

# Revised Bushfire Risk Assessment

## Multi-storey Residential Development (version 3.1)



**Proposed  
Development:**

Construction of a 'Class 2' multi-storey residential multi-unit development

**Location:**

11-12/-/DP1138310;2/-  
/DP582819;7-9/-/DP841611;8-  
9/52/DP758207;10/-  
/1153734;101/-/1263764;1/-  
/582819

**Client:** Vitale Property Group

**Our Ref:** ONE1693

29 Shirley Street & 2-4 Milton  
Street  
Byron Bay NSW 2481

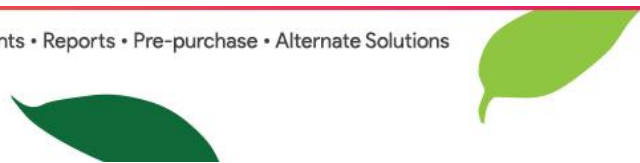


Date of Issue: 26 June 2024

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BPAD-Level 3 Accredited Practitioner & Member of the FPA Australia



# **‘Prepare—Act—Survive’**

**In the Event of an Emergency Call:**

# **‘000’**



Document Record				
Version	Date	Prepared by	Reviewed by	PDF e-mailed to:
Revision V2	20/09/2023	MJ	AP	Emailed to Client
Revision V3 – modified as per new site and landscaping plans	25/06/2024	MJ	AP	The client
Revision V3.1 – final landscape plans	26/06/2024	MJ	AP	The client

## EXPIRY

The bushfire risk assessment and resulting BAL rating contained in this report should not be relied upon for a period extending 6 months from date of issue. If this report was issued more than 6 months ago, it is recommended that the validity of the determination be confirmed with the Accredited Practitioner and where required an updated report should be issued.

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## EXECUTIVE SUMMARY

This Bushfire Risk Assessment relates to a proposed development located at:	11-12/-/DP1138310;2/-/DP582819;7-9/-/DP841611;8-9/52/DP758207;10/-/1153734;101/-/1263764;1/-/582819 29 Shirley Street; Byron Bay NSW 2481
Client/s:	Vitale Property Group
Site inspection date:	15 February 2022
Proposed development:	Construction of a 'Class 2' multi-storey residential multi-unit development & 'Class 7a' basement carpark and roof top terraces Appendix A).
Site Plans:	Building Plans by Hayball; date: 15/05/20/24 Statement of Landscape Intent by Urbis; date: 25 June 2024. (Ref. Appendix A & B respectively). The applicant shall provide a full set of plans to accompany the DA. All design and site plans must ensure compliance with the minimum building setbacks in relation to this development as proposed and the recommendations contained herein.
Is there a suitable building location envelope ensuring critical radiant heat flux limits do not exceed 29kW/m <sup>2</sup> ?	YES – appropriate building location is set out in the attached plans. Critical radiant heat flux limit of 12.5kW/m <sup>2</sup> shall not be exceeded.
Does this development satisfy the Aims and Objectives of PBP?	YES – with performance solutions.
Are performance solutions presented herein?	YES – Landscaping and APZ management has been designed to comply with the performance criteria.
Does this development require referral to the NSW Rural Fire Service as per s.100B Rural Fires Act 1997?	NO – As there is no proposal to subdivide or strata the proposed development during this stage. Consideration of the requirements set out in s.5 and s.7 of PBP (2019) were considered due to the increased density on a single parcel of land.
This assessment has been prepared and certified by Melanie Jackson BPAD-Level 3 Certified Practitioner; FPAA Cert. No: 21977	



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## ABBREVIATIONS

Abbreviation	Description
APZ	Asset protection zone
AS3959	Australian Standard – Construction of Buildings in Bushfire Prone Areas
BAL	Bush fire attack level
BCA	Building Code of Australia
BFDB	Bush fire design brief
BFPL	Bush fire prone land
BFPL Map	Bush fire prone land map
BFSA	Bush fire safety authority
BLE	Building location envelope
BPM	Bush fire protection measure
DA	Development application
DCP	Development control plan
EP&A Act	<i>Environmental Planning &amp; Assessment Act 1979</i>
FFDI	Forest fire danger index
GFDI	Grass fire danger index
IPA	Inner protection area
kW/m <sup>2</sup>	Kilowatts per metre squared
LEP	Local environmental protection plan
NSW RFS	NSW Rural Fire Service
OPA	Outer protection area
PBP	Planning for Bushfire Protection
RF Act	<i>Rural Fires Act 1997</i>
RF Reg	<i>Rural Fire Regulation 2013</i>
SEPP	<i>State Environmental Planning Policy</i>
SFPP	Special fire protection purpose
SFR	Short fire run



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# 1 INTRODUCTION

Bushfire Risk Pty Ltd was engaged by the client/s to conduct a Bushfire Risk Assessment in support of a Development Application (DA). The purpose of the assessment is to determine category of bushfire attack and critical radiant heat flux limits in relation to the proposed development.

The development shall be carried out on the lot/s referred to as the 'Subject Site' (Figure 1) and where applicable, existing or future dwellings shall be sited within a Building Location Envelope which shall be referred to as a 'BLE' throughout this document.

## 1.1 Subject Site

Address: 11-12/-/DP1138310;2/-/DP582819;7-9/-/DP841611;8-9/52/DP758207;10/-/1153734;101/-/1263764;11/-/582819 of 29 Shirley Street Byron Bay NSW 2481.

## 1.2 Land Zoning

R3 – Medium density residential



Figure 1: Aerial image of the subject site and surrounds (Source: FireMaps 2022; Google Maps 2022)

### 1.3 Proposed Development

Construction of a 'Class 2' multi-storey residential multi-unit development (Ref. Appendix A), consisting of the following:

- Twenty-five (25) 'Class 2' residential units (multi-dwelling housing);
- 'Class 7a' basement carpark for sixty-nine (69) car parking spaces (basement); and
- Ten (10) rooftop terraces.
- The proposal does not include a sub-division of land (strata or otherwise) as part of this DA.

### 1.4 Legislation

#### 1.4.1 Increased density on a single parcel of land

There is no proposal to sub-divide the units (strata or otherwise) as part of this DA. However this assessment shall take into consideration the provisions of s.5 PBP as if it were a strata sub-division and due to the increase in density as referenced in s.8.2.1 – *Increased residential densities* whereby the APZ shall be based on a radiant heat threshold of 29kW/m<sup>2</sup> and associated bushfire protection measures in combination.

