total earth care

Bush Fire Management Plan

William Charlton Village, Allambie Heights

Total Earth Care Pty Ltd
February 2020

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Allambie Heights

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William Charlton Village, Allambie Heights
Bush Fire Assessment Report

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1 EXECUTIVE SUMMARY

Allambie Heights Village Ltd (AHV) is submitting a development application for the re-development of the William Charlton Village retirement village. The site is located on land mapped by Northern Beaches Council (NBC) as being Bush Fire Prone Land and the proposal is for a Special Fire Protection Purpose (SFPP) and as such the development proposal submission must be referred to the NSW Rural Fires Service (RFS) under integrated development and must obtain a Bush Fire Safety Authority (BFSA) supported by a Bush Fire Assessment Report. (BFAR).

The proposal is to construct two (2) new residential and one (1) ancillary buildings (class 9) building within a Retirement Village on Bush Fire Prone Land and as such is considered a Special Fire Protection Purpose Development (SFPP) as described in Planning for Bush Fire Protection (PFBFP) 2006. The nature of the SFFP development also requires concurrence between the Consent Authority (NBC) and the Commissioner of the Rural Fire Service.

The proposal at 181 Allambie Road is contiguous with, and managed by the AHV aged care facility which is governed by a 50 year lease. As such the proposal can be considered to be an extension of the AHV and the proposed development is, to all intents and purposes, an infill development and has been treated as such within this report.

The current iteration of the development proposal has amended past non-compliances and the RFS has in its correspondence of the 2nd of December 2019, 30th of July 2019 and the 3rd of May 2019 (See Appendices 4, 10 and 11) makes “no objection is raised in principal to the amended proposal” contingent upon additional the following additional requirements being met.

By reference to Appendix 4. RFS D1887788 May 3 2019

Requirement 1:
The pool building must be removed from within the Asset Protection Zone (APZ).
Response:
The pool building has been removed.

Requirement 2:
All Special Fire Protection Purpose buildings must be located outside an 85 and a 30 metre APZ.
Response:
Al proposed building are located outside the RFS nominated APZ’s.

Requirement 3:
That the proposal is supported by a Plan of Management which addresses specific prescriptive outcomes.
Response:
A Biodiversity Management Plan and this Fire Management Plan address these outcomes.

Requirement 4:
Establish internal and perimeter roads in accordance with Section 4.2.7 of PBP 2006.
Response:
All internal roads comply with these requirement.
A perimeter road on the northern boundary of the property has been included. It should be noted that independent advice from Lew Short of Black Ash Bushfire Consulting and Total Earth Care’s own interpretation of PFBFP 2006 is that a perimeter road is not required. However the proponent has include a perimeter road in the design which goes someway to satisfying this request by:

- Installing a 56 metre long 6.5 metre wide reinforced turfed two way access road; and
- Relying on the existence of a fire trail on the Sydney Water Easement to north which is parallel to the perimeter road and immediately adjacent to it. This fire trail is partially managed by Allambie Heights Village by written agreement with Sydney Water, the details of which will be supplied to Council and the RFS as a condition of consent.

By reference to Appendix 10. RFS D1887788 May 3 2019
The RFS require that the following issues be addressed as conditions of consent:

Requirement 5:
Asset Protection Zone Management.
The Management of the Asset Protection Zones must supported by a Bushland Management Plan:
Response:
New iterations of Biodiversity Management Plans and this Fire Management Plan have been provided.

Requirement 6:
Written Agreement with Northern Beaches Council and Sydney Water regarding offsite APZ's
Response:
Reliance is made on:

- An existing APZ within the Manly Warringah War Memorial Park (MWWMP) which, by written agreement with the former Warringah Council (now NBC). A formal written agreement with Northern Beaches Council will be ratified once the Development Application has been approved and will be included as a condition of consent.
- An APZ within Sydney Water land to the north of the site. A formal written agreement with Sydney Water will be ratified once the Development Application has been approved and will be included as a condition of consent.

Requirement 7:
Design and construction
All buildings will be built to AS 3959/2009 (BAL12.5)
Response
These standards have been incorporated into the design.

Requirement 8:
Water and Utilities
All infrastructure be compliant with sections 4.1.3 and 4.2.7 PBP 2006
Response
These standards have been incorporated into the design.

Requirement 9:
An Evacuation and Emergency Management Plan must be written in accordance with "Development Planning - A Guide to developing a Bushfire Emergency Management and Evacuation Plan 2014."
Response
This plan will be approved as a condition of consent.

Requirement 10:
Landscaping will comply with the standards of Appendix 5 of PBP 2006.
Response
The Landscape Plan complies with these requirements. Refer to Appendix 12. Landscape Concept Plan LSD -01

2. INTRODUCTION

2.1 Background

AHV, an aged care organisation, has taken a lease over Crown lands at 181 Allambie Rd, Allambie Heights (William Charlton Village) (Deposited Plan 752038 lot number 2615). These lands are contiguous to the south with a property, which is currently owned by the same organisation, at Martin Luther Place, Allambie Heights. AHV intend to develop this leased land to expand upon their facilities by building a Retirement Village. Development of the land was substantially started by the past lessees and it is the intention of the new current lessees to continue with what they consider to be an existing use right. It should also be noted that the Rural Fires Act (Planning for Bush Fire Protection) specifically discourages locating SFPP developments within Bush Fire Prone Land, consequently the existing use right has added importance to the proponent.

AHV is redeveloping the William Charlton Village site at Allambie Heights (hereafter referred to as the 'site') as a Retirement Village. Approximately 2.5 hectares (ha) of vegetation will remain on the site and will be the subject of bushland restoration as per the Biodiversity Management Plan (Appendix 9).

2.2 The Site and Proposed Development

AHV has leased a 3.72 Hectare property at 181 Allambie Road, Allambie Heights (The Site). The proposed development will be a state-of-the-art retirement village infrastructure precinct which will augment its current capacity, and service a burgeoning need for aged care. The site is currently being used as a Residential Aged Care Facility, however the western end of the property has not been fully developed and a significant portion of the site is remnant bushland.

It should be noted that the remnant bushland section of the site has been partially developed by the past lessee. A sealed road has been built on cut and filled soil through the centre of the site. Two drains have been excavated into solid rock which have created de-facto creeks neither of these drains have been mapped by the office of water. Walking tracks have also been installed and the site has been cleared and burned.

Historical documents demonstrate a willingness of the past consent authority and the Crown to develop the land. These historical works and the current use of the site do establish a basis of claim to existing use rights as a Retirement Village housing development.

AHV proposes to redevelop the central cleared area of the site. The proposed William Charlton Village Plan is shown in Map 6 Site Plan. The main features of the Masterplan are:

- Construction of twenty-four (24) number residential apartments;
- A communal building;
- Private open space areas, including landscaped streets, parks and gardens;
- Rehabilitation of degraded bushland areas within the site; and
- Upgrading of the existing road network, including the creation of new roads.

2.3 Statutory Context

The Local Government Planning Instruments create Development Controls which regulate the use of the site. Additionally State Government agencies have jurisdiction over other values and aspects. In particular Archaeology, Biodiversity, Waterways and Bush Fire parameters are not within the jurisdiction of Local Government as Consent Authority and trigger the need for Integrated Development "concurrence" by the relevant Government agencies.

The *NSW Rural Fires Act 1997* (RF Act) and the *NSW Environmental Planning & Assessment Act 1979* (EP&A Act) were amended in 2002 to improve planning for bush fire protection within NSW. Section 4.14 of the EP&A Act establishes the requirement for development on bush fire prone land to conform to the guidelines of the NSW Rural Fire Service (RFS) published in *Planning for Bush Fire Protection* ('PFBFP' - RFS 2006).

PFBFP 2006 forms the basis for all planning and development control measures regarding building in bush fire prone areas. Under PFBFP 2006, development within a designated bush fire prone area, as mapped by the RFS and Local Government Authorities, requires a bush fire hazard assessment and the implementation of measures to control the bush fire threat. Bush fire prone areas are defined in PFBFP 2006 as those lands within 100 metres of high or medium bush fire hazards or lands within 30 metres of low bush fire hazard.

Development proposals must satisfy the broader aims and objectives of PFBFP 2006, which are to construct buildings within fire safe locations. If buildings are proposed for construction within locations which may experience bush fire i.e. in potentially unsafe locations, then approval will only be given to the development proponent if performance criteria for each of the Bush Fire Protection Measures in sections 4.1 and 4.2 of PFBFP 2006 can be met. The measures may include construction requirements set out in the Building Code of Australia (BCA), which is a performance based code related to the construction of buildings. The code contains 'deemed to satisfy' provisions which are the construction requirements contained in AS3959-2009.

For Residential Subdivision, the APZ distances are designed to meet the deemed-to-satisfy provisions, and the calculation is based on the modelled radiant heat exposure which buildings are likely to experience in the event of a bush fire. Corresponding AS3959-2009 construction levels, known as Bush Fire Attack Levels (BAL), are required as part of the deemed to satisfy provisions.

Section 100B of the RF Act 1997 states that the NSW Rural Fire Service Commissioner may be required to issue a *Bush Fire Safety Authority* for "a subdivision of bush fire prone land that could lawfully be used for residential or rural residential purposes, or development of bush fire prone land for a *Special Fire Protection Purpose*[1]". Developments requiring approval under Section 100B of the RF Act are referred to as "integrated development" under Section 4.46 of the EP&A Act 1979. The property in question is classified as "Integrated Development", and as such has been referred to the NSW Rural Fire Service for approval and issue of a *Bush Fire Safety Authority* (BFSA).

This bush fire assessment, completed in accordance with PFBFP 2006 and clause 44 of the RF Regulation 2013 provides information to support the BFSA application.

The Northern Beaches Council (Warringah Council LEP 2011) is an additional Planning Instrument which might impact on the permissible land uses on site. The site is zoned as R2 Low Density Residential.

2.5 Adjacent Land Use

The northern boundary adjoins a Sydney Water (Water reticulation pipe) easement. The pipe is approximately 1500mm in diameter and is located downslope of a 4WD track. This pipe line easement is approximately twenty (20) metres wide and two (2) narrow weed infested bushland remnants grow along the edges of the easement.

Beyond the Sydney Water Easement are multiple aged care facilities and the Sunnyfield Cerebral Palsy treatment centre. The AHV has a common boundary on the development site's south eastern boundary. The eastern boundary is Allambie Road.

The sites south western and western boundary is contiguous with the MWWMP) which is a 375 hectare passive and active recreational bushland park.

Special Fire Protection Purpose means the purpose of the following:
(a) a school,
(b) a child care centre,
(c) a hospital (including a hospital for the mentally ill or mentally disordered),
(d) a hotel, motel or other tourist accommodation,
(e) a building wholly or principally used as a home or other establishment for mentally incapacitated persons,
(f) housing for older people or people with disabilities within the meaning of State Environmental Planning Policy No 5—Housing for Older People or People with a Disability,
(g) a group home within the meaning of State Environmental Planning Policy No 9—Group Homes,
(h) a retirement village,
(i) any other purpose prescribed by the regulations.

Additionally it is also important to note that AHV have an ongoing bushland fire management agreement with the MWWMP Trust. MWWMP undertake regular and routine management of the APZ and access tracks adjoining the Allambie Heights Village.

Adjacent to the southern and western boundaries of the site is an electrical power easement. The bushland below and within 10 metres of the power lines is slashed under a regular maintenance regime. This easement creates a 25 metre wide fuel reduced zone between the site and the dominant fire run.

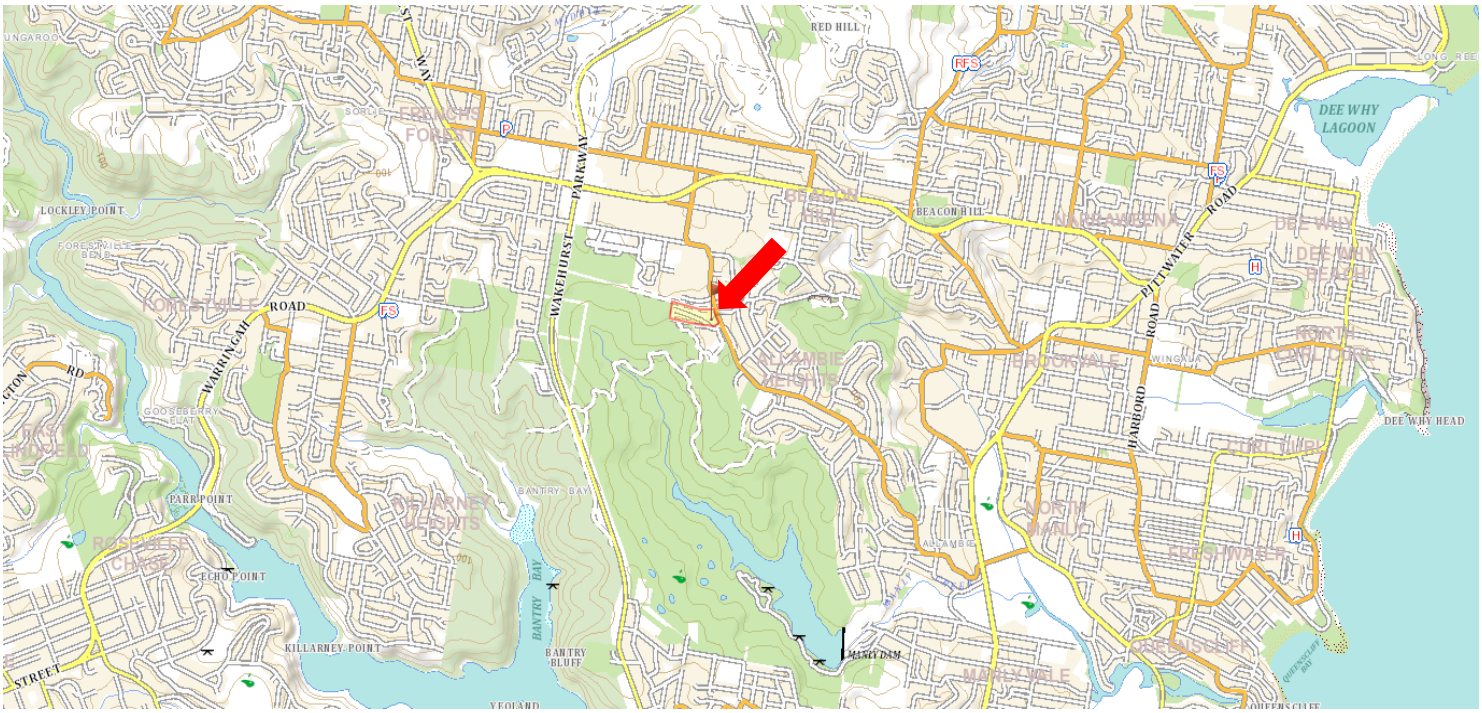


Figure 1. Site Locality

Figure 2. Subject Site

2.7 Bush Fire Prone Land

The property has been mapped as being bush fire prone by NBC. See Figure 3 and Figure 4.

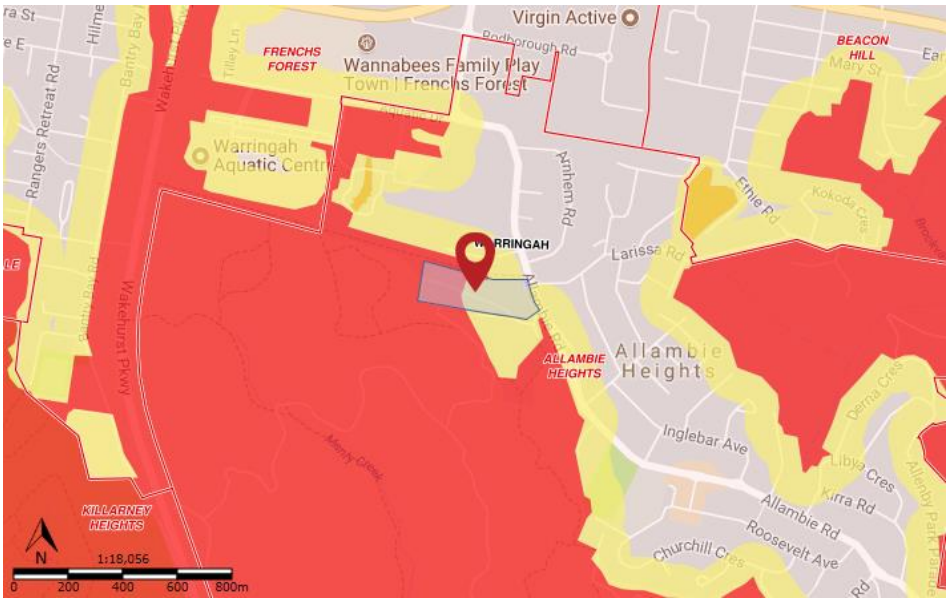


Figure 3. Bush Fire Prone Land - Landscape Scale

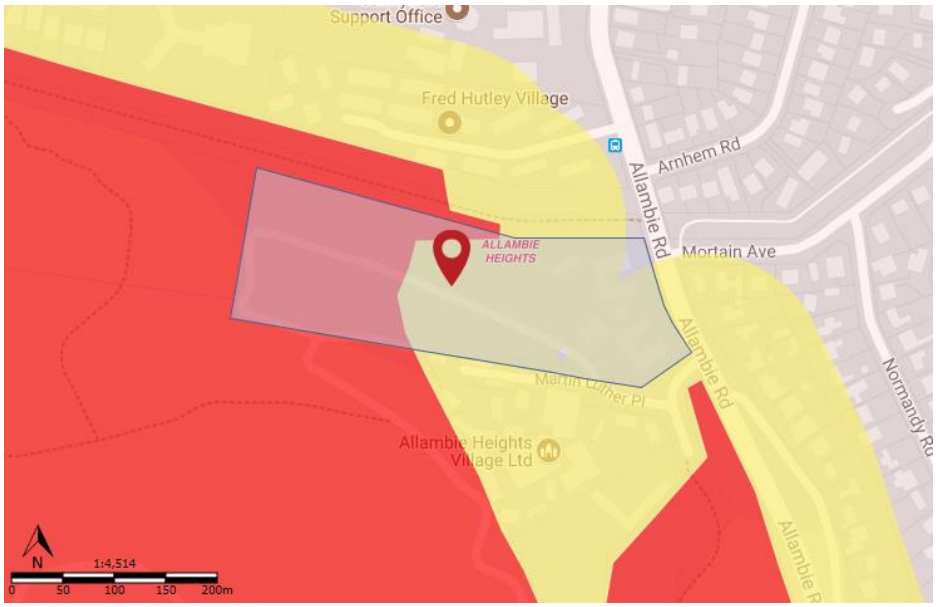


Figure 4. Bush Fire Prone Land within the Site

Vegetation Category 1 (pub. 2017-08-10)	1
Vegetation Buffer (pub. 2017-08-10)	0

2.8 Site Assessment

2.8.1 Topography and Aspect

The Site
The property is roughly rectangular in shape with the long axis orientated to the east and west. The western half of the site is dominated by bushland (Heath-Mallee/Woodland/Forest), whilst the centre is open parkland and the eastern end contains two (2) two-storey residential buildings and a number of smaller service buildings.

The site is spilt in half along the east-west access along the contour by a level sealed eight (8) metre wide road. A weedy fill batter approximately twenty (20) metres wide supports the road. This (30 metre wide) clearing reduces the width of the bushland (woodland) above the road to approximately 45 metres and the bushland (forest) is approximately 45 metres wide below the road.

The bushland remnant has a south facing aspect and is located on moderately sloping land with its highest point being 134 metres above sea level and its lowest point being 117 metres above sea level with 114 metres between these points, i.e. a 15% grade or 9 degree slope.

The land is evenly benched along the contour from west to east with the steepest possible grade of 5% grade or 3 degree slope.

Adjacent Bushland

Downslope
The majority of the bushland (heathland) immediately downslope and to the south of the site is situated on shallow soil on a 100m wide sandstone bench. This is a managed landscape (a cleared power easement and access roads) and is consistent in its structure with an Outer Protection Area (OPA). This one-hundred (100) metres wide broad flat sandstone bench within MWWMP is the dominant fire run threatening the site. In light of the access tracks, power easements and the central road, the maximum un-interrupted fire run from this direction is less than one-hundred (100) metres long. The managed bushland access track along the sites south-western boundary and the managed bushland beneath the power line easement has created a fifty (50) metre wide fuel reduced zone along most of the interface with the MWWMP.

The southern eastern boundary is located on a twenty (20) metres wide flat sandstone bench which extends beyond and along the southern eastern boundary of the bushland (forest) interface. At the downslope edge of this bench is a ten (10) metres wide stepped broken scarp of sandstone that flattens after approximately twenty (20) metres. This ground then flattens and meets a vehicle access road.

The twenty (20) metres wide sandstone bench has been excavated at its eastern end to create an artificial wetland and narrow drain. This excavation is into solid rock and although it creates steeper ground, it does not support vegetation. This wetter gully is the steepest land adjacent to the site, 12% slope or 7 degrees, but it is unlikely to be the direction of the fire threat and is also unlikely to have a strong influence to the fire run.

Upslope
A five (5) to ten (10) metres wide strip of weedy Heath-Mallee is located along the upslope northern boundary. It is not mapped as a fire risk and verbal communication with the Rural Fire Service at Terrey Hills confirmed that it does not pose a fire threat.

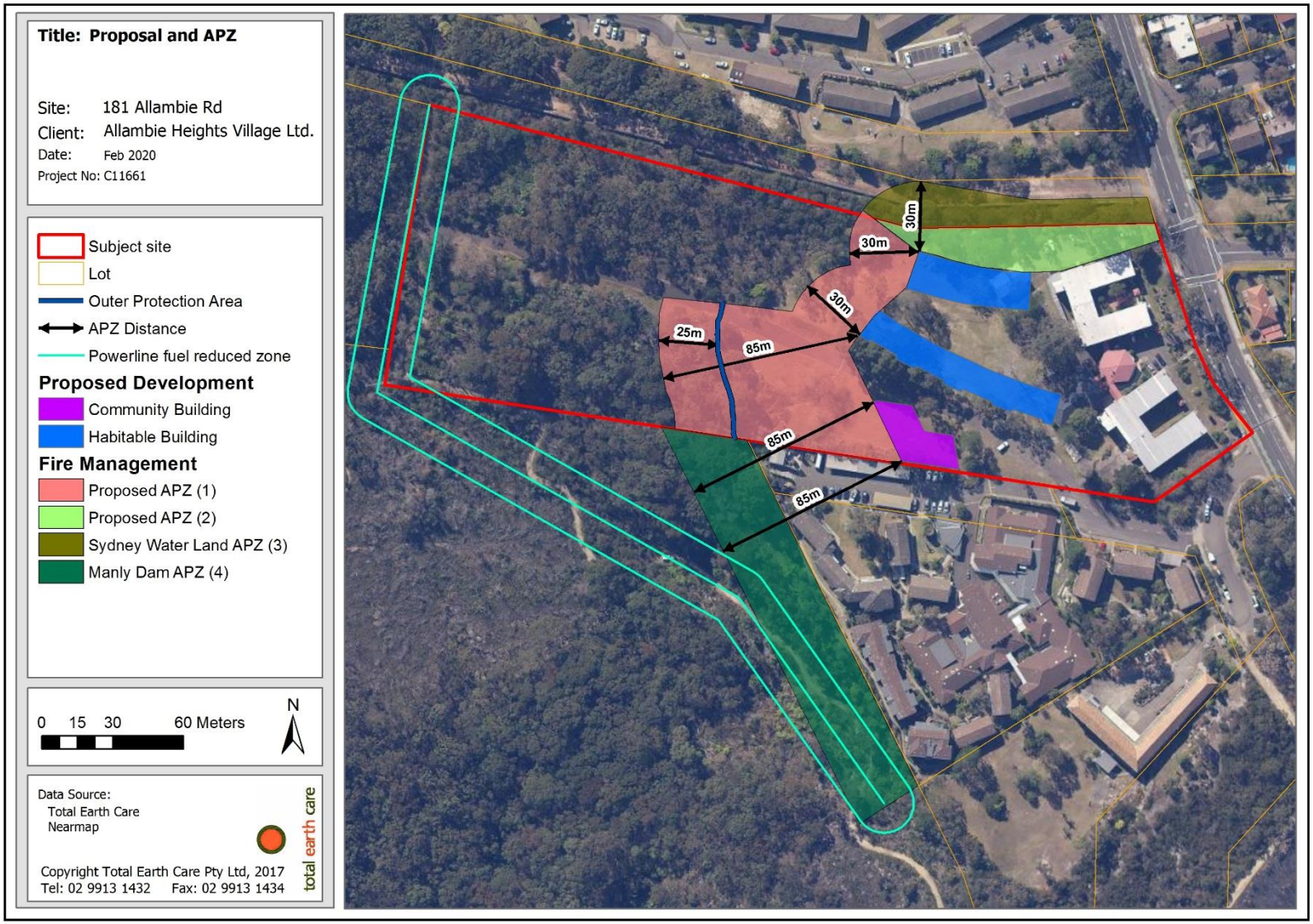
On Level
The western end of the site is bounded by Woodland. The power easement runs diagonally away from the site through this remnant.

