access to a fire front for fire-fighting, which is maintained in a minimal fuel condition and in which there are no other hazards present which will significantly contribute to the spread of a bushfire'.

Further information on the maintenance of the equivalent 'defendable space' are also provided in the TFS document Guidelines for Development in Bushfire-Prone Areas of Tasmania (2005).

Requirements

The HMA requirements are outlined under Element B of Table 4.4 in Requirements for Building in Bushfire-Prone Areas for the proposed building type.

The HMA provides a cleared space (separation distance) between the building and the bushfire hazard. Any vegetation in this area needs to be strategically modified and then maintained in a low fuel state to protect buildings from direct flame contact and intense radiant heat thereby allowing them to be defended from lower intensity bushfires. Fine fuel loads must be minimal to: reduce the quantity of windborne sparks and embers reaching buildings; to reduce the radiant heat at the building; and to halt or check direct flame attack.

Current conditions

The site is partially cleared for the building envelope i.e. Title 146945/1 is cleared of native vegetation, but Title 146945/2 is not cleared.

Compliance

In the absence of being able to achieve an HMA with separation distances that comply with BAL 29, the HMA will comply with the following performance requirements and Attachment 1.

- HMA must be established across the whole of the lot (PID 7581530) with the aim of achieving minimum distance of 16 m to the northeast which will include Grays Road right-of-way. The minimum separation distance downslope to the southeast and southwest for BAL 29 is 37 m which cannot be achieved within the lot boundaries. The reduced HMA to the lot boundaries and including the pipeline track is approximately 21 m. This HMA achieves performance criteria because the pipeline track has heavily modified surface fuel loads (4-10 t/ha) and the likely radiant heat flux associated with the southern exposure is <29 kW/sqm.
- There are some mature trees within the HMA which may be retained provided they are at least 10 m from the dwelling and there is horizontal separation between tree canopies (min. 6 m) and low branches are removed to create vertical separation between the ground and the canopy.
- Small clumps of shrubs can be planted within the HMA provided they are further than 10 m from the dwelling and there is separation between clusters (min 10 m).

- Non-combustible elements including driveways, paths and short cropped lawns are recommended within the HMA.
- Fine fuels (leaves bark, twigs) should be removed from the ground periodically (pre-fire season) and all grasses or pastures must be kept short (<100 mm).
- Fuels are reduced sufficiently, and other hazards are removed such that the fuels and other hazards do not significantly contribute to the bushfire attack.

Maintenance

The HMA must be maintained in a minimal fuel state at all times for bushfire protection mechanisms to be effective. An annual inspection and maintenance of the HMA should be conducted prior to the bushfire season. All grasses or pastures must be kept short (<100 mm) and any flammable fine fuels at ground level such as leaves, litter and wood piles must be suitably managed. Small clumps of established trees and/or shrubs may be maintained to trap embers and reduce wind speeds. In addition, fire protection measures such as fire pumps and sprinkler systems must be tested to ensure functionality.

4. Conclusions

Based on the assessment of the bushfire risk of a proposed new dwelling at 34 Grays Road which indicates that it is not able to achieve the *Requirements for Building in Bushfire-Prone Areas* for a BAL 29 rating and approval from the TFS for the HMA separation distances identified in this report the following performance criteria are required:

- The whole of the lot will be managed as a HMA to achieve a minimum 16 m separation distance from the new habitable building to classified vegetation to the northeast and northwest. This separation distance includes Grays Road as part of the 16 m wide HMA. The separation distances to the southeast and southwest must extend to the property boundaries and include the pipeline track. This is the basis of the minimum HMA performance criteria designated around the perimeter of the proposed dwelling because the requirements set out in Table 4.4B of the Requirements for Building in Bushfire-Prone Areas as indicated in Table 1 (above) cannot be achieved. The forest and grassland vegetation must be managed to meet these separation distances.
- Building work must meet all construction standards for BAL 29 as per AS3959-2009 (Sections 3 and 7) as has been determined as a Performance Solution using Method 2 BAL assessment under AS 3959-2009.
- There are no specified requirements for the design and construction of the property access to the building envelope as it is less than 30 m long (Section 4.2 and Element A of Table 4.2 – Standards for Property Access).
- Provision of adequate, accessible, reliable water supply for fire-fighting purposes to meet the requirements of Section 4.3 and Table 4.3A – Reticulated Water Supply for Fire-fighting or Table 4.3B – Static Water Supply for Fire-fighting.

5. Recommendations

The recommendation is to adopt the BHMP as per Attachment 1.

Limitations of Plan

The bushfire protection measures outlined in this report are beyond the scope of a Fire Danger Index of 50 (FDI 50) which relates to a fire danger rating of 'very high'. Defending the property or sheltering within a structure constructed to *AS3959-2009* on days when the fire danger rating is greater than 50 (i.e. 'severe' or higher) is not recommended.

Due to the unpredictable nature of bushfire behaviour and the impacts of extreme weather no structure built in a bushfire-prone area can be guaranteed to survive a bushfire. The safest option in the event of a bushfire is to leave the area early and seek shelter in a safe location.

APPENDIX 1 – Base Drawing by Field Labs (June 2017)

ADDRESS 34 GRAYS ROAD, FERNTREE
PROPERTY ID 7581530
TITLE REF 146946/1
OWNER ROSEMARY ELLEN JAMES
DESIGNER J. WILSON CC 1043M
SITE AREA 2,565M2
FLOOR AREA 35M2 (HOUSE)
BUILDING CLASS 1A
BAL NA
SITE CLASS NA
CLIMATE ZONE NA

Field Labs

Telephone:
0437-255-439
Email:
james@fieldlabs.com.au
Accreditation:
CC 1043M

PROJECT

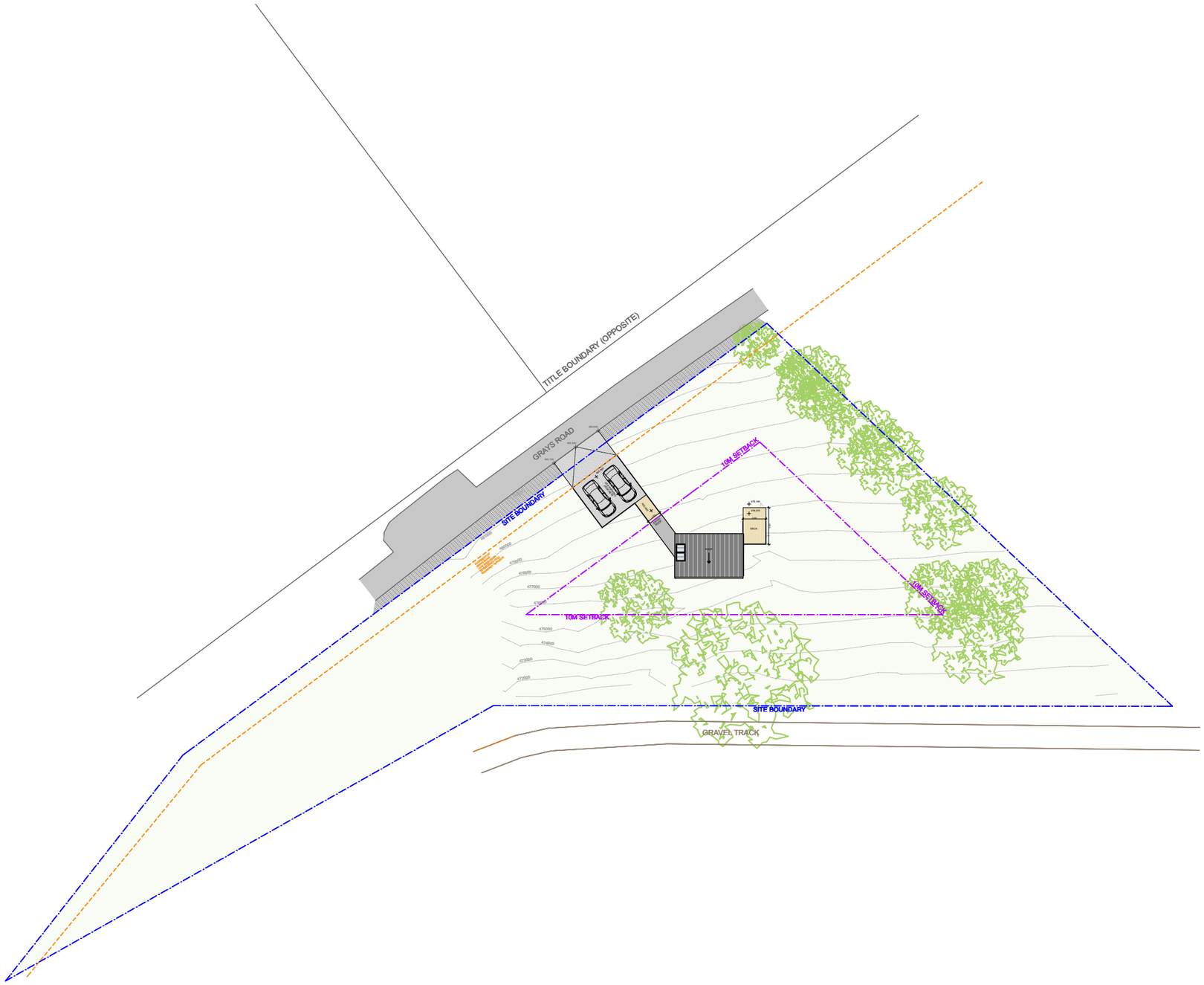
34 GRAYS ROAD, FERNTREE

REV A - WIP

ISSUE	REVISION ID	DATE
FOR INFORMATION	REV A - WIP	Work in Progress

SKETCH DESIGN DRAWING INDEX

SHEET	ID	NAME	CURRENT REVISION
SK100	SITE	AERIAL	REV A - WIP
SK101	SITE	AERIAL	REV A - WIP
SK102	SITE	LOCATION 1:500	REV A - WIP
SK200	PLANS	HOUSE (LOWER)	REV A - WIP
SK201	PLANS	HOUSE (GROUND)	REV A - WIP
SK202	PLANS	HOUSE (UPPER)	REV A - WIP
SK203	PLANS	HOUSE (ROOF)	REV A - WIP
SK300	ELEVATIONS	NORTH/SOUTH	REV A - WIP
SK301	ELEVATIONS	EAST/WEST	REV A - WIP
SK310	SECTIONS	01, 02 + 03	REV A - WIP
SK700	PROJECT IMAGE	HOUSE VIEW 01	REV A - WIP
SK701	PROJECT IMAGE	HOUSE VIEW 02	REV A - WIP
SK702	PROJECT IMAGE	HOUSE VIEW 03	REV A - WIP
SK703	PROJECT IMAGE	HOUSE VIEW 04	REV A - WIP
SK704	PROJECT IMAGE	HOUSE SECTIONS	REV A - WIP



1:500 | SITE

Field Labs

Telephone:
0437-255-439
Email:
james@fieldlabs.com.au
Accreditation:
CC 1043M

Client
#Client Full Name

Project Name
34 GRAYS ROAD, FERNTREE

Project Address
FIELDLABS TEMPLATE

Issue ID	Issue Name	Issue Date
REV A	FOR INFORMATION	Work in Progress

FOR INFORMATION

Issue ID	Issue Name	Issue Date

FOR INFORMATION

Drawing Title:
SITE - LOCATION 1:500

Scale: AS SHOWN @ A3 **Date:** 8/08/2017

Status: #Project Status **Checked By:**

Drawing No.:
SK102
REV A - WIP

EXTERIOR FINISHES
1. COLORBOND NAILSTRIP. (COLOR: DULUX 'MONUMENT')
2. FIXED CLEAR GLASS (2A OPAQUE GLASS)
3. OPERABLE CLEAR GLASS.
4. HARDWOOD SCREENING. (SPECIES TBC - NATURAL FINISH)
5. COLORBOND CLADDING/ROOFING
   (PROFILE TBC, COLOR: DULUX 'MONUMENT')
6. BLACK MILD STEEL SHEET ENTRY.

GRAYS ROAD

SITE BOUNDARY

10M SETBACK

ALIGNMENT OF GRAYS ROAD 10.06 WIDE FROM ESTABLISHED TITLE BOUNDARY OPPOSITE

482000
481000
480000
479000
478000
477000
476000
475000
474000

ENTRY ROOF

SKYLIGHT
SKYLIGHT

ROOF

A
B
1
2

4,590

7,300

10M SETBACK

1:100 | ROOF

Field Labs

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james@fieldlabs.com.au
Accreditation:
CC 1043M

Client
#Client Full Name

Project Name
34 GRAYS ROAD, FERNTREE

Project Address
FIELDLABS TEMPLATE

Issue ID	Issue Name	Issue Date
REV A	FOR INFORMATION	Work in Progress

FOR INFORMATION

Issue ID	Issue Name	Issue Date

FOR INFORMATION

N

Drawing Title:
PLANS - HOUSE (ROOF)

Scale: AS SHOWN @ A3 **Date:** 8/08/2017

Status: #Project Status **Checked By:**

Drawing No.:
SK203
REV A - WIP

APPENDIX 2 – Photos of vegetation across the property

Photo 1 – Forest across Grays Road to Northwest – Upslope

Photo 2 – Grassland and Forest to Northeast – Downslope >0-5°

Photo 3 – Grassland and Forest to the Southeast – Downslope >5-10^{o} towards Pipeline track

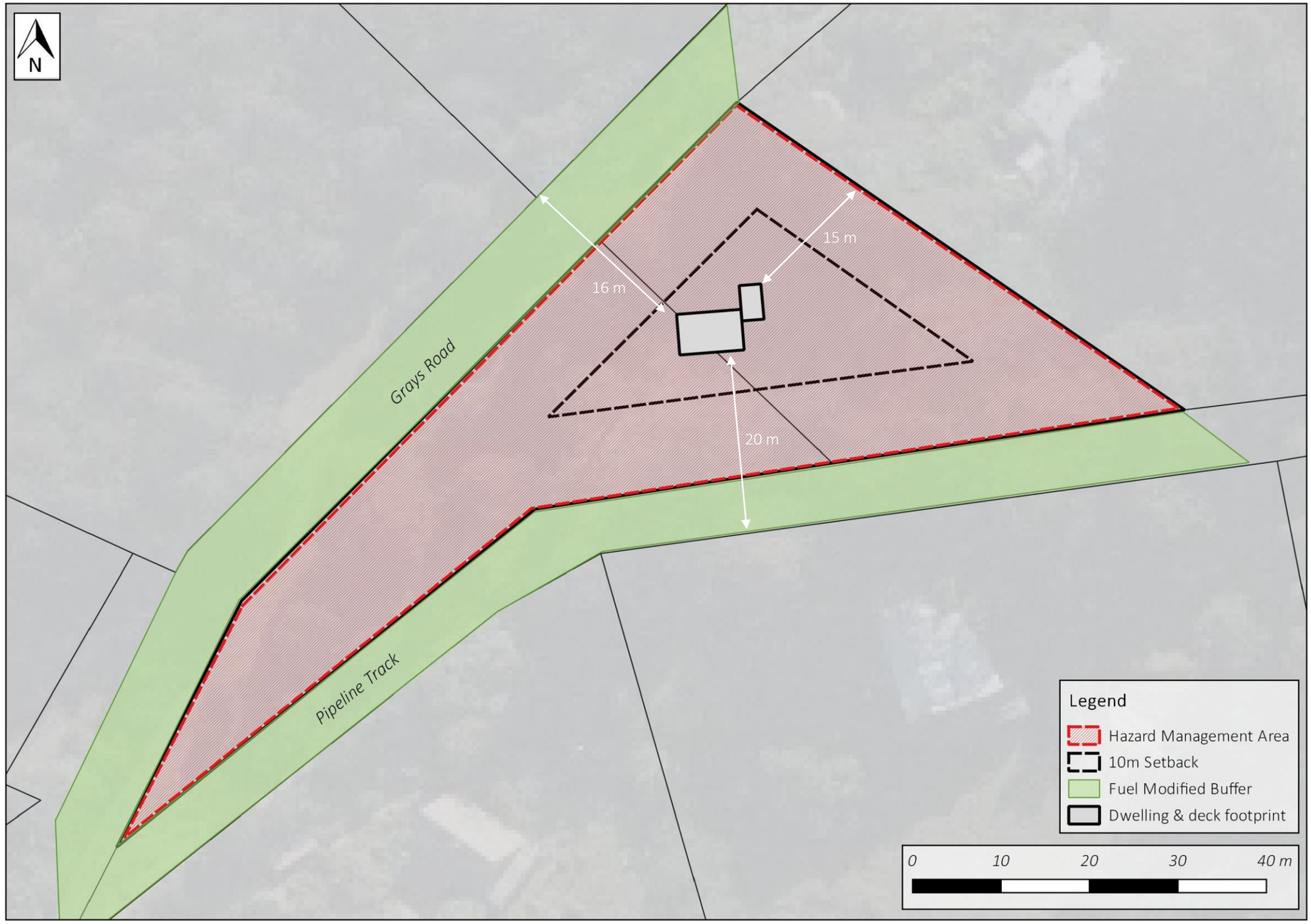
Photo 4 – Grassland and Forest to the Southwest – Downslope >5-10^{o} under grassland and >15-20^{o} under Forest

Photo 5 – Strip of forest >20 m wide and connected to area of bushfire prone vegetation that is greater than 1 ha in area to the South and Southeast. Beyond the forest strip, the vegetation is a combination of managed land and grassland – Downslope >15-20^{o}

Photos 6 – Site access is directly off Grays Road which is a 5 m wide paved road with one passing bay and no formal cul-de-sac i.e. turning requires a 3-point turn.

Photo 7 – The closest fire hydrant is located on the two-meter-wide Pipeline track downslope and within approximately 30 m of the proposed dwelling. The pipeline track is not deemed a suitable access for fire-fighting vehicles in terms of the Director's Determination – Building in Bushfire-Prone Areas. Another fire hydrant is located at the intersection of the pipeline track and Grays Road which is approximately 100 m from the proposed dwelling.