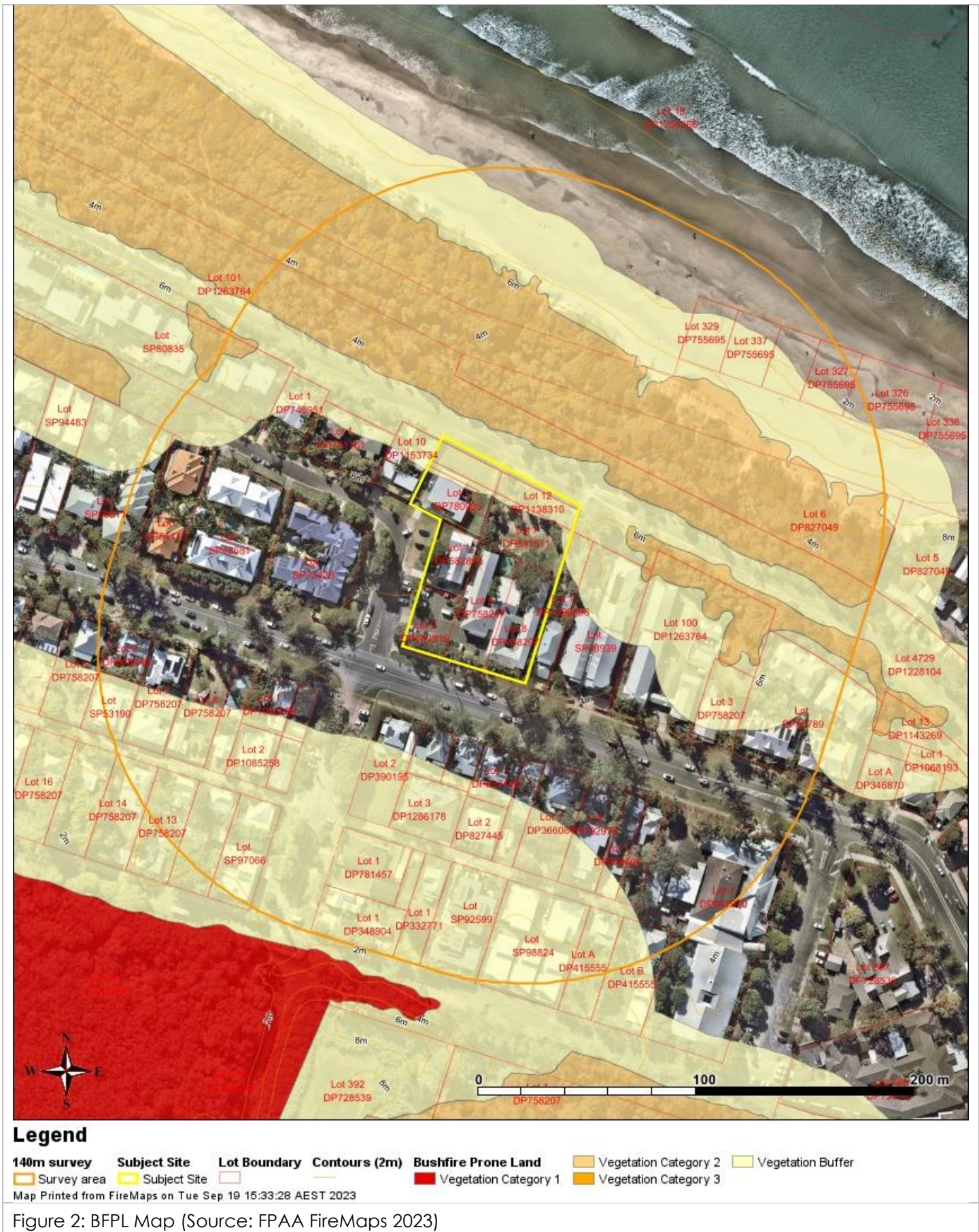
#### 1.4.2 Building on Bushfire Prone Land

The National Construction Code (NCC) contains Performance Requirements and Deemed-to-Satisfy provisions relating building on Bushfire Prone Land (BFPL). Construction on BFPL must comply with AS3959-2018 – Construction of buildings in bushfire prone areas (AS3959) or the National Association of Steel Framed Housing (2021) Steel Framed Construction in Bush Fire Areas (NASH Standard) as varied in NSW. These requirements are considered Deemed-to-Satisfy solutions, however, do not extend to BAL-FZ or where modified by specific conditions of the relevant development consent.

#### 1.4.3 Bushfire Prone Land

The subject site is mapped as 'Bush Fire Prone Land' (BFPL) under s.10.3 Environmental Planning and Assessment Act 1979 (EPA Act), triggering the legislative requirements for building on bushfire prone land as applicable (Figure 2).





#### 1.4.4 Environmental, Ecological and Aboriginal Features

The scope of this bushfire report does not include an environmental, ecological, or aboriginal assessment. As a result this report should be read in conjunction with the Statement of Environmental Effects (SEE) and any supporting assessments and reports submitted in support of the DA, which shall address the environmental, ecological, or Aboriginal features known to the applicant/client for consideration during the Development Application (DA) process.

It is the responsibility of the applicant/client to disclose the details of any threatened species, population or ecological community identified under the Threatened Species Conservation Act 1995 that is known to the applicant to exist on the property and details and location of any Aboriginal object (within the meaning of the National Parks and Wildlife Act 1974) or Aboriginal place (within the meaning of that Act) that is known to the applicant to be situated on the property.

Identification of any significant environmental features may include the following:

- Riparian corridors
- SEPP 14 – Coastal Wetlands
- SEPP 26 Littoral Rainforest
- SEPP 44 – Koala Habitat
- Areas of geological interest
- Environmental protection zone or steep lands (>18°)
- Land slip or flood prone areas
- National parks estate or various other reserves

Details of threatened species, populations, endangered ecological communities and critical habitat known to the applicant may include the following:

- Details of some threatened species can be found online ([www.environment.nsw.gov.au](http://www.environment.nsw.gov.au))
- Past studies or surveys for the area (e.g. local environment studies)
- Documentation supplied to council in relation to flora and fauna

Details of Aboriginal heritage known to the applicant

- Past surveys and information held by the DEC (application fees may apply).

## 1.5 Aim & Objectives

### 1.5.1 Aim and Objectives of PBP 2019

All development on BFPL must satisfy the aim and objectives of Planning for Bush Fire Protection (PBP 2019). This report demonstrates how the requirements can be met by ensuring suitable Bushfire Protection Measures (BPM) are put in place commensurate with the level of risk and characteristics of the occupants.

The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.



The objectives of PBP are to:

- Afford buildings and their occupants protection from exposure to a bush fire.
- Provide for a defensible space to be located around buildings.
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings.
- Ensure that appropriate operational access and egress for emergency service personnel and occupants is available.
- Provide for ongoing management and maintenance of BPMs; and
- Ensure that utility services are adequate to meet the needs of firefighters.

#### 1.5.2 Specific Objectives of s.5 PBP

- Minimise perimeters of the subdivision exposed to the bushfire hazard (hourglass shapes, which maximise perimeters and create bottlenecks should be avoided).
- Minimise vegetation corridors that permit the passage of bushfire towards buildings.
- Provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests.
- Ensure that APZs between a bushfire hazard and future dwellings are effectively designed to address the relevant bushfire attack mechanisms.
- Ensure the ongoing maintenance of APZs.
- Provide adequate access from all properties to the wider road network for residents and emergency services.
- Provide access to hazard vegetation to facilitate bushfire mitigation works and fire suppression.
- Ensure the provision of an adequate supply of water and other services to facilitate effective fire fighting.

## 2 BUSHFIRE RISK ASSESSMENT

This Bushfire Risk Assessment includes an analysis of the hazard, threat and subsequent risk to the development as proposed and provides recommendations that the proposal satisfies the aim and objectives of PBP 2019 by complying with the acceptable solutions or performance criteria by applying an appropriate suite of bushfire protection measures (BPM) for the development as proposed, commensurate with the level of risk and characteristics of the occupants.