Bushland Management

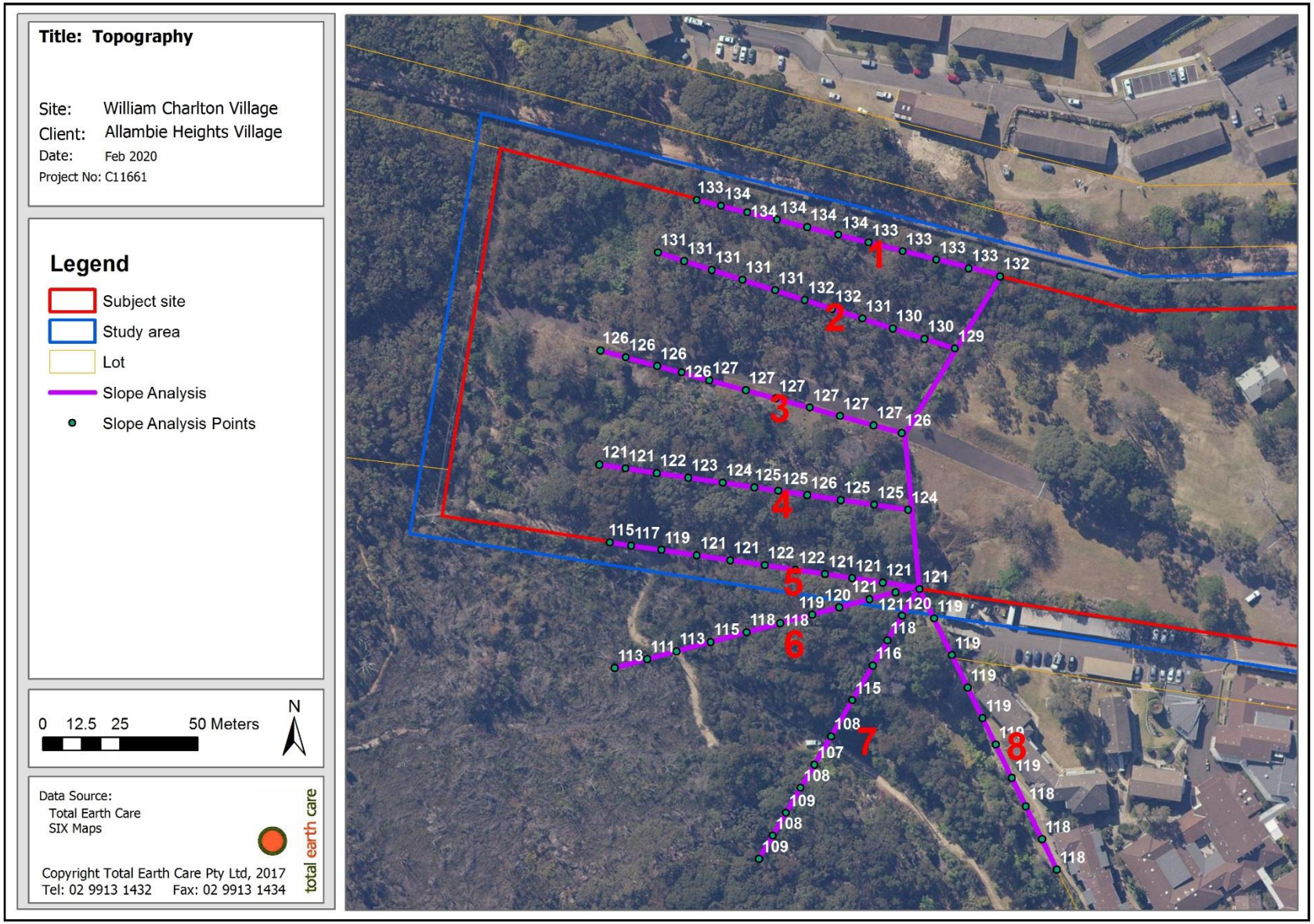
All areas dominated by exotic vegetation within bushland will be managed as per the Biodiversity Management Plan (Total Earth Care 2020).

Map 1. Vegetation Communities

Map 2. Bush Fire Management Overview



Map 3. Topography



Map 4. Site Plan

2.8.2 Assessment of Vegetation and Slope

An assessment of the vegetation and slope surrounding the proposed development is provided in Table 1 below.

Table 1. Effective Slope Calculations

Effective Slope & BAL calculation					
Building #	Vegetation Formation	Distance from building to hazard	Height change under vegetation	Distance under vegetation hazard	Effective Slope
1	Mallee Mulga	30	upslope	30	upslope
2	Mallee Mulga	30	upslope	30	upslope
2	Forest To the west	85	Level	35	0 degrees
4	Forest To the south west	85	12 metres	35	9 degrees

2.8.3 Assessment of Environmental Issues

Previous studies by Total Earth Care determined that there were no threatened species, populations or threatened ecological communities known to occur in the subject site. However, there were records of other species within the study area which may possibly use the site in the future.

At the time of assessment, there were no known Aboriginal relics that will affect or be affected by the bush fire protection proposals in this report.

3 ACCESS & SERVICE SUPPLY

3.1 Access

A perimeter road is proposed as the main access for the development. It will be a 350 metre long loop road which enters and exits from Allambie road and from Martin Luther place. The proposed road does not fully satisfy the prescribed parameters set out in PFBFP 2006 (4.1.3 Access (1) – Public Roads) and 4.2.7 Standards for Bush Fire Protection Measures for Special Fire Protection Purpose Developments, however it does meet the purpose of those parameters please consider these below.

Non compliances

1. Perimeter Road / Fire Trail
The perimeter road separating the bushland from the residential buildings should be considered in two (2) parts in accordance with the bush fire threat and firefighting staging areas.

Threat 1. Forest to the south/west.
Total Earth Care and the RFS concur in the determination that the main bush fire threat is from the south west. The perimeter road at the point adjacent to this hazard is fully compliant with the design requirements established in 4.1.3. of the PFBFP 2006 which are:

- Two-wheel drive, sealed, all-weather roads;
- Two way traffic;
- Two lane wide;
- Eight (8) metres minimum kerb to kerb;
- Shoulders are on each side;
- A through road;
- No traffic management devices are proposed;
- A minimum vertical clearance of four metres to any overhanging obstructions;
- Curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress;
- The minimum distance between inner and outer curves is six metres;
- Maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees;
- Crossfall of the pavement is not more than 10 degrees;
- Roads do not traverse through a wetland or other land potentially subject to periodic inundation (other than flood or storm surge);
- Roads are clearly sign-posted;
- There are no bridges on the perimeter roads; and
- The road surface has a capacity to carry fully-loaded firefighting vehicles (15 tonnes) the details of the geotechnical foundations to the turf have been provided in the landscape plans.

Threat 2. Heath-Mallee to the north
The perimeter road along the northern boundary if not fully compliant with the design requirements established in 4.1.3. of the PFBFP 2006 in that it:

- Is not sealed but is all-weather two wheel-drive (Reinforced turf);
- Is two way traffic;
- Is two lanes wide;
- Is 6.5 metres minimum without a kerb;
- Is shouldered on each side;
- Is a through road;
- Is without traffic management devices;
- Is cleared to a minimum vertical height of four metres;
- Is curved with a minimum inner radius of six metres;
- Is with minimum six metre distances between inner and outer curves;
- Is graded less 15 degrees and has average grades not more than 10 degrees;
- Has a crossfall of less than 10 degrees;
- does not traverse a wetland or other land potentially subject to periodic inundation (other than flood or storm surge);

- Is clearly sign-posted;
- Has no bridges; and
- Has a capacity to carry fully-loaded firefighting vehicles (15 tonnes).

Note:
An existing fire trail is located contiguous to and running parallel with the northern section of the perimeter road. This fire-trail is maintained by MWWMP and Sydney Water. This fire trail not only provides protection for the proposed development, but also provides protection for the Residential Aged Care facilities and Special Needs facilities upslope of it.

These two firefighting vehicle access and egress routes provide the desired outcome. The proposed perimeter road substantially improves the fire safety outcome for the adjacent properties.

2. Public / Private Road
The road is private not public and as such will reduce the volume of traffic upon it. There will be no gates or access restrictions upon the road. The road will be maintained under a management program which is conditioned in the development approval.

3. Sealed / 15 tonne Capable Road
The proposed road is not fully sealed. A 56 metre section of the road is not sealed but turfed. This turf is laid on a geotechnical product and provides all-weather two-wheel drive access for 15 tonne vehicles.

4. 6.5 metre road width
The proposed road width is 6.5 metres wide not the preferred eight (8) metres for 56 metres of its length. However, it had been designed to enable two (2) way traffic flow and all corners provide the mandated radius to accommodate firefighting emergency service vehicles. The narrow section of the road is also unlikely to be a staging area for a firefighting effort and if it is a staging area the contiguous fire trail will most likely be used as the primary firefighting line because properties to the north are more likely to be at risk from a fire run that comes directly from the west. The combination of these two staging points are more than adequate to mitigate the fire risk.

Compliances

Two way / Through Road
The road is a two (2) way through road however one internal road is an existing sealed secondary two (2) way road which terminates at a dead end. This dead end will be modified to comply with the eight (8) metres minimum road width will have a twelve (12) metres turning circle and have a fifteen (15) tonne capacity and will be less than a 3% slope. All other standards set in 4.2.7 Standards for Bush Fire Protection Measures for Special Fire Protection Purpose Developments have been met for internal roads.

3.2 Services

3.2.1 Water Supply

It is proposed that a ring main water reticulation system will be installed along the outer alignment of the road verge, i.e. on the bushland side of the access road. Metal Stortz valves / hydrants will be provided at intervals and with pressures and volumes in compliance with AS 2419.1 - 2005 and specifically in accordance with the performance criteria table for water supply services in PFBFP 2006.

3.2.2 Gas and Electrical Supplies

Gas and electrical supply will also be located underground within the road corridor. All above ground gas take off points will be set outside the APZ. All gas services will be installed and maintained in accordance with *Australian Standard 1596: The storage and handling of LP Gas (AS1596)* and specifically in accordance with the performance criteria for gas supply services outlined in Section 4.1.3 of the PFBFP 2006.

4 HAZARD ASSESSMENT

The SFFP development (Retirement Village) requires a BAL- Low rating of 10kW/m2 or less to ensure that the safety of emergency personnel is not compromised during an evacuation. The proposed development includes both domicile and ancillary buildings.

4.1 Determination of Bush Fire Attack

4.1.1 Overview

There are six (6) Bush Fire Attack Levels (BAL) that are used to determine the appropriate construction to be applied to a development:

- BAL-LOW;
- BAL-12.5;
- BAL-19;
- BAL-29;
- BAL-40; and
- Flame Zone (Alternative Solution required).

The categories of attack are determined by:

1. The type of vegetation;
2. How close the building is to the vegetation;
3. What the effective slope is (i.e. fire runs more readily and with greater intensity uphill); and
4. The Fire Danger Index applicable to the region

The building requirements for house design and construction vary according to the BAL that a development falls into. The building requirements for each BAL are set out in *Australian Standard 3959: Construction of buildings in bush fire-prone areas 2009 (AS3959).* A full version of this document can be purchased from Standards Australia.

The various BALs and the associated construction requirements have been determined by the RFS and have resulted in the APZ widths provided in Map 2 above. BAL LOW has been achieved for all buildings and building construction levels for the building surface facing the hazard at the equivalent of BAL-12.

Table 2. Expected Fire Behaviour and Construction Level

Heat Flux Exposure	Expected Fire Behaviour	AS 3959 – Level of Construction
N/A	Minimal attack from radiant heat and flame due to the distance of the site from the vegetation, although some attack by burning debris is possible. There is insufficient threat to warrant specific construction requirements	Bush Fire Attack Level – Low (BAL-LOW)
≤ 12.5	Attack by burning debris is significant with radiant heat (not greater than 12.5 kW/m2). Radiant heat is unlikely to threaten building elements (e.g. unscreened glass). Specific construction requirements for ember protection and accumulation of debris are warranted.	Bush Fire Attack Level – 12.5 (BAL-12.5)
>12.5 ≤ 19	Attack by burning debris is significant with radiant heat flux (not greater than 19 kW/m2) threatening some building elements (screened glass). Specific construction requirements for embers and radiant heat are warranted	Bush Fire Attack Level – 19 (BAL-19)
>19 ≤ 29	Attack by burning debris is significant and radiant heat flux (not greater than 29 kW/m2) threaten building integrity. Specific construction requirements for ember and higher radiant heat are warranted. Some flame contact is possible.	Bush Fire Attack Level – 29 (BAL-29)
>29 ≤ 40	Radiant heat flux and potential flame contact could threaten building integrity.	Bush Fire Attack Level – 40 (BAL-40)
>40	Significant radiant heat and significant higher likelihood of flame contact from the fire front will threaten building integrity and result in significant risk to residents.	Bush Fire Attack Level – Flame Zone

4.2 Analysis of Fire Behaviour

Contiguous lands to the development site

South-Western Fire Threat
The source of bush fire that might threaten the property would most certainly be the MWWMP.

This large urban parkland is contiguous to the lower boundary of the site and is substantially south-west of it. Hot drying winds are likely to be westerly and will cause a fire ignited to the west to run uphill and across the contour from the south-west.

Mitigating Factors
The south-west aspect has several parameters, which will influence fire behavior:

- The MWWMP have a current fire management plan in place which includes a thirty (30) metres wide APZ along the south and western boundaries of the site.
- Hazard reduction burns and manual clearing are regularly undertaken by the management authorities.
- An existing trail network has been used by the MWWMP Trust to define and undertake hazard reduction burn areas.
- This trail network of trails is also available to emergency service personnel to contain wild fires.
- The western boundary, like the southern boundary, also has a power line easement running parallel to it. This power line easement is also cleared of tall trees and the shrub layer is reduced in height with each asset maintenance event.
- The Scalabrini Village approximately 450 metres to the south is also located on the MWWMP' eastern boundary. The MWWMP trust also manages an APZ along this interface. These managed lands significantly reduce the fire threat from the south east.
- The lands to the north and south have been substantially developed and are considered managed lands by PFBFP 2006.
- The AHV also provides threat mitigation to the proposed development. The recently approved developments within AHV have been deemed to satisfy the requirements of PFBFP 2006 and provide shielding from the south and east.
- An existing perimeter fire access trail within and along the sites southern boundary effectively reduces the bushland forests remnant within the site to less than 1 hectare.
- An existing road batter, within the site is, covered in weeds which is approximately twenty (20) metres wide and a central sealed road approximately ten (10) meters wide, separate the northern and southern bushland remnants on site and reduce the remnant sizes to less than one (1) hectare. The twenty (20) metre wide weedy batter will be formally managed under the Biodiversity Management Plan provided in Appendix 9. This area is not directly adjacent to any of the buildings and so is not an APZ. However due to the weedy nature of the zone and to reduce the available fuel load and act as a fire break, this area will be managed as an IPA and will be revegetated with native grasses and sedges to be consistent with a native grassland.

Western Fire Threat
The heath-mallee and forest community northern bushland remnant, upslope of the central road, are separated from the bushland to the west by a wet weed-dominated area which is approximately twenty (20) metres wide. This twenty (20) metre wide drainage area will be formally managed under a Biodiversity Management Plan (Appendix 9). This area is not directly adjacent to any of the buildings and so is not an APZ. However due to the weedy nature of the zone and to reduce the available fuel load and act as a fire break, this area will be managed as an IPA and will be revegetated with native grasses and sedges to be consistent with a native grassland.

Eastern Fire Threat
A narrow and small bushland remnant less than one (1) hectare, joins the MWWMP and wraps around the adjacent development AHV and is roughly located to the east of the property.

Mitigating Factors
This remnant, which separates Allambie Road and Martin Luther Place, is too small and too isolated to constitute a fire threat.

Northern Fire Threat
A very narrow bushland corridor which runs along the northern boundary adjacent to the proposed and existing residential buildings.

Mitigating factors
The northern hazard is less than one (1) hectare and is too narrow to constitute a fire run or pose a substantial fire threat. The Sydney Water reticulation easement also provides emergency services the access required during an emergency to contain fires that approach from the west or the north. Sydney Water has agreed in principle to AHV managing an APZ within their land, a formal written agreement will be provided by Sydney Water once the Development Application has been approved. This will require the removal of weeds and dead plants from the remnant and thereby remove the minimal fire threat it posed. Refer to Map 1. Vegetation communities for the areas mapped as “Weeds and Exotics”.

Bush Fire Risk within the Property Boundaries
The structure of the Bushland within the property boundaries is Heath-Mallee, Woodland and Forest.

The bushland is comprised of two (2) strips of bushland approximately 45 metres wide which are located on the lower and upper sides of a sealed access road. These two areas are currently approximately 120 metres long and being contiguous with the bushland to the west they are located at the end of a substantial, although partially managed, fire run. The eastern end of the bushland is a managed "parkland / grassland".

Mitigation
It is proposed that the weedy bushland be weeded and or completely removed which will reduce the overall area of these two bushland components to less than one-hundred (100) metres long and approximately 0.45 hectares in size. Both the upper and lower sections section will be further reduced in size by the management of a twenty (20) metre wide weed infested wet area which traverses the site near the western end of the bushland. Refer to Map 1. Vegetation communities for the areas mapped as "Weeds and Exotics".

The weed clearing proposed in the centre of the site will separate the bushland remnants by approximately fifty (50) metres and allow the two (2) areas to be considered as two (2) distinct fire management units. The weedy area will be managed as a native grass land. This will improve access to the remnant bushland areas for fire fuel management and for fire-fighting purposes.

The regenerating bushland will be managed in a fashion to remove the shrub and small tree layer to ensure that there is no connectivity between fire fuels in the grass layer and the canopy layer.
These works will be completed in accordance with the Biodiversity Management Plan William Charlton Village Allambie Heights Total Earth Care February 2020 (Appendix 9).

Table 3. Compliance with requirements for Bush Fire Protection Measures for Infill Development

Performance Criteria	Proposal	Meets Performance Criteria?
In relation to APZs: • A defendable space is provided onsite. • An APZ is provided and maintained for the life of the development.	A defendable space is provided on site, and is located within the north east section of the property away from the hazard. The vegetation within the developed area of the site will be managed as an Inner Protection Area (IPA) and OPA. Canopy separation improved and selective clearing of ground fuels to occur. Fuel loadings within the IPA should ensure that (PFBFP - RFS 2001): ▪ There is minimal fine fuel at ground level which could be set alight by a bush fire; and ▪ Any vegetation in the IPA does not provide a path for the transfer of fire to the development – that is, the fuels are discontinuous. The presence of a few shrubs or trees in the IPA is acceptable provided that they: ▪ Do not touch or overhang the building within 5 metres; ▪ Do not form a continuous canopy; ▪ Are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and ▪ Are located far enough away from the house so that they will not ignite the house by direct flame contact or radiant heat emission. Woodpiles, combustible materials, large areas/quantities of garden mulch, stacked flammable building materials etc should not be located in the IPA. The APZ and all bushland on site will be managed in accordance with the Biodiversity Management Plan (Appendix 9) which meets these objectives.	Yes
In relation to siting and design: • Buildings are sited and designed to minimise the risk of bush fire attack.	The proposed building envelope have not sited closer to the hazard than the existing building on the neighboring property, (AHV). The elevation towards the hazard is relatively simple and constructed from non-combustible materials. The roof cladding is most vulnerable and it will need to be securely fixed to account for increased winds during a fire event. Guttering and gutter valleys should have gutter guard with a flammability of not more than five (5) installed.	Yes
In relation to construction standards: for the ancillary buildings • It is demonstrated that the proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact.	BAL 12.5 Construction to be adopted as per AS3959-2009 *Construction of Buildings in Bush Fire Prone Areas*. The relevant requirements of Sections 3 and 7 will need to be considered for design of the additions. Items to note: Section 3.6 deals with vents, weepholes and gaps and this needs to be included into the door and window design. AS 1288 should be consulted for an explanation of the terminologies used to describe various types of glass in AS 3959-2009 Cladding requirements are discussed in Section 7.4, and timber paneling will need to comply with this section. All portions of openable windows facing the fire hazard shall be screened with mesh with a maximum aperture of two (2)	Yes, if AS requirements incorporated

Performance Criteria	Proposal	Meets Performance Criteria?
	millimetres, which remains in place while the window is open, made from corrosion resistant metal gauze screens. The openable portion of doors will need to be protected with corrosion resistant metal gauze screens with a maximum aperture of two (2) millimetres. Gaps should not exceed three (3) millimetres. Glazing shall be five (5) millimetres and six (6) millimetres toughened glass for windows and doors respectively. The roof will need to be sarked to prevent the entry of embers to the roof space.	
In relation to access requirements: • Safe, operational access is provided (and maintained) for emergency services personnel in suppressing a bush fire while residents are seeking to relocate, in advance of a bush fire, (satisfying the intent and performance criteria for access roads in sections 4.1.3 and 4.2.7).	Vehicular access is not restricted from Allambie Road or the driveway into the AHV. The public road satisfies the acceptable solutions in Section 4.1.3 of PFBFP 2006. With respect to the driveway, passing bays or similar will be provided at least every two-hundred (200) metres which are twenty (20) metres long, with a minimum width of six (6) metres at these points. Any turning areas available within the site will have a minimum twelve (12) metre outer radius. Please refer above to more detailed discussions of the access proposed.	Yes
In relation to water and utility services: • Adequate water and electricity services are provided for firefighting operations • Gas and electricity services are located so as not to contribute to the risk of fire to a building.	There is mains water supply available, and new hydrants and booster valves will be located within the road verge on the side of the road closest to the bush fire threat. The electrical service is delivered underground to the subject buildings. Gas supply lines will be buried and in all other ways compliant with PFBFP 2006	Yes
In relation to landscaping: • It is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignitions.	It is important that landscaping is not incorporated adjacent to the ancillary buildings. Preferably a pathway or non-combustible ground finish is to adjoin buildings for a distance of at least one (1) metre. Any landscaping works should be developed in accordance with the principles outlined in PFBFP 2006, addressing landscape design, plant species selection and ongoing maintenance. The developed portion of the site should be maintained as an IPA. This IPA, in combination with the distance to the	Yes

Performance Criteria	Proposal	Meets Performance Criteria?
	unmanaged vegetation, will reduce the potential for fire to impact the structure. All native shrubs and weedy vegetation will be removed between the buildings and the man made drain.	