ATTACHMENT 1: Bushfire Hazard Management Plan



NOTES

Hazard Management Area

- HMA to be established to the property boundaries as discussed in the Bushfire Attack Level Assessment for BAL 29.
- Vegetation in the HMA needs to be strategically modified and then maintained in a low fuel state to protect buildings from direct flame contact and intense radiant heat. An annual inspection and maintenance of the HMA should be conducted prior to the bushfire season. All grasses or pastures must be kept short (<100 mm). Fine fuel loads at ground level such as leaves, litter and wood piles must be minimal to reduce the quantity of windborne sparks and embers reaching buildings, and to halt or check direct flame attack.
- Some trees can be retained provided there is horizontal separation (6 m) between the canopies and low branches are removed to create vertical separation between the ground and the canopy. Small clumps of established trees and/or shrubs may act to trap embers and reduce wind speeds.
- No trees to overhang house to prevent branches or leaves from falling on the building.
- Non-combustible elements including driveways, paths and short cropped lawns are recommended within the HMA.
- Fine fuels (leaves bark, twigs) should be removed from the ground periodically (pre-fire season) and all grasses or pastures must be kept short (<100 mm).

Construction Standards

- Dwelling must be constructed to comply with BAL 29 (north, east, south and west elevations) as per AS3959 – 2009 (Sections 3 and 7).

Access Requirements

- No specified requirements for design and construction of access to house site as per Section 4.2 and Table 4.2A of Requirements for Building in Bushfire-Prone Areas – specifications for access that is less than 30 m long.

Water Supply

- Must meet requirements of Section 4.3 and Table 4.3A **or** 4.3B of Requirements for Building in Bushfire-Prone Areas to ensure an adequate, accessible and reliable water supply for fire-fighting is supplied.

This plan is to be read in conjunction with the Bushfire Report (Enviro-dynamics, December 2017).

For: R. James – 34 Grays Road, Ferntree

Title: C.T. 146945/1 and 2 PID: 7581530

December 2017 Assessment #: ED1757

enviro-dynamics
environmental solutions for a changing world

Natural Values Report

For a residential development at 34 Grays Road, Fern Tree

For FieldLabs

December 2017

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enviro-dynamics

environmental solutions for a changing world

Level 1, 2 Edward Street, Glebe – andy.welling@enviro-dynamics.com.au

Contents

1. Introduction

This natural values report has been carried out as a requirement of a development application under the Hobart Interim Planning Scheme 2015. The property is zoned as Rural Living, and is within a Biodiversity Protection Area (BPA). Parts of the property are also covered by the Fern Tree Cultural Landscape overlay. As the development has the potential to impact on natural values within the BPA, a natural values assessment is required under the planning scheme.

Enviro-dynamics has been engaged to undertake the assessment on behalf of the proponent. This report details the findings of the assessment including results of a field survey and desktop analysis. It also assesses potential impacts and addresses requirements of the planning scheme.

2. Background

2.1 Property description

The 0.25 ha property is located at 34 Grays Road, Fern Tree. It is on a south-east facing slope, approximately 480 m above sea level (Figure 1). The property adjoins the Pipeline Track along its eastern boundary, and is surrounded by larger residential lots. The northern portion of the lot, including the building envelope is cleared land, while the southern portion is covered by wet Eucalypt forest. The underlying geology is Jurassic dolerite.

2.2 Development proposal

The proposal is to construct a three-storey residential dwelling within the existing cleared area (Refer to Site Plan in Appendix 1). The property is Bushfire Prone and as such will require Hazard Management Areas to be established.

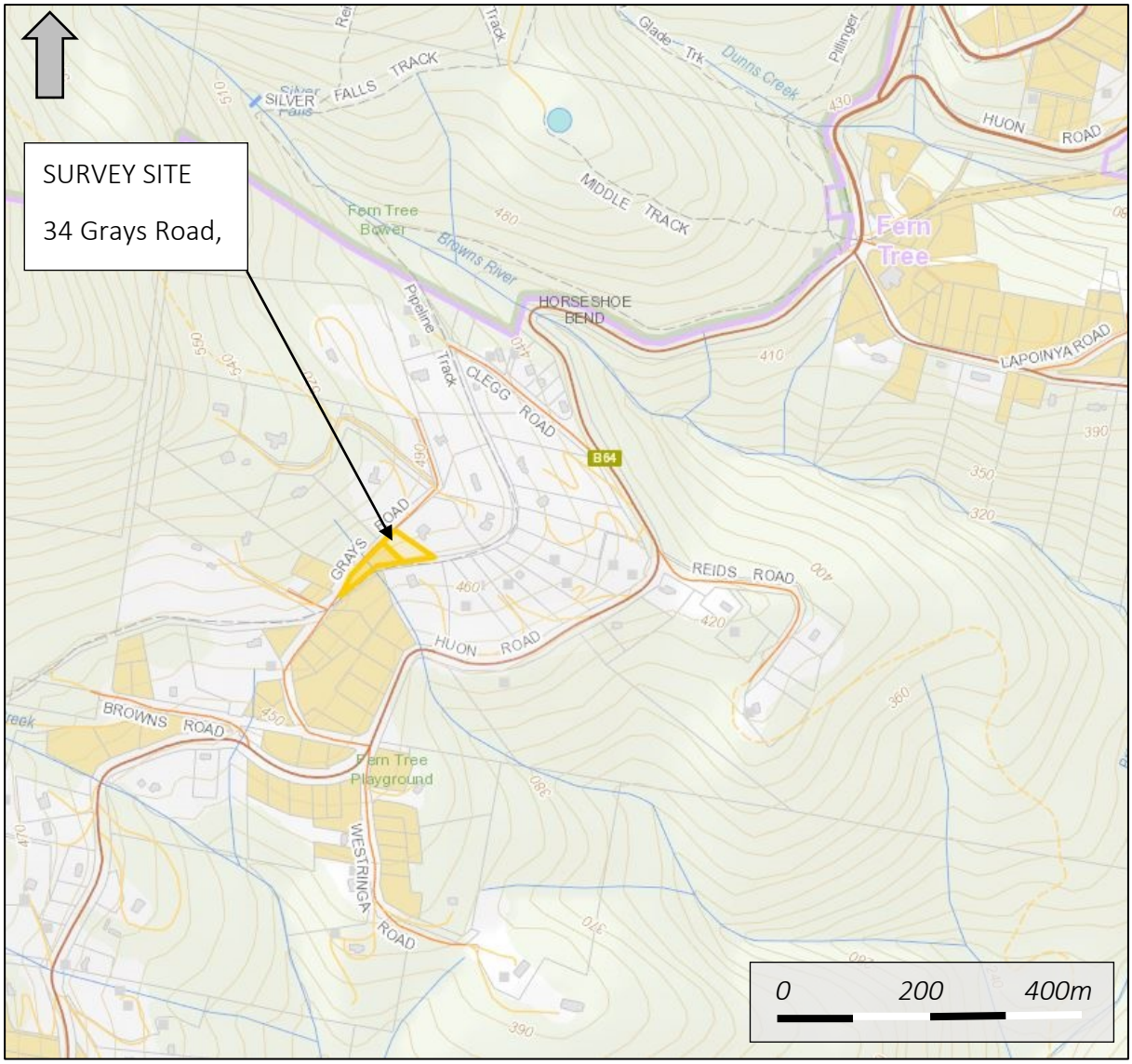

Figure 1 - Location of the site (Image source: TheList 2017).

3. Methods

The natural values assessment was undertaken in two stages; desktop analysis and field survey. The desktop analysis involved extracting data from a variety of sources, including:

- Natural Values Atlas (DPIPWE 2017)
- Protected Matters Search Tool (DEE 2017)
- LIST map

The field survey was undertaken by a single observer on the 11th September 2017 using a timed-meander method. All perceivable vegetation communities were mapped and classified according to TASVEG 3.0. All vascular plant species encountered were recorded, with an emphasis on detecting rare and threatened species. Searches for potential threatened fauna habitat e.g. tree hollows and den sites, and other evidence e.g. scats, diggings and tracks was also undertaken. No detailed fauna surveys were conducted.

Locations of threatened flora, fauna habitat and significant weeds were mapped with a handheld GPS and population data was captured e.g. numbers of individuals, area occupied etc. Geographic datum used was GDA94 Zone 55.

Taxonomic nomenclature for flora follows the latest Census of Vascular Plants of Tasmania (Baker & de Salas 2017). Classification of vegetation communities is in accordance with Kitchener and Harris (2013) and TASVEG 3.0.

3.1.1 Limitation of the survey

Whilst every effort was made to compile a complete list of vascular plants for the property, a single survey is unlikely to detect all species present due to seasonal/temporal variations. Some plants could not be identified to a species level due to a lack of flowers and others may have been overlooked due to a lack of fertile material. It is also possible that additional species are present but were dormant at the time of the survey.

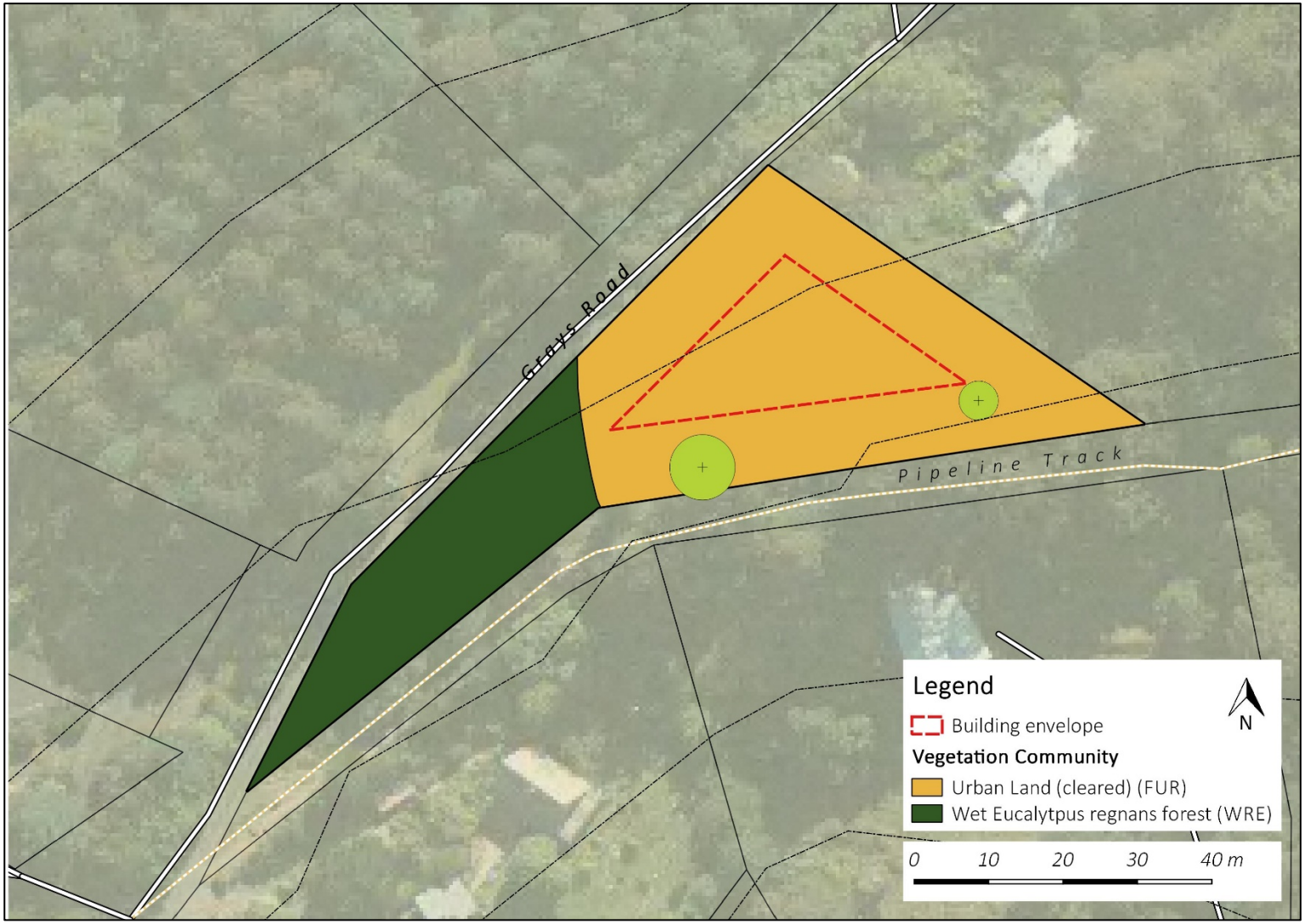

Figure 2 – Vegetation communities recorded on site.

4. Natural Values Assessment

4.1 Vegetation communities

The building envelope is situated within an existing cleared area classified as Urban land (FUR) under TASVEG 3.0. This area is largely covered by moss and introduced species such as Wiltshire fog (*Holcus lanatus*), foxglove (*Digitalis purpurea*), and blackberry (*Rubus fruticosus*). Buzzy (*Acaena novae-zeelandiae*), weeping grass (*Ehrharta stipoides*), fireweed (*Senecio minimus*), and pale rush (*Juncus pallidus*) are also common. There are several large mountain ash (*Eucalyptus regnans*) around the eastern edge of clearing, along with scattered silver wattle (*Acacia dealbata*), Tasmanian blanketleaf (*Bedfordia salicina*), cheesewood (*Pittosporum bicolor*), and shield fern (*Polystichum proliferum*).

Figure 3 - Cleared area (FUR) containing the building envelope.

The southern section of the lot contains a small area of native vegetation classified as *Eucalyptus regnans* forest (WRE).

Eucalyptus regnans forest

A small area of native vegetation classified wet *E. regnans* forest (WRE) (Figure 2). This wet forest vegetation has a tree canopy of mountain ash (*Eucalyptus regnans*). There is a tall shrub layer of silver wattle, Tasmanian blanketleaf, cheesewood, dogwood (*Pomaderris apetala*) and musk (*Acacia argophylla*). The lower shrub layer contains prickly currant bush (*Coprosma quadrifida*), and dollybush (*Cassinia aculeata*). Shield fern and tree fern (*Dicksonia antarctica*) are also prominent. The vegetation has been disturbed, and is infested with blackberry and foxglove.

Figure 4 – Eucalyptus regnans forest (WRE).

4.1.1 Conservation status of the vegetation communities

Eucalyptus regnans forest is not listed as a threatened vegetation community under Schedule 3A of the *Nature Conservation Act 2002*. WRE is classed as a low priority biodiversity value under Table E10 of the planning scheme.

4.2 Flora

A total of 17 vascular plant species were recorded during the survey, including 3 introduced species.

4.2.1 Threatened flora

No threatened flora species were recorded during the survey. There are no previous records of threatened flora within 500 m of the site (NVA 2017). Numerous threatened species have been recorded within 5 km, but very few of these are likely to occur within the site based on habitat. Species with some potential to occur based on habitat are listed in Table 1. For simplicity, those species with no probability of occurring have been excluded (e.g. coastal species, alpine species etc.).

Species	Status TSPA	Status EPBCA	Comments
Australina pusilla subsp. *muelleri* shade nettle	r		15 records within 5 km. Very restricted occurrence on the southern flanks of Mount Wellington in deeply shaded gullies within wet eucalypt forest. Unlikely to have been overlooked.
Isolepis habra wispy clubsedge	r		3 records within 5 km. Habitat preferences of this species are poorly understood, but has been previously recorded in Fern Tree. No clubsedge species detected during survey.
Pomaderris elachophylla small-leaf dogwood	v		5 records within 5 km. Occurs in wet forest habitat but only known from <10 small populations. Unlikely to have been overlooked.
Thismia rodwayi fairy lanterns	r		11 records within 5 km. Occurs in wet forest habitats in leaf litter on forest floor. Unlikely to occur based on small area of habitat and disturbed condition of site.

Based on the probability analysis in Table 1, no threatened species are likely to occur within the site. This is mainly due to the small size of remnant and the modified condition of the site.

4.2.2 Introduced Plants

A total of 3 introduced plant species were recorded during the survey. This included scattered plants of blackberry (*Rubus fruticosus*), which is listed as a declared weed under the *Weed*

Management Act 1999. Foxglove (*Digitalis purpurea*) was also prevalent across the property, which is a disturbance-induced environmental weed.

Figure 2 – Blackberry amongst native vegetation.

4.3 Fauna

4.3.1 Threatened fauna

No evidence of threatened fauna was observed during the survey. Several threatened fauna species have been recorded within 500 m of the site (NVA 2017) and may occur based on habitat. A number of threatened fauna species have been recorded within 5 km of the site, or have the potential to occur based on range boundaries. Those species with potential habitat are listed in Table 2 along with comments about the importance of the habitat. For simplicity, pelagic and migratory species have been excluded from the analysis.

Table 2 – List of threatened fauna species previously recorded within 5 km (NVA 2017)

Species	Status TSPA	Status EPBCA	Comments
Species recorded within 500 m			
grey goshawk *Accipiter novaehollandiae*	e		5 records within 500 m. Potential to forage over site, but no nest sites

Species	Status TSPA	Status EPBCA	Comments
Species recorded within 500 m			
			observed.
eastern quoll *Dasyurus viverrinus*		EN	2 records within 500 m. Potential to forage across site, but no potential den sites or important habitat present.
eastern barred bandicoot *Perameles gunnii*		VU	3 records within 500 m. Potential to forage across cleared area. Species is widespread in Tas and locally secure. No important habitat present.
tasmanian devil *Sarcophilus harrisii*	e	EN	16 records within 500 m. Potential to forage across site, but no potential den sites or important habitat present.
Species recorded within 5 km			
Tasmanian wedge-tailed eagle *Aquila audax* subsp. *fleayi*	e	EN	Potential to forage over site, but no nest sites recorded.
spotted tailed quoll *Dasyurus maculatus*	r	VU	Potential to forage across site, but no potential den sites or important habitat present.
swift parrot *Lathamus discolor*	e	CR	No potential foraging or nesting habitat within site.
mount mangana stag beetle *Lissotes menalcas*	v		Occurs in wet forest and Inhabits rotting logs on the forest floor. No suitable large logs present and unlikely to occur.
masked owl *Tyto novaehollandiae*	v	VU	Potential to forage across site, but no hollow bearing trees or important habitat present.

4.3.2 Threatened fauna habitat

The fauna habitat values of the property were determined during the assessment. No important habitat elements were recorded on the site such as trees with hollows or potential den sites. The site provides marginal foraging habitat for the Tasmanian devil and eastern quoll due to the small area of habitat. No potential den sites were recorded. The eastern barred bandicoot may also forage across the site but no nesting habitat is present.

The site contains no potential foraging habitat for swift parrot (i.e. no blue gum or black gum). No mature trees containing hollows were recorded. Likewise, no raptor nests were observed and the site contains no potential nesting habitat for goshawks or eagles.