The bushfire risk assessment shall incorporate provisions to ensure appropriate separation distance between building/s and the hazard can be afforded relevant to the BAL rating. The specific objectives for the proposed development shall be met by demonstrating compliance against the acceptable solutions set out in PBP. Alternatively, deviations from the acceptable solutions will be addressed by providing performance solutions to demonstrate compliance.

### 2.1 Methodology

#### 2.1.1 PBP 2019

The bushfire risk assessment was undertaken pursuant to the requirements set out in s.5 – *Residential and Rural Residential Subdivisions* (PBP 2019).

The proposed development is classified as a 'Multi-Storey Residential Development', shall be assessed against section 5 – *Residential and Rural Residential Subdivisions* of PBP (2019). APZ thresholds shall not exceed 29kW/m<sup>2</sup> and consideration of the following key issues considered (Ref. s.8.2.2, PBP):

- Population
- Location
- Egress
- Construction
- Height

#### 2.1.2 Site Analysis

A desktop and onsite assessment were carried out pursuant to the methodology described in PBP 2019 commensurate with the proposed development type and level of risk. The following methodology was used:

- As per the acceptable solutions, the minimum distance for APZs was determined pursuant to Table A1.12.3 Appendix 1 PBP.
- The acceptable solution as per the methodology described in Appendix 1 – Site Assessment Methodology using table A1.12.6 – Determination of BAL, FFDI 80 – residential development (PBP 2019) was used to determine the BAL rating and appropriate APZ/setbacks for the proposed development.

### 2.1.3 Vegetation & Significant Environmental Features

The assessment and classification of the predominant vegetation types on and surrounding the subject site (out to a minimum distance of 140m from the boundaries of the property) was undertaken (Ref. Table 1; Figure 3), using Keith (2006) vegetation classification system as described in PBP (2019).

### 2.1.4 Slope & Aspect

An assessment of the aspect and effective slope, being the land under the classified vegetation most likely to have the greatest effect on bushfire behaviour within 100m of the site was undertaken.

Slope analysis was undertaken using assessment methodology:

- A desktop assessment of 2m contours available via the Fire Protection Association (FPAA) *FireMaps NSW* platform (FPAA 2022)
- On-site ground truthing was undertaken on-site, the slope was determined using a Leopold Laser Range Finder and a comparison made to determine the effective slope of the hazard. The results presented in the assessment tables herein (Table 4).

### 2.1.5 Bushfire Protection Measures (BPM)

The BPMs are a set of measures to be satisfied which aim to reduce risk from bushfires and enhance occupant survival, property protection and community resilience to bushfire attack. Analysis of the BPMs shall be undertaken commensurate to the level of risk to occupants and the subject site. Recommendations provided are based on the results. BPMs to be satisfied include the following:

- APZ
- Access
- Construction
- Siting and design
- Landscaping
- Services
- Emergency and evacuation planning





### 3 ANALYSIS & RESULTS

The following sections describe in detail, the vegetation type, slope, access, availability of water supplies and environmental considerations for the subject site and surrounds (Ref. Figure 3).

#### 3.1 Site Inspection Details

An assessment of the subject site was undertaken by Melanie Jackson (BPAD-Level 3 Accredited Practitioner No. 21977) on 15 February 2022.

Table 1: Vegetation Analysis

Vegetation Formation, Description & Photos	
<p>Rainforest – North and Northeast</p> <p>Rainforest vegetation is situated 17m from the boundary of the subject site north. Between the hazard and the subject site the 'Byron Bay Solar Train' rail corridor is situated, which is managed in a low fuel state in perpetuity to allow clear 'safe' passage of the trains. Approx. 80m from the subject site is an ocean beach.</p>	
 <p>Photo 1: Railway corridor and rainforest (dune) north of the subject site (photo taken facing northwest)</p>	 <p>Photo 2: Narrow rainforest area (left) east of the subject site (right)</p>
 <p>Photo 3: Subject site facing south from rail corridor, some tree removal required to create the APZ.</p>	 <p>Photo 4: Ocean beach approx. 80m from the subject site.</p>



## Vegetation Formation, Description & Photos



Photo 5: Image facing west, adjacent to an existing developed lot (holiday letting)

Managed Land – East, South, and West

These areas consist of a mix of low-density residential lots to multi-storey apartment buildings.





Figure 3: Vegetation analysis (Source: FireMaps 2023)



## 3.2 Bushfire Protection Measures (BPM)

The BPMs, namely APZ, access, construction, siting and design, landscaping, services and emergency and evacuation planning, are the relevant set of specifications and requirements to be satisfied to improve life safety, property protection and community resilience to bushfire attack.

### 3.2.1 APZ & Landscaping

APZ shall comply with the acceptable solutions, assessed using table A1.12.3 – *Minimum distances for APZs – Residential development FFDI 80 areas (<29kW/m<sup>2</sup>, 1090K)* as per the setbacks presented in Table 4 herein, which relate to the separation distance between the BLE and the hazard.

- All fences and gates shall be constructed from non-combustible material.
- A 23m APZ existing between the subject site and hazard land which consists of the following:
  - 6.6m to be managed within the bounds of the subject site in perpetuity based on the requirements of Appendix 4 – Asset Protection Zone Requirements (PBP) with deviations from the acceptable solutions (See S.3.2.2 below).
  - 17m offsite solar train corridor managed in a low fuel state which provides clear separation from the hazard on the dune system providing redundancy for operational activities, occupant and building safety.
- As a result of native vegetation removal from the subject site, onsite offset planting is required within the subject site and landscaping deviations from strict compliance with the acceptable solutions of PBP 2019, however the principles of the acceptable landscaping requirements shall be followed as a guide.
- Minor deviations from the acceptable solutions include the following:
  - Landscaping has been designed to minimise flame contact and radiant heat to the buildings and potential wind-driven embers to cause ignitions and to prevent the spread of fires towards the buildings.
  - Landscaping treatments have been designed to include low threat, succulent and species with low flammability potential i.e. rainforest species, around, on and near the buildings including built in window boxes, shrubs, and trees near the buildings.
  - Landscaping deviations shall be addressed in the following simplified performance-based design brief (PBDB).

### 3.2.2 Performance Solution – APZ & Landscaping

The proposed APZ and Landscaping requirements shall comply with the Performance Criteria, whereby the proposed development is separated from the hazard by public roads, non-vegetated, low threat areas and similar multistorey developments. The entire site shall be managed within the bounds of the subject site in perpetuity subject to the landscaping plans provided herein (Ref. Appendix B).

The proposed APZ and landscaping shall comply with the following performance criteria:

- *'APZs are managed and maintained to prevent the spread of a fire towards the building'.*
- *'Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions'.*

The landscaping plan has been designed subject to the guiding principles of Appendix 4 (PBP 2019) and NSW RFS 'Asset Protection Zone Standards' with minor deviations from strict compliance with the acceptable solution. Specifically some of the listed shrubs may climb or hang over concrete planter boxes and **do not** achieve the following acceptable statement listed in Appendix 4 PBP (2019):

- Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation;
- Tree canopy cover should be less than 15% at maturity;
- Tree canopies should be separated by 2 to 5m;

Furthermore, some of the grasses listed in the planting palette are decorative (Ref. Figure 4), therefore not consistent with the following statement:

- Grass should be kept mown (as a guide grass should be kept to no more than 100mm in height)'.