Table 4: Compliance with requirements for Bush Fire Protection Measures for residential subdivision and SPFPP developments, as contained in Section 4.1.2, and 4.2.3

Performance Criteria	Proposal	Meets Performance Criteria?
Minimise perimeters of the sub-division exposed to the bush fire hazard.	Hourglass shapes, which maximise perimeters and create bottlenecks, should be avoided.	Achieved
Minimise bushland corridors that permit the passage of bush fire.	Refer to Proposal and Map 2.	Achieved
Provide for the siting of future dwellings away from ridge-tops and steep slopes - particularly up-slopes, within saddles and narrow ridge crests.	Refer to Proposal and Map 2.	Achieved
Ensure that separation distances (APZ) between a bush fire hazard and future dwellings enable conformity with the deemed-to-satisfy requirements of the BCA.	Refer to Proposal and Map 2.	Achieved
Provide and locate, where the scale of development permits, open space and public recreation areas as accessible public refuge areas or buffers (APZs).	Refer to Proposal and Map 2.	Achieved
Ensure the ongoing maintenance of asset protection zones Manage all gardens as an Inner Protection Area (IPA).	Refer to Biodiversity Management Plan Total Earth Care February 2020 (Appendix 9).	Achieved
Provide clear and ready access from all properties to the public road system for residents and emergency services.	A perimeter road has been proposed as described above and all internal roads are compliant with PFBFP 2006.	Achieved
Ensure the provision of and adequate supply of	The site has a mains fed reticulations system which complies with the requirements of PFBFP 2006.	Achieved

Performance Criteria	Proposal	Meets Performance Criteria?
water and other services to facilitate effective firefighting.		
Ensure that the bush fire risk to adjoining lands is not increased.	The development will substantially reduce the bush fire risk to adjoining lands by reducing the areas of bushland and increasing the defendable space on site.	Achieved
Provide a minimum defendable space.	The proposal creates APZs between thirty (30) and eighty-five (85) metres wide and compartmentalised bushland remnants which substantially improve the defendable space on site. Refer to Proposal and Map 2.	Achieved
Provide better bush fire protection, on a re-development site, than the existing situation.	Refer to Proposal and Map 2.	Achieved
Ensure that the footprint of the proposed building does not extend towards the hazard beyond existing building lines on neighbouring land.	The proposed development does not extend closer to the bush fire hazard than the closest existing building footprints on neighbours land.	Achieved
Not result in an increased bush fire management and maintenance responsibility on adjoining land owners unless they have agreed to the development.	The development relies on written agreements enabling the proponent to manage the adjacent land.	Achieved
Ensure building design and construction enhance the chances of occupant and building survival.	This bush fire assessment requires the proponent to upgrade the building construction standards to meet the standards for PFBFP 2006.	Achieved

5 REFERENCES

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6 LIST OF ABBREVIATIONS

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2009 as amended.
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Pittwater Council
DA	Development Application
EP&A Act	Environmental Planning and Assessment Act - 1979
ESD	Ecologically Sustainable Development
FRNSW	Fire & Rescue NSW
IPA	Inner Protection Area
NCC	National Construction Code
NP	National Park
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection – 2006
ROW	Right of Way
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

Appendix 1. APZ Management

APZ's

With respect to the standards for asset protection zones in PFBFP 2006 SFFP requires an APZ which reduces the Building construction Level to 3 at the interface, however alternate solutions that meet the performance criteria could be acceptable.

Please refer to the following map and descriptions of the APZs.

Figure 5. William Charlton Village Plan and APZ's

APZ(1)

The APZ requirements to achieve less than 10kw/m^2 for the Communal Building has been calculated based on one vegetation formation hazards and effective slope, namely,

1. The Sydney Sandstone Gully forest downslope of the communal building (partly within the site and partly within the MWWMP within and beyond the existing MWWMP APZ's.)
    a. This Vegetation formation is Forest formation,
    b. Effective slope is less than 10 degrees downslope,
    c. APZ width required 85 metres, including 25 meters managed as an OPA.
2. An 85 metre wide APZ will be installed to protect Buildings A and B and the communal building from the south / western hazard and a 30 metre wide APZ can be installed to the west.

APZ (2)

A 10-15 metre wide APZ will be installed along the northern boundary contiguous to and as an adjunct to APZ 3 to protect Buildings A and B from the western hazard and northern hazard. In combination APZ 2 and 3 and the Sydney Water access trail will be 30 metres wide.

APZ (3)

APZ 3 will be created in the Sydney Water Pipe Line Easement to the North of the site. This will be managed in accordance with a formal written agreement with Sydney Water which will be ratified once the Development Application has been approved. The contiguous vegetation on the proponents land for approximately 100 metres from Allambie Road is predominantly weeds and is proposed to be cleared to install a road. The remaining vegetation, on Sydney Water land, is also predominantly weeds. The

Sydney Water land is also under active management for the removal of weeds and encroachment over the reticulation pipe line. Sydney Water has accepted a proposal to extend the APZ into this narrow strip to provide an improved fire management outcome to the existing and new William Charlton Village residents. Additionally this will provide greater protection to the neighbouring SFPP properties upslope. This will achieve less than 10>kW/m^2 required and there subsequently being no requirement for an increased building Level under AS 3959 -1999.

APZ (4)
A 30 metre wide APZ has been installed and is managed by the neighbouring MWWMP as an IPA. Please find the written undertaking by the neighbour attached. The proponent will need to obtain written confirmation from the relevant authority that the easement will continue to be maintained in a suitable manner. NBC has agreed in principle to allow AHV to manage this APZ in protection of this development.

APZ (Power Easement)
An electrical overhead power line easement which runs between the south western corner of the Allambie Heights Village and the South Western Corner of the William Charlton Village and then upslope to the Sydney Water pipe line easement. The vegetation beneath these powerlines is managed by the power authority. Trees and tall shrubs have been removed which will further lessen the fire risk to the property.

Inner Protection Areas
All APZ's (except one (1)) on site will be maintained as IPAs:

- Litter fuels within the IPA should be kept below 10 cm in height and be discontinuous.
- In non-landscaped areas ie bushland the vegetation, predominantly ground covers will be native plants,
- In landscaped areas in the immediate curtilage of the buildings exotic grasses will be mown and shrub and tree spacings/separation will be maintained as the guidelines require in PFBFP 2006 outline. Specifically:
    - Trees: canopy cover should be less than 15% (at maturity) trees (at maturity) should not touch or overhang the building lower limbs should be removed up to a height of 2m above ground canopies should be separated by 2 to 5m preference should be given to smooth barked and evergreen trees.
    - Shrubs: create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings shrubs should not be located under trees shrubs should not form more than 10% ground cover clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.
    - Grass: should be kept mown (as a guide grass should be kept to no more than 100mm in height) leaves and vegetation debris should be removed.

Maintenance of the IPA to the standards given above should be undertaken on an annual basis, in advance of the fire season, as a minimum the APZ's will be maintained three (3) times a year with one (1) of the maintenance events occurring immediately prior to and one during summer when the RFS no-burn period is in effect. Fuel loads in all APZ's and "Weed and Exotic" areas will be maintained at less than 10/tonnes per hectare. 'Standards for Asset Protection Zones (RFS 2005) will be applied to the ongoing management in accordance with the Appendix 9: Biodiversity Management Plan February 2020 TEC

Appendix 2. Bush Fire Protection Measures

FIREFIGHTING VEHICLES

Performance criteria
Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.

Acceptable solution

- SFPP access roads are two-wheel drive, all-weather roads;
- Access is provided to all structures and hazard vegetation;
- Traffic management devices are constructed to not prohibit access by emergency services vehicles; and
- Access roads must provide suitable turning areas in accordance with Appendix 3 of PFBFP 2019.

ACCESS ROAD CAPACITY

Performance criteria
The capacity of access roads is adequate for firefighting vehicles.

Acceptable solution
The capacity of road surfaces, there are no bridges or causeways is sufficient to carry fully loaded firefighting vehicles (up to fifteen (15) tonnes).

19 February 2020

arterra LANDSCAPE ARCHITECTS

ALLAMBIE HEIGHTS VILLAGE
c/o Mr Nick Winberg
CENTURION GROUP PTY LTD

RE: RFS ALTERNATE EMERGENCY EXIT – REINFORCED TURF – ALLAMBIE HEIGHTS VILLAGE 2

Dear Nick,

As part of the proposed development at Allambie Heights Village 2 an emergency exit has been designed to the north, between the proposed built form and the northern boundary. Given its close proximity to the proposed building and northern boundary, it has been designed as a reinforced turf surface. This exit has been designed to provide access for an RFS (Rural Fire Service) emergency vehicle.

Reinforced turf systems are often used in the construction of emergency access, overflow parking, home driveways, and slope stabilisation. It has a porous structure allowing rainwater to infiltrate into the ground. A high load-bearing plastic matrix protects grass roots against compaction and effectively supports the loads imposed by vehicles.

To ensure the surface is appropriate for the weight of an emergency vehicle, we will specify *Elmich TurfPave XD* or an approved equivalent. This product specifies a compressive strength of >200 tonne/m² with applications commonly used and recommended for emergency vehicle assess ways. Please refer to the attached specification sheets for further product information. We believe this to be appropriate to the proposal.

Sincerely

Chloe Bristow,
Landscape Architect / Consulting Arborist (AQF 5)
cbristow@arterra.com.au

ACCESS TO WATER

Performance criteria
There is appropriate access to water supply.

Acceptable solution
- Reticulated water is supplied;
- All hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression; and
- Hydrants are provided in accordance with AS 2419.1:2005.

WATER SUPPLY
Performance criteria
A water supply is provided for firefighting purposes.

Acceptable solution
- Reticulated water is to be provided to the development.

FOR ELECTRICITY SERVICES
Performance criteria
Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.

Acceptable solution
- Electrical transmission lines are underground.

FOR GAS SERVICES

Performance criteria
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.

Acceptable solution
- Reticulated will be installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used; and
- Above-ground gas service pipes external to the building are metal, including and up to any outlets.

Emergency Management Planning
Intent of measures:
- To provide suitable emergency and evacuation arrangements for occupants of SFPP developments.

EMERGENCY MANAGEMENT

Performance criteria
A bush fire emergency and evacuation management plan will be prepared and approved by Local Emergency Management Committee prior to occupation certificate.

Acceptable solution
- Bush fire emergency management and evacuation plan is prepared consistent with the:
    - The NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan; and
    - Australian Standard AS 3745:2010 Planning for emergencies in facilities; and
    - The emergency and evacuation management plan will include a mechanism for the early relocation of occupants.

Performance criteria
- Stable management arrangements are established for consultation and implementation of the bush fire emergency and evacuation management plan;

- An Emergency Planning Committee is established to consult with residents and staff in developing; and
- Implementing an Emergency Procedures Manual, and detailed plans of all emergency assembly areas including 'on-site' and 'off-site' arrangements as stated in AS 3745 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted.

Development of existing SFPP facilities

No redevelopment of existing SFPP facilities is proposed.

A bush fire emergency management plan that is consistent with the NSW RFS publication: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan, and the Australian Standard AS 3745:2010 Planning for emergencies in facilities will be prepared to include the proposed and existing facility. The specific objectives that will be met include to:

- Provide an appropriate defendable space;
- Site the building in a location which ensures appropriate separation from the hazard to minimise potential for material ignition;
- Provide a better bush fire protection outcome for existing buildings;
- New buildings are located closer to the hazard than the existing buildings but are proposed to meet the performance requirements of PFBFP 2006;
- Ensure there is no increase in bush fire management and maintenance responsibility on adjoining land owners without their written confirmation;
- Ensure building design and construction enhances the chances of occupant and building survival; and
- Provide for safe emergency evacuation procedures including capacity of existing infrastructure (such as roads).

Defendable space
Defendable space is an area within the IPA of an APZ adjoining the asset within which firefighting operations can be undertaken to defend the structure. The physical size of the development will determine whether the defendable space is provided as pedestrian access or will require sufficient space for vehicular movements. Vegetation within the defendable space should be kept to an absolute minimum and the area should be free from combustible items and obstructions.

The proposal provides for defendable space within every IPA.

Appendix 3. Bush Fire Assessment Report William Charlton Village February 2020

Northern Beaches Council

Bush Fire Assessment Report of SFPP at
181 Allambie Rd. Allambie Heights

Assessment by D. B. Macarthur

Grad. Dip. in Design for Bushfire Prone Areas

University of Western Sydney

510/180 Campbell Parade, Bondi Beach. 2026

Message Bank 0400 5599 45

Email: bruce@bushfireprotectionplan.com.au

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Introduction

The assessment is to establish the AS 3959-2009 BAL requirements of the site for the extension of the existing Special Fire Protection Purpose, a retirement village and a communal building (Class 9). Compliance with Section 100B Rural Fires Act 1997 is required.

RFS advice May 3 2019 required the installation of an 85 metre and a 30 metre APZ to reduce the radiant heat <10kW/M² and BAL to low. These APZ's must be supported with a Fire Management Plan which this document is an Appendix to.

The Fire Management Plan TEC February 2020 which this is an appendix to will include that the areas mapped as weeds, in Map 1 Vegetation Communities below will be managed as IPAs to reduce the available fuel load and act as a fire break.

It should also be noted that all bio-filtration zones within the APZ's will also be managed as IPA's.

Bush Fire Attack Level Overview

Address & Title Details	181 Allambie Rd, Allambie Heights L2615 DP752038
Local Government Area	Northern Beaches Council
Area of L2615	37176M²
Bushfire Risk Assessment (PBP 2006)	Bushfire Prone Land within the Northern Beaches Council Bushfire Prone Land Map.
FFDI	100

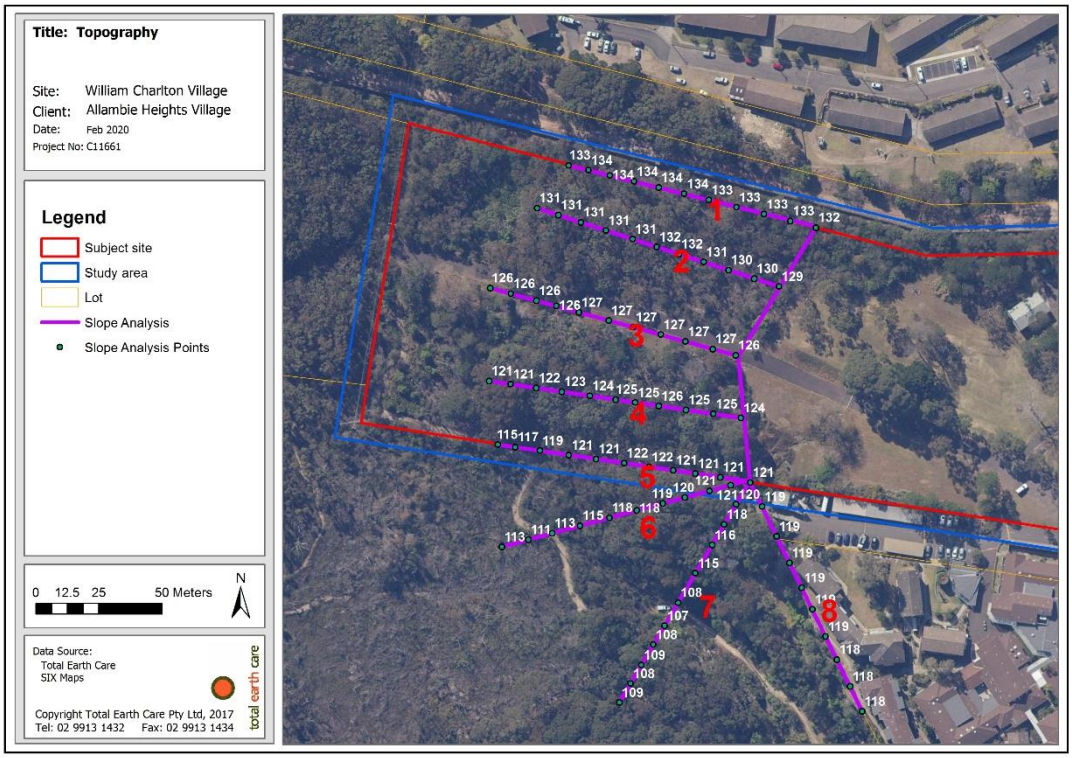
Map 1: Vegetation Communities

Map 2: Site Plan

Map 3. APZ Overview

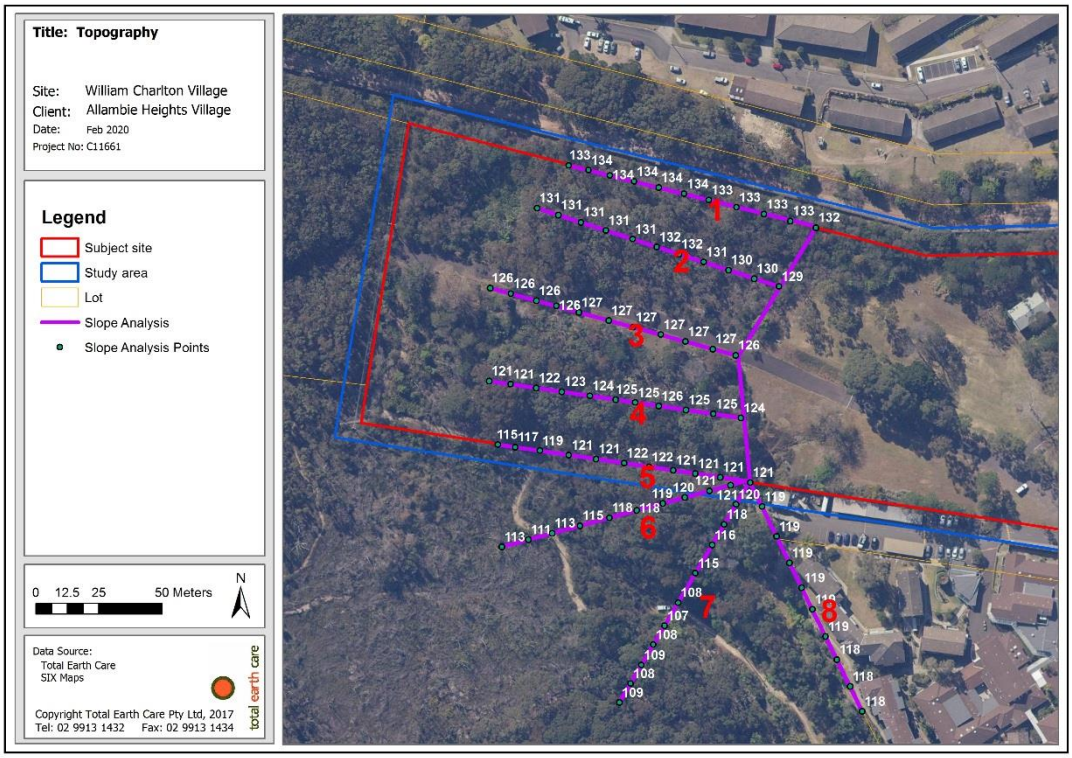
Bush Fire Attack Level Calculations and Asset Protection Zones

Buildings to be Protected : Community SFPP	
APZ Number 1	Forest and the previously cleared area.
Building protected	Community building
Radiant heat	Radiant heat <10kW/M²
Bushfire Attack Level BAL	LOW
Predominant Vegetation Classification	Forest
APZ distance required	85 m
Slope Assessment	Line 7 below <9°downslope of dominant hazard

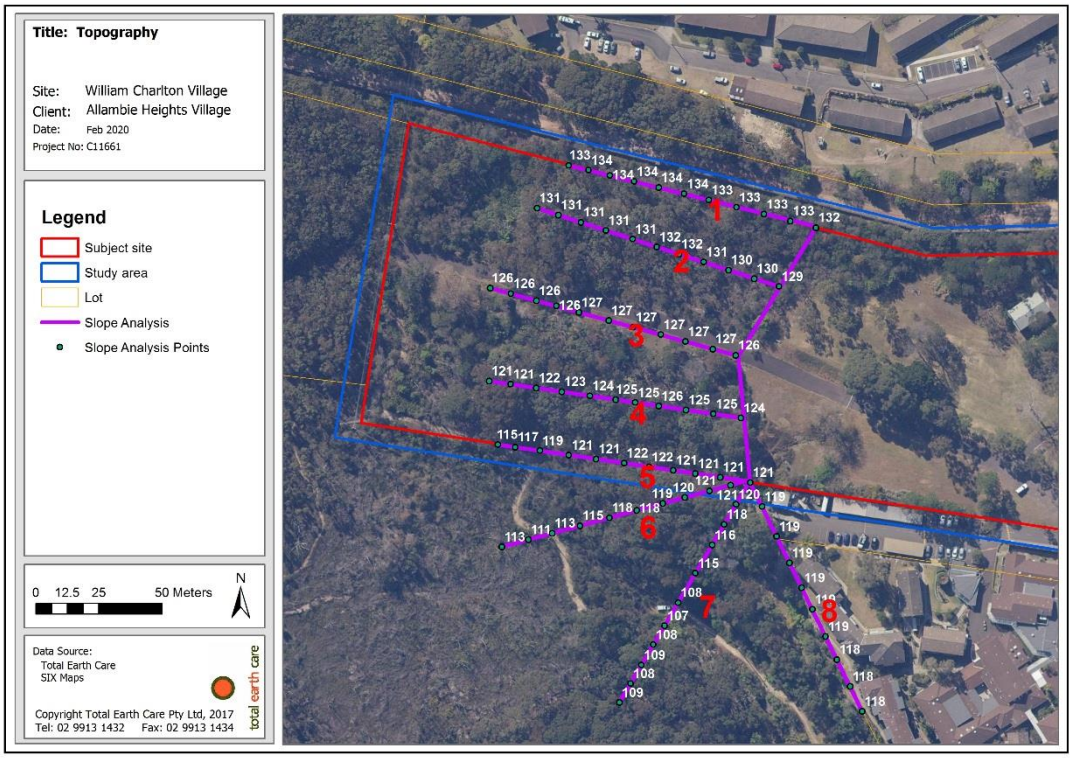


Effective Slope

Buildings to be Protected : Residential SFPP	
APZ Number 1 (85 metres)	Forest and the previously cleared area.
Building protected	Residential building
Radiant heat	Radiant heat <10kW/M²
Bushfire Attack Level BAL	LOW
Predominant Vegetation Classification	Forest
APZ distance required	85 m
Slope Assessment	Line 7 below <9°downslope of dominant hazard