5. Development Impacts

The impacts on natural values associated with the development will be limited to the modification of a small area of WRE vegetation within the bushfire management hazard area. The building envelope is positioned within an existing cleared area and will not require any clearance or conversion of native vegetation. There are two large *Eucalyptus regnans* trees (dbh >70 cm) near the eastern boundary of the site, which should be retained. These trees are outside of the building envelope and can be retained within the HMA provided the understorey is managed.

The site does not contain any important habitat for threatened species, and the proposal will not impact on any listed flora or fauna. WRE is not a threatened vegetation community and it does not contain any important habitat features for threatened fauna (e.g. tree hollows, potential den sites, large logs etc.).

5.1 Hobart Interim Planning Scheme 2015

The property is zoned Rural Living and is within a Biodiversity Protection Area. It is also within the Fern Tree Cultural Heritage Precinct and must meet the relevant provisions of the Historical Heritage Code (E13.9.2). An assessment of cultural values is outside the scope of this natural values report and should be addressed as part of the planning approval process.

Residential use is permitted on large lots within a Rural Living Zone, and vegetation clearance will be kept to a minimum in line with Desired Future Character Statement of the Zone.

E10.0 Biodiversity Code

Most of the property is covered by a Biodiversity Protection Area so the proposal must satisfy the relevant provisions of the Biodiversity Code. These are listed below, including a response to the criteria in bold.

E10.7 Development Standards for Buildings and Works

Clearance and conversion or disturbance must comply with one of the Acceptable Solutions under E10.7.1. This proposal meets Acceptable Solution A1 (b) as outlined below:

A1 (b) the development is for a single dwelling on an existing lot within the Low Density Residential Zone, Rural Living Zone or Environmental Living Zone and:

The proposal is for a single dwelling within a Rural Living Zone.

(i) clearance and conversion or disturbance is confined to Low Priority Biodiversity Values;

The dwelling is situated within existing cleared land and the native vegetation outside the building envelope is classed as a Low Priority Biodiversity Value. *Eucalyptus regnans* forest (WRE) is not listed as a threatened vegetation community, and no important habitat for any threatened species is present.

(ii)the area of clearance and conversion is no more than 3,000 m^2;

No native vegetation will be cleared or converted for the dwelling. The remaining vegetation on the lot will need to be managed to reduce fuel loads (see below).

(iii) the area of disturbance is no more than 3,000 m^2

Approximately 750 m^2 of WRE will be managed to establish the bushfire hazard management area. This will generally involve thinning understorey shrubs and small trees. Large trees and low risk elements of the understorey e.g. ferns can be retained (refer to Bushfire Report, Enviro-dynamics 2017).

Clearance and conversion or disturbance must also satisfy the following Performance Criteria for low priority biodiversity values:

P1 a (i) development is designed and located to minimise impacts, having regard to constraints such as topography or land hazard and the particular requirements of the development;

There is a designated building envelope for the site with the proposed dwelling situated within existing cleared land to minimise impacts. No native vegetation will be cleared or converted. Large trees near eastern boundary can be retained.

(ii) impacts resulting from bushfire hazard management measures are minimised as far as reasonably practicable through siting and fire-resistant design of habitable buildings;

Due to the narrow triangular shape of the site and the proximity of the surrounding vegetation, the entire lot is required to be managed as a hazard management area. The adjoining pipeline track and Grays Road along north west boundary provide an additional fuel modified zone. An estimated 750m^2 of WRE vegetation will be modified for the development.

6. Conclusion and recommendations

The proposed dwelling is situated within an existing cleared area, and will have minimal impact on natural values. There is a small area of degraded wet forest vegetation in the southern portion of the lot, classified as *Eucalyptus regnans* forest (WRE). This is not a threatened vegetation community, and does not contain any important habitat for threatened species. It is classed as a Low Priority Biodiversity Values under the Planning Scheme. The bushfire hazard management area encroaches on the WRE vegetation and a area of approximately 750m^2 will need to modified. The impacts will be limited to thinning of the understorey and removal of small trees such as silver wattles and will not result in the complete loss of vegetation.

No threatened flora species were recorded during the survey, and it is highly unlikely that the site would support any threatened species populations based on habitat. Likewise, a number of threatened fauna species are known from the local area, but there are no important habitat features such as potential den sites, tree hollows or raptor nests within the site.

There is a scattered infestation of blackberry (*Rubus fruticosus*) across the property, which is a declared weed and should be controlled. There is also an infestation of foxglove across the property, which is likely to increase after disturbance. Control measures should be undertaken prior to the commencement of works to contain the spread of these weeds. Annual monitoring and follow-up treatment will be required for several years following initial treatment.

Best practice hygiene procedures should be followed during the development phase to ensure that other weeds are not introduced to the site. This should include wash-down procedures for equipment prior to entering the site, and the use of uncontaminated materials. Vehicles and machinery should also be free of soil prior to leaving the site to prevent the spread of blackberry and foxglove. Further information regarding best practice hygiene protocols is available from the '*Tasmanian Wash-down Guidelines for Weed and Disease Control'.*

The following recommendations are provided to minimise impacts on the natural values of the site and improve the condition of the retained vegetation.

Recommendations

- Large trees near the eastern boundary and in the south western portion of the site can be retained provided the provisions of he bushfire report are complied with.
- Blackberry and foxglove is to be controlled prior to works commencing to prevent further spread. Ongoing monitoring and follow-up control should be undertaken for several years.
- Weed hygiene measure should be followed to prevent introducing other weeds. All machinery and equipment must be free of soil prior to leaving the site. Top-soil should be stockpiled and must remain on-site.
- Any soil or gravel imported to the site for construction or landscaping purposes should be from a weed free source to prevent the establishment of other weeds.

References

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de Salas, M.F. and Baker, M.L. (2017) *A Census of the Vascular Plants of Tasmania, including Macquarie Island*. (Tasmanian Herbarium, Tasmanian Museum and Art Gallery, Hobart) www.tmag.tas.gov.au

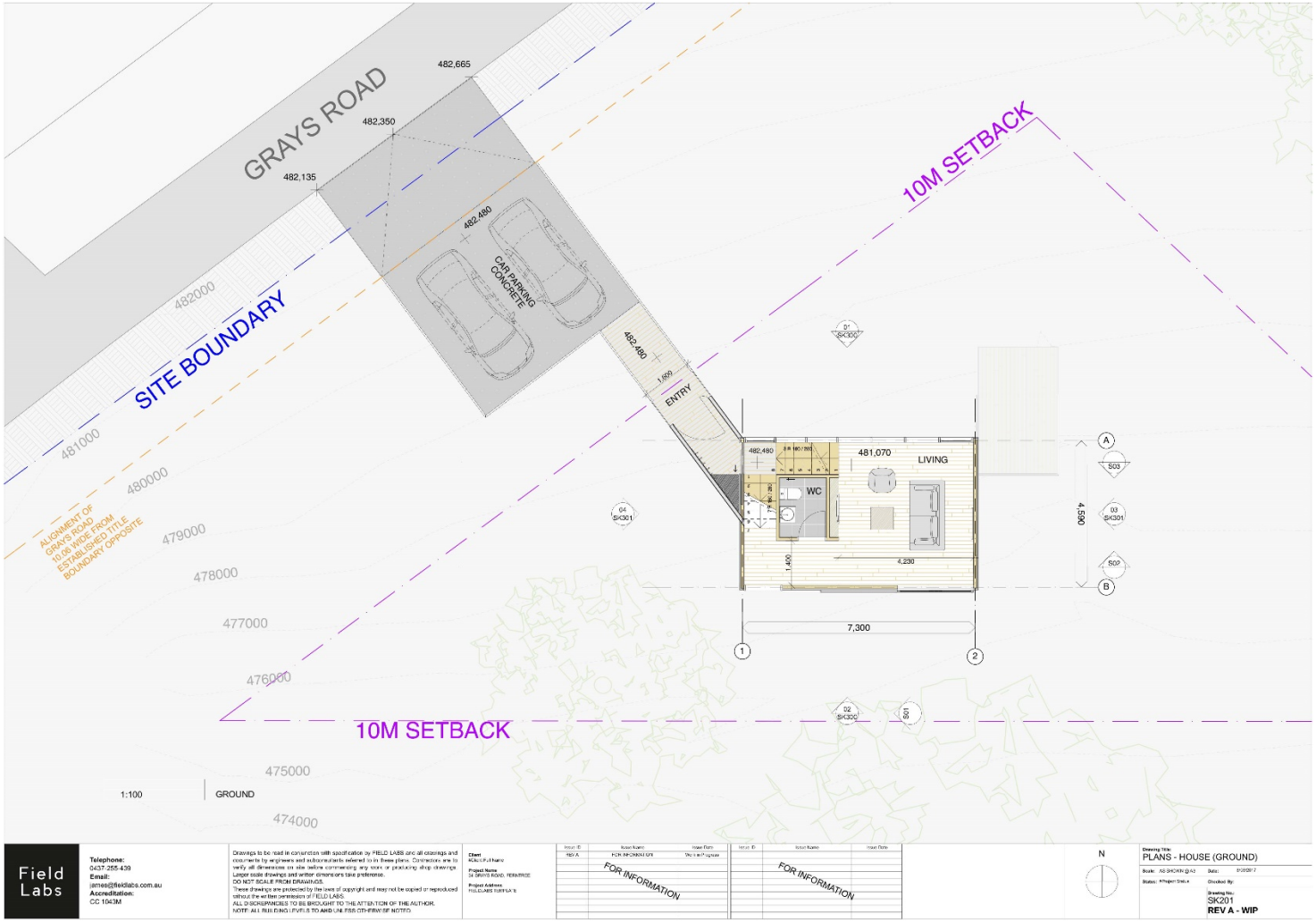
Kitchener, A. and Harris, S. (2013). *From Forest to Fjaeldmark: Descriptions of Tasmania's Vegetation. Edition 2*. Department of Primary Industries, Parks, Water and Environment, Tasmania

Weed Management Act 1999. Available at http://dpipwe.tas.gov.au/invasive-species/weeds/weed-legislation-and-management-plans/about-the-weed-management-act.

Nature Conservation Act 2002. Available at http://www.thelaw.tas.gov.au/index.w3p.

Threatened Species Protection Act 1995. Available at http://www.thelaw.tas.gov.au/index.w3p.

Appendix 1 – Development Plan



GEO-ENVIRONMENTAL ASSESSMENT

34 Grays Road

Fern Tree

March 2018

Updated April 2018

GEO-ENVIRONMENTAL

SOLUTIONS

Geo-Environmental Solutions P/L 29 Kirksway Place, Battery Point 7004. Ph 6223 1839

Introduction

Client: Rosemary James
Date of inspection: 02/03/18
Location: 34 Grays Road, Fern Tree
Land description: Approx. 1323m^2 residential lot
Building type: Proposed new dwelling
Investigation: 5t excavator/exposed cuttings
Inspected by: John Paul Cumming B.Agr.Sc (hons) PhD CPSS GAICD

Background information

Map: Mineral Resources Tasmania, Hobart sheet 1:25 000
Rock type: Interbedded Permian sandstone/siltstone
Soil depth: 2.0m+
Planning overlay: Biodiversity Protection Area. Bushfire Prone Areas
Local meteorology: Annual rainfall approx 700 mm
Local services: Mains water and services on site.

Site conditions

Slope and aspect: 8-25% South facing slope, 13% in wastewater area
Site drainage: Moderate drainage
Vegetation: Good cover of grass and occasional tree species
Weather conditions: Dry, approx 5mm rainfall received in preceding 7 days.
Ground surface: Dry surface conditions, with common surface stones

Investigation

A number of excavations were completed to identify the distribution of, and variation in soil materials on the site. The natural soils on the site are generally moderate in depth (~2.0m) and weathered Permian sandstone was encountered in all test holes. Some areas of the site close to the road frontage are also overlain with variable amounts of site fill.

Profile Summary

Hole 1 Depth (m)	Horizon	Description
0 – 0.20	A1	Dark Greyish Brown Silty **SAND (SM**), weak polyhedral structure, moist loose consistency, few fine roots, grading to
0.40 -0.80	B1	Light Yellowish Brown **Clayey SILT (ML**), approx. 5-10% clay, low plasticity, weak polyhedral structure, moist firm consistency, approx 10% 5-20mm angular gravels and rocks, varied depth and stone content, grading to
0.80 – 1.60	B2	Brownish Yellow **Clayey SAND/SILT (ML/SC)**, approx. 60-70% fine to medium sand and silt, low to medium plasticity, weak angular blocky structure, common weathered sandstone gravels and rocks, gradual boundary to
1.60 - 2.0+	B/C	Greyish Brown **Clayey GRAVEL (GC)**, dense consistency, highly weathered gravels, lower boundary undefined.

Soil Profile Notes

The soil on site consists of sands and silts overlying gravels which have formed from Permian sediments. Given the sand and gravel content the soil is likely to only experience slight ground surface movement from moisture fluctuations. It is also recommended that foundations be paced onto sandstone bedrock wherever possible. The site is predominantly covered with residual soils, and appears stable in its present form, with no evidence of potential instability due to unconsolidated sediments/boulders.

Slope Stability

No apparent issues, however, it is recommended attention be paid to drainage upslope of the house to avoid water accumulation adjacent to the footings.

AS2870 Site Classification

According to AS2870-2011 for construction the natural soil is classified as **Class M** which is a moderately reactive site. Design and construction must adhere to this classification.

Wind Classification

The AS 4055-2012 *Wind load for Housing* classification of the site is:

Region:	**A**
Terrain category:	**TC2.5**
Shielding Classification:	**PS**
Topographic Classification:	**T2**
Wind Classification:	**N3**
Design Wind Gust Speed ($V_{h,u}$)	**50 m/sec**

Wastewater Classification and Recommendations

According to AS1547-2012 for on-site wastewater management the soil on the property is classified as **Loam (category 3)** with a Design Loading Rate (DLR) of 15L/m^2/day. The soil on site is moderately permeable but the slope angle and the close proximity to surface water pose a limitation to the installation of wastewater systems.

The proposed one bedroom dwelling has a calculated maximum wastewater loading of 300L/day. This is based on tank water supply and a maximum occupancy of 2 people (150L/ person/day).

Using the DLR for secondary treated effluent of 30L/m^2/day, an absorption area of 10m^2 will be required. This may be installed as a terraced Eljen trench 11.11m x 0.9m x 0.6m connected to a dual purpose septic tank (min 3000L). The geotextile sand filter (Eljen) trench will require one row of 7 Eljen units within a bed of specified sand. High and low vents will be required for this system and a cut-off diversion drain will need to be installed upslope of the absorption area. The wastewater area excluded from traffic or any future building works. A 100% reserve area should be set aside for future wastewater requirements. For further detail please refer to the attached plan and Trench summary reports.

To comply with Building Act 2016 the following setback distances need to be adhered to: 3m from level or upslope buildings, 3.75m from downslope buildings, 8.5m to downslope boundaries, 1.5m to level or side boundaries, 29m to downslope surface water. Compliance with Building Act 2016 is shown in the attached table.

To comply with E23.10.1 of the Hobart Council Interim Planning Scheme 2015;

A1 *Horizontal separation distance from a building to a land application area must comply with one of the following:*

(a) be no less than 6m;	Non-compliance
(b) be no less than; (i) 2m from an upslope or level building; (ii) if primary treated effluent be no less than 4m plus 1m for every degree of average gradient from a downslope building; (iii) if secondary treated effluent and subsurface application, no less than 2m plus 0.25m for every degree of average gradient from a down slope building.	Complies

A2 *Horizontal separation distance from downslope surface water to a land application area must comply with any of the following:*

(a) be no less than 100m;	Non-compliance
(b) if the site is within a high rainfall area or the site soil category is 4, 5 or 6, be no less than the following; (i) if primary treated effluent standard or surface application, 50m plus 7m for every degree of average gradient from downslope surface water; (ii) if secondary treated effluent standard and subsurface application, 50m plus 2m for every degree of average gradient from down slope surface water.	N/A
(c) if the site is not within a high rainfall area or the site soil category is not 4, 5 or 6, be no less than the following; (i) if primary treated effluent 15m plus 7m for every degree of average gradient from downslope surface water; (ii) if secondary treated effluent and subsurface application, 15m plus 2m for every degree of average gradient from down slope surface water.	Complies (29m required)

A3 *Horizontal separation distance from a property boundary to a land application area must comply with either of the following:*

(a) be no less than 40m from a property boundary;	Non-compliance
(b) be no less than: (i) 1.5m from an upslope or level property boundary; and	Complies
(ii) if primary treated effluent 2m for every degree of average gradient from a downslope property boundary; or	
(iii) if secondary treated effluent and subsurface application, 1.5m plus 1m for every degree of average gradient from a downslope property boundary.	Complies (8.5m required)

A4

Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must be no less than 50m.	N/A

A5

Vertical separation distance between groundwater and a land application area must be no less than 1.5m.	Complies

A6

Vertical separation distance between a limiting layer and a land application area must be no less than 1.5m.	Complies

A7 *The arrangement of a land application area must comply with both of the following:*

(a) not include areas beneath buildings, driveways or other hard stand areas;	Complies
(b) have a minimum horizontal dimension of 3m.	Complies

Construction Recommendations

The natural soil is classified as **Class M**, that is a moderately reactive site. Consideration should be given to drainage and sediment control on site during and after construction to minimise loss of the sandy materials onsite. In particular, drainage upslope of the construction area is recommended to prevent saturation around footings.

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

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

GES

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Assessment Report

Site assessment for on-site waste water disposal

Assessment for	Rosemary James	Assess. Date	27-Apr-18
		Ref. No.	
Assessed site(s)	34 Grays Road, Fern Tree	Site(s) inspected	2-Mar-18
Local authority	Hobart City Council	Assessed by	John Paul Cumming

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

Wastewater Characteristics

Wastewater volume (L/day) used for this assessment = 300 (using the 'No. of bedrooms in a dwelling' method)

Septic tank wastewater volume (L/day) = 100

Sullage volume (L/day) = 200

Total nitrogen (kg/year) generated by wastewater = 0.9

Total phosphorus (kg/year) generated by wastewater = 0.7

Climatic assumptions for site

(Evapotranspiration calculated using the crop factor method)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean rainfall (mm)	80	68	79	77	78	83	96	94	101	102	107	103
Adopted rainfall (R, mm)	80	68	79	77	78	83	96	94	101	102	107	103
Retained rain (Rr, mm)	68	58	67	65	66	71	82	80	86	87	91	88
Max. daily temp. (deg. C)												
Evapotrans (ET, mm)	130	110	91	63	42	29	32	42	63	84	105	126
Evapotr. less rain (mm)	**62**	**52**	**24**	**-2**	**-24**	**-41**	**-50**	**-38**	**-23**	**-3**	**14**	**38**

Annual evapotranspiration less retained rain (mm) = 9

Soil characterisitics

Texture = Loam Category = 3 Thick. (m) = 2

Adopted permeability (m/day) = 1 Adopted LTAR (L/sq m/day) = 30 Min depth (m) to water = 5

Proposed disposal and treatment methods

Proportion of wastewater to be retained on site:	All wastewater will be disposed of on the site
The preferred method of on-site primary treatment:	In dual purpose septic tank(s)
The preferred method of on-site secondary treatment:	In-ground
The preferred type of in-ground secondary treatment:	Trench(es)
The preferred type of above-ground secondary treatment:	None
Site modifications or specific designs:	Are needed

Suggested dimensions for on-site secondary treatment system

Total length (m) =	9
Width (m) =	0.9
Depth (m) =	0.6
Total disposal area (sq m) required =	10
comprising a Primary Area (sq m) of:	10
and a Secondary (backup) Area (sq m) of:	

Sufficient area is available on site

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

Comments

Using the DLR for secondary treated effluient of 30L/m2/day an absorption area of 10m2 is required.