In this instance, the entire development site and the landscaping requirements shall be carried out pursuant to the landscaping plans (Ref. Appendix B). These plans comply with the performance criteria and deemed acceptable from a bushfire perspective.

#### Implemented Landscaping Criteria

The following criteria considered and implemented are consistent with the 'bushfire acceptable' landscaping plans provided in support of the DA:

- The species palette and planting layout consisting of low threat species, i.e. those with a high moisture content etc. are consistent with the performance criteria which prevents fires from spreading towards a building.
- Vegetation is planted throughout the site, most of the vegetation being planted in non-combustible planter boxes in courtyards and balconies, adjacent to the non-combustible concrete building structure.
- Horizontal louvres: All horizontal louvres less than 50cm from planted vegetation (including window boxes) shall be constructed from non-combustible material only (NB: all horizontal louvres are currently referenced as timber on the attached plans).
- The proposed built infrastructure being predominantly non-combustible provides a significant shielding effect throughout the subject site. The interface buildings and associated open spaces i.e. courtyards and concrete balconies, footpaths etc. protect the western buildings which negates vegetation connectivity, effects of radiant heat, ember attack and therefore spread of fire towards all buildings onsite.
- Vegetation within the IPA is dominated by 'tree' species chosen for reduced fuel loads with a narrow growth habit. Rainforest trees dominate the north boundary (west side).
- The east, centre, south and western aspects include sparsely planted coastal feature trees and palms.
- The 'shrub' 'grass', groundcovers and climber species palettes include appropriate species i.e. high moisture content with low flammability potential, to be planted in discontinuous concrete planter boxes i.e. species with a high moisture content, ferns, succulents etc.

- Non-combustible mulching material shall be used throughout the site i.e. pebbles, and loose litter removed regularly.
- Flammable mulch shall not be used.
- A body corporate, property management group or onsite manager should be engaged to ensure ongoing management of the entire site (buildings and vegetation) is appropriately carried out.
- Management by-laws shall be created to ensure ongoing vegetation management in accordance with an 'approved' landscaping plans subject to the principles of Appendix 4 PBP 2019, shall be carried out in perpetuity.
- Note: a s.88b instrument for the management of the entire site including APZ and landscaping may be prepared and placed on title.

### Discussion – APZ & Landscaping

The property shall be managed to prevent the spread of a fire towards the building. Whereby the proposed landscaping plan ensures appropriate species choice is compliant with the recommended species whereby low threat species, high moisture species etc. have been chosen particularly those in close proximity to the building.

Plants are an integral part of the application and are integrated not only around the building but in constructed non-combustible integrated window boxes etc. These shall have the effect of cooling the structure during summer whilst being watered provides an additional level of redundancy.

The proposed trees to the rear of the lot consist of rainforest species which can act as a buffer for catching embers, it is also noted the beach dune being less than 50m wide and adjacent to the ocean, experiences significant salt spray. Therefore the likelihood of a full canopy fire would be unlikely.

A body corporate, management company or manager should be engaged to ensure ongoing management of the entire building and surrounds including the APZ is carried out in perpetuity. Debris build up is therefore highly unlikely, as each area is not only the responsibility of individual owners, but works shall also be carried out to a high standard under a body corporate management company, consistent with the body corporate bylaws.

Ongoing building and APZ maintenance and responsibilities of owners and body corporate should be clearly documented, and accompanying by-laws, the 'approved' landscaping plan etc. shall be incorporated into the body corporate management plan (BCMP) including provisions for a vegetation management plan (VMP). A copy of the BCMP/VMP shall be given to all owners of the site, to ensure they understand their maintenance responsibilities.

The combined conditions including provisions for a BCMP/VMP shall be undertaken, body corporate management and vegetation and building maintenance along with the addition of non-combustible Gutter Guard to be installed on the building, the proposed performance solution demonstrates the performance criteria can be met.

### 3.2.3 Conclusion

The landscaping plan provided in support of the DA and property management regime are critical in the prevention of spread of fire to the building. The property management being managed under

a body corporate/strata scheme shall be secured by additional by-laws and 'approved' landscaping plan and responsibilities shall be placed on the development. A copy of the BCMP/VMP should be given to all owners.

In conclusion, the landscaping plans provided herein, is appropriate in preventing the spread of a fire towards a building, thus compliance against the performance criteria shall be achieved (Ref. Table 2).

Table 2: Performance solution summary

Performance Criteria	Acceptable Solutions	Performance Solution
APZs are managed and maintained to prevent the spread of a fire towards a building.	APZs are managed in accordance with the requirements of Appendix 4 (PBP).	<p>The 'Landscaping Plan' presented in Appendix B herein, is deemed to meet the 'Performance Criteria' whereby the species selection and placement prevents the spread of a fire towards the building provided the following is applied:</p> <ul style="list-style-type: none"> <li>• A BFMP/VMP be applied ensuring an APZ is maintained in perpetuity as per the landscaping plan provided.</li> <li>• Ongoing maintenance of the vegetation and fuel shall be managed in a low fuel state as per the guiding principles of Appendix 4 PBP 2019. The BFMP/VMP and bushfire conditions shall be placed on title.</li> <li>• Comply with the Landscaping Plan presented herein (Appendix B) which has been designed to prevent the spread of fire towards the buildings.</li> <li>• Any modifications to the landscaping plan and species lists shall be checked and approved by a BPAD-Level 3 Bushfire consultant.</li> <li>• The species list complies with the principles of the acceptable solutions, whereby low flammable species, species with high moisture content etc. are preferred fire-resisting species.</li> <li>• Trees shall be pruned regularly to prevent contact with the building.</li> <li>• Fences should be constructed from non-combustible material.</li> </ul>
Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions'	Landscaping is in accordance with Appendix 4.	<ul style="list-style-type: none"> <li>• The landscaping plans presented herein, have been designed to comply with the guiding principles of Appendix 4 PBP.</li> <li>• Direct flame contact is minimised, and radiant heat flux assessed below 12.5kW/m<sup>2</sup>.</li> <li>• Low fuel species have been chosen which may entrap embers thus preventing ignition from wind-driven embers.</li> <li>• Non-combustible Gutter Guards shall be installed on the building.</li> <li>• Horizontal louvres: All horizontal louvres less than 50cm from planted vegetation (including window boxes) shall be constructed from non-combustible material only (NB: all horizontal louvres are currently referenced as timber on the attached plans).</li> </ul>



Figure 4: Planting Palette (Source; Urbis June 2024 – refer Appendix B)



Design Details  
Plant Palette

Note: The total number of planting will be a mix of 90% native species and 10% exotic species



*Lomandra longifolia*



*Pittosporum tobira* 'Miss Muffett'



*Psychotria loniceroides*



*Westringia fruticosa* 'Zena'



*Chrysocephalum apiculatum*



*Cissus antarctica*



*Ficus pumila*



*Hibbertia scandens*



*Myoporum parvifolium*



*Plectranthus australis*



*Viola hederacea*



*Zoysia tenuifolia*



### 3.2.4 Likely Environmental Impacts

The scope of this report does not include an environmental assessment of the mature and regrowth vegetation required to be removed for bushfire management purposes and therefore this report should be read in conjunction with the Statement of Environmental Effects (SEE) and the supporting ecological assessment report submitted in support of the subdivision application.