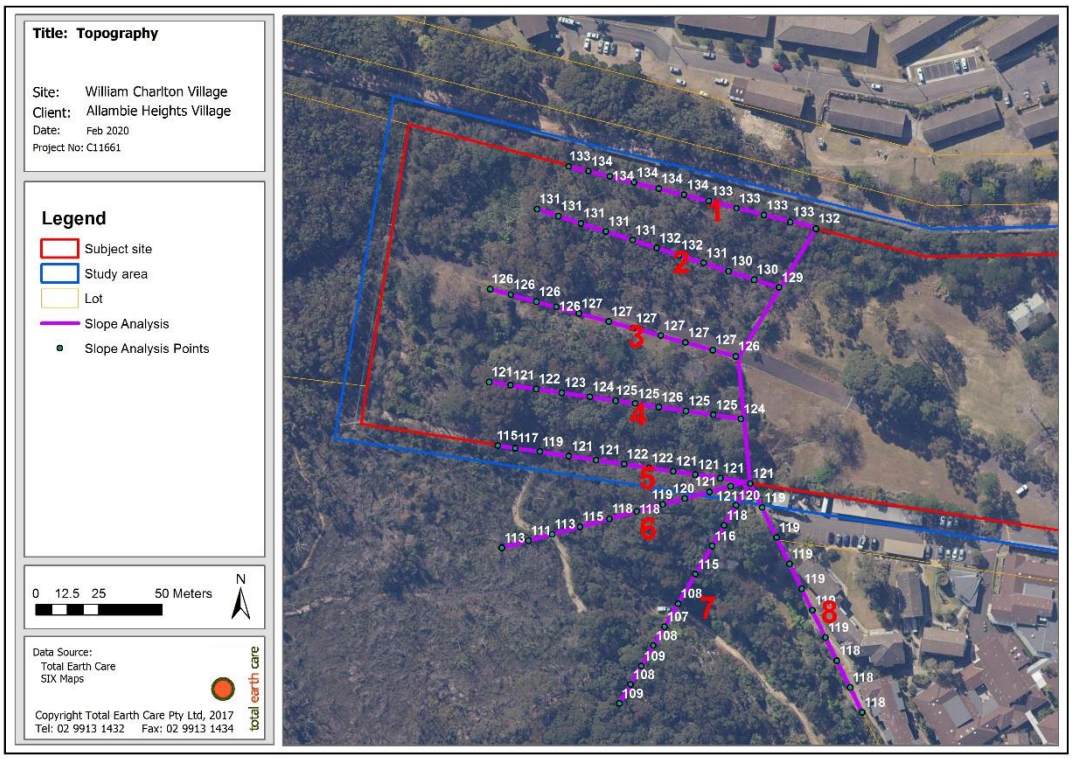


Building to be Protected: Residential SFPP	
APZ Number 1	Modified woodland and cleared land
Building protected	Residential
Radiant heat	Radiant heat <10kW/M²
Bushfire Attack Level BAL	LOW
Predominant Vegetation Classification	Heath-Mallee and previously cleared land (Remnant) reliance is made on the management of Weed and Exotic Areas described in Map 1: Vegetation Communites “Weed and Exotic Areas” described in Red being managed as IPA’s. .
APZ distance required	30 m as per RFS advice
Slope Assessment	Lines 1, 2 and 3 below level with or Upslope of hazard



Effective Slope

Building to be Protected: Residential SFPP	
APZ Number 2 and 3	2 Previously cleared and 3 modification of weedy bushland
Building protected	Residential
Radiant heat	Radiant heat <10kW/M²
Bushfire Attack Level BAL	LOW
Predominant Vegetation Classification	Mallee Heath and previously cleared land
APZ distance required	Mallee / Heath and previously cleared land (Remnant) reliance is made on the management of Weed and Exotic Areas described in Map 1: Vegetation Communites “Weed and Exotic Areas” described in Red being managed as IPA’s
Slope Assessment	Line 1 Upslope of hazard



Effective Slope

References

NSW Rural Fire Service, Planning for Bushfire Protection 2006.
NSW Rural Fire Service Building in Bushfire Prone Areas
Northern Beaches Council Bushfire Prone Land Map
Standards Australia. AS 3959 – 2009
Rural Fires Act 1997
Total Earth Care Pty. Ltd.

Conclusion

Compliance with AS 3959-2009 Construction Level BAL 12.5 on all aspects of the proposed dwellings will provide across the total site.

Disclaimer

The report is prepared in accordance with current accepted practice as described in Australian Standard AS 3959 – 2009 and amendments thereto "Construction of Buildings in Bushfire Prone Areas" and N.S.W. Rural Fire Services guide "Planning for Bushfire Protection 2006" and other relevant regulations.
This report is not an insurance policy because owing to the unpredictable nature of bushfires and of weather conditions at the time of a bushfire this report cannot be taken as a warranty that the recommended bushfire mitigation measures will protect the property from damage in every possible bushfire condition.
Ultimately the responsibility is the owner's to accept the risks associated with development in bushfire prone areas.
This report is for the use only of Total Earth Care for whom it was prepared and its financial or business associates with whom it may share the report in its entirety and for no other purpose.
No responsibility is accepted for any third party who may use or rely on the whole or any part of the content of this report.
No responsibility will be accepted for photocopied signatures. Neither the whole nor any part of this report nor any reference thereto maybe included in part or full in any way without my written approval of the form and context in which it may appear.
Such approval should not be an automatic expectation.

D. B. Macarthur.
24/02/2020

Graduate Diploma in Design for Bushfire Prone Areas. University of Western Sydney
Member Fire Protection Association of Australia. BPAD-A-16778
University of Technology, Sydney. Planning for Bushfire Prone Areas.
University of Sydney/Australian Property Institute Associate Professional Certificate in Expert Witness for the Land & Environment Court

Appendix 4. RFS D1887788 May 3 2019

NSW RURAL FIRE SERVICE

The General Manager
Northern Beaches Council
PO Box 882
MONA VALE NSW 1660

Your reference: DA2018/1667
Our reference: D18/7788

3 May 2019

Attention: Lashta Haidari

Dear Ms Haidari,

Proposed Development at 181 Allambie Road Allambie Heights

I refer to your correspondence dated 23 October 2018 seeking general terms of approval in relation to the above matter.

It is acknowledged that an initial request for additional information has been addressed in the correspondence from total earth care dated 8 March 2019. However, the information provided has not adequately addressed the issues raised. As such, further information is required on the following issues for further assessment of the proposal:

1. The 'Proposed Clearing Area', as identified in the 'APZ Bushfire Overview' in the document *Northern Beaches Council Bush Fire Assessment Report of SFPP at 181 Allambie Rd. Allambie Heights* prepared by D.B.Macarthur, shall be supported through a Plan of Management. The Plan of Management shall include:
    - The prescribed APZ requirements and its treatment details e.g. Inner Protection Area (IPA) widths and fuel loads, etc;
    - The range of specific management options available to the development, its prescription and its location;
    - The predicted timing intervals of the management options; and
    - Detailed methodology of the management of the fuel loads; and
    - Acknowledgement of responsibility from the landholder that the APZ will be managed in perpetuity.
2. The New South Wales Rural Fire Service (NSW RFS) does not support the vegetation assessment as outlined in the document *Northern Beaches Council Bush Fire Assessment Report of SFPP at 181 Allambie Rd. Allambie Heights* prepared by D.B.Macarthur. The Service has assessed the vegetation as forest to the southwest and dependant on the implementation of proposed asset protection zones (APZs) (to be supported through a Plan of Management), remnant vegetation to the west of proposed Buildings A and B. Vegetation occurring on adjacent land (Sydney Water easement) to the north is to be assessed as remnant vegetation.

Postal address
NSW Rural Fire Service
Planning and Environment Services
Locked Bag 17
GRANVILLE NSW 2141

Street address
NSW Rural Fire Service
Planning and Environment Services (East)
4 Murray Rose Avenue
Sydney Olympic Park NSW 2127

T 1300 NSW RFS
F (02) 8741 5433
E records@rfs.nsw.gov.au
www.rfs.nsw.gov.au

In this regard, the APZ requirements of Table A2.6 of *Planning for Bush Fire Protection (PBP) 2006* are:

- 30 metres to the north and west of proposed Buildings A and B; and
- 85 metres to the southwest of proposed Building B and the Pool Building.

3. The proposed Pool Building will incorporate a pool, gymnasium, lounge, hair salon, kitchen, storerooms, bathrooms and multi-function room which is considered to form an integral part of the facility and a public assembly building. As such, it needs to be considered against the Special Fire Protection Purpose (SFPP) development requirements of Section 4.2.7 *PBP 2006* and the Fast Fact *Places of Public Worship and Other Public Assembly Buildings on Bush Fire Prone Land* (dated October 2014, Fact Sheet 2/14).

4. The proposed access, as identified in the document *Northern Beaches Council Bush Fire Assessment Report of SFPP at 181 Allambie Rd. Allambie Heights* prepared by D.B.Macarthur, has been designed to comply with property access requirements. However, as a SFPP development access should be compliant with Section 4.2.7 of *Planning for Bush Fire Protection 2006*.

   This includes but is not limited to:

   - Internal roads are two-wheel drive, sealed, all-weather roads;
   - Internal perimeter roads are provided with at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb) and shoulders on each side, allowing traffic to pass in opposite directions;
   - Roads are through roads. Dead end roads are not more than 100 metres in length from a through road, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end;
   - Traffic management devices are constructed to facilitate access by emergency services vehicles;
   - A minimum vertical clearance of four metres to any overhanging obstructions, including tree branches, is provided;
   - Curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress;
   - The minimum distance between inner and outer curves is six metres;
   - Maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees;
   - Crossfall of the pavement is not more than 10 degrees;
   - Roads do not traverse through a wetland or other land potentially subject to periodic inundation (other than flood or storm surge);
   - Roads are clearly sign-posted and bridges clearly indicate load ratings; and
   - The internal road surfaces and bridges have a capacity to carry fully-loaded firefighting vehicles (15 tonnes).

If you have any queries regarding this advice, please contact Josh Calandra, Development Assessment and Planning Officer, on 1300 NSW RFS.

Yours sincerely,

Kalpana Varghese
Acting Manager, Development Assessment and Planning
Planning and Environment Services (East)

Appendix 5. MWWMP Fire Regime Management Plan

ASSESSMENT | PLANNING | MANAGEMENT

MANLY WARRINGAH WAR MEMORIAL PARK FIRE REGIME MANAGEMENT PLAN

Report prepared for:
Warringah Council
(Project No. 57-03)

September 2005

ABN 87 096 512 088 | address Suite 503 3-5 Stapleton Ave Sutherland NSW 2232
postal PO Box 12 Sutherland NSW 1499 | phone 02 8536 8600 | fax 02 9542 5622
web www.ecoaus.com.au

Table 4 Operation Schedule for Manly Warringah War Memorial Park

Name	Zone Type	Treatment	Management	HR Treatment Priority*	HR Treatment Year	Assets	Threatened Species and Endangered Ecological Communities▲	Aboriginal or Cultural Sites	Land Tenure	APZ Widths
APZ 1	APZ	Initial weed removal and long term weed suppression, hand removal of fuels within areas of build up	Maintain fire trail to specifications	-	-	Sewer Pipe, Fire trail, Storm water pipe, Track	-	Historically significant area	Crown land CCM Warringah Council	APZ applied in accordance to development/ landownership boundary
APZ 2	APZ (OPA)	Initial weed removal and long term weed suppression, hand removal of fuels within areas of build up. Treatment to be undertaken for Priority 4 & 19 - Burning	Maintain fire trail to specifications. A current Active Evacuation Plan required for adjacent retirement village	4, 19	2006, 2012	Sewer Pipe, Track	-	Historically significant area	Crown land CCM Warringah Council	Outer Protection Area -10m
APZ 3	APZ (IPA)	Initial weed removal and long term weed suppression, hand removal of fuels within areas of build up. Treatment to be undertaken for Priority 4 & 19 - Burning	Maintain fire trail to specifications. A current Active Evacuation Plan required for adjacent retirement village	4, 19	2006, 2012	Sewer Pipe, Track	-	Historically significant area	Crown land CCM Warringah Council	Inner Protection Area - 25m

ntal Management and Planning
Ph - (02) 8536 8600
Fax - (02) 9542 5622

Explanation of zones

Asset Protection Zones (APZ)

Description

- Area surrounding a development and managed to reduce the bush fire hazard
- Often has Inner Protection Area (IPA) and Outer Protection Area (OPA)
- APZ widths and fuel reduction treatment will be determined by slope and existing nature of assets
- Reduction techniques will include:
  - raking and slashing
  - bush regeneration, involving initial weed removal and long term weed management. This method should be combined with hand removal of ground fuels and manual removal of shrub and middle storey layers
  - burning

Aims

- To protect human life and property
- To protect highly valued assets

Prescriptions

IPA:

- To maintain minimum ground fuel loads by raking and slashing to less than 40cm in height, with discontinuous shrub and canopy layers. Reduction techniques will include:
  - removal/ suppression of weeds
  - thinning of regrowth
  - hand removal
  - raking and slashing
- Trees should not over-hang buildings

OPA:

- To maintain reduced ground fuel loads and maintain understorey to less than 50cm in height. Reduction techniques will include:
  - removal/ suppression of weeds
  - thinning of regrowth
  - hand removal
  - raking and slashing

Land Management Zone (LMZ)

Description

- Broader areas of the landscape, incorporating those areas not sa Management Zones or Asset Protection zones
- Reduction techniques will include:
  - burning
  - weed control

Aims

- Protection of natural and cultural heritage values
- Maintenance of ecological processes

Prescription

- Fire management to meet conservation objectives for species, hc
  - to control breaches in minimum fire thresholds and address thresholds
  - implementation of cultural heritage and threatened specie: threatened species sites are known or likely to occur

Strategic Fire Advantage Zones (SFAZ)

Description

- Usually adjacent to and complementing Asset Protection Zones
- Managed to protect community assets and ecological sustainabi

Aims

- To restrict fire movement into and out of reserves
- Reduce the speed and intensity of fire
- Reduce the potential for spot fire development

Appendix 6. Sydney Water In Principle Agreement

Sydney WATER

27 August 2019

Allambie Heights Village Ltd
3 Martin Luther Place
Allambie Heights NSW 2100
Attention: Ciaran Foley

Dear Ciaran,

Proposed Licence to Allambie Heights Village Ltd at 181 Allambie Road, Allambie Heights. Folio Identifier 2/91527.

Sydney Water confirm discussions with Total Earth Care in relation to the land containing the Sydney Water mains pipeline, situated immediately to the north of 181 Allambie Road, Allambie Heights NSW, Lot 2 DP 91527.

Sydney Water is supportive of granting a licence agreement to Allambie Heights Village Ltd and their nominated Bushfire Management subcontractor/s, to access the portion of Sydney Water controlled land, situated immediately to the north of 181 Allambie Road Allambie Heights. It is for the purposes of managing the Asset Protection Zones (identified as "Adjoining Owners Land – APZ" labelled 9 & 10 on the attached Proposal & APZ Map No.1 – May 2019) required by the NSW Rural Fire Services for the life of their proposed new residential buildings (identified as "Habitable Buildings" on the attached Proposal & APZ Map No.1 – May 2019).

Sydney Water acknowledges that the land identified as "Adjoining Owners Land – APZ" labelled 9 & 10 on the attached Proposal & APZ Map No.1 – May 2019, as the total extent of the Asset Protection Zone required to be managed by Allambie Heights Village Ltd in accordance with the "Fire Management Plan for William Charlton Village, Allambie Heights - May 2019", produced by Total Earth Care for Allambie Heights Village Ltd.

Yours sincerely

Grant May
Group Property, Portfolio Manager
Sydney Water Corporation

Title: Proposal and APZ

Map No: 1
Site: 181 Allambie Rd
Client: Allambie Heights Village Ltd.
Date: May 2019
Project No: C10437
Author: G Barron

Legend

- Subject site
- Study area

Proposed Development

- Pool Building
- Habitable Building

Fire Management

- Manly Dam 30m APZ
- Fire reduced fuel load APZ
- Proposed APZ
- Adjoining Owners Land - APZ
- Manly Dam IPA
- Manly Dam OPA
- APZ Distance
- APZ Boundary

TEC Vegetation Survey

- Coastal Sandstone Heath Mallee
- Sydney Coastal Sandstone Gully Forest
- Sydney North Exposed Sandstone Woodland
- Urban Exotic/Native
- Weeds and exotics

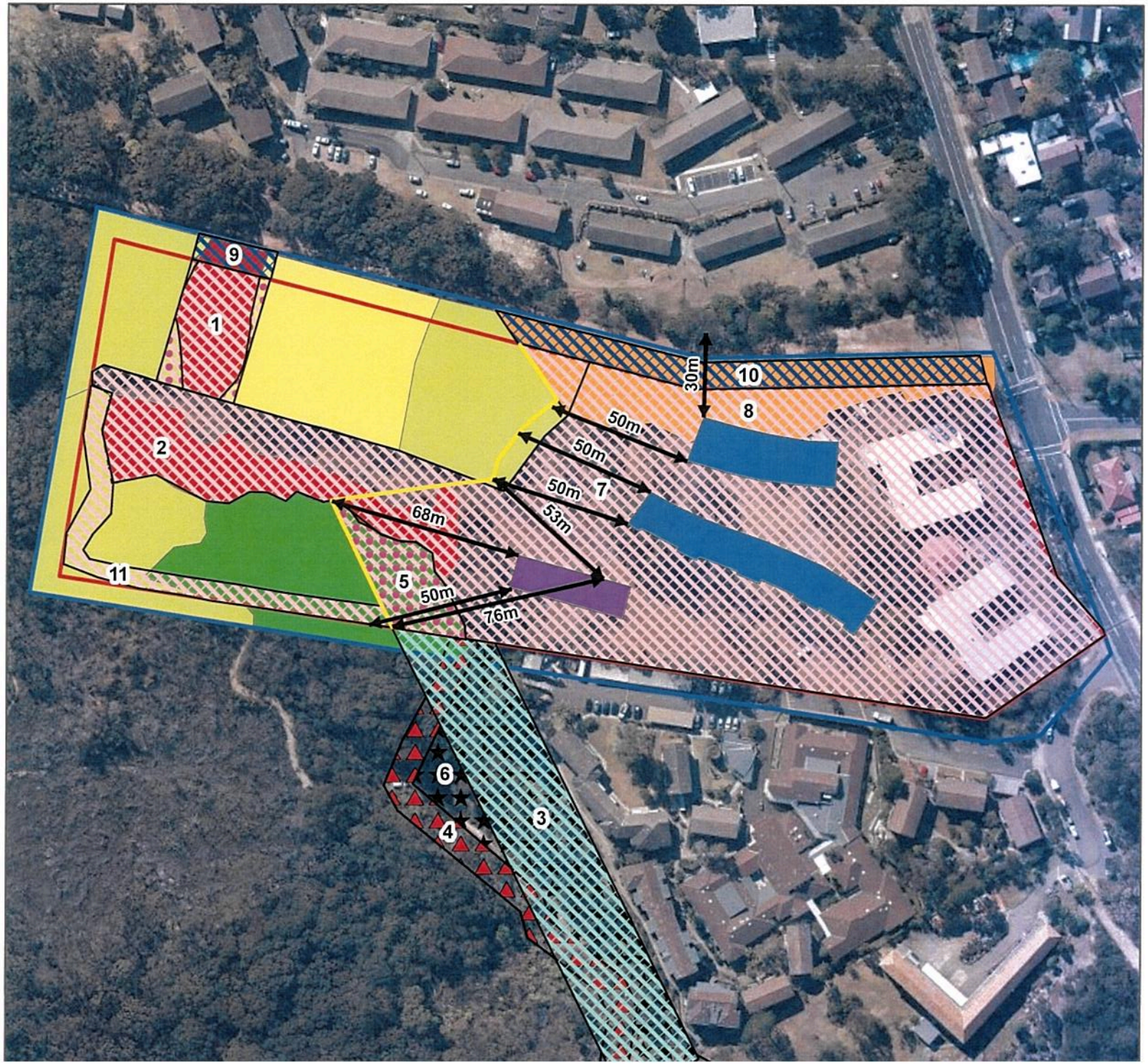
0 15 30 60 Meters

N

Data Source:
Total Earth Care
Nearmap

Copyright Total Earth Care Pty Ltd, 2017
Tel: 02 9913 1432 Fax: 02 9913 1434

total earth care



Appendix 7. Confirmation of existing APZ from Warringah Council, dated 23rd April 2009

Warringah Council

Civic Centre 725 Pittwater Road
Dee Why NSW 2099
DX 9118
Telephone (02) 9942 2111
Facsimile (02) 9971 4522

Website www.warringah.nsw.gov.au
Email council@warringah.nsw.gov.au

23 April 2009

Mr Ciaran Foley
CEO
Allambie Lutheran Homes Inc
3 Martin Luther Place
ALLAMBIE HEIGHTS NSW 2100

Dear Mr Foley

Re: Allambie Lutheran Homes – DA 2004/0335 – Management Agreement. Consent Condition 5: The Establishment of an Asset Protection Zone.

Thank you for the final instalment cheque of $4373.83 for the establishment of an asset protection zone at the rear of Allambie Lutheran Homes, which brings the overall contribution to the agreed $26,243.00.

The work commenced with Plateau Tree Services removal of trees from the asset protection zone. This was followed by Australian Areas Management and Repair removing other fire prone vegetation and planting out selected areas as required. This project component took some 500 hours of weed control and bush regeneration work. This included mulching and ongoing maintenance as the work progressed.

The NSW Department of Lands carried out significant complementary drainage and fire trail repair work next to the fuel reduction works. This should ensure safe and efficient negotiation of these tracks in the event of a wildfire and during periodic fire hazard reduction work.

The project began in mid 2007 and the principal contract work is now complete as of March 2009. Ongoing maintenance and some "fine tuning" at the site will continue at cost to Council as in all the asset protection zone sites in Manly Dam to bring the asset protection zone to its full potential. Village residents should be aware that this is not a landscaping project hence parts of the work will continue to look partially complete for quite some time before the site fully matures.

Council thanks Allambie Lutheran Homes for their support in this project and the results benefit both the Village and Manly Dam Management needs. Should you have any further enquiries please contact Mr Chris Buckley on 9949 3235.

Yours sincerely

Steven Bax

Steven Bax
Team Leader
Land Management and Foreshores

Appendix 8. Undertaking from Proponent to Manage APZ's in Perpetuity

To be provided by AHV.

Appendix 9. Biodiversity Management Plan (Total Earth Care 2020)

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Biodiversity Management Plan

William Charlton Village
Allambie Heights

Total Earth Care Pty Ltd
February 2020

total earth care

Biodiversity Management Plan

William Charlton Village
Allambie Heights

February 2020

Quality Control	© Total Earth Care Pty Ltd 2020		
Revision/Version No.	Rev A	**Date of Revision**	24 February 2020
Prepared by:	G Teear		
Approved by:	A McGahey & G Barron		
Prepared for:	Allambie Heights Village		
TEC Job No.	C11661		

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Executive Summary

Total Earth Care was engaged by Allambie Heights Village to prepare a Biodiversity Management Plan for the proposed independent living development at William Charlton Village, 181 Allambie Rd, Allambie Heights. The lot is a large block which currently consists of a residential aged care facility and associated buildings with an area of managed lawn and planted and remnant trees. The western half of the lot consists of remnant bushland intersected by an access road.