GES

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Site Capability Report

Site assessment for on-site waste water disposal

Assessment for	Rosemary James	Assess. Date	27-Apr-18
		Ref. No.	
Assessed site(s)	34 Grays Road, Fern Tree	Site(s) inspected	2-Mar-18
Local authority	Hobart City Council	Assessed by	John Paul Cumming

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

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
AA	Expected design area	sq m	100	V. high	Very high		
A	Density of disposal systems	/sq km	30	Mod.	High		
	Slope angle	degrees	7	High	Low		
AA	Slope form	Concave converging		High	Very high		
	Surface drainage	Mod. good		High	Low		
	Flood potential	Site floods <1:100 yrs		High	Very low		
	Heavy rain events	Infrequent		High	Moderate		
AA	Aspect (Southern hemi.)	Faces S		V. high	Very high		
	Frequency of strong winds	Common		High	Low		
	Wastewater volume	L/day	300	High	Low		
	SAR of septic tank effluent		1.7	High	Low		
	SAR of sullage		2.6	High	Moderate		
	Soil thickness	m	2.0	V. high	Very low		
	Depth to bedrock	m	2.0	V. high	Low	Moderate	
	Surface rock outcrop	%	0	V. high	Very low		
	Cobbles in soil	%	0	V. high	Very low		
	Soil pH		6.5	High	Very low		
	Soil bulk density	gm/cub. cm	1.4	High	Very low		
	Soil dispersion	Emerson No.	8	V. high	Very low		
	Adopted permeability	m/day	1	Mod.	Moderate	No change	
A	Long Term Accept. Rate	L/day/sq m	30	High	High		

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

Comments

Site capability for wastewater disposal on the site is limited by the area available and the steep slope. Due to this a terraced Eljen trench will need to be installed.

GES

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Environmental Sensitivity Report

Site assessment for on-site waste water disposal

Assessment for	Rosemary James	Assess. Date	27-Apr-18
		Ref. No.	
Assessed site(s)	34 Grays Road, Fern Tree	Site(s) inspected	2-Mar-18
Local authority	Hobart City Council	Assessed by	John Paul Cumming

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

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
	Cation exchange capacity	mmol/100g	55	High	Moderate		
A	Phos. adsorp. capacity	kg/cub m	0.5	High	High		
	Annual rainfall excess	mm	-9	High	Very low		
	Min. depth to water table	m	5	High	Very low		
	Annual nutrient load	kg	1.6	High	Very low		
	G'water environ. value	Agric non-sensit		V. high	Low		
	Min. separation dist. required	m	10	High	Low		
	Risk to adjacent bores		Very low	V. high	Very low		
	Surf. water env. value	Agric non-sensit		V. high	Low		
AA	Dist. to nearest surface water	m	40	V. high	Very high		
AA	Dist. to nearest other feature	m	5	V. high	Very high		
	Risk of slope instability		Low	V. high	Low		
AA	Distance to landslip	m	13	V. high	Very high		

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

Comments

The soil onsite has a loam texture and a moderate CEC for the retention of nutrients, therefore the soil system should have capacity to cope with the applied nutrient load from the applied wastewater

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

Acceptable Solutions	**Performance Criteria**	**Compliance**
A1 Horizontal separation distance from a building to a land application area must comply with one of the following: a) be no less than 6m; or b) be no less than: (i) 3m from an upslope building or level building; (ii) If primary treated effluent to be no less than 4m plus 1m for every degree of average gradient from a downslope building; (iii) If secondary treated effluent and subsurface application, no less than 2m plus 0.25m for every degree of average gradient from a downslope building.	P1 a) The land application area is located so that (i) the risk of wastewater reducing the bearing capacity of a building's foundations is acceptably low.; and (ii) is setback a sufficient distance from a downslope excavation around or under a building to prevent inadequately treated wastewater seeping out of that excavation	Complies with A1 (b) (i) Land application area will be located with a minimum separation distance of 3m from an upslope or level building.
A2 Horizontal separation distance from downslope surface water to a land application area must comply with (a) or (b) (a) be no less than 100m; or (b) be no less than the following: (i) if primary treated effluent 15m plus 7m for every degree of average gradient to downslope surface water; or (ii) if secondary treated effluent and subsurface application, 15m plus 2m for every degree of average gradient to down slope surface water.	P2 Horizontal separation distance from downslope surface water to a land application area must comply with all of the following: a) Setbacks must be consistent with AS/NZS 1547 Appendix R; b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A2 (b) (ii) Land application area will be located with a minimum separation distance of 40m of downslope surface water (29m required)

A3 Horizontal separation distance from a property boundary to a land application area must comply with either of the following: (a) be no less than 40m from a property boundary; or (b) be no less than: (i) 1.5m from an upslope or level property boundary; and (ii) If primary treated effluent 2m for every degree of average gradient from a downslope property boundary; or (iii) If secondary treated effluent and subsurface application, 1.5m plus 1m for every degree of average gradient from a downslope property boundary.	P3 Horizontal separation distance from a property boundary to a land application area must comply with all of the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A3 (b) (i) Land application area will be located with a minimum separation distance of 1.5m from an upslope or level property boundary Complies with A3 (b) (iii) Land application area will be located with a minimum separation distance of 14m of downslope property boundary (8.5m required)
A4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must be no less than 50m and not be within the zone of influence of the bore whether up or down gradient.	P4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must comply with all of the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment completed in accordance with Appendix A of AS/NZS 1547 demonstrates that the risk is acceptable	Complies with A4 No bore or well identified within 50m

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

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AS1547:2012 – Loading Certificate – Eljen System Design

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

Site Address: 34 Grays Road, Fern Tree

System Capacity: 2 persons @ 150L/person/day

Summary of Design Criteria

DLR: 30L/m^2/day.

Absorption area: 10m^2

Reserve area location /use: Assigned – more than 100% available

Water saving features fitted: Standard fixtures

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

Typical loading change consequences: Expected to be minimal due to capacity of system and site area (provided loading changes within 25% of design)

Overloading consequences: Continued overloading may cause hydraulic failure of the absorption area and require upgrading/extension of the area. Risk considered acceptable due to visible signs of overloading and owner monitoring.

Underloading consequences: Lower than expected flows will have minimal consequences on system operation unless the house has long periods of non occupation. Under such circumstances additional maintenance of the system may be required. Risk considered acceptable.

Lack of maintenance / monitoring consequences: Issues of underloading/overloading and condition of the absorption area require monitoring and maintenance, if not completed system failure may result in unacceptable health and environmental risks. Septic tank de-sludging must also be monitored to prevent excessive sludge and scum accumulation. Monitoring and regulation by the property owner required to ensure compliance.

Other operational considerations: Owners/occupiers must be aware of the operational requirements and limitations of the system, including the following; the absorption area must not be subject to traffic by vehicles or heavy stock and should be fenced if required. The absorption area must be kept with adequate grass cover to assist in evapotranspiration of treated effluent in the absorption bed. The septic tank must be desludged at least every 3 years, and any other infrastructure such as septic tank outlet filters must also be cleaned regularly (approx. every 6 months depending upon usage). Foreign materials such as rubbish and solid waste must be kept out of the system.

Wastewater system:

Dual purpose septic tank (min 3000L)
with outlet filter

Surface diversion drain

Eljen Trench
11.11m x 0.9m x 0.6m
One row of 7 Eljen Units within a trench of specified sand.

Min 3m from upslope buildings
Min 1.5m from upslope or level boundaries
Min 8.5m from downslope boundary
Min 29m from downslope surface water

Refer to GES report

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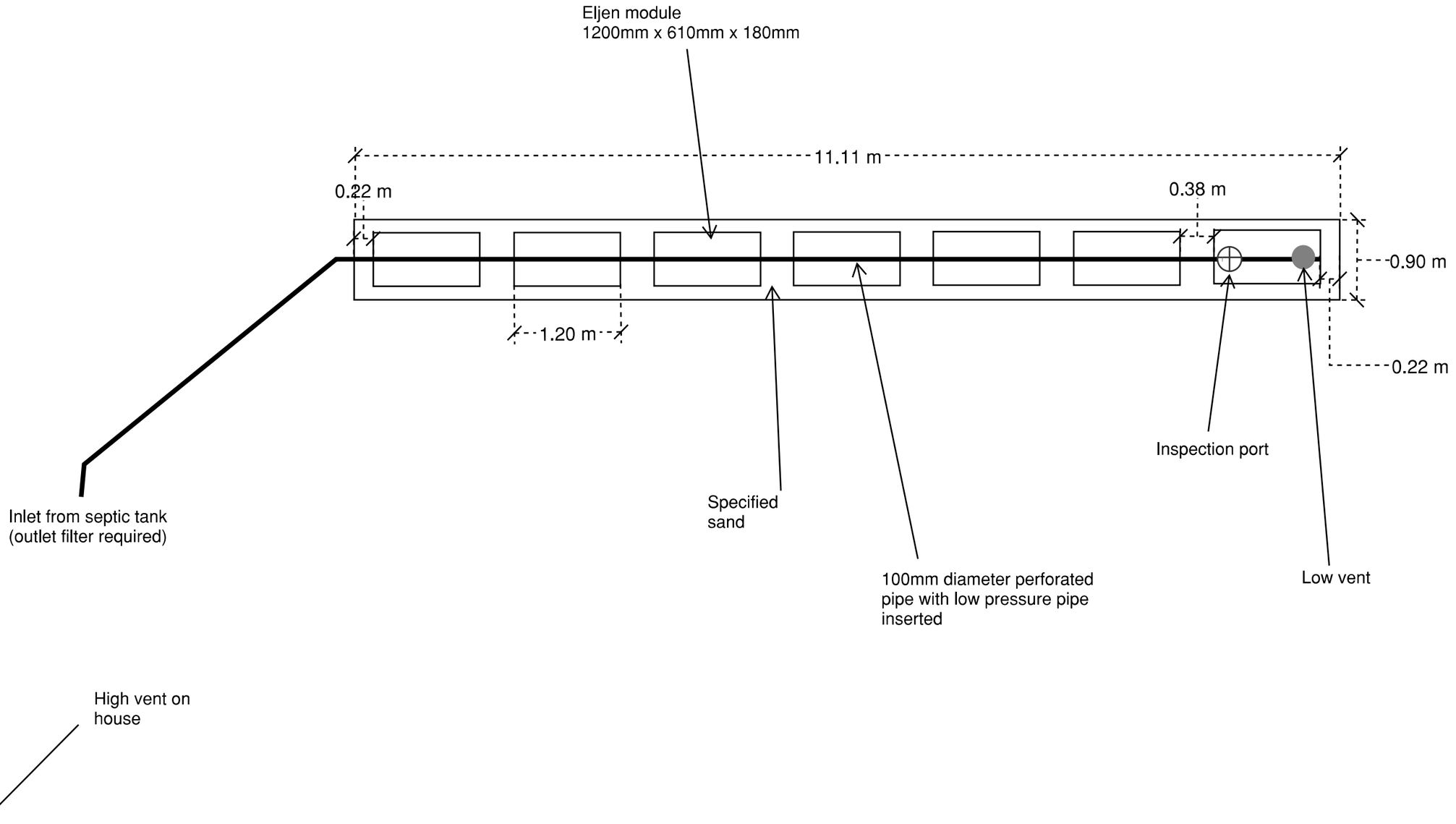
Dr. John Paul Cumming
Building Services Designer-Hydraulic
CCC774A

27/04/2018

Do not scale from these drawings. Dimensions to take precedence over scale.	Rosemary James 34 Grays Road, FERN TREE	C.T.: 146946/1 PID: 7581530	Date: 27/04/2018	Geo-Environmental Assessment 34 Grays Road, FERN TREE	Drawing Number: 1	Sheet 1 of 1 Prepared by: PL

Eljen Bed Plan 1 Trench of 7 units



Do not scale from these drawings. Dimensions to take precedence over scale.	Eljen Bed Plan 1 row of 7 units		Date: April 2018		Sheet 1 of 1 Prepared by: PL

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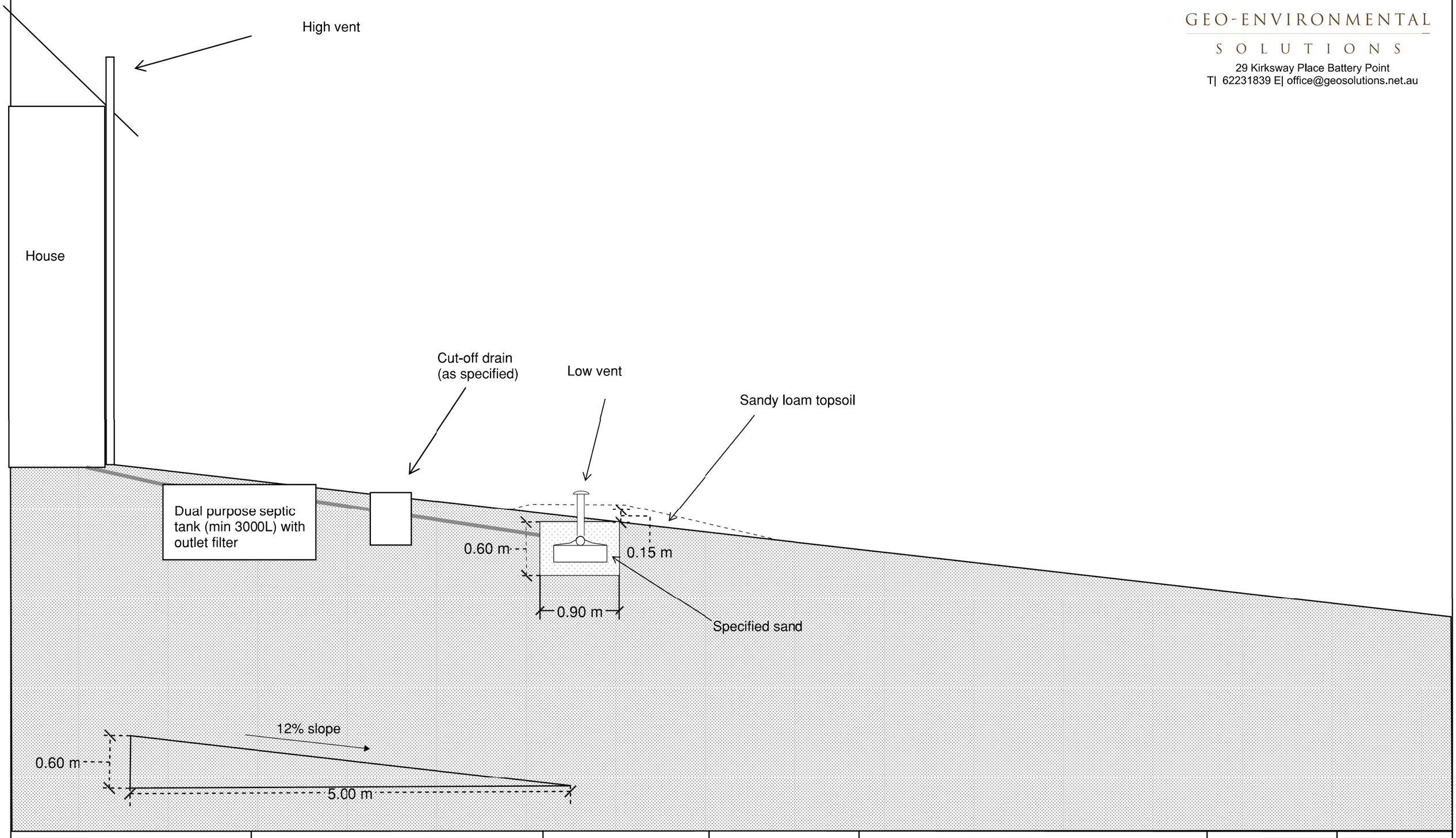

Do not scale from these drawings. Dimensions to take precedence over scale.