However the following ecological matters were considered in the preparation of the bushfire assessment report:

- An ecological assessment was undertaken by JWAEC and shall be read in conjunction with the report.
- A landscaping plan has been undertaken in support of the DA.
- Native trees shall be removed from the subject site with replanting to offset the native vegetation removal.
- Landscaping has been designed pursuant to the performance criteria ensuring APZ and landscaping requirements are met.
- Gutter guard shall be installed as a redundancy and ongoing pruning shall be required to ensure ongoing tree health and prevent branches touching or overhanging the buildings.
- Supporting documentation shall be lodged with the DA in support of the development.
- Approval should be obtained prior to undertaking any vegetation works.
- Once the APZ is approved and created, the area shall be managed in a low fuel state as per the landscaping plans referenced herein and in perpetuity (Ref. Table 4 herein).

### 3.2.5 Access

The development shall remain accessible via Milton Street and contained within the subject site. The proposed underground carparking incorporates 7 visitor and 62 resident car parking spaces. It is acknowledged underground carparking protects both occupants and vehicles from ember attack thus lowering the risk of ignition. The car parking exit is sited in an area of lower bushfire risk.

A 3.6m wide driveway access facilitates adequate access from all properties to the wider road network for residents. Emergency services shall access the buildings from the public road network and via the pedestrian footpaths provided on the subject site.

Pedestrian access for emergency operational access to the hazard. A gate shall be installed to ensure adequate pedestrian access onto the railway corridor for emergency operational activities.

A number of fire hydrants shall be positioned throughout the building and grounds complying with the acceptable solutions i.e. as per AS2419.1:2005 requirements (Ref. Figure 5).

Occupants shall be able to leave the building on foot or by vehicle, via Ewingsdale Road east to Byron Bay Surf Club Building (Bay Street), or west to the Cavanbah Centre (Ewingsdale Road), both are Council approved 'Neighbourhood Safer Places'.



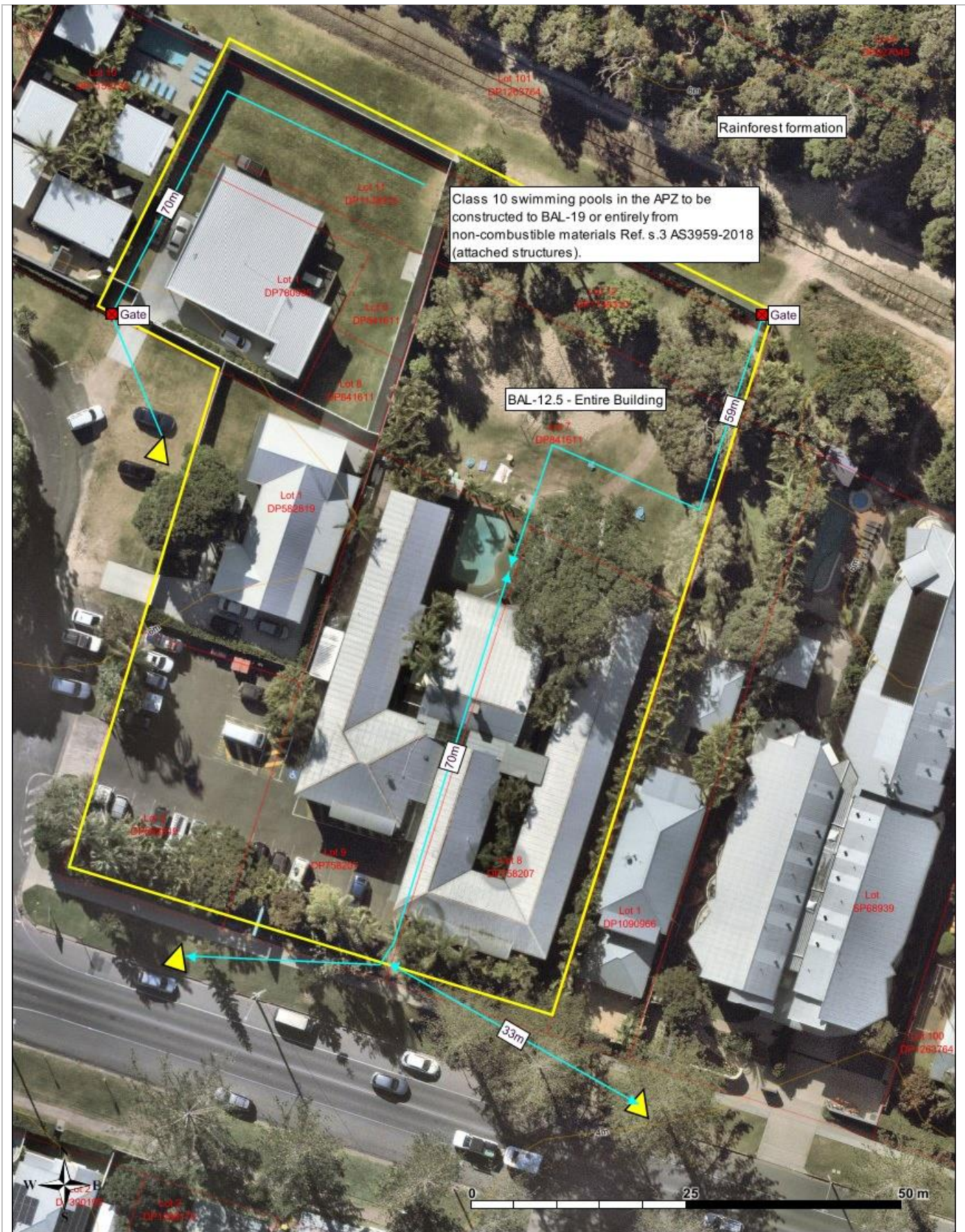
Photo 6: Site entrance, Milton and Shirley Street (Council managed roads; Source: Google 2022)

### 3.2.6 Water Supplies for Fire Fighting Purposes

Reticulated water supplies service the area. An engineered water supply and sewage service have been designed in support of this DA. Three hydrants within the proximity of the subject site, two (2) on Shirley Street and one (1) on Milton Street (Ref. Figure 5). Additional hydrants shall be installed onsite ensuring adequate coverage to the entire the lot including the rear of the lot.

Additional hydrants shall be installed within the subject site as per the acceptable solutions to ensure full coverage of the entire structure and site. Unobstructed pedestrian access around the entire site, i.e. min. 1m wide pathways shall be provided to ensure accessibility for occupants evacuating and firefighting operations (Ref. Figure 5). The proposed development is unlikely to place pressure on the existing reticulated water supply system as a result assuming the existing water supply in use is deemed adequate.





## Legend

### Operations

Operational Hazard Access (pedestrian)

Map Printed from FireMaps on Tue Sep 19 15:40:03 AEST 2023



Existing Hydrant

140m survey

Survey area

Subject Site

Subject Site

Lot Boundary

Lot Boundary

Contours (2m)

Contours (2m)

Figure 5: Existing hydrant coverage (Source: Firemaps 2023)



### 3.2.7 Electricity & Gas Services

An existing overhead supply services the subject site. An underground power supply shall be installed pursuant to the acceptable solutions as per the recommendations contained herein.