The proposed development includes the construction of two (2) additional buildings containing independent living units, a communal building, associated landscaping, internal access roads, car parking and required Asset Protection Zones (APZs).

A site survey was conducted on the 19th February 2020 by two (2) qualified Ecologists. Weed densities have been mapped and management zones allocated.

Mitigation methods and management actions provided in this report have been designed to address current management issues. This report separates the site into five (5) management zones and details management actions and performance criteria for the five (5) years following the construction to ensure that the remnant bushland within the site is maintained. Management actions include weed control, delineation of management zones, fencing no-go zones and management of an Outer Protection Area (OPA).

1 Introduction

1.1 Background

Total Earth Care (TEC) has been commissioned by Allambie Heights Village Ltd to prepare this Biodiversity Management Plan (BMP) for this the independent living development proposal at 181 Allambie Road to support the development application. The site is within the Northern Beaches LGA.

This BMP is written in accordance with the Biodiversity Management Plan Report Guidelines available on the Northern Beaches Council Website titled – "2014 112357 Guideline for preparing a Biodiversity Management Plan April 2014".

Site-specific plans and documents reviewed for this project:

- DA011 Site Plan, by Jackson Teece, dated 19/12/2019;
- L-SD-01 Landscape Concept Plan by Arterra Design Pty Ltd, dated 24/10/2019; and
- Bush Fire Assessment Report by Total Earth Care, dated February 2020.

1.2 Subject Site

The Subject Site (the Site) comprises the area of land likely to be directly or indirectly impacted by future development. The study area comprises the subject site in addition to the surrounding land that may be potentially indirectly affected by the development or affect the development. The locality encompasses a larger area that includes neighbouring properties and includes areas of native biodiversity values nearby. The subject site details are outlined in Table 1 and the boundaries and simplified plans are shown in Map 1. The architectural drawings are provided in Appendix A.

Table 1. Site Details

Property name	William Charlton Village
Site address	181 Allambie Rd
Property identifier (Lot and DP)	DP 752038 lot 2615
Local Government Area	Northern Beaches Council
Zoning	R2 Low Density Residential

1.3 Staff Qualifications

This report has been prepared by suitably qualified personnel. Their qualifications are below:

1.3.1 Andrew McGahey – 35 years experience

- Associate Diploma of Horticulture
- Certificate II in Bushland Regeneration
- Planning for Bush Fire Protection
- White Card (WHS General Construction Induction)
- Senior First Aid Certificate

1.3.2 Gillian Teear – 3 years experience

- Bachelor of Environmental Biology – University of Technology Sydney
- White Card (WHS General Construction Induction)
- First Aid and CPR
- Sydney Metropolitan Wildlife Course and Volunteer
- NSW Seabird Rescue First Responders Course
- UNSW Advanced Plant ID Course – 2018
- Van Klaphake – Eucalyptus ID Course – 2018
- Teresa James Cumberland Plain Woodland Plant ID Workshop – 2018
- Teresa James Biodiversity Site Assessment Workshop - 2018

1.3.3 Georgina Barron – 4 years experience

- Bachelor of Science (Biology) (1st Class Honours) The University of Sydney
  Honours project: Ecological benefits of invasive plants in novel ecosystems: does Lantana provide habitat for urban sensitive species?
- White Card (WHS General Construction Induction)
- First Aid and CPR
- Introduction to Animal Research (ITAR), Module 1: Fundamentals of Animal Research
- Introduction to Animal Research (ITAR), Module 3: Wildlife
- WIRES Possum & Glider Course
- WIRES Rescue & Intermediate Care Course

1.4 Relevant Legislation and Planning Instruments

Within the Northern Beaches Council LGA, relevant legislation and policies which apply to this BMP include:

- 10/50 Vegetation Clearing Code of Practice
- Biodiversity Conservation Act 2016 (NSW)
- Biosecurity Act 2015 (NSW)
- Bushfire Environmental Assessment Code 2006
- Environment Protection and Biodiversity Conservation Act 1999 (Cth)
- Environmental Planning and Assessment Act 1979 (NSW)
- Local Government Act 1993 (NSW)
- National Parks and Wildlife Act 1974 (NSW)
- Planning for Bushfire Protection 2006
- Protection of the Environment Operations Act 1999 (NSW)
- Rural Fires Act 1997 (NSW)
- State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004
- State Environmental Planning Policy (Exempt and Complying Development Codes)
- State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004
- State Environmental Planning Policy No 19-Bushland in Urban Areas
- State Environmental Planning Policy No 1-Development Standards
- State Environmental Planning Policy No 33-Hazardous and Offensive Development
- State Environmental Planning Policy No 36-Manufactured Home Estates
- State Environmental Planning Policy No 44-Koala Habitat Protection
- State Environmental Planning Policy No 55-Remediation of Land
- State Environmental Planning Policy (Primary Production and Rural Development) 2019

- State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017: Subject Land
- Warringah Development Control Plan 2011
- Warringah Local Environmental Plan 2011
- Water Management Act 2000 (NSW)

Title: Impact Area

Map No: 1
Site: William Charlton Village
Client: Allambie Heights Village
Date: February 2020
Project No: C11661
Author: G Teear

Legend

Remaining bushland

Impact Area

0 15 30 60 Meters

N

Data Source:
Total Earth Care
Nearmap

Copyright Total Earth Care Pty Ltd, 2018
Tel: 02 9913 1432 Fax: 02 9913 1434

total earth care

2 Methods

2.1 Desktop Research

A preliminary desktop study was conducted to assess the likelihood of the study area to support threatened species, populations or threatened ecological communities, or their habitats. All records of threatened species and populations within five (5) kilometres of the subject site (10km locality search) were obtained from the Office of Environment & Heritage (OEH) Wildlife Atlas database (DPIE 2020), and the Federal Environment Department of Environment Protected Matters search tool.

2.2 Site Survey

A diurnal survey was conducted over one (1) day on 19th February 2020. Weather conditions were warm and sunny (around 22˚C at 9am) with a light wind. The site survey was conducted by Georgina Barron and Gillian Teear. Their qualifications are provided in Section 1.3 of this report.

2.2.1 Botanical Survey

A general botanical survey was conducted with reference to existing vegetation community descriptions and mapping from previous TEC surveys of the site. Threatened flora likely to occur within the locality were surveyed using the NSW Guide to Surveying Threatened Plants (OEH 2016b). Surveys on the subject site were generally random meanders (DEC 2004), but focused on identifying native vegetation and included:

- The identification of native and exotic plant species according to Field Guide to the Native Plants of Sydney (Robinson, 2003), Flora of NSW, Volumes 1-4 (Harden 1992, 1993, 2000, 2002), Weeds of the south-east: an identification guide for Australia (Richardson et al, 2006) and PlantNET (Botanic Gardens Trust, 2008), with reference to recent taxonomic changes;
- Targeted searches for threatened plant species according to the “random meander” method (Cropper 1993);
- The identification and mapping of plant communities based on current site conditions, soils and species list, and previous vegetation mapping including The Native Vegetation of the Sydney Metropolitan Area Version 3.0 (OEH 2016a);
- An assessment of the natural resilience of the vegetation of the site;
- Identification of previous and current factors threatening the ecological function and survival of native vegetation on the site; and
- Determination of appropriate rehabilitation and bush regeneration techniques for the native vegetation of the site.

2.2.2 Fauna Survey

Incidental fauna observations and fauna habitats were recorded as part of the survey effort. This included noting the GPS locations of hollow bearing trees, describing notable habitat features such as termite mounds, target searches for indirect evidence of fauna such as scats and scratchings and brief targeted searches for associated fauna (Triggs 1984).

2.3 Limitations

The diurnal field survey was conducted over one (1) day during February 2020. The flora and fauna field survey was based on the recommendations of Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft (DECC, 2004) with particular reference to the size of the subject site and a relatively homogeneous wider urbanised landscape.

As stated by the DECC (2004) ‘The absence of a species from survey data does not necessarily mean it does not inhabit the survey area. It may simply means that the species was not detected at that time with the survey method adopted and the prevailing seasonal or climatic conditions.’ Therefore, the relative brevity of the survey and its timing mean that the full spectrum of flora and fauna species and ecological processes likely to occur on the site cannot be fully quantified or described in this report. These limitations have been partly addressed by identifying potential habitats for fauna species and assessing the potential for these species to occur on the site based on previous records, the type and condition of habitats present, the land use throughout the subject site, surrounds and the landscape context.

When reviewing maps please note that the hand-held GPS equipment used is only accurate to three (3) metres.

3 Site Description

3.1 Identification and description of the site and surrounds

3.1.1 General

The subject site is located in the suburb of Allambie Heights in the Northern Beaches LGA. The site is zoned as R2 Low Density Residential, with RE1 Public Recreation and SP1 Special Activities: Health Services Facilities characterising the surrounding area. The western and southern boundaries of the site are contiguous with the Manly Warringah War Memorial Park, a 375ha passive and active recreational bushland park. The northern boundary adjoins a Sydney Water bushland easement for a water reticulation pipe.

The remnant bushland section of the site has been partially developed by the previous lessee. A sealed road has been built on cut and filled soil through the centre of the site. Three (3) drains have been excavated into solid rock which have created de-facto creeks. In addition to residential dwellings, the site incorporates open lawns, landscaped gardens with exotic and native horticultural species plantings, and some remnant native vegetation.

3.1.2 Soils

The entirety of both the subject site and study area is contained within the Lambert Soil Landscape, as mapped by Chapman et al (1989). It derives from Hawkesbury Sandstone which consists of medium to coarse-grained quartz sandstone with minor shale and laminite lenses. Soils are shallow (<50 cm) discontinuous Earthy Sands (Uc5.11, Uc5.22) and Yellow Earths (Gn2.2) on crests and insides of benches; shallow (<20 cm) Siliceous Sands/Lithosols (Uc1.2) on leading edges; shallow to moderately deep (<150 cm) Leached Sands (Uc2.21), Grey Earths (Gn2.81) and Gleyed Podzolic Soils (Dg4.21) in poorly drained areas; and localised Yellow Podzolic Soils (Dy4.1, Dy5.2) where associated with shale lenses. Typical limitations of the soil include very high soil erosion hazard, rock outcrop, seasonally perched watertables, shallow, highly permeable soil and very low soil fertility (DPIE2013).

The soil in the eastern portion of the site and along the existing road shows a high level of disturbance associated with construction and demolition through excavation and filling. Sealed access ways and formalised drainage lines have also caused some level of soil disturbance outside of excavated areas. Notwithstanding, soils within some of the landscaped areas including lawns and garden beds have retained much of their original structure.

3.1.3 Topography, Aspect and Hydrology

The site is roughly rectangular in shape with the long axis orientated to the east and west. The western half of the site is substantially bushland while the centre is open parkland and the eastern end contains two (2) two-storey residential buildings and a number of smaller service buildings.

The bushland remnant has a south facing aspect and is located on moderately sloping land. The highest point is 134m above sea level (asl) and the lowest point is 117m asl. The median point is 114m asl. It has a 15% grade or 9° slope. The land is evenly benched along the contour from west to east with the steepest possible grade of 5% grade or 3° slope.

A 20m wide sandstone bench extends beyond and along the southern eastern boundary of the bushland interface. At the downslope edge of this bench is a stepped broken scarp of sandstone bedrock that flattens after approximately 20m. This ground then flattens and meets a vehicle access road. The bench has been excavated at its eastern end to create a narrow drain. This excavation is into solid rock and although it creates steeper ground it, does not support vegetation. This wetter gully is the steepest land adjacent to the site and has a 12% slope or 7°.

3.1.4 Riparian Lands and Waterways

Three (3) drainage lines were found on site. All appear to have been cut into sandstone and some areas concreted (See Figure 1). The drainage line at the western end of the site is a continuation of the drainage channel that runs along the northern side of the driveway through the site. The easterly drainage line that crosses the existing driveway would not have occurred naturally in this position within the topography and cannot be considered a creek line or waterway for the purpose of the developable land on site. None of these drainage lines have been mapped by the Office of Water as streams recognised by the Strahler System.

Map 6 shows the location of the drainage lines. A 10m buffer has been included in the map although it is unlikely that such an exclusion zone would be required.

Despite the artificial origin of the ephemeral creek lines, they provide breeding and foraging habitat for fish, amphibians, reptiles and invertebrates. Protection and recovery of riparian vegetation will help to ensure the viability of theses unofficial wildlife corridors. It will allow plant and animal species to access areas of suitable habitat and promote genetic diversity via dispersal vectors supported by these corridors. This process encourages diversity and sustainability within ecosystems.

Figure 1. Drainage lines.

3.2 The ecological value of existing bushland and bushland impacted upon by the proposed development.

The bushland portion of the site to the west, is mostly of high quality and is contiguous with the Manly Warringah War Memorial Park. It provides potential foraging sites for a range of threatened species. The bushland's location also provides a buffer between urban development and the reserve. Some of the bushland on the site is mapped on the NSW Biodiversity Values Map under the BC Act 2016. The site is part of the Curl Curl Creek catchment, which is recognised as a waterway of high ecological value in Warringah's Creek Management Study 2004.

3.2.1 Flora Habitat

Three (3) remnant native plant communities are identified on the site (see Map 3). These are:

- PCT 1824 – Coastal Sandstone Heath-Mallee (S_HL08)
- PCT 1783 – Sydney North Exposed Sandstone Woodland (S_DSF_11)
- PCT 1250 – Swamp Oak-Prickly Tea-tree-Swamp Paperbark Swamp Forest on Coastal Floodplains, Sydney Basin and South East Corner (S_DSF_09)

The February survey found that a significant portion of these native plant communities are in good to moderate condition with high levels of natural resilience in some areas (see Figure 2). No threatened flora species or Endangered Ecological Communities (EECs) have been identified on the site.

Areas of high density weeds were identified along the southern edge of the access road that heads west into the bushland part of the site. These are largely associated with the fill batter, below the central access road and drainage line. These areas are shown in Map 5. A number of mature Coral Trees

(*Erythrina × sykesii*) are located within the managed lawn area and the edges of the bushland area. Other weeds encroaching on bushland includes Morning Glory (*Ipomoea indica*), dense thickets of Lantana (*Lantana camara*), Crofton Weed (*Ageratina adenophora*) and Senna (*Senna pendula* var. *glabrata*).

A managed exotic lawn area in the central portion of the site, hosts some isolated native remnant trees from the local plant community, planted native trees and exotic trees.

The land holder obligations under the *Biosecurity Act 2015* are listed in Table 11 and Table 12 of Appendix E. Of the weed species present two (2) are listed as Weeds of National Significance (WONS): Lantana (*Lantana camara*) and Asparagus Fern (*Asparagus aethiopicus*).

Figure 2. Highly resilient bushland within PCT 1250 [left] and PCT 1783 [right].

3.2.2 Fauna Habitat

A total of fifteen (15) native vertebrate fauna species were recorded during the February 2020 survey (see Appendix C). A total of twenty-three (23) native vertebrate fauna species have also previously been recorded on the site or within the study area. Previous fauna surveys by TEC included Anabat recordings, motion sensing cameras and spotlighting. Fauna detected in the previous surveys included six (6) micro bat species and seven species of (7) birds and mammals including Swamp Wallaby (*Wallabia bicolor*), Brush-tailed Possum (*Trichosurus vulpecula*), and Sugar Gliders (*Petaurus breviceps*). Of the species previously recorded in the site and greater study area, five (5) threatened species, which are listed as Vulnerable under the BC Act 2016, were recorded. These are:

- Eastern Pygmy-possum *Cercartetus nanus*
- Square-tailed Kite *Lophoictinia isura*
- Little Bentwing-bat *Miniopterus australis*
- Eastern Bentwing-bat *Miniopterus schreibersii oceanensis*
- Grey-headed Flying-fox *Pteropus poliocephalus* (also Vulnerable under the EPBC Act)

During the current survey three (3) Ring-tailed Possum dreys were observed and at least one (1) was observed to be in use (see Figure 3).

A number of exotic species, including rabbits, foxes and rats were also recorded. See Table 10 in Appendix C for the full fauna list from previous recent TEC surveys.

The site does not contain important breeding habitat for threatened species due the lack of suitable caves (for microbats), tree hollows (for Eastern Pygmy-possums) or nesting or colony sites (for Square-tailed Kite and Grey-headed flying foxes). Fauna habitat is mostly associated with the native plant communities on site as a foraging resource. Exposed sandstone boulders and benches in the southern portion of the bushland area can provide smaller cracks and ledges that can be used as habitat by reptiles and other small creatures. Larger caves, and older trees with large hollows are not present on site.

The abundance of Banksias on site provide important foraging habitat for various bird species and the Eastern Pygmy Possum. Formalised drainage lines provide habitat for fish, amphibians, reptiles and invertebrate species. Native and exotic trees, which are going to be cleared in the managed lawn area, may provide opportunistic nectar foraging and perching sites for visiting species.

Figure 3. Small pool on the western boundary of the site [Left] and Ring-tailed Possum drey in use [Right].

3.3 Site Constraints including Significant Environmental Features

As previously discussed the site contains moderate to good quality remnant bushland which provides habitat for several fauna species including threatened species. No threatened plants, communities or threatened species breeding habitats are to be removed by direct clearing for the proposal. The boundary of permanent clearing for the development footprint is contained to the eastern side of the artificial drainage line. Bushland adjacent to the drainage line falls into the Outer Protection Area (OPA) of the APZ for the development. Management of the APZ in proximity to the drainage line will need to consider appropriate erosion control measures.

There are rock outcrops throughout the site with exposed sandstone benches which run east to west on either side of the access road. There are some crevices within the rock outcrops although these were determined to be unsuitable for microbat species due to being accessible by predators such as goannas, foxes and cats. Rock plateaus and boulders are present throughout the site which provide potential habitat for reptiles. Refer to Map 6 for the habitat constraints and features.

3.4 Vegetation Condition and Resilience

The intact bushland is of moderate to good quality being fully structured in most areas and of good resilience. Weeds are present in high densities in areas of historic disturbance associated with the installation of the access road and the areas adjacent to the managed lawn and the two (2) eastern drainage lines. Weed species include Morning Glory (*Ipomoea indica*), dense thickets of Lantana (*Lantana camara*), Crofton Weed (*Ageratina adenophora*) and Senna (*Senna pendula* var. *glabrata*). These are encroaching on good quality bushland and need to be controlled particularly along the drainage lines to prevent their spread into the areas of resilient bushland downstream. Refer to Map 5 for the weed densities. The weed species present within the site are detailed in Table 2 and the description of the weed zones displayed in Map 5 are provided in Table 3. See Figure 4 to Figure 9 for photos of the condition of the site.

Table 2. Weed Species Inventory

Family	Scientific Name	Common Name
Agavaceae	*Yucca spp.*	
Apocynaceae	*Nerium oleander*	Oleander
Araceae	*Zantedeschia aethiopica*	Arum Lily
Asparagaceae	*Asparagus aethiopicus*	Asparagus Fern
Asteraceae	*Ageratina adenophora*	Crofton Weed
	Conyza spp.	A Fleabane
Convolvulaceae	*Ipomoea indica*	Morning Glory
Crassulaceae	*Bryophyllum delagoense*	Mother of millions
Euphorbiaceae	*Ricinus communis*	Castor Oil Plant
Fabaceae (Caesalpinioideae)	*Senna pendula var. glabrata*	
Fabaceae (Faboideae)	*Erythrina x sykesii*	Coral tree
Musaceae	*Musa acuminata*	Edible banana
Oleaceae	*Ligustrum sinense*	Small-leaved Privet
Passifloraceae	*Passiflora suberosa*	Cork Passionfruit
Poaceae	*Paspalum quadrifarium*	Blue Paspalum
Solanaceae	*Solanum chrysotrichum*	Devil`s Fig
	Solanum mauritianum	Wild Tobacco Bush
Verbenaceae	*Lantana camara*	Lantana

Table 3. Description of Weed Zones

Weed Area	Description
A	**<5% weed cover.** This weed zone is predominantly undisturbed except for the powerline easement along the western boundary. As a result this patch is made up of good quality bushland that is highly resilient and mostly weed free. This zone is a priority to manage and monitor to prevent the encroachment or establishment of weeds from the neighbouring zones.
B	**75-100% weed cover.** This area lacks canopy species and mostly consists of dense patches of Blue Paspalum (*Paspalum quadrifarium*), Crofton Weed (*Ageratina adenophora*) and scattered Arum Lily (*Zantedeschia aethiopica*).
C	**<5% weed cover.** This area is predominantly, good quality bushland which is highly resilient and mostly weed free. This zone is a priority to manage and monitor to prevent the encroachment or establishment of weeds from the neighbouring zones.
D	**50-75% weed cover.** This weed zone follows a drainage line where there are encroachments of Crofton Weed (*Ageratina adenophora*), Small-leaved Privet (*Ligustrum sinense*) and exotic

Weed Area	Description
	ornamental garden species. This zone will be re-landscaped as part of the proposed development.
E	**<5% weed cover.** This area is predominantly, good quality bushland which is highly resilient and mostly weed free. This zone is a priority to manage and monitor to prevent the encroachment or establishment of weeds from the neighbouring zones.
F	**25-50% weed cover.** This area forms a transition between the high density weeds of Zone 4 and the moderate quality bushland. The bushland most consists of intact native strata but is subject to weed encroachment from the high density weed area of Zone G. Lantana (*Lantana camara*) continues down the edge of the track and Blue Paspalum (*Paspalum quadrifarium*) is scattered throughout the zone and along the track. Despite the weed encroachment this area has a good level of resilience.
G	**75-100% weed cover.** Previous disturbance during the construction of the access road has led to dense weed infestations in this area. This area contains dense thickets of Lantana (*Lantana camara*), a mature Coral Tree (*Erythrina × sykesii*), scattered Oleander (*Nerium oleander*), Morning Glory (*Ipomoea indica*) at the western end as well as Wild Tobacco (*Solanum mauritianum*), Giant Devil's Fig (*Solanum chrysotrichum*) and a few small shoots of Asparagus Fern (*Asparagus aethiopicus*).
H	**75-100% weed cover.** Dense patches of Blue Paspalum (*Paspalum quadrifarium*) are scattered throughout this area. Crofton Weed (*Ageratina adenophora*) follows the drainage line and the edge of bushland areas. Mature Coral Trees (*Erythrina × sykesii*) are present and juvenile Coral Trees (*Erythrina × sykesii*) are becoming scattered in this area. Lantana (*Lantana camara*) and Wild Tobacco (*Solanum mauritianum*) are also encroaching on bushland edges.

Figure 4. North-west corner of Weed Zone G.

Figure 5. Looking east over Weed Zone B.

Figure 6. Looking north over Weed Zone C.

Figure 7. Managed lawn area looking to bushland area.

Figure 8. Managed lawn area to be developed.

Figure 9. Edge of Weed Zone G and H looking west.