Date: April 2018

Eljen Trench Cross-section Plan

Sheet 1 of 1
Drawn by: PL

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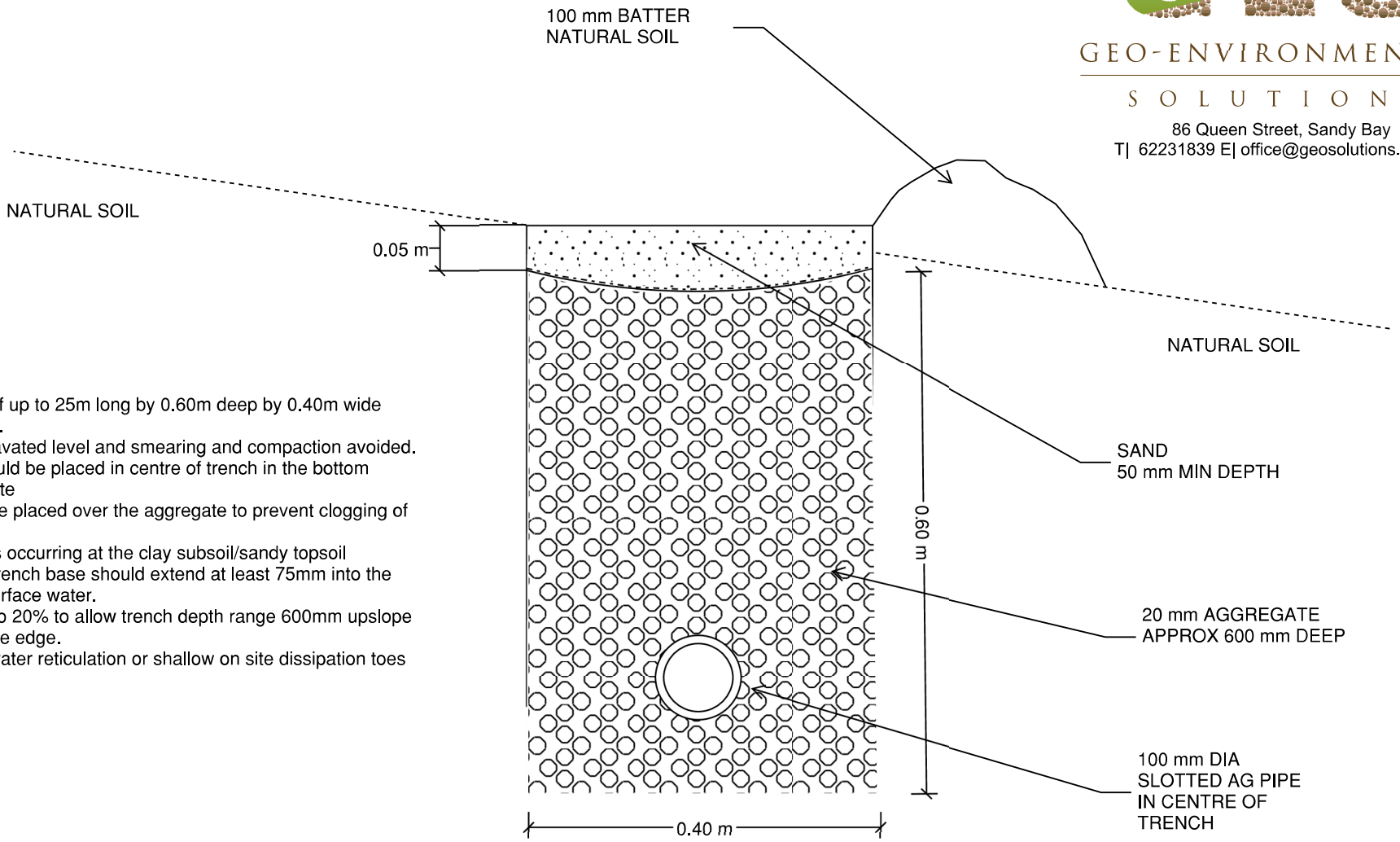

Design notes:

1.Cut-off trench dimensions of up to 25m long by 0.60m deep by 0.40m wide (depths and widths minimum).
2.Base of trenches to be excavated level and smearing and compaction avoided.
3.100mm slotted ag-pipe should be placed in centre of trench in the bottom 100mm of the 20mm aggregate
4.Geotextile or filter cloth to be placed over the aggregate to prevent clogging of the pipes and aggregate
5.If shallow subsurface flow is occurring at the clay subsoil/sandy topsoil boundary (duplex soils), the trench base should extend at least 75mm into the subsoil clay to capture sub-surface water.
6.Construction on slopes up to 20% to allow trench depth range 600mm upslope edge to 400mm on down slope edge.
7.Trench discharge to stormwater reticulation or shallow on site dissipation toes across the contour.

Do not scale from these drawings. Dimensions to take precedence over scale.	Geo-Environmental Solutions		Date: 01/05/2017	Cut-Off Drain Detail	Sheet 1 of 1

Eljen GSF System Design Program

RESET FORM

Date:	27-Apr-18	Client Name:	Rosemary James		
Site Address:	34 Grays Road, Fern Tree			Council Area:	Hobart
Designer:	JP Cumming ; P Lucas	Designer Phone Number:	62231839	Is this new construction Y or N:	Y
Plumber:	Eljen Pacific	Plumber Phone Number:	407782308	Plumber License Number:	1110675

Note: This design program is a guide only. All design constraints and limitations must be addressed by the designer prior to design and installation.

System Design Information		Design Notes and Comments
Design Occupancy (Number of persons):	2	eljen PACIFIC 27/4/2018
Daily Design Flow (L/Person/Day):	150	
Total Daily Design Flow (L/Day):	300	
Trench or Bed	Trench	
Soil Category *(Note: Soil Catagories 4-6 May Require additional design consideration. Please reference AS/1547 2012 when designing in these soil types.)*	3 - Loams	
Site Design Loading Rate (L/mm/day):	30	
System Area Slope (%):	13%	
System Area Slope (converted from % slope to degrees slope):	7.41	
System Basal Area Bore Log Depth: *(Note: Must be greater than 600 mm)*	600	
Maximum System Length Based on Site Constraints:	20	
Desired Rows or Trenches in System	1	
Distribution Type (G = Gravity - P = Pump to Gravity - LPD = Low Pressure Distribution):	G	

System Dimensions	
Would you like to use a specific width?	**N**
Specific Width (m)	

	Treatment Zone	Dispersal Zone Extension
Length (m)	**11.11**	
Width (m)	**0.90**	
Sand Height (m)	**0.15**	
Sand Area (m^2)	**10.00**	

System Capacity	
Total Daily Design Flow (L/Day):	**300**
Minimum Number of A42 Units Required	**7**
Units per Row	**7**
Length of Rows with 0.15 m Sand Extension	**11.11111111**
End to End Space Between Modules (TRENCH ONLY)	**0.38**

Materials		
Minimum Number of A42 Units Required	**7**	
The system requires a high vent. Are using 50mm or 100mm pipe?		
Low vent	**1 x 100mm vent**	
Effluent Filter	**1**	
Inspection Ports	**2**	
Pipe Required (m)	**11.11**	
Estimate of System Sand Required (m^3)	**4.30**	

ADDRESS 34 GRAYS ROAD, FERNTREE
PROPERTY ID 7581530
TITLE REF 146946/1
OWNER ROSEMARY ELLEN JAMES
DESIGNER J. WILSON CC 1043M
SITE AREA 2,565M2
FLOOR AREA 35M2 (HOUSE)
BUILDING CLASS 1A
BAL 29
SITE CLASS NA
CLIMATE ZONE 7

Field Labs

Telephone:
0437-255-439
Email:
james@fieldlabs.com.au
Accreditation:
CC 1043M

PROJECT

34 GRAYS ROAD, FERNTREE

REV D

ISSUE	REVISION ID	DATE
FOR DEVELOPMENT APPLICATION	REV A	9/8/17
FOR DEVELOPMENT APPLICATION	REV B	20/12/17
DA - RFI	REV C	4/4/18
DA - RFI 2	REV D	15/6/18

SKETCH DESIGN DRAWING INDEX

SHEET	ID	NAME	CURRENT REVISION
SK100	SITE	AERIAL	REV D
SK101	SITE	AERIAL	REV D
SK102	SITE	LOCATION 1:250	REV D
SK103	SITE	STORMWATER	REV D
SK200	PLANS	HOUSE (LOWER)	REV D
SK201	PLANS	HOUSE (GROUND)	REV D
SK202	PLANS	HOUSE (UPPER)	REV D
SK203	PLANS	HOUSE (ROOF)	REV D
SK204	PLANS	PARKING	REV D
SK300	ELEVATIONS	NORTH/SOUTH	REV D
SK301	ELEVATIONS	EAST	REV D
SK302	ELEVATIONS	WEST	REV D
SK310	SECTIONS	01, 02 + 03	REV D
SK700	PROJECT IMAGE	HOUSE VIEW 01	REV D
SK701	PROJECT IMAGE	HOUSE VIEW 02	REV D
SK702	PROJECT IMAGE	HOUSE VIEW 03	REV D
SK703	PROJECT IMAGE	HOUSE VIEW 04	REV D
SK704	PROJECT IMAGE	HOUSE SECTIONS	REV D

Field Labs

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Email:
james@fieldlabs.com.au
Accreditation:
CC 1043M

Client
#Client Full Name

Project Name
34 GRAYS ROAD, FERNTREE

Project Address
FIELDLABS TEMPLATE

Issue ID	Issue Name	Issue Date
REV A	FOR DEVELOPMENT APPLICATION	9/8/17
REV B	FOR DEVELOPMENT APPLICATION	20/12/17
REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

Issue ID	Issue Name	Issue Date

Drawing Title:
SITE - AERIAL

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK100
REV D

Field Labs

Telephone:
0437-255-439
Email:
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Client
#Client Full Name

Project Name
34 GRAYS ROAD, FERNTREE

Project Address
FIELDLABS TEMPLATE

Issue ID	Issue Name	Issue Date
REV A	FOR DEVELOPMENT APPLICATION	9/8/17
REV B	FOR DEVELOPMENT APPLICATION	20/12/17
REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

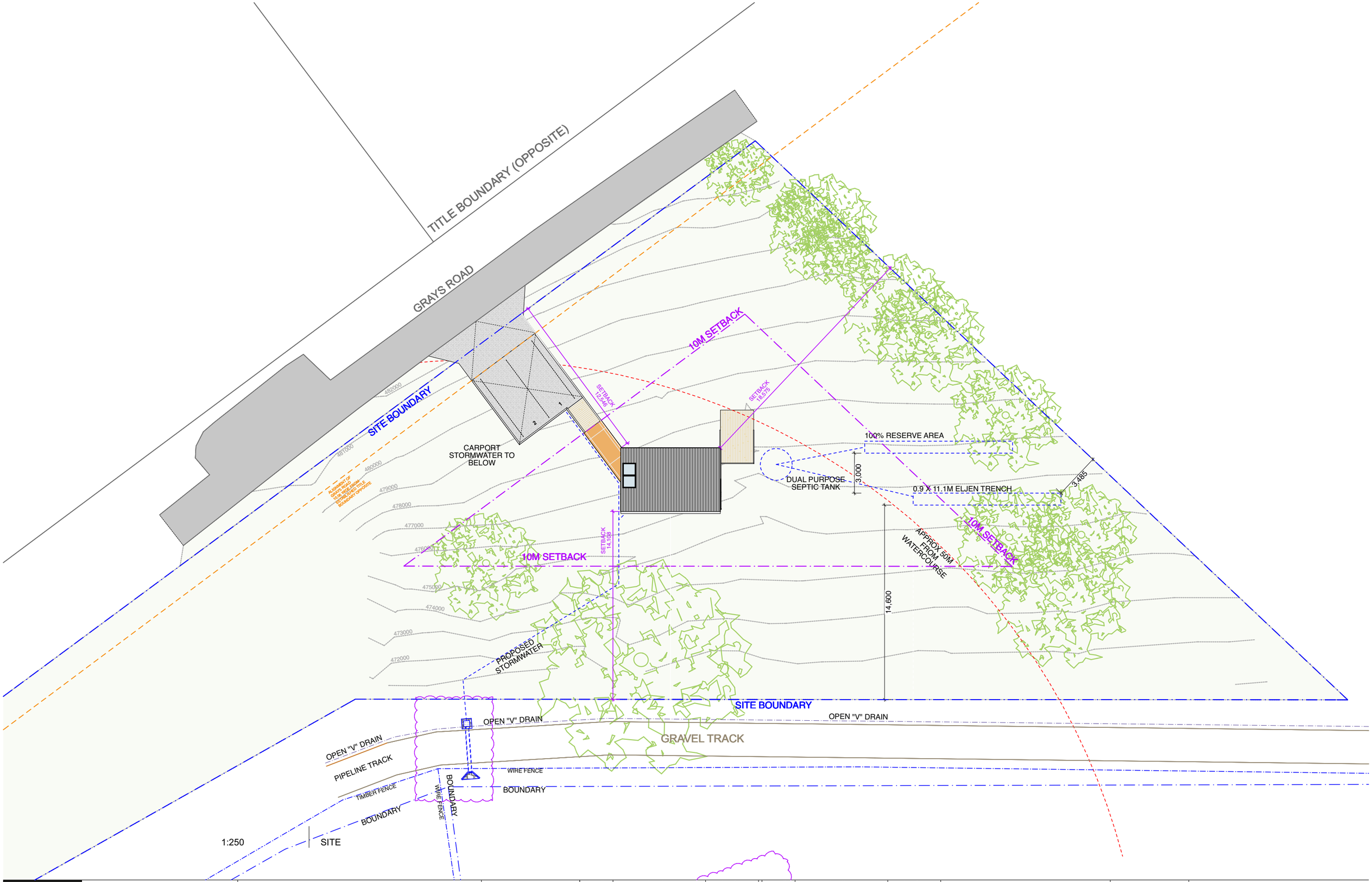
Issue ID	Issue Name	Issue Date

Drawing Title:
SITE - AERIAL

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK101
REV D



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Issue ID	Issue Name	Issue Date
REV A	FOR DEVELOPMENT APPLICATION	9/8/17
REV B	FOR DEVELOPMENT APPLICATION	20/12/17
REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

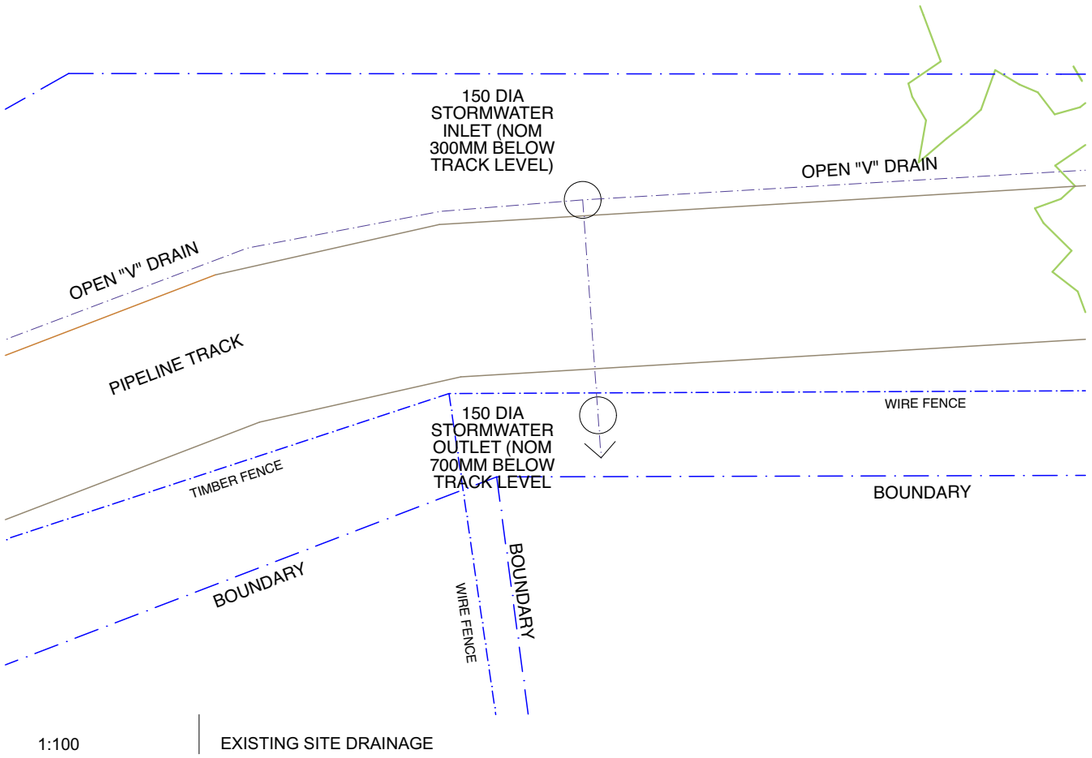
Issue ID	Issue Name	Issue Date

Drawing Title:
SITE - LOCATION 1:250

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

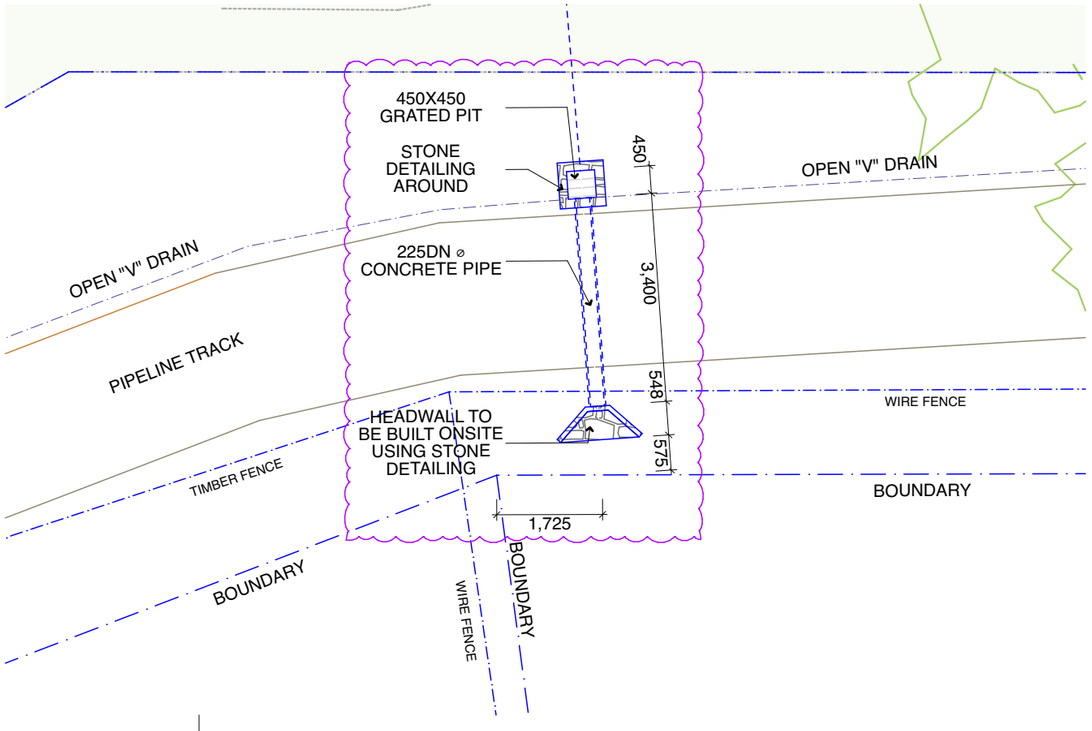
Drawing No.:
SK102
REV D



1:100 EXISTING SITE DRAINAGE

EXISTING UPSLOPE CULVERT INLET

EXISTING DOWNSLOPE CULVERT OUTLET



1:100 PROPOSED STORMWATER

STORMWATER NOTES:
- OVERFLOW STORMWATER TO BE DISCHARGED TO NEW 450X450 GRATED PIT.
- GRATED PIT TO CONNECT TO UPGRADED CULVERT (MIN225DN OR SIMILAR), TO REPLACE EXISTING 150DN STORMWATER DRAIN.
- OUTLET HEADWALL TO BE UPGRADED, PROPORTIONS ARE TO MATCH WITH HEADWALL DETAILS AS PER "LGAT STANDARD DRAWINGS 2013 / TSD-SW17V1"
- EXPOSED DETAILING FOR BOTH GRATED PIT AND HEADWALL ARE TO BE MADE FROM ROCK SOURCED FROM SITE DURING CONSTRUCTION, AND IS TO BE SYMPATHETIC TO DRYSTONE DETAILING AS NOMINATED IN "HOBART MOUNTAIN WATER SUPPLY SYSTEM DESIGN GUIDELINES" PAGE 22.