### 3.2.8 Construction Requirements

The proposed development complies with the acceptable solutions whereby BAL-12.5 (entire structure) shall be achieved. It is noted the NSW variations to AS3959 are required and lower BAL ratings are proposed for aspects that are shielded or are of a satisfactory distance from the hazard. Refer to the recommendations herein (Table 5).

### 3.2.9 Multi-storey Dwelling – Additional Considerations

#### Population & Location

In relation to bushfire the increase in population is insignificant as it is in a high-density location, the subject site is in a low-risk area and being close to the township of Byron Bay the threat is low.

#### Egress

As described herein, access is made available for occupants in the opposite direction from the closest bushfire threat. Egress can be undertaken on foot by or by vehicle and Neighbourhood Safer Places are available in both directions to the east and west of the subject site.

#### Construction & Height

The height of the proposed development does not exceed 9m. When considering the potential effect of the hazard on the height of the building there is an additional built in redundancy achieved by the managed Railway corridor whereby significant vegetation specifically trees or shrubs shall not be regenerating in this area due to the existing safety train clearances required.

Further analysis was undertaken using 'Method 2' analysis as described in Appendix B of AS3959. The analysis uses the '*Newcastle Bushfire Attack Assessment Calculator*' (Couch 2021) which allows for inputs to be modified. In this instance, the maximum building height of 9m was input. The results indicate the radiant heat flux reduced slightly to 9.58kW/m<sup>2</sup> well below the threshold for BAL-12.5 and the maximum flame length of 7.82 remaining constant (Ref. Table 3).

In relation to convective heat exposure, the APZ and Railway corridor providing an additional level of redundancy being managed low fuel state for 23m which exceeds the minimum BAL-12.5 APZ setback by 3m. This additional low fuel area negating excessive radiant heat flux to the receiver.

The remaining trees in the APZ, and the design of the structure itself, including swimming pools and decks to the north consisting of hardwood, non-combustible rendered block/brick walls and arches provide a barrier which may hinder the movement and transfer of heat. For example swimming pools and trees provide shade and have a cooling effect on airflow lowering potential effects of convective heat to the receiver, in addition to block work arches and walls physically block the transfer of radiant heat.

The proposed building mass and height in this low-risk locality (beside ocean dunes) are unlikely to increase the risk to occupants or the building from excessive radiant or convective fire behaviour and the proposed development, APZ and BAL ratings for this site are deemed appropriate.

Table 3: Rainforest – building height method 2 test

<b>Run Description:</b> north	
<b><u>Vegetation Information</u></b>	
<b>Vegetation Type:</b>	Rainforest
<b>Vegetation Group:</b>	Forest and Woodland
<b>Vegetation Slope:</b>	0 Degrees
<b>Surface Fuel Load(t/ha):</b>	10
<b>Vegetation Height(m):</b>	2
<b>Vegetation Slope Type:</b>	Level
<b>Overall Fuel Load(t/ha):</b>	13.2
Only Applicable to Shrub/Scrub and Vesta	
<b><u>Site Information</u></b>	
<b>Site Slope:</b>	0 Degrees
<b>Site Slope Type:</b>	Level
<b>Elevation of Receiver(m):</b>	9
<b>APZ/Separation(m):</b>	23
<b><u>Fire Inputs</u></b>	
<b>Veg./Flame Width(m):</b>	100
<b>Flame Temp(K):</b>	1090
<b><u>Calculation Parameters</u></b>	
<b>Flame Emissivity:</b>	95
<b>Heat of Combustion(kJ/kg)</b>	18600
<b>Relative Humidity(%):</b>	25
<b>Moisture Factor:</b>	5
<b>Ambient Temp(K):</b>	308
<b>FDI:</b>	80
<b><u>Program Outputs</u></b>	
<b>Level of Construction:</b>	BAL 12.5
<b>Peak Elevation of Receiver(m):</b>	3.84
<b>Radiant Heat(kW/m2):</b>	9.58
<b>Flame Angle (degrees):</b>	82
<b>Flame Length(m):</b>	7.82
<b>Maximum View Factor:</b>	0.153
<b>Rate Of Spread (km/h):</b>	0.96
<b>Inner Protection Area(m):</b>	23
<b>Transmissivity:</b>	0.824
<b>Outer Protection Area(m):</b>	0
<b>Fire Intensity(kW/m):</b>	6547

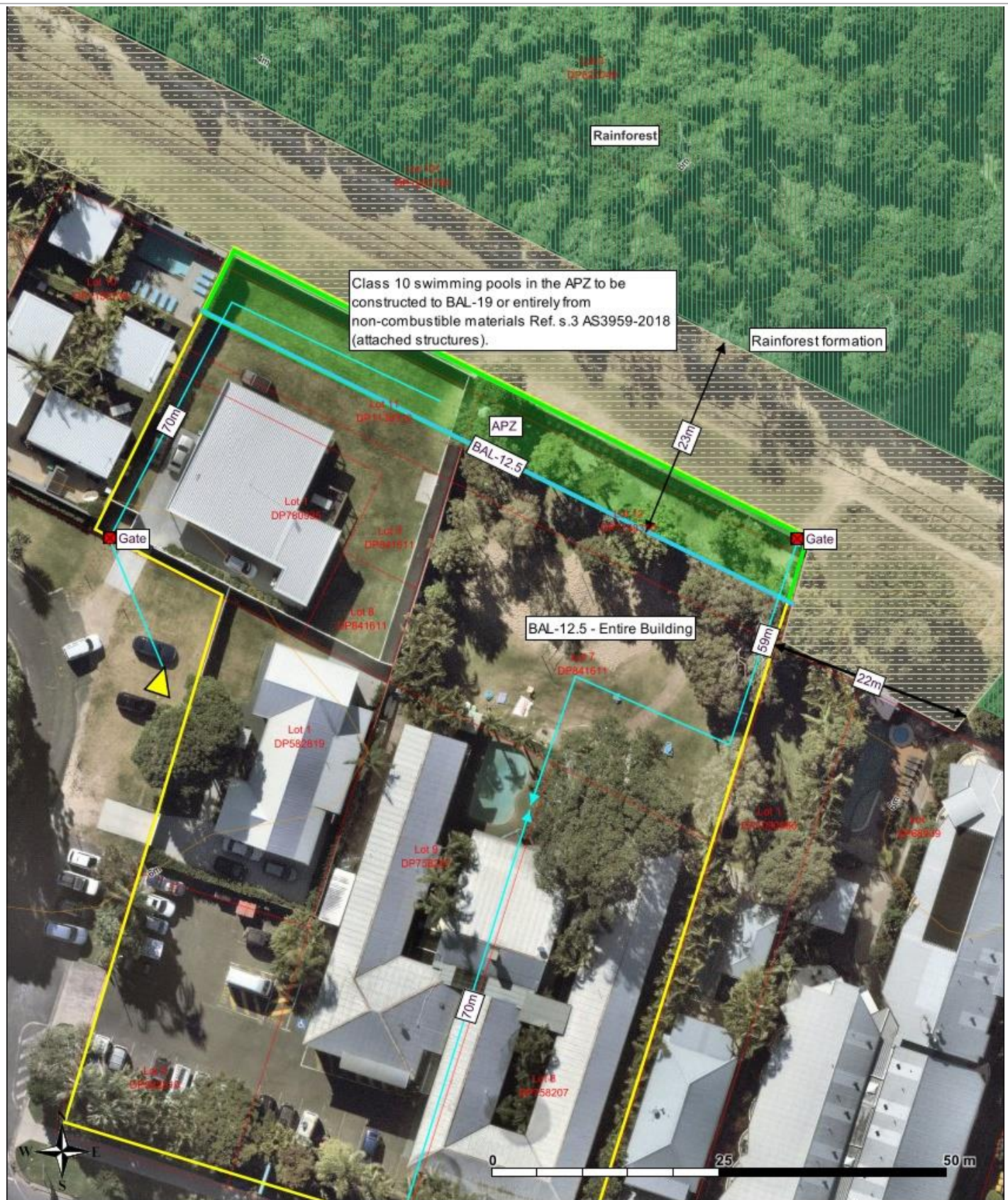
### 3.3 Summary of Results – APZ & BAL Rating