Title: Asset Protection Zone

Map No: 2
Site: William Charlton Village
Client: Allambie Heights Village
Date: February 2020
Project No: C11661
Author: G Teear

Legend

- Outter Protection Zone
- Subject Site
- APZ

0 15 30 60 Meters

N

Data Source:
Total Earth Care
Nearmap

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Title: OEH 2016 Vegetation Mapping

Map No: 3

Site: William Charlton Village

Client: Allambie Heights Village

Date: February 2020

Project No: C11661

Author: G Teear

Legend

Subject Site

Plant Community Type

- S_DSF09: Coastal Sandstone Gully Forest
- S_DSF11: Sydney North Exposed Sandstone Woodland
- S_HL08: Coastal Sandstone Heath-Mallee
- Urban_E/N: Urban Exotic/Native
- Weed_Ex: Weeds and Exotics

0 15 30 60 Meters

N

Data Source:
Total Earth Care
Nearmap
OEH 2016

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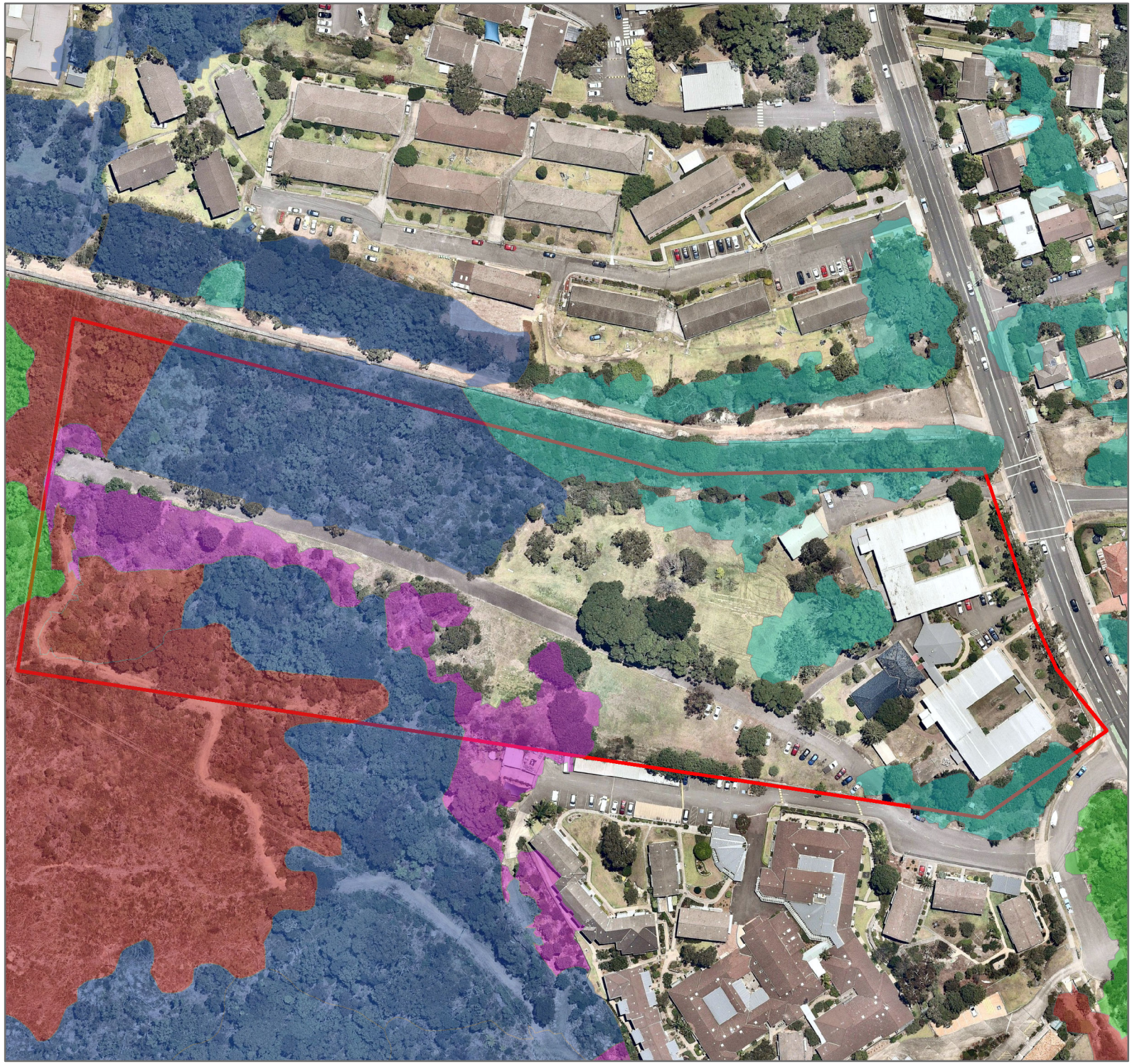
total earth care



Title: Vegetation Communities TEC 2019

Map No: 4

Site: William Charlton Village

Client: Allambie Heights Village

Date: Feb 2020

Project No: C11661

Legend

- Subject site
- Study area
- Lot

Plant Community Type (PCT)

- PCT 1250: Sydney Peppermint - Smooth-barked Apple - Red Bloodwood
- PCT 1783: Red Bloodwood - Scribbly Gum / Old-man Banksia
- PCT 1824: Mallee - Banksia - Tea-tree - Hakea
- Urban Exotic/Native
- Weeds and Exotics

0 15 30 60 Meters

N

Data Source:
Total Earth Care
SIX Maps

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Title: Weed Density

Map No: 5
Site: William Charlton Village
Client: Allambie Heights Village
Date: February 2020
Project No: C11661
Author: G Teear

Legend

Subject Site

Weed Density

- < 5%
- 5 - 25%
- 25 - 50%
- 50 - 75%
- 75 - 100%

0 12.5 25 50 Meters

N

Data Source:
Total Earth Care
Nearmap

total earth care

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Tel: 02 9913 1432 Fax: 02 9913 1434

Title: Habitat Constraints

Map No: 6
Site: William Charlton Village
Client: Allambie Heights Village
Date: February 2020
Project No: C11661
Author: G Teear

Legend

- Subject Site
- Drainage lines and 10m buffer
- Sanstone Rock Outcrops

0 15 30 60 Meters

N

Data Source:
Total Earth Care
Nearmap

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4 Identification of Potential Impacts to Biodiversity

4.1 Nature and Extent of Proposed Construction Activities

The proposed development includes the construction of the following:

- Two additional building containing independent living units;
- Communal building;
- Associated landscaping;
- Required APZs;
- Internal access roads; and
- Car parking.

The impact area for the construction of buildings and roads and landscaping is show on Map 1. Landscaping includes the modification and naturalization of the drainage line north of the access road to include boulders and pools.

Most of the vegetation to be cleared is within the areas of managed lawn and includes mature native and exotic tree species and small patches of vegetation predominantly made up of weeds and exotic plant species.

4.2 Nature and Extent of any Bushfire Hazard Asset Protection Zones

The area to be managed as an APZ is shown in Figure 9. The APZ will be managed as an Inner Protection Area (IPA) and an OPA(Australian Bushfire Safety & Planning 2018). The OPA is defined in Map 2 and the remainder of the APZ will form the IPA. Most of the area to be managed as an IPA is already cleared with some mature remnant and planted native trees and patches of weeds and exotic species. Sections of the OPA have a high density of weeds and will therefore benefit from the clearing required for the OPA. Some native ground cover and shrub species may require removal to meet the below requirements for the OPA. Some canopy species may also need to be removed to meet the OPA requirements.

Planning for Bushfire Protection (NSW RFS 2019) states that the following requirements apply when establishing and maintaining an IPA:

"Trees:

- *canopy cover should be less than 15% (at maturity)*
- *trees (at maturity) should not touch or overhang the building*
- *lower limbs should be removed up to a height of 2m above ground*
- *canopies should be separated by 2 to 5m*
- *preference should be given to smooth barked and evergreen trees.*

Shrubs:

- *create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings*
- *shrubs should not be located under trees*
- *shrubs should not form more than 10% ground cover*
- *clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.*

Grass:

- *should be kept mown (as a guide grass should be kept to no more than 100mm in height)*
- *leaves and vegetation debris should be removed."*

Planning for Bushfire Protection (NSW RFS 2019) states that the following requirements apply when establishing and maintaining an OPA:

"Trees:

- *tree canopy cover should be less than 30%; and*
- *canopies should be separated by 2 to 5m.*

Shrubs:

- *shrubs should not form a continuous canopy; and*
- *shrubs should form no more than 20% of ground cover.*

Grass:

- *grass should be kept mown to a height of less than 100mm; and*
- *leaf and other debris should be removed.*

These APZs are to be managed in a manner that provides as much biodiversity value as possible, within the constraints required for fire protection performance. The measures taken include:

- Weeds to be completely removed and supressed;
- Tree and shrub thinning is required to reduce the canopy cover to 15% or less and the shrub layer to 20% cover or less;
- Retain some larger tree specimens as standing habitat by poisoning rather than felling,
- Retain diversity in groundcover species with grasses and forbs;
- Supplemental planting of low native grasses and ground covers at minimum of 10 per square metres; and
- Use of sandstone and erosion control measures where the APZ is in close proximity to drainage lines.

4.3 Nature and Extent of Proposed Operational Activities

The nature of the ongoing operational activities include use of the residential buildings, facilities and garden areas by senior residents and their visitors. Road use is likely to be infrequent and as it will be used as a thoroughfare. There are few ongoing impacts foreseen during the operational activities. Potential impacts included increased ongoing human presence closer to the bushland area, including some increased to noise and light.

4.4 Potential Indirect Impacts to Any Vegetation in Areas Adjoining the Development

Potential indirect impacts to vegetation include the potential encroachment of exotic plants into bushland by gardening activities. The appropriate selection of landscaping species can minimise this risk.

Increase rate of run-off from hard surfaces of the proposal may alter stream flow rates outside the subject site and lead to increases in sediment or nutrient loads and should be addressed in the Storm Water Management Plan addressing onsite detention measures.

There are potential impacts from erosion and sediment run-off which can be minimised with standard control techniques and must be addressed in the Construction Environment Management Plan (CEMP) which should be prepared prior to works as a requirement of this management plan. See 5.1 for further details.

5 Impact Mitigation Pre-clearing and During Clearing Works

5.1 Pre-clearing

The following mitigation measures are to be documented in a CEMP and implemented prior to clearing:

- All Environmental Subplans (e.g. Soil & and Water MP, Flora and Fauna MP etc.) within the CEMP must include Scope, Project Compliance Requirements, Project Targets, Control Measures Used, and Monitoring Details.
- Erosion and sediment control must be detailed in an Erosions and Sediment Management Plan, including types of control, method of installation, locations, maintenance regime, responsibilities, and stockpile storage. These may include, but are not limited to, silt fencing, vehicle shake-down, floating silt boom, and stabilisation access for machinery.
- Prior to works commencing a pre-clearance survey must be conducted by a qualified Ecologist to determine the presence of any nests, dreys or fauna using hollows. A report of findings for any required supervision of clearing works is to be submitted to Council.
- Areas determined not to be cleared must be marked and flagged off as “no-go” zones prior to construction and maintained throughout the works period.
- Any trees marked within “no-go” zones are to be retained and protected. Any impacts to these trees have not been assessed in this current report. AS 4970-2009 Protection of trees on development sites, is to be followed for all trees to be retained.
- Any trees within close proximity to the works zones must be examined by an arborist prior to works to identify the Tree Protection Zone (TPZ) and the Structural Root Zone (SRZ).
- For APZs;
    - Survey the APZ alignments (OPA, IPA and significant habitat features);
    - Delineate the alignment with bunting;
    - Identify trees for removal or pruning in consultation with fire consultant and ecologist;
    - Tag all trees which are to be protected; and
    - Protect all trees which are to remain within the APZs in close proximity to the clearing alignment.
- All environmentally sensitive areas must be permanently delineated from clearance areas with fencing and signage. Delineation must allow for passage of native fauna.
- All personnel must undertake environmental site inductions to highlight any and all environmental and ecological constraints within the site.
- Hygiene controls must be implemented for all vehicles and personnel entering the site. Phytophthora hygiene controls are provided in Appendix D.
- The bushland area must be permanently delineated from the areas managed as APZs, to assist in defining areas for ongoing fuel reduction management actions. This is to be an indicative boundary and not designed to restrict human or fauna access. A minimum specification consists of a single wire star picket fence or similar. Other posts of similar dimensions could be chosen for aesthetic consideration. Small auger or drilled post holes may be required given the shallow exposed bedrock.

5.2 During Clearing

The following mitigation measures should be implemented and maintained during clearing:

- Erosion and sediment controls should be implemented and maintained as per the Erosions and Sediment Management Plan.
- Areas which are marked and flagged off as “no-go” zones should be maintained during construction.
- Any trees marked within “no-go” zones are to be retained and protected. AS 4970-2009 Protection of trees on development sites, is to be followed.
- TPZs and the SRZs should be maintained for trees within proximity of the work zones.

- All environmentally sensitive areas must be permanently delineated from impacted areas with fencing and signage. Delineation must allow for passage of native fauna.
- All personnel should undertake environmental site inductions to highlight any and all environmental and ecological constraints within the site.
- Hygiene controls should be implemented for all vehicles and personnel entering the site. Phytophthora hygiene controls are provided in Appendix D.
- Felled trees, particularly those with hollows, are be placed within the remnant bushland within the site under the direction of an ecologist.
- Any hollows which are removed should be replaced with nest boxes at a ratio of 2:1 (two nest boxes for every hollow removed). The size of these should be determined by the size of the hollow removed. For example, large hollows should be replaced with large nest boxes at a 2:1 ratio.
- During tree clearing works, a qualified ecologist should be on present on site. If an animal is identified and at risk during construction, works should not continue until the animal has been rescued. If the animal is injured a qualified carer should be contacted by either ringing Sydney Metro Wildlife on 02 9413 4300 or WIRES on 1300 094 737.
- All weed vegetation should be removed from the site for disposal. Weedy vegetation should not be moved or stockpiled in areas of retained vegetation in order to reduce their spread. Ongoing treatment of remaining weeds outside cleared areas is covered in Section 6 of this management plan.

5.3 Construction

The following mitigation measures should be implemented and maintained during construction:

- Erosion and sediment controls should be implemented and maintained as per the Erosions and Sediment Management Plan.
- Areas which are marked and flagged off as “no-go” zones should be maintained during construction.
- Any trees marked within “no-go” zones are to be retained and protected. AS 4970-2009 Protection of trees on development sites, is to be followed.
- TPZs and the SRZs should be maintained for trees within proximity of the works zones.
- All environmentally sensitive areas must be permanently delineated from construction areas with fencing and signage. Delineation must allow for passage of native fauna.
- All personnel should undertake environmental site inductions to highlight any and all environmental and ecological constraints within the site.
- Hygiene controls should be implemented for all vehicles and personnel entering the site. Phytophthora hygiene controls are provided in Appendix D.
- The marking and flagging of the APZ boundaries should be maintained to protect the surrounding remnant intact bushland.

5.4 Post-construction

The following mitigation measures should be implemented post construction:

- Bush regeneration within the adjacent remnant bushland is recommended to increase habitat quality for native ground cover species and address the existing problem weeds at the edges which include but are not limited to: Wild Tobacco (*Solanum mauritianum*), Morning Glory (*Ipomoea indica*), dense thickets of Lantana (*Lantana camara*), Crofton Weed (*Ageratina adenophora*) and Senna (*Senna pendula* var. *glabrata*). Bush regeneration is also required to address new weed infestations that are likely to arise after construction.
- Bush regeneration and management of the retained bushland should be conducted as per the management zones detailed in Section 6 of this report.
- All environmentally sensitive areas must be permanently delineated from the residents’ area. Delineation must allow for passage of native fauna.

- Landscaping works are to be outside areas of bushland and do not include Environmental Weeds.

Title: Boundaries for Delineation

Map No: 7
Site: William Charlton Village
Client: Allambie Heights Village
Date: February 2020
Project No: C11661
Author: G Teear

Legend

Subject Site

Delineation Boundaries

Management Zones

1
2
3
4
5

0 10 20 40 Meters

N

Data Source:
Total Earth Care
Nearmap

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6 Management of Retained Vegetation and Rehabilitation Areas

The areas of vegetation to be retained and managed as an OPA following development are described in Table 4 below. The boundaries for these zones are shown in Map 8 with photo-monitoring points for each zone. Photos taken during the February field survey at these photo-monitoring points are provided in Table 5. The management actions, timing, duration and performance indicators for these zones are provided in Table 6. A Gantt Chart with the timing of works is provided in Table 7.

Table 4. Management Zones

Management Zone	Management Issues
1	This management zone is predominantly undisturbed, good quality bushland that is highly resilient and mostly weed free. This zone is a priority to manage and monitor to prevent the encroachment or establishment of weeds from the neighbouring zones. Small shoots of Asparagus Fern (*Asparagus aethiopicus*) are beginning to emerge near photo-point A at the boundary of this zone. These should be targeted as a priority to prevent further encroachment into the adjacent areas of high quality bushland.
2	This zone lacks canopy species and mostly consists of dense patches of Blue Paspalum (*Paspalum quadrifarium*), Crofton Weed (*Ageratina adenophora*) and scattered Arum Lily (*Zantedeschia aethiopica*). Management efforts in this zone must focus on preventing the spread of weeds into the good quality bush of Zone 1 to the east and west.
3	This area forms a transition between the high density weeds of Zone 4 and the moderate and good quality bushland. Lantana (*Lantana camara*) continues down the edge of the track and Blue Paspalum (*Paspalum quadrifarium*) is scattered throughout the zone and along the track. Management actions should focus on reducing the weed infestation and preventing the spread into the good quality bushland of Zone 1.
4	This zone contains dense thickets of Lantana (*Lantana camara*), a mature Coral Tree (*Erythrina × sykesii*), scattered Oleander (*Nerium oleander*), Morning Glory (*Ipomoea indica*) at the western end, as well as Wild Tobacco (*Solanum mauritianum*), Giant Devil's Fig (*Solanum chrysotrichum*) and a few small shoots of Asparagus Fern (*Asparagus aethiopicus*) in close proximity to photo-point A. Management efforts in this zone must focus on preventing the spread of weeds into the good quality bush of Zone 1. Asparagus Fern (*Asparagus aethiopicus*) should be a priority target as only a small amount of young growth was observed. This can be eradicated easily at this stage before it spreads.
5	This area forms the OPA of the APZ. There is a high density of weeds at the northern part of this zone and along the drainage line including Crofton Weed (*Ageratina adenophora*) and Wild Tobacco (*Solanum mauritianum*). Management actions should focus on the removal of weeds around the drainage line working from upstream areas to downstream areas. Weed management should also prevent the spread of weeds into the good bushland of in Zone 1 and in the western portion of Zone 5. This zone will also be managed as an OPA as per the Planning for Bushfire Protection (NSW RFS 2019) requirements discussed in Section 4.2.

Title: Management Zones

Map No: 8
Site: William Charlton Village
Client: Allambie Heights Village
Date: February 2020
Project No: C11661
Author: G Teear

Legend

Subject Site

Photo Monitoring Points

Management Zones

1
2
3
4
5

0 10 20 40 Meters

N

Data Source:
Total Earth Care
Nearmap

Copyright Total Earth Care Pty Ltd, 2018
Tel: 02 9913 1432 Fax: 02 9913 1434

total earth care

Table 5. Photo-monitoring point images

Photo Point	Direction	Photo
1	North	

Photo Point	Direction	Photo
2	East	

Photo Point	Direction	Photo
3	East	

Photo Point	Direction	Photo
4	South-west	

Table 6. Schedule of Works

Management Action	Management Zones	Task	Specifications	Timing	Estimated Duration	Responsibility	Performance Indicators/ deliverables
Site Meeting, Induction and WH&S	All zones	Project meeting with client, construction contractors and bush regeneration contractor	Meeting on site with all concerned parties prior to commencement of works. Induction, including environmental inductions undertaken. Review and implementation of site specific WH&S and CEMP. Discussion, review and induction for protocols for prevention of pathogen and weed spread.	Pre-construction	Half a (0.5) day	Property Owner and Contractors	WH&S documentation Inductions, including environmental inductions completed by all staff Wash down area designated All staff inducted into work site safety and protocols
Baseline Survey	All zones	Begin establishment of baseline monitoring photo-points. Begin baseline weed mapping of all zones.	Establish baseline monitoring photo points and weed density mapping for each management zone. Conduct weed density mapping. An overall assessment of the density of weeds on site is to be conducted by an ecologist or qualified bush regenerator	Start of BMP implementation	One (1) day	Ecologist or qualified Bush Regeneration Contractorr	Baseline photo points, signs of dieback in vegetation and weed densities established, to be collated into first progress report (at 6 months from implementation of BMP)

Management Action	Management Zones	Task	Specifications	Timing	Estimated Duration	Responsibility	Performance Indicators/ deliverables
Pre-clearance survey	Construction zone and OPA	Pre-clearance survey for active nest, dreys and any fauna that could be injured.	A qualified ecologist experienced in handling fauna is required to do a pre-clearance survey before any trees or vegetation are removed. If any nests or hollows are identified an ecologist must supervise the clearing.	Prior to clearing	One (1) day	Ecologist	Pre-clearance letter report.
Fence of "no-go" zones	Zones 1 and 4	Protection of conservation areas.	Zones 1 and 4 must be fenced off as "no-go" zones prior to construction. High-vis flagging is recommended to flag off the "no-go" zones. No equipment or fill is to be stored in these areas. Machinery or construction contractors must not enter the "no-go" areas.	Pre-construction and maintained until post construction	One (1) day	Construction Constructor	Photos provided in monitoring report and flagging maintained throughout the construction period.
Permanent delineation between the OPA and bushland areas	Zone 1, 4 and 5	Delineation of conservation areas from OPA	Zones 1 and 4 must be permanently delineated from the APZ area to provide a clear management line. As a minimum, a 3 strand wire fence with post at 2-5 m intervals must be installed. Other fencing options can be used provided they are fauna friendly (no	During construction and must be maintained indefinitely.	Two (2) to three (3) days	Construction Contractor	Photos provided in monitoring report. Fence maintained and functional for the life of the BMP.

Management Action	Management Zones	Task	Specifications	Timing	Estimated Duration	Responsibility	Performance Indicators/ deliverables
			barbed wire and allow fauna to pass through).				
Sediment Fencing	Zones 1, 5 and the construction area	Installation of sediment fencing and maintenance of existing sediment fencing	Sediment fencing to be installed down slope of any earthworks and above drainage lines. Specifications included in Appendix F. Sand bags must be used in the access road gutter to prevent sediment entering drainage lines, bushland and stormwater. Fences to be maintained and functional throughout period of construction.	Before construction works begin. Must be maintained during the entire construction period until the erosion risk is eliminated.	One (1) day, two (2) staff	Construction Contractor or Bush Regeneration Contractor	No sediment flow into bushland or drainage lines. Sediment fence functional throughout the period of construction. Performance of fence noted in monitoring BMP reporting.
Identify trees for APZ Clearing	Zone 5 (OPA)	Identify trees for removal	Bushfire consultant and ecologist to determine the trees required for removal within the OPA.	Prior to APZ clearing (within two (2) weeks of clearing)	One (1) day with ecologist and fire consultant	Bush Fire consultant and Ecologist	Trees to be removed and retained clearly marked.
Initial Weed Control	Zones 1 and 2 to the north of access road	Weed Control	Weed treatment including hand removal, cut and paint and herbicide spraying where relevant. Treat woody weeds in situ. See Appendix E for species specific treatment techniques.	Prior to or during construction work	Two (2) days, team of four (4)	Bush Regeneration Contractor	Before and after monitoring photographs. Waste and weed propagules removed off-site.
Initial Weed Control	Zones 1 to 4 south of access road.	Primary Weed Control	Control weeds working outwards from the centre of Zone 1 towards other zone boundaries. Treat woody weeds in situ. See Appendix E for species specific treatment techniques.	Prior to or during construction work	Two (2) days, team of four (4)	Bush Regeneration Contractor	Before and after monitoring photographs. Waste and weed propagules removed off-site.