PLEASE NOTE: DESIGN IS CONCEPT ONLY, FINAL DESIGN TO BE PROVIDED BY CIVIL ENGINEER

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Project Address
FIELDLABS TEMPLATE

Issue ID	Issue Name	Issue Date
REV D	DA - RFI 2	15/6/18

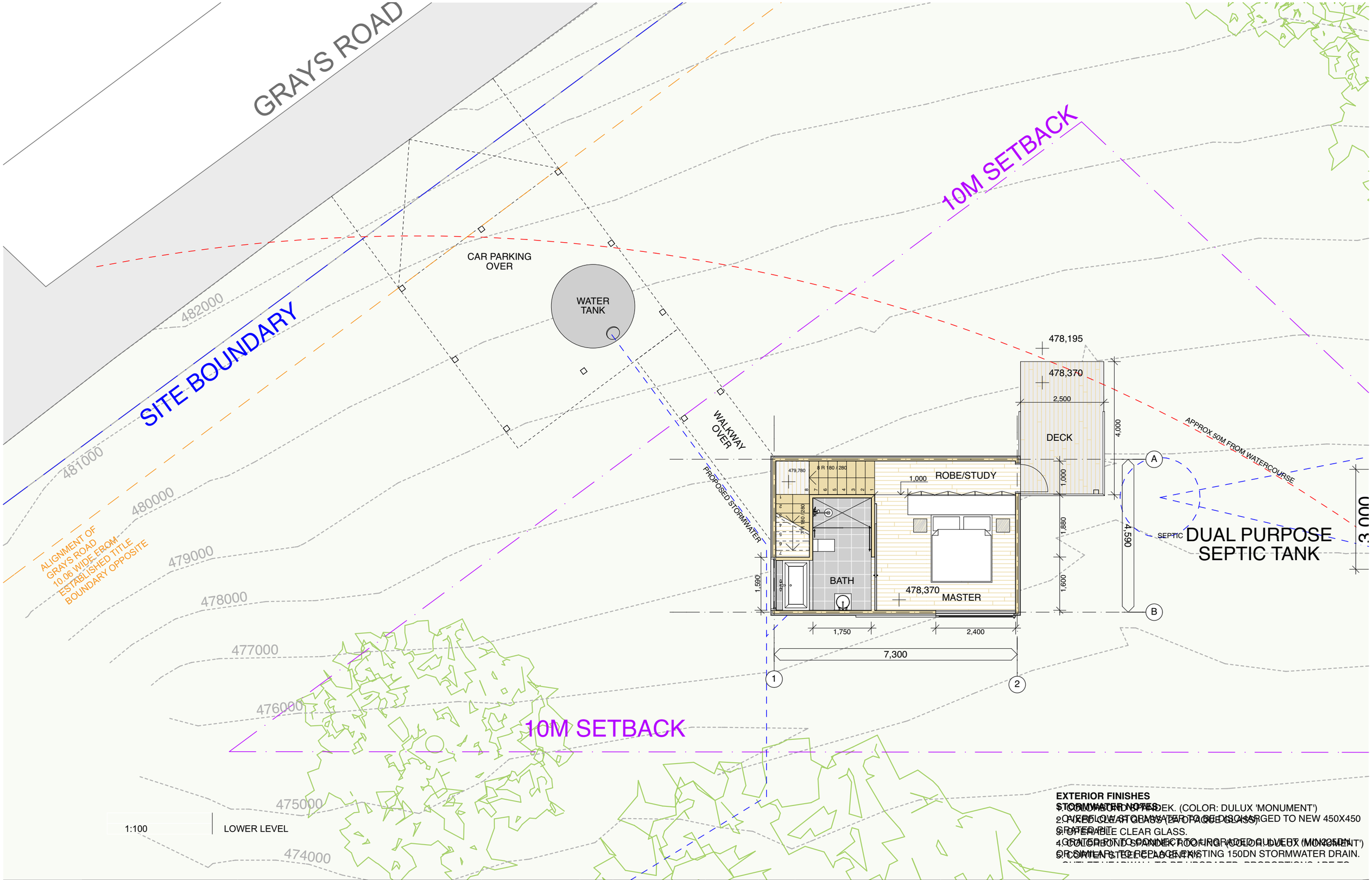
Issue ID	Issue Name	Issue Date

Drawing Title:
SITE - STORMWATER

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK103
REV D



1:100 | LOWER LEVEL

EXTERIOR FINISHES

1. COLORBOND ROOF. (COLOR: DULUX 'MONUMENT')
2. FIXED CLEAR GLASS (EXCEPT WHERE NOTED)
3. OPERABLE CLEAR GLASS.
4. COLORBOND GUTTER AND DOWNPIPES (COLOR: DULUX 'MONUMENT')
5. CORTEN STEEL CLAD ENTRY.

STORMWATER NOTES

1. ROOF/DRIVEWAY RUNOFF TO BE DISCHARGED TO NEW 450X450 GRATED PIT.
2. GUTTERS AND DOWNPIPES TO BE CONNECTED TO NEW 150DN STORMWATER DRAIN OR SIMILAR TO REPLACE EXISTING 150DN STORMWATER DRAIN.
3. OUTLET HEADWALL TO BE UPGRADED. PROPORTIONS ARE TO

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Client #Client Full Name
Project Name 34 GRAYS ROAD, FERNTREE
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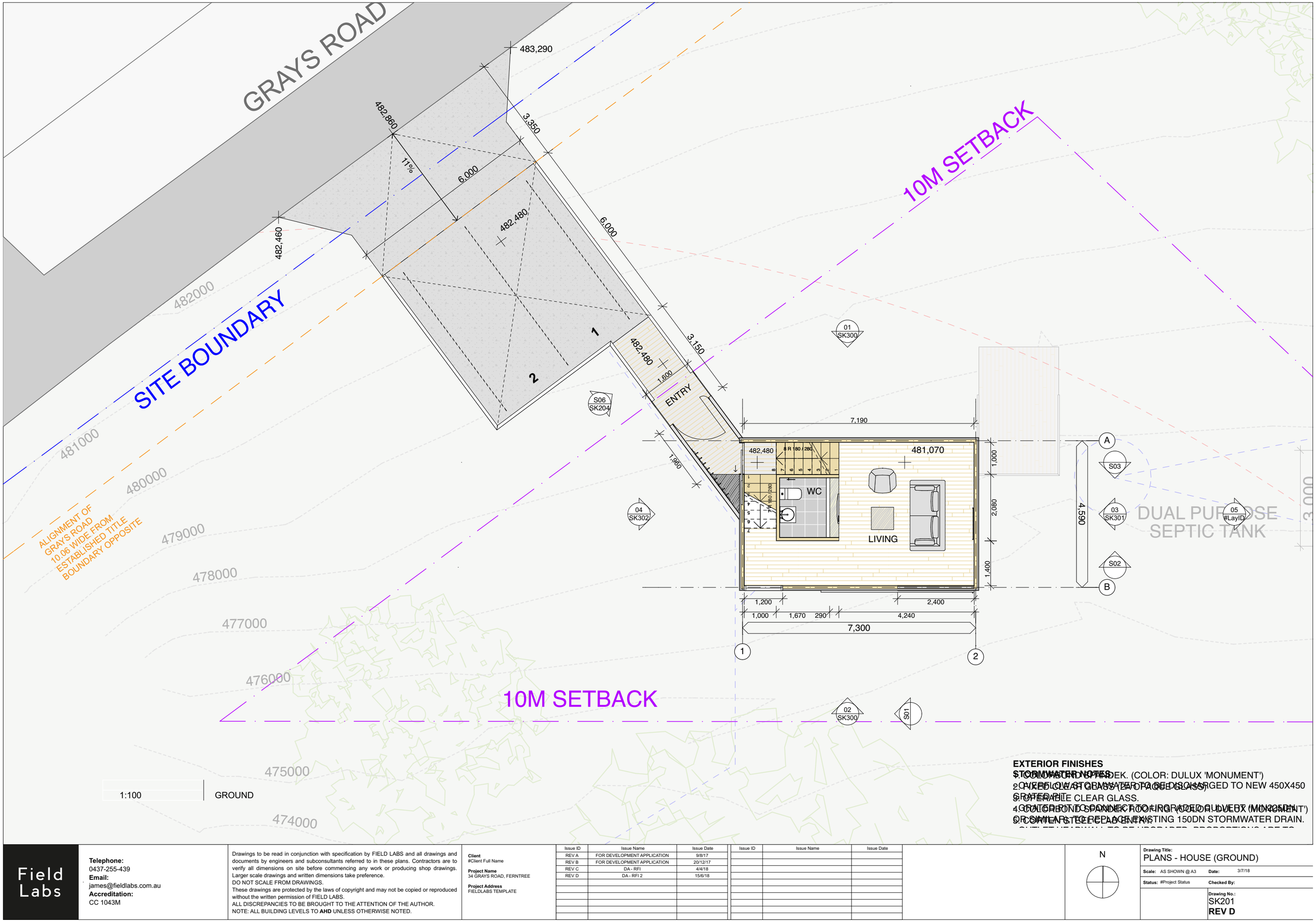
Issue ID	Issue Name	Issue Date
REV A	FOR DEVELOPMENT APPLICATION	9/8/17
REV B	FOR DEVELOPMENT APPLICATION	20/12/17
REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

Issue ID	Issue Name	Issue Date

N

Drawing Title: PLANS - HOUSE (LOWER)
Scale: AS SHOWN @ A3 **Date:** 3/7/18
Status: #Project Status **Checked By:**
Drawing No.: SK200
REV D



1:100

GROUND

EXTERIOR FINISHES

1. COLORBOND SPANDEK. (COLOR: DULUX 'MONUMENT')
2. FIXED CLEAR GLASS (ALTERNATIVE GLASS)
3. OPERABLE CLEAR GLASS.
4. COLORBOND SPANDEK ROOFING (COLOR: DULUX 'MONUMENT')
5. CONCRETE SLAB ENTRY

STORMWATER NOTES

1. OVERFLOW STORMWATER TO BE DISCHARGED TO NEW 450X450 GRATED PIT.
2. GRATED PIT TO CONNECT TO UPGRADED CULVERT (MIN225DN OR SIMILAR) TO REPLACE EXISTING 150DN STORMWATER DRAIN.
3. OUTLET HEADWALL TO BE UPGRADED, PROPORTIONS ARE TO

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Issue ID	Issue Name	Issue Date
REV A	FOR DEVELOPMENT APPLICATION	9/8/17
REV B	FOR DEVELOPMENT APPLICATION	20/12/17
REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

Issue ID	Issue Name	Issue Date

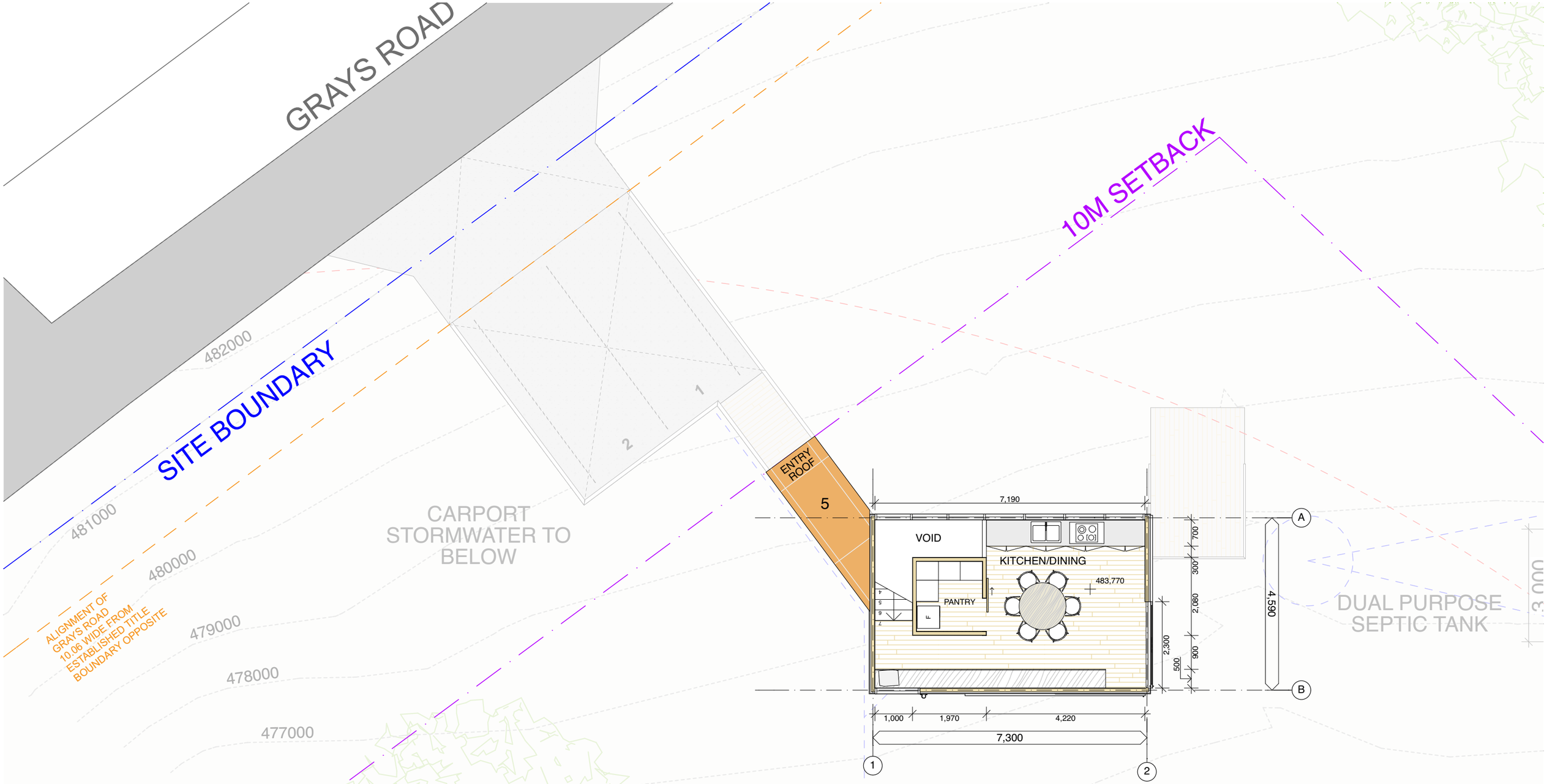
N

Drawing Title:
PLANS - HOUSE (GROUND)

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK201
REV D



1:100 | UPPER FLOOR

EXTERIOR FINISHES

STORMWATER NOTES

1. COLORBOND STANDEK. (COLOR: DULUX 'MONUMENT')
2. OVERFLOW STORMWATER TO BE DISCHARGED TO NEW 450X450 GRATED PIT.
3. OPERABLE CLEAR GLASS.
4. GUTTERS TO CONNECT TO UPGRADED CULVERT (MIN 225DN STORMWATER DRAIN.
5. COLORBOND STEEL CLADDING (COLOR: DULUX 'MONUMENT')
6. CONTRACTOR TO REPLACE EXISTING 150DN STORMWATER DRAIN.

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34 GRAYS ROAD, FERNTREE

Project Address
FIELDLABS TEMPLATE

Issue ID	Issue Name	Issue Date
REV A	FOR DEVELOPMENT APPLICATION	9/8/17
REV B	FOR DEVELOPMENT APPLICATION	20/12/17
REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

Issue ID	Issue Name	Issue Date

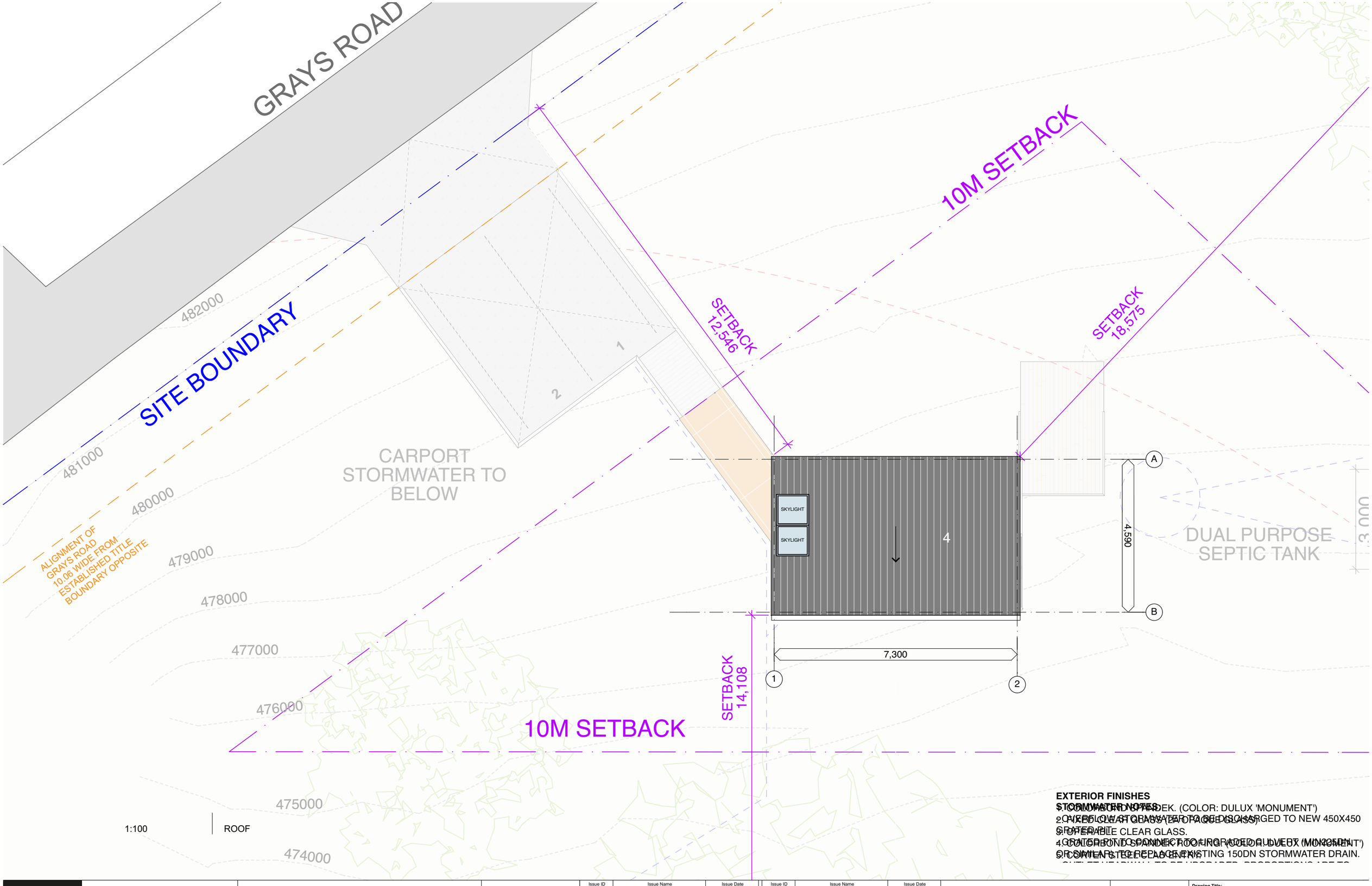
N

Drawing Title:
PLANS - HOUSE (UPPER)

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK202
REV D



1:100 | ROOF

EXTERIOR FINISHES

1. COLORBOND STEEL. (COLOR: DULUX 'MONUMENT')
2. FIXED CLEAR GLASS (EXTERNAL GLASS)
3. OPERABLE CLEAR GLASS.
4. COLORBOND STEEL GUTTER AND DOWNPIPES (COLOR: DULUX 'MONUMENT')
5. CORTEN STEEL CLADDING.