A summary of the findings of the on-site bushfire risk assessment is presented in the following table/s of results (Ref. Table 4).

Table 4: Results Summary – APZ &amp; BAL Rating

Vegetation/Hazard Analysis				APZ Analysis (m)	APZ & BAL Results	
Direction/Plot	Veg Formation / Class	Hazard Slope (°)	Setback BLE to Veg (m)	Table A1.12.3 (PBP)	APZ (m)	Highest BAL
North	Rainforest	0 Level	23	9	To boundary	BAL-12.5
East	Remnant	0 Level	22	9	To boundary	BAL-12.5
South, West	Managed Land	-	>100m	-	To boundary	BAL-12.5





## Legend

### Operations

- Operational Hazard Access (pedestrian)
- Existing Hydrant

### Annotations

- BAL-12.5 Building Setback
- Onsite APZ (10m)

### Veg

- Excluded
- Rainforest

### 140m survey

- Survey area

### Subject Site

- Subject Site

### Lot Boundary

- 

### Contours (2m)

- 

Map Printed from FireMaps on Tue Sep 19 15:47:11 AEST 2023

Figure 6: APZ and BAL analysis (Source: FireMap 2023)

## 4 RECOMMENDATIONS & COMPLIANCE

The following table/s indicate the extent to which the proposed development conforms with or deviates from the standards, specific objectives, performance criteria and acceptable solutions set out in PBP 2019.

The results and recommendations herein are commensurate with the level of bushfire risk and characteristics of the occupants for the proposed development, by applying the suite of BPMs in combination, being the site-specific requirements that must be satisfied in order to comply. Table 5 below specifies the method used to demonstrate compliance i.e. acceptable solution or performance-based solution, against the BPMs and provides recommendations to ensure the intent of each BPM shall be met.



Table 5: Compliance Tables; Re: s.5 – Residential and Rural Residential Subdivisions (PBP)

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
The intent may be achieved where:			
<b>s.5.3.1 APZ – Intent of measures:</b> To provide sufficient space and maintain reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and prevent direct flame contact.			
APZ	<ul style="list-style-type: none"> <li>Potential building footprints must not be exposed to radiant heat levels exceeding 29kW/m<sup>2</sup> on each proposed lot.</li> </ul>	<ul style="list-style-type: none"> <li>APZs are provided in accordance with Tables A1.12.2 or A1.12.3 based on the FFDI.</li> </ul>	<p>Complies with the acceptable solution.</p> <ul style="list-style-type: none"> <li>The APZ meets the recommended distances pursuant to table A1.12.3 (PBP) commensurate with BAL-29 (or lower) construction level.</li> <li>A defensible space will be provided as a result of the recommended APZ results presented in Table 4 herein.</li> </ul>
APZ	<ul style="list-style-type: none"> <li>APZs are managed and maintained to prevent the spread of a fire towards a building.</li> </ul>	<ul style="list-style-type: none"> <li>APZs are managed in accordance with the requirements of Appendix 4 (PBP).</li> </ul>	<p>Complies with the performance criteria, as per the performance solution presented in s.3.2.2 herein.</p> <p>The solution is based on the principles of the acceptable solutions. The following recommendations shall be applied:</p> <ul style="list-style-type: none"> <li>Comply with the 'Landscaping Plan' by Urbis (presented in Appendix B herein) which has been designed around the principles of Appendix 4 of PBP (Ref. Appendix C herein).</li> <li>Non-combustible Gutter Guards shall be installed on the building.</li> <li>Horizontal louvres: All horizontal louvres less than 50cm from planted vegetation (including window boxes) shall be constructed from non-combustible material only (NB: all horizontal louvres are currently referenced as timber on the attached plans).</li> </ul>



BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
			<ul style="list-style-type: none"> <li>• Other trees i.e. north APZ, shall be pruned to ensure the trees do not touch or overhang the building.</li> <li>• Regular maintenance shall be carried out i.e. trim trees and maintain separation between trees as identified on the landscaping plans.</li> <li>• Lower tree branches shall be pruned to provide a min. 2m vertical clearance above ground level.</li> <li>• Ongoing building and APZ maintenance and responsibilities of owners and body corporate should be clearly documented, and accompanying by-laws, the 'approved' landscaping plan etc. shall be incorporated into a body corporate management plan (BCMP) including provisions for a vegetation management plan (VMP).</li> <li>• A Vegetation Management Plan (VPM) should be prepared for the entire subject site and address issues in relation to fuel management requirements.</li> <li>• A copy of the BCMP/VMP shall be given to all owners of the site, to ensure they understand their maintenance responsibilities.</li> <li>• Note: a s.88b instrument may be required to ensure vegetation management is undertaken in a low fuel manner in perpetuity and placed on title.</li> </ul>
APZ	<ul style="list-style-type: none"> <li>• The APZ is provided in perpetuity.</li> </ul>	<ul style="list-style-type: none"> <li>• APZs are wholly within the boundaries of the development site.</li> </ul>	Complies with the acceptable solutions.

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
APZ	<ul style="list-style-type: none"> <li>APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.</li> </ul>	<ul style="list-style-type: none"> <li>APZ are located on lands with a slope less than 18 degrees.</li> </ul>	Complies with the acceptable solutions.
Landscaping	<ul style="list-style-type: none"> <li>Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.</li> </ul>	<ul style="list-style-type: none"> <li>Landscaping is in accordance with Appendix 4 (PBP); &amp;</li> <li>Fencing is constructed in accordance with section 7.6.</li> </ul>	<p>Comply with the performance criteria and the following:</p> <ul style="list-style-type: none"> <li>Landscaping is to be managed in accordance with the landscaping plan (Ref. Appendix B) as per the performance solution and recommendations for APZ referred to above).</li> <li>Rainforest species and/or species with high moisture content etc. should be prioritised being the preferred fire-resistant species.</li> <li>Any modifications to the landscaping plan and species lists shall be checked and approved by a BPAD-Level 3 Bushfire consultant.</li> <li>Fences and gates shall be constructed as follows: <ul style="list-style-type: none"> <li>All fences and gates shall be constructed from non-combustible materials.</li> </ul> </li> </ul>
<b>s.5.3.2 Access – Intent of measures:</b> To provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.			
Access (General Requirements)	<ul style="list-style-type: none"> <li>Firefighting vehicles are provided with safe, all-weather access to structures.</li> </ul>	<ul style="list-style-type: none"> <li>Property access roads are two-wheel drive, all-weather roads.</li> <li>Perimeter roads are provided for residential subdivisions of three or more allotments.</li> </ul>	<p>The existing public road appears adequate.</p> <ul style="list-style-type: none"> <li>There is no requirement to upgrade and/or modify the existing public road system.</li> </ul>