Management Action	Management Zones	Task	Specifications	Timing	Estimated Duration	Responsibility	Performance Indicators/ deliverables
Secondary Weed control	All zones	Secondary Weed Control	Secondary weed treatment including hand removal, cut and paint and herbicide spraying where relevant. See Appendix E for species specific treatment techniques.	Six (6) months after initial weed control	Two (2) days, team of four (4)	Bush Regeneration Contractor	Before and after monitoring photographs. Waste and weed propagules removed off-site.
Year 1 maintenance	All Zones	Weed Maintenance	Minimum four (4) visits. Maintenance works to prevent re-establishment of weeds. Weed control methods that can be undertaken include hand weeding and spraying if necessary. Maintenance of APZ following RFS specifications for an OPA as outlined in Section 4.2.	First visit six (6) months after the secondary weed control. At least two (2) visits during the spring and summer months to target the flush of annual species.	One (1) day, team of four (4) each visit	Qualified Bush Regeneration Contractor	Reduce weeds to less than 15% cover within Year 1. APZ meets RFS specifications for maintenance of an OPA.
Year 2 maintenance	All Zones	Maintenance weeding	Minimum of two (2) annual maintenance visit. Maintenance works to prevent re-establishment of weeds. Weed control methods which can be undertaken include hand weeding and spraying if necessary. Maintenance of APZ following RFS specifications for an OPA as outlined in Section 4.2.	During the spring and summer months to target the flush of annual species.	One (1) day, team of four (4) each visit	Qualified Bush Regeneration Contractor	Reduce weeds to less than 10% cover within Year 2. APZ meets RFS specifications for maintenance of an OPA.

Management Action	Management Zones	Task	Specifications	Timing	Estimated Duration	Responsibility	Performance Indicators/ deliverables
Year 3 maintenance	All Zones	Maintenance weeding	Minimum of two (2) annual maintenance visits. Maintenance works to prevent re-establishment of weeds. Weed control methods which can be undertaken include hand weeding and spraying if necessary. Maintenance of APZ following RFS specifications for an OPA as outlined in Section 4.2.	During the spring and summer months to target the flush of annual species.	One (1) day, team of four (4) each visit	Qualified Bush Regeneration Contractor	Maintain weeds to less than 5% cover within Year 3. APZ meets RFS specifications for maintenance of an OPA.
Year 4 maintenance	All Zones	Maintenance weeding	Minimum of two (2) annual maintenance visits. Maintenance works to prevent re-establishment of weeds. Weed control methods which can be undertaken include hand weeding and spraying if necessary. Maintenance of APZ following RFS specifications for an OPA as outlined in Section 4.2.	During the spring and summer months to target the flush of annual species.	One (1) day, team of four (4) each visit	Qualified Bush Regeneration Contractor	Maintain weeds to less than 5% cover within Year 4. APZ meets RFS specifications for maintenance of an OPA.
Year 5 maintenance	All Zones	Maintenance weeding	Minimum of two (2) annual maintenance visits. Maintenance works to prevent re-establishment of weeds. Weed control methods that can be undertaken include hand weeding and spraying if necessary.	During the summer months to target the flush of annual species.	One (1) day, team of four (4) each visit	Qualified Bush Regeneration Contractor	Maintain weeds to less than 5% cover within in Year 5.

Management Action	Management Zones	Task	Specifications	Timing	Estimated Duration	Responsibility	Performance Indicators/ deliverables
			Maintenance of APZ following RFS specifications for an OPA as outlined in Section 4.2.				
Monitoring and Reporting	All Zones	Conduct annual monitoring, surveys and progress reports	Assess and present progress and monitoring reports on a six-monthly basis to Council to show whether Key Performance Indicators (KPIs) have been satisfactorily met to Council guidelines.	Every six (6) months	All years	Property Owner, Ecological Consultant or qualified Bush Regeneration Contractor	Weeds are to be reduced to less than 15% cover within Year 1, less than 10% in year 2 and to less than 5% by Year 5.
Final Monitoring Report	All Zones	Conduct final monitoring, surveys and progress report.	Assess and present a final report to Council to show whether KPIs have been satisfactorily met to Council guidelines	End of Year 5 after practical completion	All years	Property Owner, Ecological Consultant or qualified Bush Regeneration Contractor	Weeds to be reduced to less than 10% cover within Year 1 less than 10% in year 2 and to less than 5% by Year 5.

Table 7. Implementation Schedule

Management Zone	ACTION	Construction Stage				OPERATION / MAINTENANCE																				Responsibility
						YEAR 1				YEAR 2				YEAR 3				YEAR 4				YEAR 5				
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
All Zones	Site Meeting & Inductions - address WH&S issues																									Property Owner/Project Manager
1,4 and 5	Permanent delineation between the OPA and bushland areas																									Property Owner/Construction contractor
Zone 5	Identify trees for APZ clearing																									Fire Consultant and Ecologist
1,4 and 5	Fence of “no-go” zones																									Property Owner/Project Manager
5 and Construction area	Preclearance Survey																									Ecologist
1, 5 and Construction area	Install sediment fencing																									Property Owner/Construction contractor
All Zones	Baseline Survey																									Bush Regenerator or Ecologist
	Initial Weed Control - Zones 1 and 2 to the north of access road																									Bush Regenerator
	Initial Weed Control - Zones 1 to 4 south of access road																									Bush Regenerator
	Secondary Weed Control																									Bush Regenerator
	Year 1 Maintenance					x2			x2																	Bush Regenerator
	Year 2 Maintenance																									Bush Regenerator
	Year 3 Maintenance																									Bush Regenerator
	Year 4 Maintenance																									Bush Regenerator
	Year 5 Maintenance																									Bush Regenerator
	Monitoring Reports																									Bush Regenerator or Ecologist

7 Monitoring Guidelines

A program of monitoring and inspection is to be carried out by a qualified bushland management consultant (qualified ecologist or bush regeneration supervisor) to ensure the measures outlined in this BMP are implemented and that performance criteria have been satisfied. The monitoring programme will commence prior to any works to gather baseline data and will continue for the duration of the maintenance period.

The monitoring programme will involve:

- Assessment of weed control works and native regeneration success via permanent repeatable photographic monitoring points, and surveys of whole management zones by a suitably qualified person (ecologist or bush regeneration supervisor) to measure percentage cover of native and exotic species for each zone. Monitoring point locations are shown in Map 8;
- Mapping of weed densities per zone for the site to assess the progress of the works towards the final requirement of maximum <5% weed cover;
- Assessment of evidence of herbivory, and recommendations to counteract;
- Assessment of evidence of erosion, and recommendations to mitigate;
- Recommendations for corrective measures and/or specific vegetation management required; and,
- Provision of regular reports outlining data collected and tracking of works towards final KPIs.

Monitoring events and reporting are to follow the following schedule:

- Baseline Survey – Prior to commencement of bushland management works. No report required, but this information must be added to initial progress report;
- Surveys and Progress Report at Six (6) Monthly Intervals– following every 6 months of management activities. Report to include baseline from previous report, commencement and continuation of works, and survey results;
- Final monitoring report after five (5) years from practical completion is required which will report as to whether KPIs have been achieved, and if not, include recommendation on further works required.

All reports should be prepared by suitably qualified professionals and submitted to Council. Council defines a qualified person for supervision of on ground bush regeneration works such as weed removal, bush regeneration and revegetation as having:

- A minimum two years supervising experience of on–ground bush regeneration work and TAFE Certificate III in Conservation and Land Management - Natural Area Restoration or equivalent.

And for undertaking the bush regeneration works:

- A minimum of a TAFE Certificate II in Conservation and Land Management-Natural Area Restoration or equivalent.

8 Corrective Actions

Based on the monitoring report results corrective actions must be implemented where performance targets are not on track. Table 8 details corrective actions for potential management issues which may be identified during the monitoring stage. Corrective actions must be provided in the monitoring reports when required:

Table 8. Potential management issues and corrective actions

Management Issue	Corrective Action
Weed cover exceeding targets by 10% or more.	Increase weed control visits by a qualified bush regenerator. Frequency of visits to be determined by a qualified ecologist or bush regenerator to meet KPI's.
Ineffective sediment fencing or in disrepair	Repair existing fencing. Add additional fencing where required to ensure no sediment is entering drainage lines, bushland or stormwater.
Destabilisation after weed removal work	If the slope in management Zone 4 becomes destabilised after weed removal it should be stabilised using the following methods: - Installation of coir logs and/or jute matting depending on the extent and level of erosion potential. - Planting of local provenance tube stock plant species and watering. Plant survival rates must be maintained at 80% and in filled with additional plants if required.

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Appendix A. Proposed Plans

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AMENDMENTS

ISSUE	DESCRIPTION	APPROVED	DATE
1	AUTHORITY APPROVAL	MR	19/12/19

DRAWING KEY:

- SITE BOUNDARY
- PROJECT BOUNDARY
- 25m / 50m OFFSET FROM APZ LINE AS ASSESSED BY BUSHFIRE CONSULTANT, DASHED RED.
- APZ LINE AS ASSESSED BY BUSHFIRE CONSULTANT DASHED BLUE
- SITE VIEWS
- EXISTING ACCESS TO SITE
- MAIN SITE ENTRY
- EXISTING RETAINED BUILDING
- EXISTING RETAINED TREE
- TREE PROTECTION ZONE, REFER ARBORIST REPORT
- PROPOSED TREE, REFER LANDSCAPE PLAN

THIS DRAWING ISSUE HAS BEEN REVIEWED FOR

AUTHORITY APPROVAL

APPROVED BY: MR
CHECKED BY: GA

CLIENT
ALLAMBIE HEIGHTS VILLAGE

DRAWING
SITE PLAN

DATE	SCALE @ A1	DRAWN
09/03/18	1 : 500	SF

PROJECT No.	DISCP.	DRAWING No.	ISSUE
2017019	A	DA-011	1

PROJECT
2017019 - ALLAMBIE HEIGHTS

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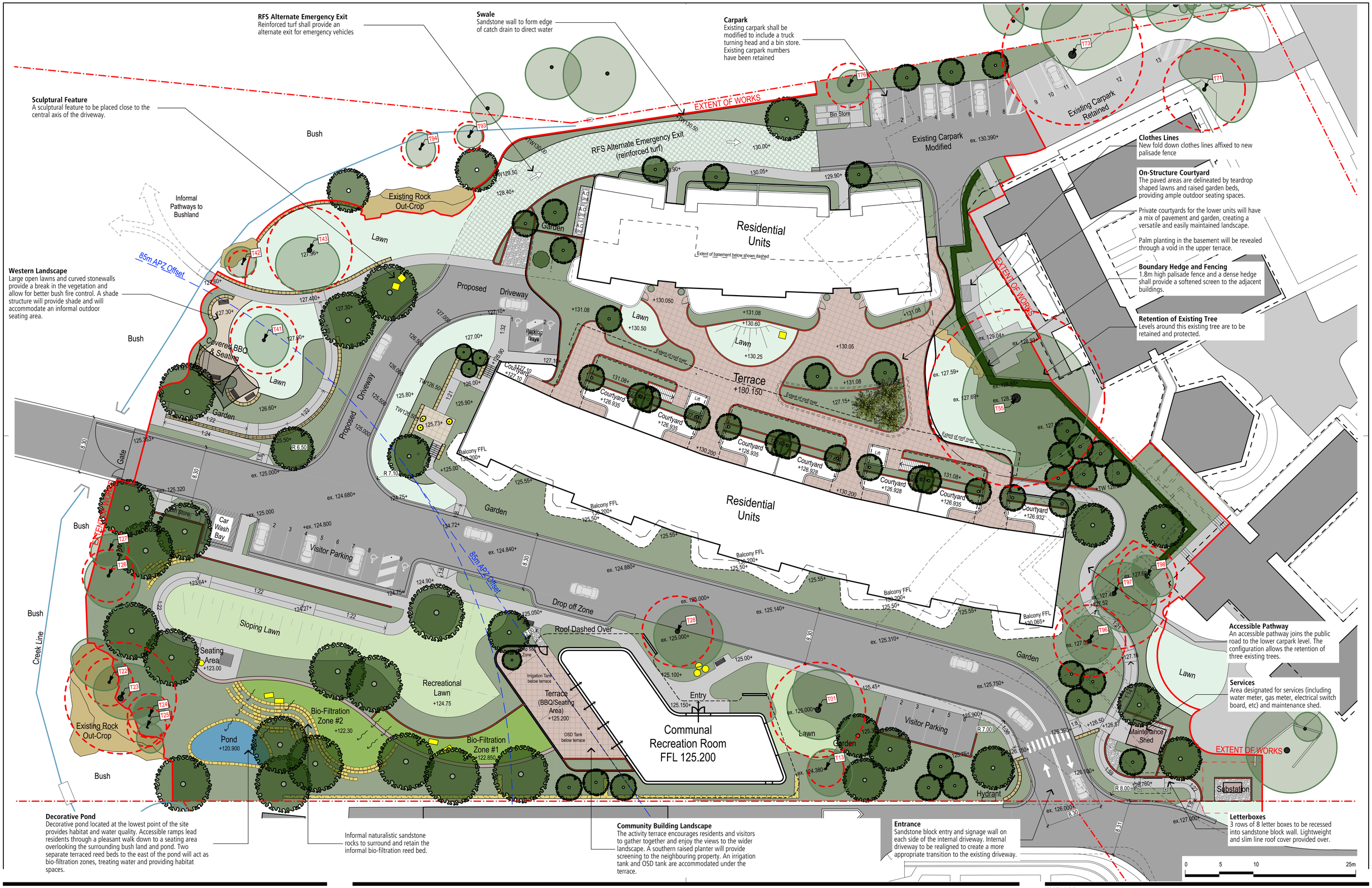
Jackson Teece Chesterman Willis Pty Ltd
Trading as Jackson Teece
ABN 15 089 837 290
JACKSON TEECE

Appendix B. Landscape Plans



arterra

ARTERRA DESIGN PTY LTD ABN 40 069 552 610
SUITE 602 / 51 RAWSON STREET, EPPING, NSW 2121
P 02 9957 2466 F 02 9957 3977 W ARTERRA.COM.AU

Legend

- Boundary
- Building Outline
- Building Above
- Building Below
- Existing Creek Line
- Existing Tree Retained (Extent of canopy as verified by site measure)
- Nominal Tree Protection Zone (TPZ)
- T01 Tree ID Numbers (Retained)
- Proposed Tree
- Garden
- Bio-filtration Zone
- Turf
- Pavement - Standard Grey Concrete
- Pavement -Tile
- Pavement - Decomposed Granite
- Pavement - Gravel
- Retaining Wall - Blockwork
- Retaining Wall - Dry Stacked Stone Wall
- Retaining Wall - Gabion
- Informal Sandstone Boulders
- Clothesline
- Bench Seat
- Overland Flow Path
- Sculptural Features/ Planter

REVISION	DESCRIPTION	CHKD	DATE
P1	For Rural Fire Service Review	RWS	24/10/19

PROJECT & CLIENT

Allambie Heights Village - Project 2

Allambie Heights Village Ltd.

North

Project No : 18.11
Designed : CLB
Drawn : CLB
Scale : 1:250@A1/1:500@A3

DRAWING TITLE

Landscape Concept Plan

DRAWING NUMBER L-SD-01

REVISION P1

Plotted at : 5:27 pm 24/10/19

Appendix C. Fauna Species Lists

Table 9. Fauna species observed during February 2020 survey.

Family	Scientific Name	Common Name	Exotic	BC Status	EPBC Status
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra		P	
Cacatuidae	*Cacatua galerita*	Sulphur-crested Cockatoo		P	
Corvidae	*Corvus coronoides*	Australian Raven		P	
Estrildidae	*Neochmia temporalis*	Red-browed Finch		P	
Leporidae	*Oryctolagus cuniculus*	Rabbit	*		
Meliphagidae	*Acanthorhynchus tenuirostris*	Eastern Spinebill		P	
	Anthochaera chrysoptera	Little Wattlebird		P	
	Manorina melanocephala	Noisy Miner		P	
	Meliphaga lewinii	Lewin's Honeyeater		P	
	Phylidonyris niger	White-cheeked Honeyeater		P	
	Phylidonyris novaehollandiae	New Holland Honeyeater		P	
Pseudocheiridae	*Pseudocheirus peregrinus*	Common Ringtail Possum		P	
Psittacidae	*Trichoglossus haematodus*	Rainbow Lorikeet		P	
Psophodidae	*Psophodes olivaceus*	Eastern Whipbird		P	
Pycnonotidae	*Pycnonotus jocosus*	Red-whiskered Bulbul	*		

Table 10. Fauna species observed during previous TEC surveys.

Common name	Scientific name	BC Act status	EPBC Act status
Red Wattlebird	*Anthochaera carunculata*	P	
White-striped Free-tail Bat	*Austronomus australis*	P	
Eastern Pygmy-possum	*Cercartetus nanus*	V	
Gould's Wattled Bat	*Chalinolobus gouldii*	P	
Large-eared Pied Bat	*Chalinolobus morio*	P	
Common Eastern Froglet	*Crinia signifera*	P	
Kookaburra	*Dacelo novaeguineae*		
Australian Magpie	*Gymnorhina tibicen*	P	
Striped marsh frog	*Limnodynastes peronii*	P	
Square-tailed Kite	*Lophoictinia isura*	V	
Noisy Miner	*Manorina melanocephala*	P	
Common Dwarf Skink	*Menetia greyii*	P	
Little Bentwing-bat	*Miniopterus australis*	V	
Eastern Bentwing-bat	*Miniopterus schreibersii oceanensis*	V	

Common name	Scientific name	BC Act status	EPBC Act status
Rabbit	*Oryctolagus cuniculus*		
Yabby (in Southern creek)	*Parastacidae* family		
Sugar Glider	*Petaurus breviceps*	P	
Common Ringtail Possum	*Pseudocheirus peregrinus*	P	
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V
Black Rat	*Rattus rattus*		
Pied Currawong	*Strepera graculina*	P	
Rainbow Lorikeet	*Trichoglossus haematodus*	P	
Common Brushtail Possum	*Trichosurus vulpecula*	P	
Large Forest Bat	*Vespadelus darlingtoni*	P	
Little Forest Bat	*Vespadelus vulturnus*	P	
Fox	*Vulpes vulpes*	U	
Swamp Wallaby	*Wallabia bicolor*	P	

Appendix D. Phytophthora Hygiene Protocols

Task	Action
Timing	When possible/practical, the development should be completed in dry soil conditions and postponed following significant rainfall. Working in dry soil conditions will reduce the need for cleaning vehicles and equipment. If it is necessary to work in wet or damp areas then greater attention will need to be spent on vehicle and equipment cleaning.
Staff	Contractors and staff involved in the development are to be made aware that fungus has / has not been recorded on site, and provided with information regarding management protocols and its threat to native vegetation.
Drainage and Water	Alterations to drainage that may result in the spread of *Phytophthora* into new areas are to be avoided as highest priority. Water used during construction should be minimised. When water is necessary, it should be from a reticulated mains system, bore supply or sterilised source. Surface water collected from infected areas should not be used. Water draining from the site should not to enter bushland areas. The use of water for dust suppression should be kept to a minimum.
Landscaping and Bush Regeneration	Plants used in landscaping should be purchased from a nursery with accreditation from the Nursery Industry Association, or from a nursery with excellent hygiene conditions. Species selected for landscaping should preferably be resistant to *Phytophthora cinnamomi*. Any gravel/sand/topsoil to be bought onto site should be purchased from a Nursery Industry Association accredited supplier, or should be certified (through testing) to be free of *Phytophthora cinnamomi*. Any infected soil/sand/gravel/vegetation moved on the site, or removed from the site should be stored at in area that is also infected with *Phytophthora cinnamomi*, or a site where the pathogen will not have any impact. Storage of gravel/sand/topsoil on site should preferably be on a dry well drained surface. Construction materials such as pipes, rocks, timber, bricks etc, should be free of mud and soil when arriving at the site. Staff should not enter infected areas unless necessary, movement within these areas should be kept to a minimum.
Vehicles and Machinery	All machinery, vehicles and equipment should arrive at the site free of uncontained mud and soil, particularly on tyres, mudflaps and the underbody. Vehicles and machinery exiting the site to be free of all uncontained mud and soil, particularly on the tyres, mudflaps and the underbody. Minimise the amount of water used. Try to remove soil and mud when it is dry (a stiff brush or stick maybe useful). Cleaning will be easier and more effective if it is completed at a depot or a permanent/designated cleaning area (it is acceptable for vehicles and machinery to be taken to a cleaning facility on sealed roads). If cleaning is to occur in the field select a site with a hard, well-drained surface (eg. a road) that is well away from remnant vegetation. If possible, wash down in an area that is close to the area you have been operating in. Wash down on ramps if possible. Do not allow mud and wash-down effluent to drain into bushland. Do not drive through wash-down effluent.
Footwear and Tools	Try to remove as much mud and soil as possible when it is dry with a stiff brush or stick. Minimise the amount of water used to initially clean footwear and tools. Footwear and tools should be scrubbed with a sterile solution (see below). All mud and soil should be collected (including in liquid) and removed in a bag or bucket. This material is to be disposed of at a site that is already infected with Cinnamon Fungus, or a site that contains no bushland.
Sterilising	Equipment can be sterilised by soaking in a disinfectant such as bleach (containing sodium hypochlorite). The bleach should be diluted (1 part bleach to 10 parts water), soak the tools for a few minutes, and then rinse. Alternatively methylated spirits can also be used for sterilising small hand tools and footwear in the field. A spray bottle containing methylated spirits can be used to cover all surfaces, allowing time for it to soak into all soil material (a couple of minutes is sufficient). A sterile water solution suitable for spraying down vehicles and machinery can be made by mixing 6mL of sodium hypochlorite (eg. pool chlorine or bleach) to every 10L of water.

Appendix E. Weed Species listed as a Biosecurity Risk

Table 11. Categories of Management under the Greater Sydney Regional Strategic Weed Management Plan 2017-2022 under the NSW Biosecurity Act 2015

Category	Management Action
Prevention (Prevent)	To prevent the weed species arriving and establishing in the Region.
Eradication (Eliminate)	To permanently remove the species and its propagules from the Region, OR to destroy infestations to reduce the extent of the weed in the region with the aim of local eradication.
Containment (Minimise)	To prevent the ongoing spread of the species in all or part of the Region.
Asset Protection (Manage)	To prevent the spread of weeds to key sites/ assets of high economic, environmental and social value, or to reduce their impact on these sites if spread.
GBD (General Biosecurity Duty)	All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable."
RRM **(Regional Recommended Measure)**	Specific details for each species included in table.
PoD **(Prohibition on Dealings)**	Must not be imported into the State or sold.
B Zone **(Biosecurity Zone)**	Specific details for each species included in table.
PM **(Prohibited Matter)**	A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries.