STORMWATER NOTES

1. ROOF STORMWATER TO BE DISCHARGED TO NEW 450X450 GRATED PIT.
2. NEW 375DN STORMWATER PIPE TO CONNECT TO UNDERGROUND STORMWATER DRAIN OR SIMILAR TO REPLACE EXISTING 150DN STORMWATER DRAIN.

Telephone: 0437-255-439	Drawings to be read in conjunction with specification by FIELD LABS and all drawings and documents by engineers and subconsultants referred to in these plans. Contractors are to verify all dimensions on site before commencing any work or producing shop drawings. Larger scale drawings and written dimensions take preference. DO NOT SCALE FROM DRAWINGS. These drawings are protected by the laws of copyright and may not be copied or reproduced without the written permission of FIELD LABS. ALL DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE AUTHOR. NOTE: ALL BUILDING LEVELS TO **AHD** UNLESS OTHERWISE NOTED.	**Client** #Client Full Name **Project Name** 34 GRAYS ROAD, FERNTREE **Project Address** FIELDLABS TEMPLATE

Issue ID	Issue Name	Issue Date
REV A	FOR DEVELOPMENT APPLICATION	9/8/17
REV B	FOR DEVELOPMENT APPLICATION	20/12/17
REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

Issue ID	Issue Name	Issue Date

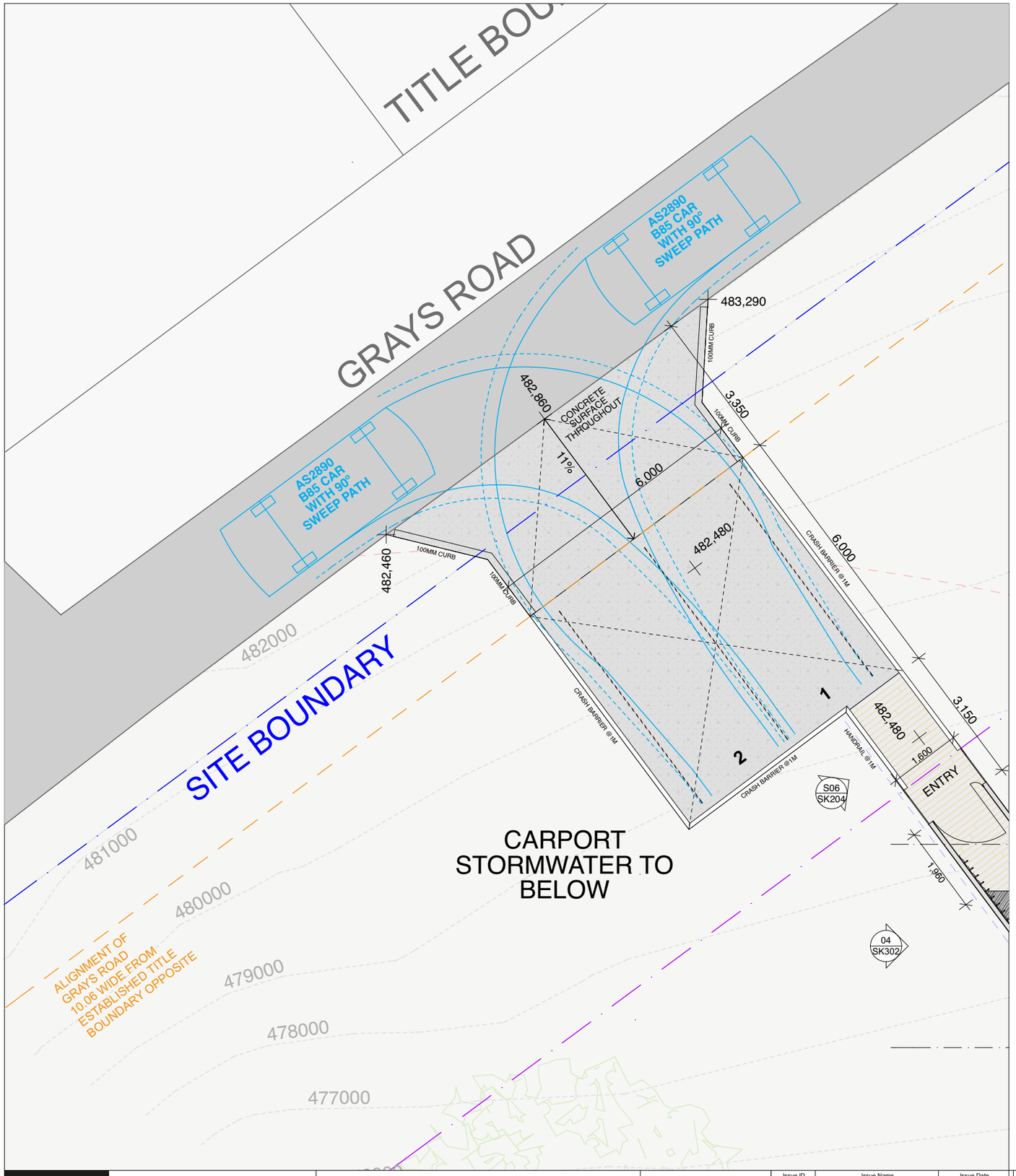
N

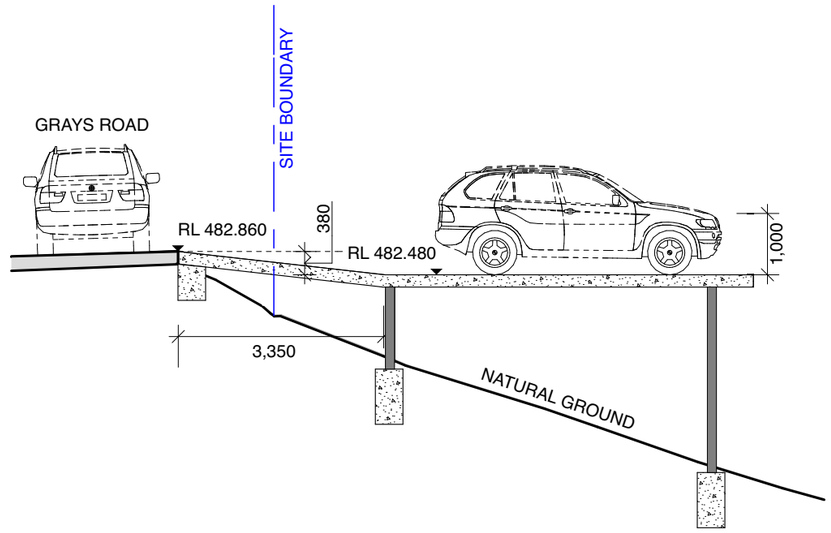
Drawing Title: PLANS - HOUSE (ROOF)

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.: SK203 **REV D**





1:100 | CROSSOVER SECTION

NOTE: THE NEW CROSSOVER IS TO BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH **(IPWEA) LGAT** - STANDARD DRAWINGS *TSD R09-V1-URBAN ROADS AND DRIVEWAYS* AND *TSD R14 - V1 TYPE KC VEHICULAR CROSSING* AT DEVELOPERS COST.

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Client
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34 GRAYS ROAD, FERNTREE

Project Address
FIELDLABS TEMPLATE

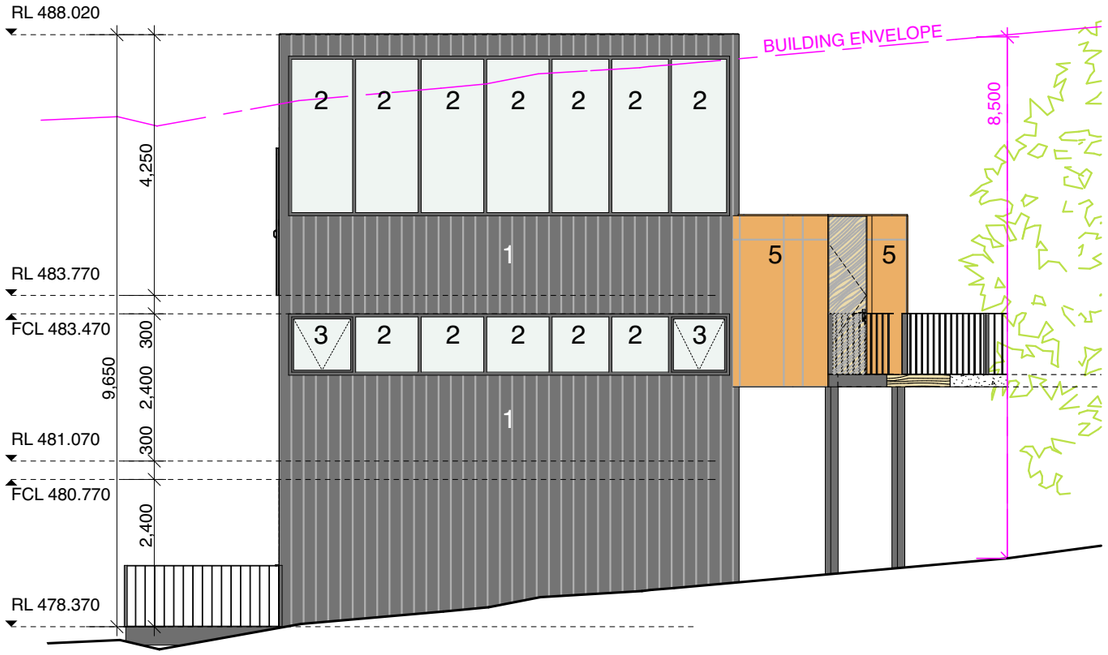
Issue ID	Issue Name	Issue Date
REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

Issue ID	Issue Name	Issue Date

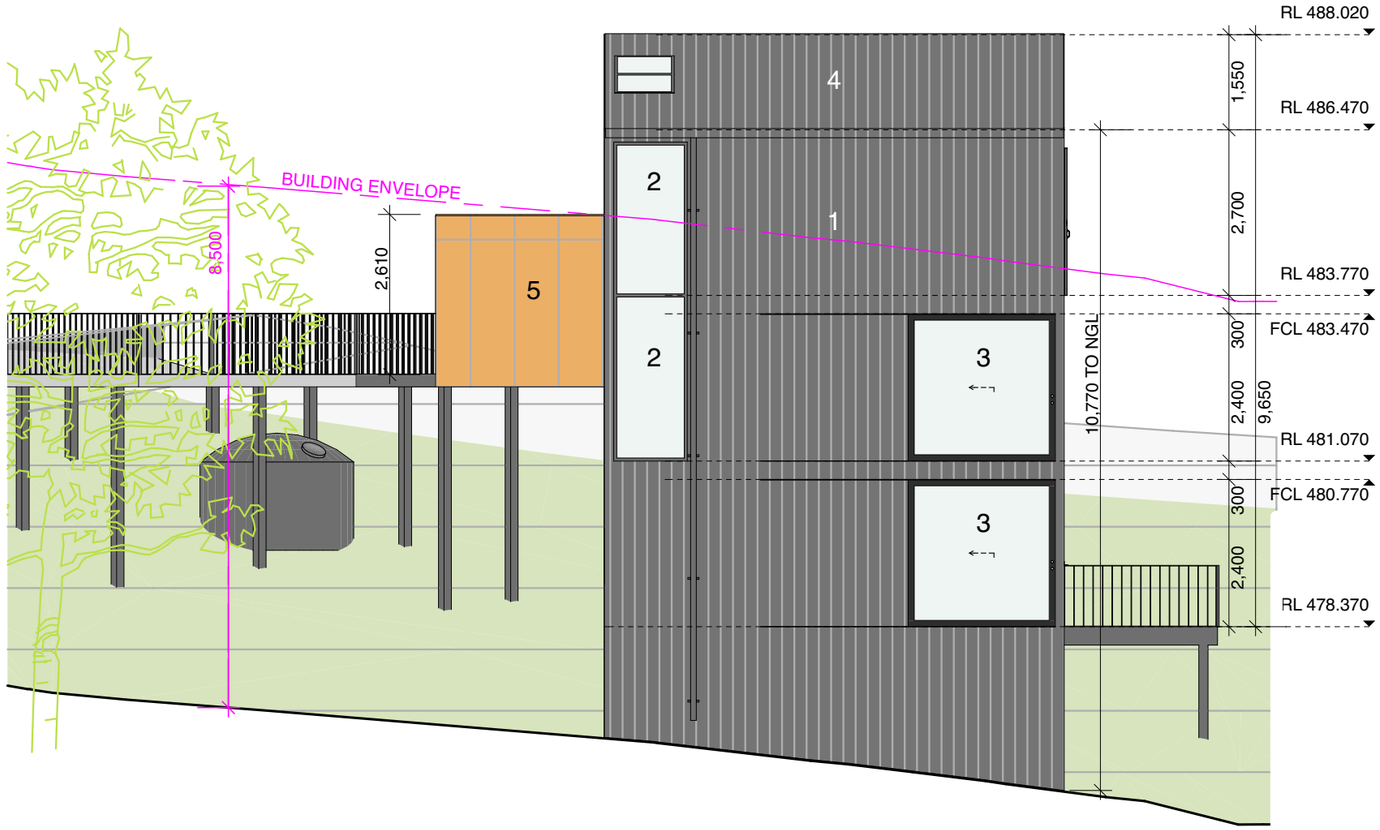
N

Drawing Title:
PLANS - PARKING

Scale: AS SHOWN @ A3 **Date:** 3/7/18
Status: #Project Status **Checked By:**
Drawing No.:
SK204
REV D



1:100 | NORTH



1:100 | SOUTH

EXTERIOR FINISHES

STORMWATER NOTES

1. COLORBOND SPANDEK. (COLOR: DULUX 'MONUMENT')
2. FIXED CLEAR GLASS (LAMINATED GLASS)
3. OPERABLE CLEAR GLASS.
4. COLORBOND SPANDEK ROOFING (COLOR: DULUX 'MONUMENT')
5. CONCRETE STEEL CLAD LINTEL.

1. OVERFLOW STORMWATER TO BE DISCHARGED TO NEW 450X450 GRATED PIT
2. CONNECT TO EXISTING 225DN STORMWATER PIPE (MIN 2%) OR SIMILAR TO REPLACE EXISTING 150DN STORMWATER DRAIN.
3. OUTLET HEADWALL TO BE UPGRADED. PROPORTIONS ARE TO

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Client
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Issue ID	Issue Name	Issue Date
REV A	FOR DEVELOPMENT APPLICATION	9/8/17
REV B	FOR DEVELOPMENT APPLICATION	20/12/17
REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

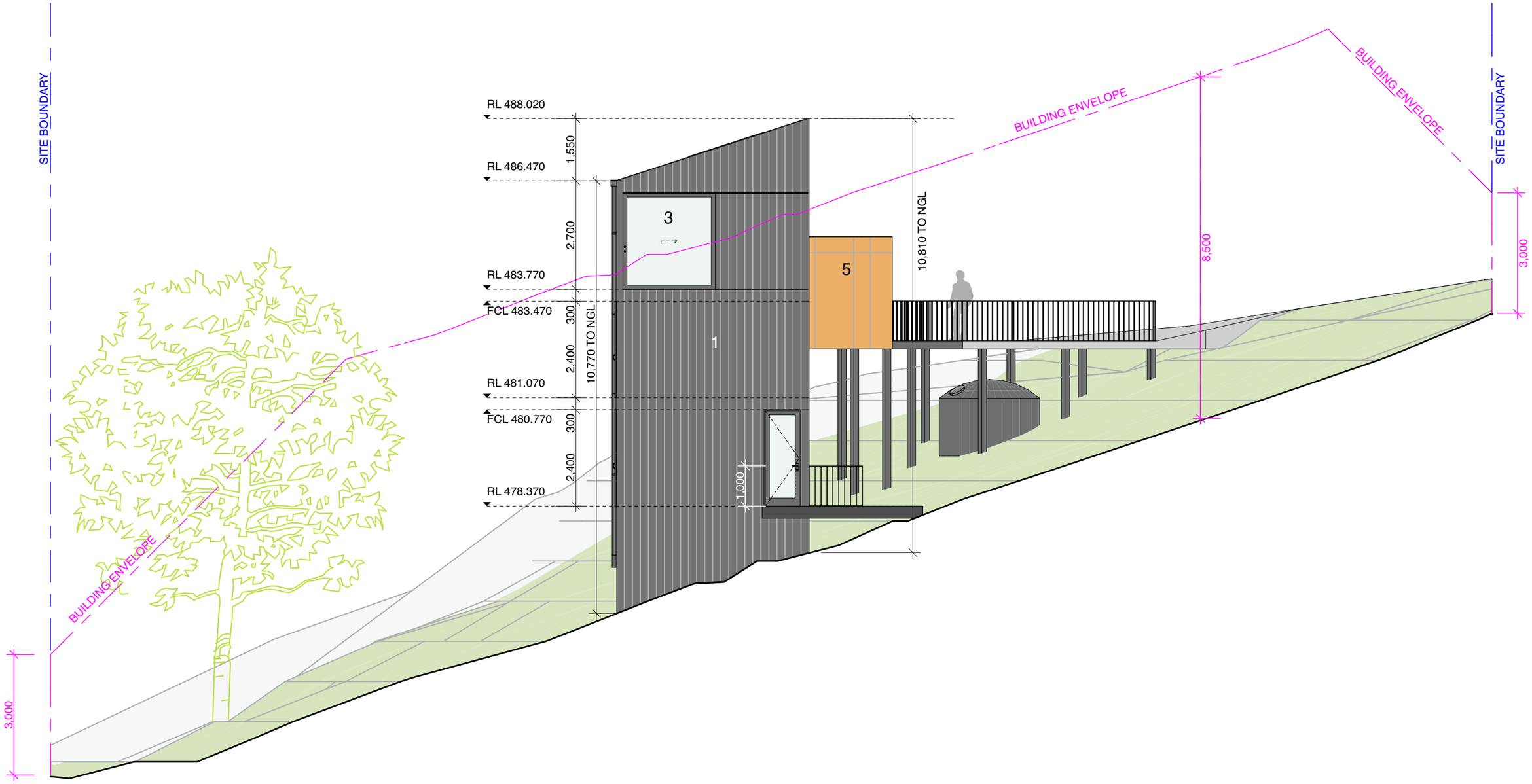
Issue ID	Issue Name	Issue Date

Drawing Title:
ELEVATIONS - NORTH/SOUTH

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK300
REV D



1:100 | EAST

EXTERIOR FINISHES

STORMWATER NOTES

1. COLORBOND SPANDEK. (COLOR: DULUX 'MONUMENT')
2. OVERFLOW STORMWATER TO BE DISCHARGED TO NEW 450X450 GRATED PIT.
3. OPERABLE CLEAR GLASS.
4. COLORBOND SPANDEK ROOFING (COLOR: DULUX 'MONUMENT')
5. CONNECT TO UPGRADED CULVERT (MIN 225DN OR SIMILAR) TO REPLACE EXISTING 150DN STORMWATER DRAIN.
6. CORTEN STEEL CLADDING.
7. OUTLET HEADWALL TO BE UPGRADED. PROPORTIONS ARE TO

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Issue ID	Issue Name	Issue Date
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REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

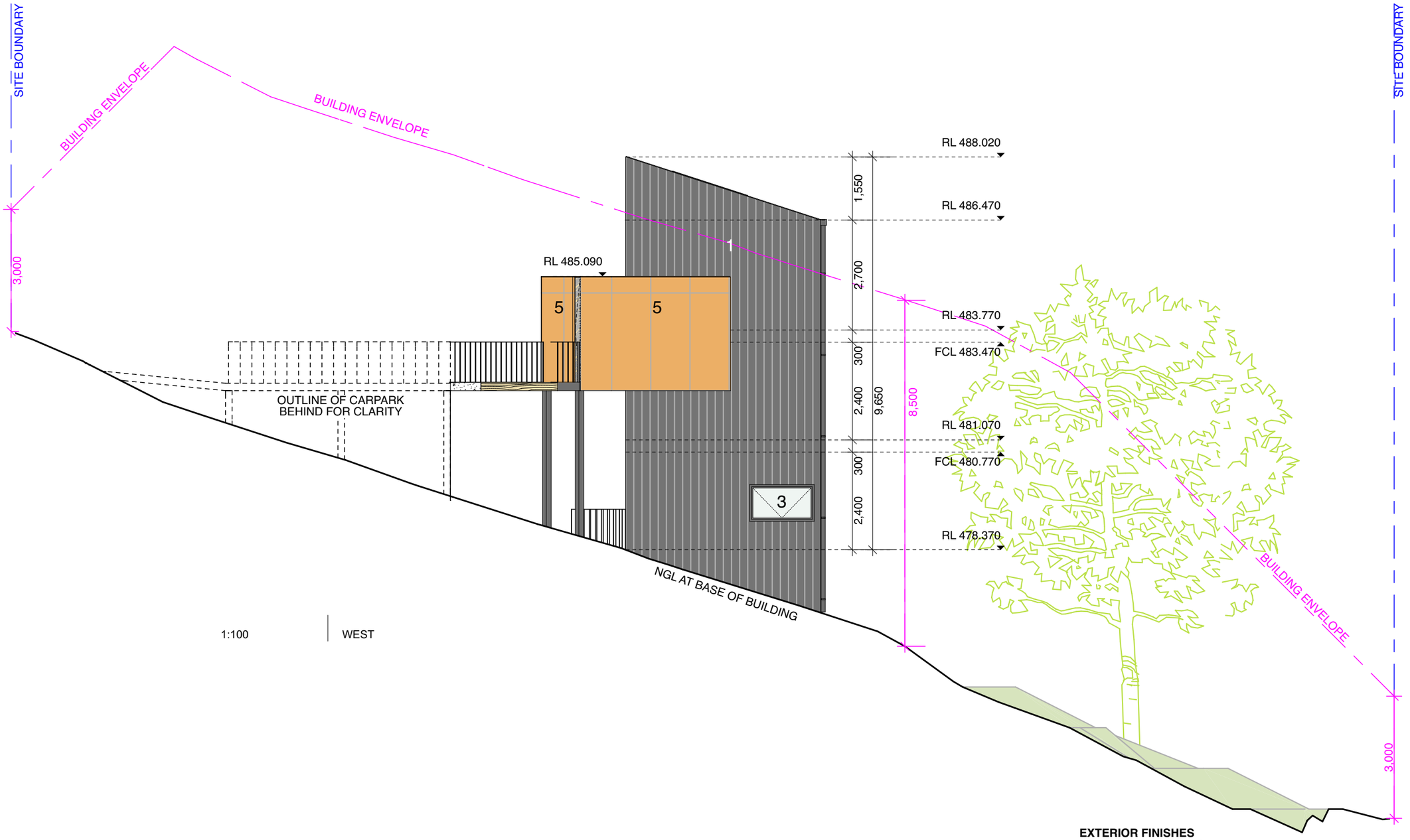
Issue ID	Issue Name	Issue Date

Drawing Title:
ELEVATIONS - EAST

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK301
REV D



1:100 | WEST

EXTERIOR FINISHES

1. COLORBOND SPANDEK. (COLOR: DULUX 'MONUMENT')
2. FIXED CLEAR GLASS (LEAD IMAGE GLASS)
3. OPERABLE CLEAR GLASS.
4. COLORBOND SPANDEK ROOFING (COLOR: DULUX 'MONUMENT')
5. CONCRETE

STORMWATER NOTES

1. ROOF AND GUTTER TO BE REDIRECTED/CHARGED TO NEW 450X450 GRATED PIT.
2. OVERFLOW STORMWATER TO BE DISCHARGED TO NEW 450X450 GRATED PIT.
3. CONTRACTOR TO CONNECT TO UPGRADED CULVERT (MIN 250DN OR SIMILAR) TO REPLACE EXISTING 150DN STORMWATER DRAIN.
4. OUTLET HEADWALL TO BE UPGRADED, PROPORTIONS ARE TO

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Issue ID	Issue Name	Issue Date
REV A	FOR DEVELOPMENT APPLICATION	9/8/17
REV B	FOR DEVELOPMENT APPLICATION	20/12/17
REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

Issue ID	Issue Name	Issue Date

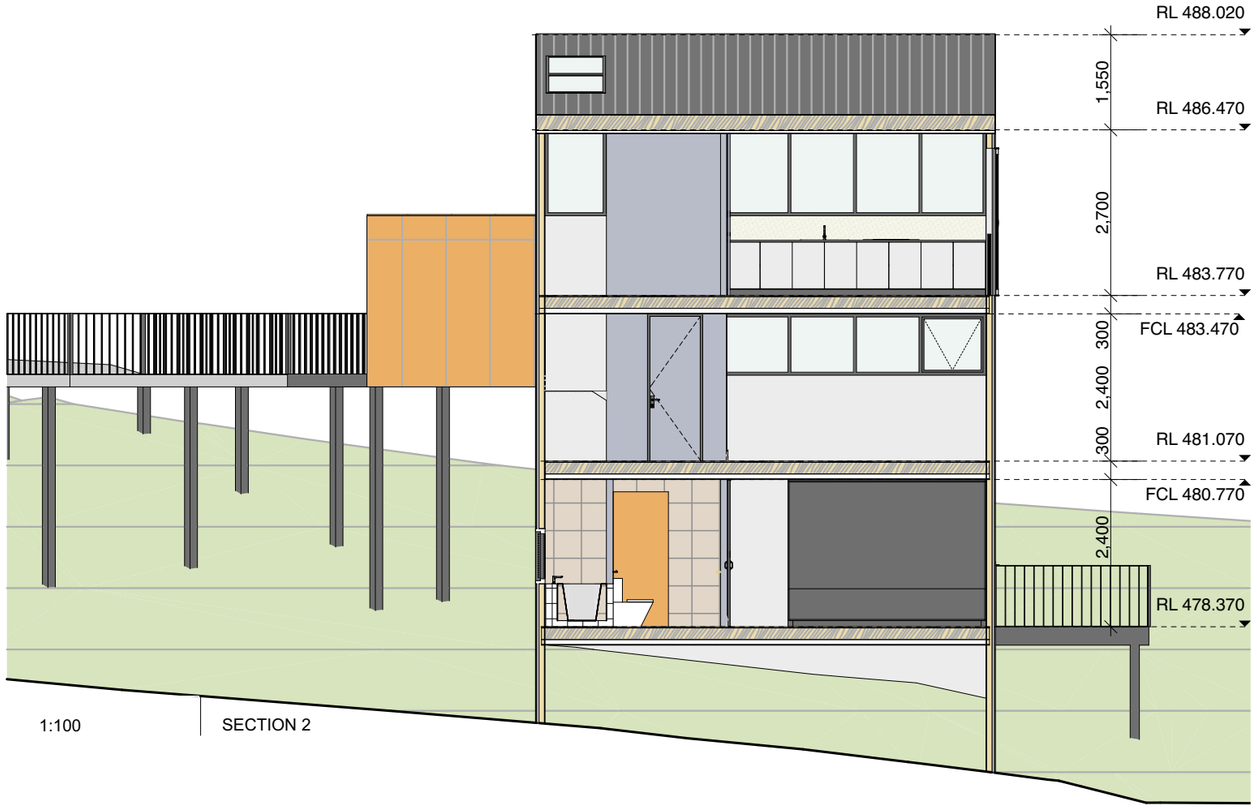
Drawing Title:
ELEVATIONS - WEST

Scale: AS SHOWN @ A3 **Date:** 3/7/18

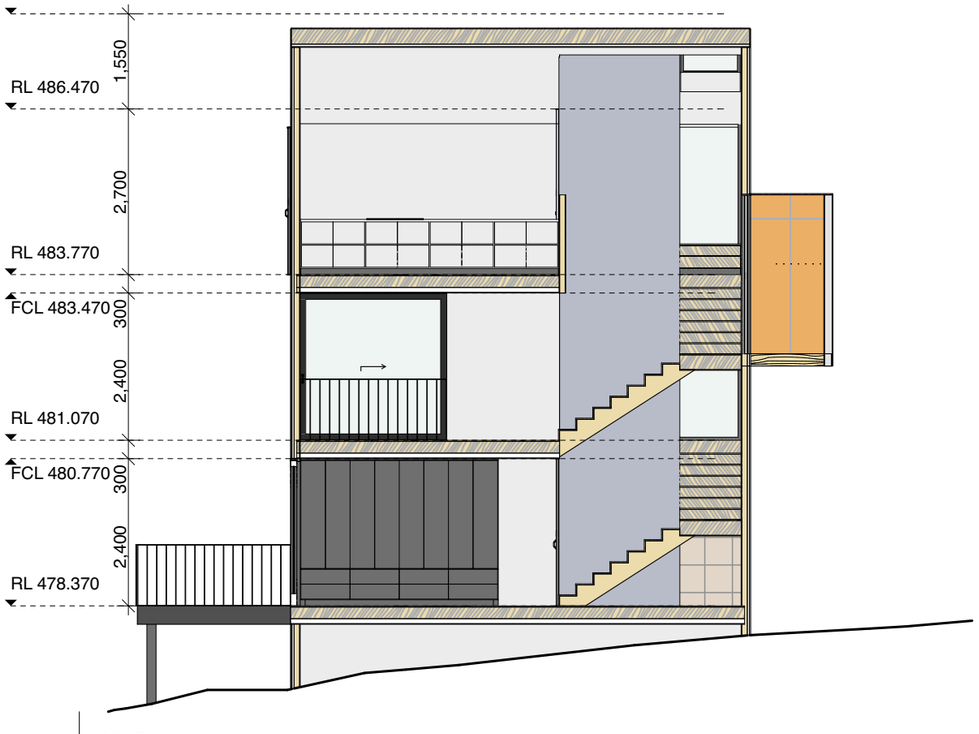
Status: #Project Status **Checked By:**

Drawing No.:
SK302
REV D

1:100 SECTION 1



1:100 SECTION 2



1:100 SECTION 3

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REV A	FOR DEVELOPMENT APPLICATION	9/8/17
REV B	FOR DEVELOPMENT APPLICATION	20/12/17
REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

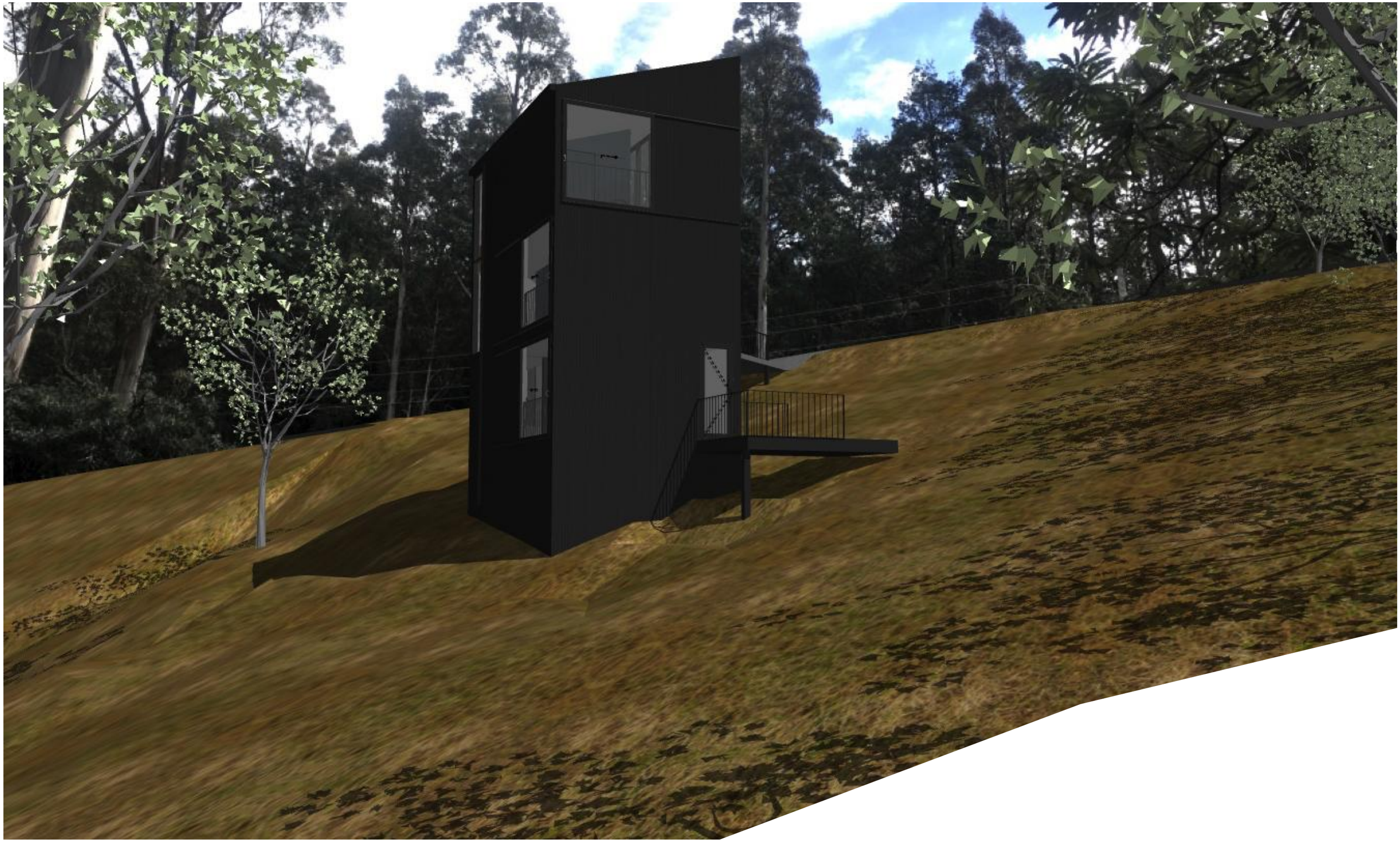
Issue ID	Issue Name	Issue Date

Drawing Title:
SECTIONS - 01, 02 + 03

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK310
REV D



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REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

Issue ID	Issue Name	Issue Date

Drawing Title:
PROJECT IMAGE - HOUSE VIEW 01

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK700
REV D

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REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

Issue ID	Issue Name	Issue Date

Drawing Title:
PROJECT IMAGE - HOUSE VIEW 02

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK701
REV D

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REV B	FOR DEVELOPMENT APPLICATION	20/12/17
REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

Issue ID	Issue Name	Issue Date

Drawing Title:
PROJECT IMAGE - HOUSE VIEW 03

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK702
REV D

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REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

Issue ID	Issue Name	Issue Date

Drawing Title:
PROJECT IMAGE - HOUSE VIEW 04

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK703
REV D

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REV A	FOR DEVELOPMENT APPLICATION	9/8/17
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REV C	DA - RFI	4/4/18
REV D	DA - RFI 2	15/6/18

Issue ID	Issue Name	Issue Date

Drawing Title:
PROJECT IMAGE - HOUSE SECTIONS

Scale: AS SHOWN @ A3 **Date:** 3/7/18

Status: #Project Status **Checked By:**

Drawing No.:
SK704
REV D