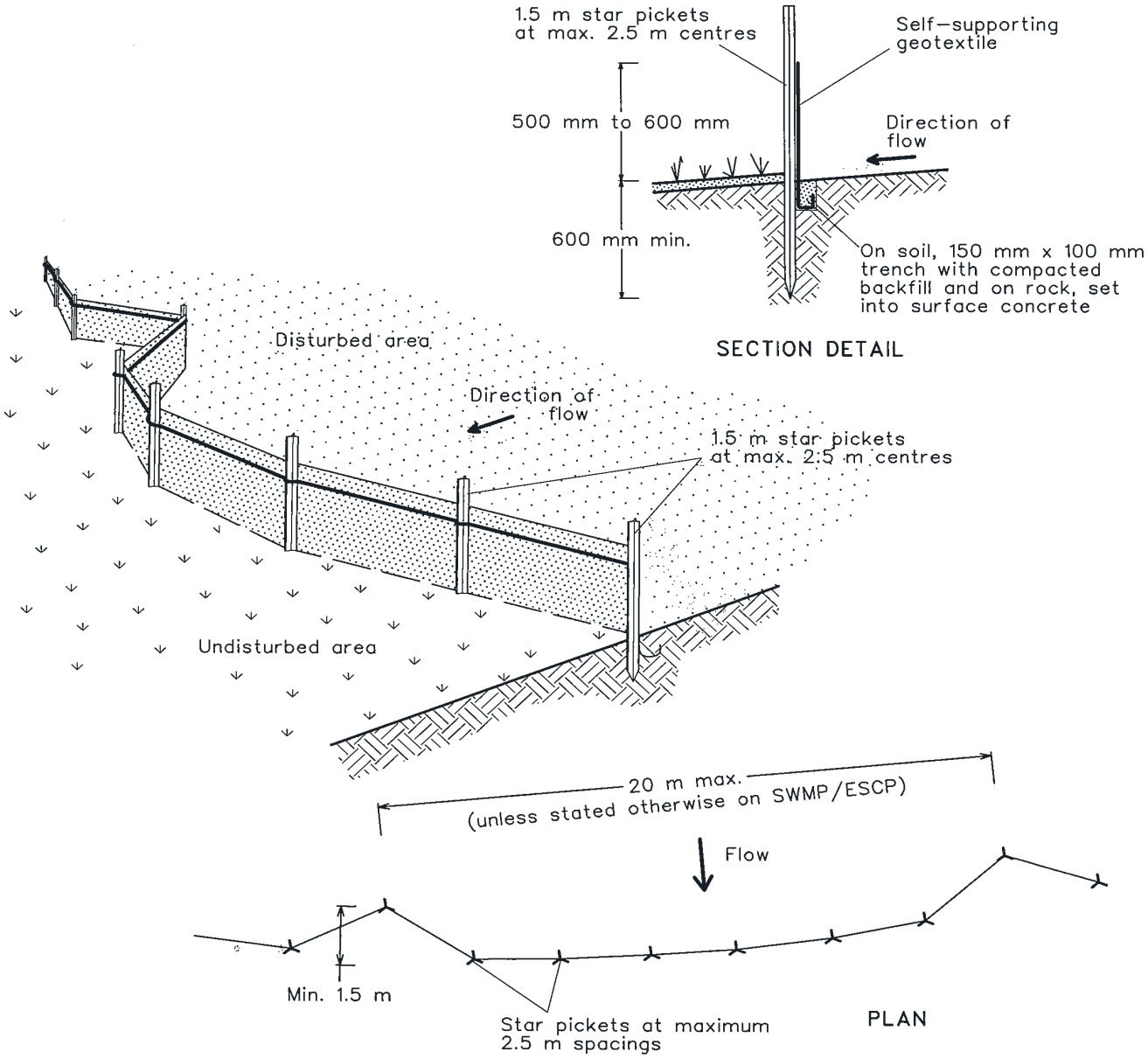
Table 12. Biosecurity Risk & Management Actions

Common Name	Botanical Name	WONS	State Priority Weed-Mgmt. Actions	Regional Priority Weeds-Mgmt. Actions	Other Regional Weeds-Asset/value at risk	Duties for Priority Weeds of Greater Sydney	Weeding Technique	Herbicide Application	Herbicide Group	Ratio
Crofton Weed	*Ageratina adenophora*				Environment, Agriculture		Hand removal, brush cut and foliar sprayed with Glyphosate	Glyphosate 360g/L	M	1/100
Asparagus Fern	*Asparagus aethiopicus*	Yes	Asset Protection			PoD	Small single specimens to be crowned or Sprayed with Glyphosate/metsulfuron methyl	Glyphosate 360g/L & Metsulfuron-Methyl 600 g/kg	M & B	1/100 & 1g/10L
Mother of Millions	*Bryophyllum delagoense*				Environment, Agriculture, Human health		Hand pulled or spot sprayed with Starane Advance	Fluroxypyr 333 g/L present as meptyl ester	I	0.36/100
Coral Tree, Common Coral Tree	*Erythrina x sykesii*				Environment		<80mm cut & painted; >80mm will be drilled/frilled with neat Glyphosate	Glyphosate 360g/L	M	Neat
Morning Glory / Blue Morning Glory	*Ipomoea indica*				Environment, Human health		Small single specimens hand pulled, skirting larger vines scraping and painting with neat Glyphosate	Glyphosate 360g/L	M	Neat
Lantana	*Lantana camara*	Yes	Asset Protection			PoD	Cut and paint, sprayed or splattered with Glyphosate	Glyphosate 360g/L	M	Neat
Small Leaf Privet	*Ligustrum sinense*				Environment, Human health		<80mm cut & painted; >80mm will be drilled/frilled with neat Glyphosate	Glyphosate 360g/L	M	Neat

Common Name	Botanical Name	WONS	State Priority Weed-Mgmt. Actions	Regional Priority Weeds-Mgmt. Actions	Other Regional Weeds-Asset/value at risk	Duties for Priority Weeds of Greater Sydney	Weeding Technique	Herbicide Application	Herbicide Group	Ratio
Tussock Paspalum, Blue Grass	*Paspalum quadrifarium*				Environment		Hand pulled or brush cut and foliar sprayed with Glyphosate	Glyphosate 360g/L	M	1/50
Corky Passionflower	*Passiflora suberosa*				Environment		Hand remove small individuals, spot spray or scrap and paint with neat Glyphosate	Glyphosate 360g/L	M	1/100 & Neat
Castor Oil Plant	*Ricinus communis*						Hand pulled and cut & painted with neat Glyphosate	Glyphosate 360g/L	M	Neat
Senna / Cassia	*Senna pendula*				Environment		Small individuals hand removed, larger plants cut and painted with neat Glyphosate	Glyphosate 360g/L	M	Neat
Giant Devil's Fig	*Solanum chrysotrichum*			Prevention		RRM: Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should				

Common Name	Botanical Name	WONS	State Priority Weed-Mgmt. Actions	Regional Priority Weeds-Mgmt. Actions	Other Regional Weeds-Asset/value at risk	Duties for Priority Weeds of Greater Sydney	Weeding Technique	Herbicide Application	Herbicide Group	Ratio
						not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.				
Tobacco Bush/ Wild Tobacco	*Solanum mauritianum*				Environment, Agriculture		Cut & paint with Glyphosate	Glyphosate 360g/L	M	Neat
Arum Lily	*Zantedeschia aethiopica*				Human health, Environment		Physical removal of whole plant and rhizome or cut and paint with Neat Glyphosate	Glyphosate 360g/L	M	Neat

Appendix F. Sediment Fence Specifications (Landcom 2004)



Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

SEDIMENT FENCE

SD 6-8

Appendix 10. RFS D1887788 July 30 019

Sent:	1/08/2019 9:30:47 AM
Subject:	DA2018/1667 - 181 Allambie Road
Attachments:	181 Allambie Road.pdf;

Dear Lashta,

Please find attached the Rural Fire Service comments regarding DA2018/1667 - 181 Allambie Road.

Regards,

Lisa Kennedy | Administration Officer | Planning and Environment Services, East
NSW RURAL FIRE SERVICE
4 Murray Rose Avenue, Sydney Olympic Park NSW 2127
P 02 8741 3401 **E** Lisa.Kennedy@rfs.nsw.gov.au
www.rfs.nsw.gov.au | www.facebook.com/nswrfs | www.twitter.com/nswrfs
PREPARE. ACT. SURVIVE.

NSW RURAL FIRE SERVICE

NSW GOVERNMENT

The General Manager
Northern Beaches Council
PO Box 882
MONA VALE NSW 1660

Your reference: DA2018/1667
Our reference: D18/7788

30 July 2019

Attention: Lashta Haidari

Dear Ms Haidari,

Integrated Development for Partial External Demolition Works and Construction of a Seniors Housing Development at Lot 265 DP752038, 181 Allambie Road, Allambie Heights, 2100

Reference is made to Council's correspondence dated 23 October 2018 to seek approval for the above application for integrated development in accordance with Section 4.47 of the *Environmental Planning and Assessment Act 1979*.

Subject to Northern Beaches Council management of the Manly Warringah War Memorial Park (specifically APZ 3) identified in *Figure 6 – Prescribed Fire Management Zones* in the document *Manly Warringah War Memorial Park Fire Regime Management Plan 2006*. This bush fire safety authority is also subject to the provision of an agreement being provided by Sydney Water allowing Allambie Heights Village Ltd and its nominated Bushfire Management subcontractors to manage the portion of Sydney Water controlled land, situated immediately north of 181 Allambie Road Allambie Heights 2100, the following recommended conditions are provided:

Asset Protection Zones

The intent of measures is to provide sufficient space and maintain reduced fuel loads so as to ensure radiant heat levels of buildings are below critical limits and to prevent direct flame contact with a building. To achieve this, the following conditions shall apply:

1. At the commencement of building works the property shall have the internal Asset Protection Zones (APZs) as identified in the figure titled 'Proposal and APZ' in the document *Fire Management Plan – William Charlton Village Allambie Heights*, prepared by Total Earth Care, dated May 2019. These APZs shall be managed as an inner protection area (IPA) as outlined within section 4.1.3 and Appendix 5 of *Planning for Bush Fire Protection 2006* and the NSW Rural Fire Service's document *Standards for asset protection zones*.
2. The portion of Sydney Water controlled land, situated immediately north of 181 Allambie Road Allambie Heights 2100, shall be managed as an Inner Protection Area.
   This shall be subject to a documented agreement, signed by all beneficiaries (Sydney Water, Allambie Heights Village Ltd and Northern Beaches Council). The agreement from Sydney Water will at a minimum allow for Allambie Heights Village Ltd and its nominated Bushfire Management subcontractors to access and undertake works, for the purposes of managing the land in perpetuity, to be consistent an inner protection area (IPA) as outlined within section 4.1.3 and Appendix 5 of *Planning for Bush Fire Protection 2006* and the NSW Rural Fire

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NSW Rural Fire Service
Planning and Environment Services
Locked Bag 17
GRANVILLE NSW 2141

Street address
NSW Rural Fire Service
Planning and Environment Services (East)
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Sydney Olympic Park NSW 2127

T 1300 NSW RFS
F (02) 8741 5433
E records@rfs.nsw.gov.au
www.rfs.nsw.gov.au

Service's document *Standards for asset protection zones*. The agreement shall be to the satisfaction of Northern Beaches Council in ensuring the ongoing nature of the arrangement.

3. The proposed Pool Building (place of public assembly) shall be setback a minimum of 85 metres from the hazard to the southwest in accordance with Table A2.6 of *Planning for Bush Fire Protection 2006* as to not be exposed to radiant heat levels greater than 10kW/m^2.

Design and Construction

The intent of measures is that buildings are designed and constructed to withstand the potential impacts of bush fire attack. To achieve this, the following conditions shall apply

4. New construction to Buildings A and B shall comply with section 3 and section 5 (BAL 12.5) Australian Standard AS3959-2009 *Construction of buildings in bush fire-prone areas* or NASH Standard (1.7.14 updated) *National Standard Steel Framed Construction in Bushfire Areas – 2014* as appropriate and section A3.7 Addendum Appendix 3 of *Planning for Bush Fire Protection 2006* as appropriate and in accordance with the Method 2 bush fire modelling provided in the document *Re: Additional bushfire information - redevelopment of William Charlton Village at 181 Allambie Road Allambie Heights,* prepared by Blackash Bushfire Consulting, dated 16 July 2019.
5. New construction to the appropriately setback Pool Building shall comply with section 3 and section 5 (BAL 12.5) Australian Standard AS3959-2009 *Construction of buildings in bush fire-prone area* or NASH Standard (1.7.14 updated) *National Standard Steel Framed Construction in Bushfire Areas – 2014* as appropriate and section A3.7 Addendum Appendix 3 of *Planning for Bush Fire Protection 2006.*

Water and Utilities

The intent of measures is to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building. To achieve this, the following conditions shall apply:

6. Water, electricity and gas are to comply with sections 4.1.3 and 4.2.7 of *Planning for Bush Fire Protection 2006.*

Access

The intent of measures for internal roads is to provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area. To achieve this, the following conditions shall apply:

7. Internal roads shall comply with following requirements of section 4.2.7 of *Planning for Bush Fire Protection 2006*:
   - Internal roads are two-wheel drive, sealed, all-weather roads.
   - Internal perimeter roads are provided with at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb) and shoulders on each side, allowing traffic to pass in opposite directions.
   - Roads are through roads. Dead end roads are not more than 100 metres in length from a through road, incorporate a minimum 12 metres outer radius turning circle, and are clearly signposted as a dead end.
   - Traffic management devices are constructed to facilitate access by emergency services vehicles. - A minimum vertical clearance of 4 metres to any overhanging obstructions, including tree branches, is provided.
   - Curves have a minimum inner radius of 6 metres and are minimal in number to allow for rapid access and egress.
   - The minimum distance between inner and outer curves is six metres. Curves have a minimum inner radius of 6 metres and are minimal in number to allow for rapid access and egress.
   - Maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees.
   - Crossfall of the pavement is not more than 10 degrees.
   - Roads do not traverse through a wetland or other land potentially subject to periodic inundation (other than flood or storm surge).
   - Roads are clearly signposted and bridges clearly indicate load ratings.
   - The internal road surfaces and bridges have a capacity to carry fully-loaded fire fighting vehicles (15 tonnes).

Evacuation and Emergency Management

The intent of measures is to provide suitable emergency and evacuation (and relocation) arrangements for occupants of special fire protection purpose developments. To achieve this, the following conditions shall apply:

8. A Bush Fire Emergency Management and Evacuation Plan shall be prepared consistent with *Development Planning- A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan December 2014.*

Landscaping

9. Landscaping to the site is to comply with the principles of Appendix 5 of *Planning for Bush Fire Protection 2006.*

General Advice – consent authority to note

The above recommendations have been based upon the maintenance of an Asset Protection Zone (APZ) within Manly Warringah War Memorial Park, managed by the Northern Beaches Council to the southwest of the subject lot. Northern Beaches Council is bound by an agreement between Warringah Council and Allambie Luther Village with relation to the development approval for DA2004/0335 to provide an APZ identified as APZ 3 in *Figure 6 – Prescribed Fire Management Zones* in the document *Manly Warringah War Memorial Park Fire Regime Management Plan 2006.*

Should you wish to discuss this matter please contact Joshua Calandra on 1300 NSW RFS.

Yours sincerely

Nika Fomin
Manager, Planning and Environment Services (East)

Appendix 11. RFS D1887788 Dec 2 2019

NSW GOVERNMENT

NSW RURAL FIRE SERVICE

PRE-DA ADVICE SUMMARY

Applicant:	Ciaran Foley – Allambie Heights Village Ltd
Subject:	Review of Amended Design – 181 Allambie Road, Allambie Heights RFS Ref. DOC19/147868

Details of the proposal

☑ SFPP	Revised Design: new Seniors Living development comprising 24 independent living units and a private communal 'clubhouse' building with a gym, lounge area & associated amenities.
☐ Residential subdivision	
☐ Other	

Bush fire protection issues discussed

☐ Hazard Assessment	
☑ Asset Protection Zones	Nominated to be consistent with the GTAs issued 30 July 2019
☑ Access	Insufficient information provided
☑ Construction Standards	Nominated to be consistent with the GTAs issued 30 July 2019
☐ Services	
☐ Emergency and Evacuation Planning	

Documentation / plans referenced

Allambie Heights Village – Project 2 – Landscape Concept Plan prepared by Arterra Design Pty Ltd, L-SD-01, Rev. P1, dated 24 November 2019

Advice Provided

- No objection is raised in principle to the amended proposal related to location of building footprints, assessment of hazard and provision of asset protection zones.
- Access requirements have previously been recommended as requiring perimeter roads in accordance with a Special Fire Protection Purposes (SFPP) development against Section 4.2.7 of *Planning for Bush Fire Protection 2006*. The current proposal has identified that a one way 5 metre wide access trail is proposed which includes a portion proposed as reinforced turf.
- Any future application should include a detailed account of why a perimeter road is not proposed for a new SFPP (this proposal is not consistent with an Infill SFPP development). This shall include any performance based solution for an alternate access approach. Specifications and details for reinforced turf shall be provided.
- Landscaping including the planting density of the Bio-Filtration Zones shall be consistent with an Asset Protection Zone.

Disclaimer

RFS advice is based on information provided and policy and legislative requirements applicable at the time. The advice should be copied into, or referenced in, any subsequent development application.

All efforts are made to identify issues of relevance and likely concern with the preliminary proposal. However, the comments and views in this document are based only on the plans and information submitted for preliminary assessment and discussion at the pre-DA meeting. You are advised that: -

- The views expressed may vary once detailed plans and information are submitted and formally assessed in the development application process, or as a result of issues contained in submissions by interested parties;
- Given the complexity of issues often involved and the limited time for full assessment, no guarantee is given that every issue of relevance will be identified;
- Amending one aspect of the proposal could result in changes which would create a different set of impacts from the original plans and therefore require further assessment and advice; and,
- The Pre-DA advice given does not bind Council officers, the elected Council members, or other parties to the DA process.

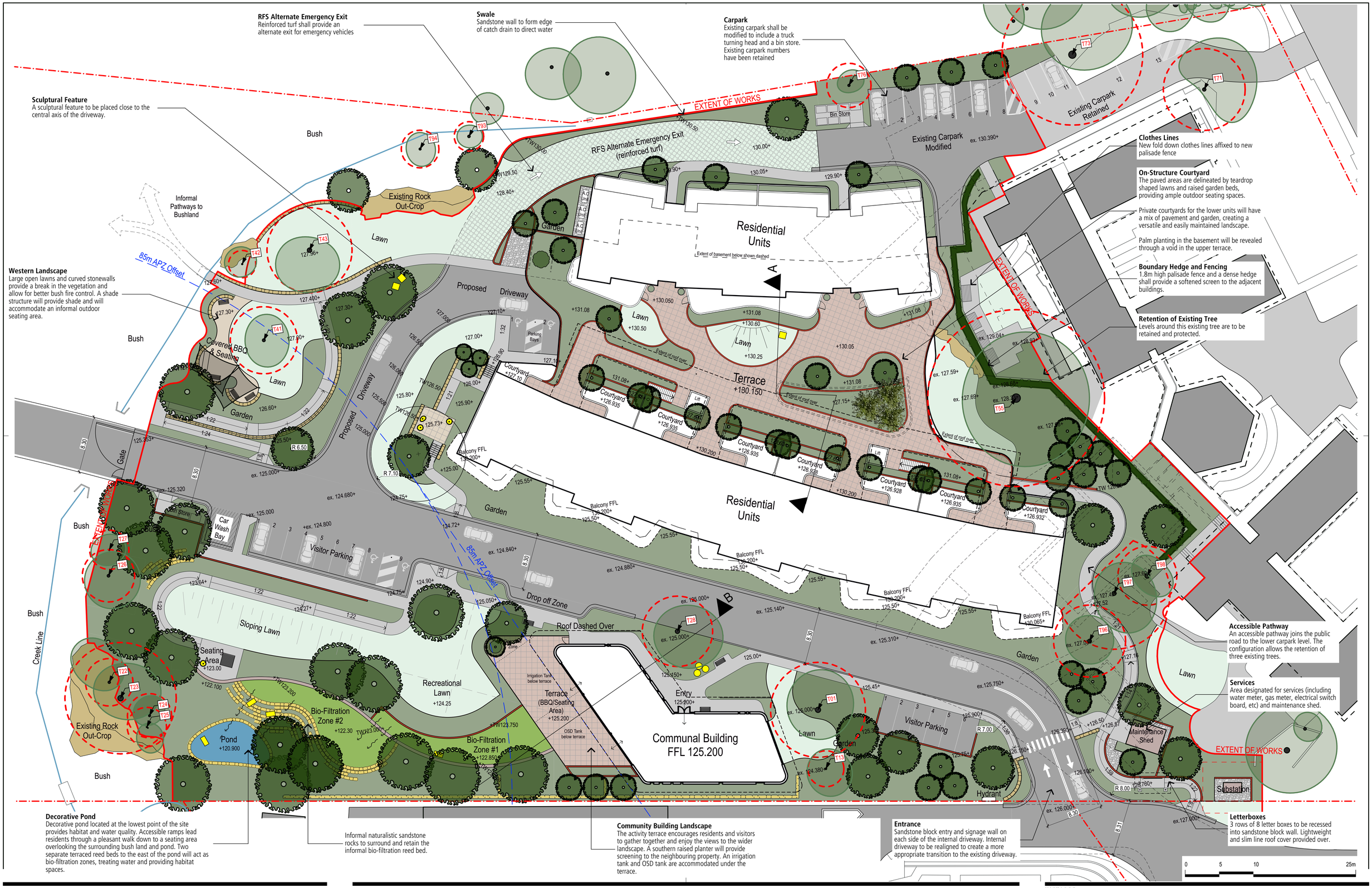
Signed:

Joshua Calandra
Development Assessment and Planning Officer
Planning and Environment Services (East)

Kalpana Varghese
Team Leader
Development Assessment and Planning
Planning and Environment Services (East)

Date: 2 December 2019

Appendix 12. Landscape Concept Plan LSD -01



arterra

ARTERRA DESIGN PTY LTD ABN 40 069 552 610
SUITE 602 / 51 RAWSON STREET, EPPING, NSW 2121
P 02 9957 2466 F 02 9957 3977 W ARTERRA.COM.AU

Legend

- Boundary
- Building Outline
- Building Above
- Building Below
- Existing Creek Line
- Existing Tree Retained (Extent of canopy as verified by site measure)
- Nominal Tree Protection Zone (TPZ)
- T01 Tree ID Numbers (Retained)
- Proposed Tree
- Garden
- Bio-filtration Zone
- Turf
- Pavement - Standard Grey Concrete
- Pavement -Tile
- Pavement - Decomposed Granite
- Pavement - Gravel
- Retaining Wall - Blockwork
- Retaining Wall - Dry Stacked Stone Wall
- Retaining Wall - Gabion
- Informal Sandstone Boulders
- Clothesline
- Bench Seat
- Overland Flow Path
- Sculptural Features/ Planter

REVISION	DESCRIPTION	CHKD	DATE
A	For Authority Approval/DA	RWS	15/11/19

PROJECT & CLIENT

Allambie Heights Village - Project 2

Allambie Heights Village Ltd.

North

Project No : 18.11
Designed : CLB
Drawn : CLB
Scale : 1:250@A1/1:500@A3

DRAWING TITLE

Landscape Concept Plan

DRAWING NUMBER L-SD-01

REVISION A

Plotted at : 2:00 pm 15/11/19