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
		<ul style="list-style-type: none"> <li>• Subdivisions of three or more allotments have more than one access in and out of the development.</li> <li>• Traffic management devices are constructed to not prohibit access by emergency services vehicles.</li> <li>• Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient.</li> <li>• All roads are through roads.</li> <li>• Dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end.</li> <li>• Where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system; and</li> <li>• One way only public access roads are no less than 3.5metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.</li> </ul>	

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
Access (General Requirements)	<ul style="list-style-type: none"> <li>The capacity of access roads is adequate for firefighting vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges and causeways are to clearly indicate load rating.</li> </ul>	<p>The existing public roads system appear adequate.</p> <ul style="list-style-type: none"> <li>There is no requirement to upgrade and/or modify the existing public road system.</li> </ul>
Access (General Requirements)	<ul style="list-style-type: none"> <li>There is appropriate access to water supply.</li> </ul>	<ul style="list-style-type: none"> <li>Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression.</li> <li>Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 – <i>Fire hydrant installations System design, installation and commissioning</i>; and</li> <li>There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.</li> </ul>	<p>Compliance with the acceptable solutions for hydrants is required.</p> <ul style="list-style-type: none"> <li>Proposed additional water supplies incl. hydrants shall be installed pursuant to the acceptable solutions.</li> <li>Hydrants shall be installed to ensure they are easily accessible for fire suppression activities.</li> <li>Unobstructed pedestrian access around the entire site and within the site shall be provided.</li> </ul> <p>NB. the existing hydrants have not been pressure tested therefore it is assumed they are adequate and fit for purpose.</p>
Perimeter Roads	<ul style="list-style-type: none"> <li>Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during fire fighting and emergency management on the interface.</li> </ul>	<ul style="list-style-type: none"> <li>Are two-way sealed roads.</li> <li>Minimum 8m kerb to kerb.</li> <li>Parking is provided outside of the carriageway width.</li> <li>Hydrants are located clear of parking areas.</li> </ul>	N/A

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
		<ul style="list-style-type: none"> <li>• Are through roads, and these are linked to the internal road system at an interval of no greater than 500m.</li> <li>• Curves of roads have a minimum inner radius of 6m.</li> <li>• The maximum grade road is 15 degrees and average grade of not more than 10 degrees.</li> <li>• The road crossfall does not exceed 3 degrees. &amp;</li> <li>• A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.</li> </ul>	
Non-perimeter Roads	<ul style="list-style-type: none"> <li>• Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum 5.5m carriageway width kerb to kerb.</li> <li>• Parking is provided outside of the carriageway width.</li> <li>• Hydrants are located clear of parking areas.</li> <li>• Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m.</li> <li>• Curves of roads have a minimum inner radius of 6m.</li> <li>• The road crossfall does not exceed 3 degrees. &amp;</li> </ul>	The existing road network complies with the acceptable solutions. There is no requirement to upgrade the existing road network.

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
Property Access	<ul style="list-style-type: none"> <li>Firefighting vehicles can access the dwelling and exit the property safely.</li> </ul>	<ul style="list-style-type: none"> <li>A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.</li> </ul> <ul style="list-style-type: none"> <li>There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.</li> </ul> <p>In circumstances where this cannot occur, the following requirements apply:</p> <ul style="list-style-type: none"> <li>Minimum 4m carriageway width.</li> <li>In forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay.</li> <li>A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches.</li> <li>Provide a suitable turning area in accordance with Appendix 3.</li> <li>Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress.</li> </ul>	<p>Complies with the acceptable solution.</p> <ul style="list-style-type: none"> <li>A short 5.5m wide (shielded) driveway off Milton Street provides access to the underground parking lot for occupant access/egress.</li> <li>Fire trucks do not require vehicular access to the underground parking lot. Firefighting vehicles obtaining parking/access from the existing public road system.</li> <li>The main entrance (Pedestrian access) is from Shirley Street.</li> <li>Unobstructed pedestrian pathways shall be provided throughout the subject site (min. 1m wide).</li> <li>A gate shall be installed on the northeast boundary for operational access (pedestrian) to the hazard (Ref. Figure 6.</li> <li>A 'Traffic Plan has been provided in support of this DA which provides suitable staging areas for fire fighting purposes from the street in addition to pedestrian access to the hazard.</li> </ul>

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
		<ul style="list-style-type: none"> <li>The minimum distance between inner and outer curves is 6m.</li> <li>The crossfall is not more than 10 degrees.</li> <li>Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and</li> <li>A development comprising more than three dwellings has formalised access by dedication of a road and not by right of way.</li> </ul> <p>Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.</p>	
<b>s.5.3.3 Services – Water, Electricity and Gas – Intent of Measures:</b> 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.			
Water Supplies	<ul style="list-style-type: none"> <li>Adequate water supplies are provided for firefighting purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Reticulated water is to be provided to the development where available.</li> <li>A static water and hydrant supply are provided for non-reticulated developments or where reticulated water supply cannot be guaranteed. &amp;</li> </ul>	<p>Complies with the acceptable solutions.</p> <ul style="list-style-type: none"> <li>An existing reticulated water supply services the locality.</li> </ul>

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
		<ul style="list-style-type: none"> <li>Static water supplies shall comply with Table 5.3d.</li> </ul>	
Water Supplies	<ul style="list-style-type: none"> <li>Water supplies are located at regular intervals; and</li> <li>The water supply is accessible and reliable for firefighting operations.</li> </ul>	<ul style="list-style-type: none"> <li>Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005.</li> <li>Hydrants are not located within any road carriageway; and</li> <li>Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.</li> </ul>	<p>Comply with the acceptable solutions to ensure adequate coverage of the entire lot including up to the proposed structures and the following:</p> <ul style="list-style-type: none"> <li>Additional hydrants shall be installed as per the engineered solution provided in support of the DA and AS2419.1.2005.</li> </ul>
Water Supplies	<ul style="list-style-type: none"> <li>Flows and pressure are appropriate.</li> </ul>	<ul style="list-style-type: none"> <li>Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.</li> </ul>	<p>Complies with the acceptable solution and as per the hydraulic engineering plans provided in support of this DA.</p> <ul style="list-style-type: none"> <li>ASSUMPTIONS: A pressure test has not been carried out. It is assumed the existing street hydrant system is adequate and fit for purpose.</li> </ul>
Water Supplies	<ul style="list-style-type: none"> <li>The integrity of the water supply is maintained.</li> </ul>	<ul style="list-style-type: none"> <li>All above-ground water service pipes are metal, including and up to any taps. &amp;</li> <li>Above-ground water storage tanks shall be of concrete or metal.</li> </ul>	Comply with the acceptable solution.
Electricity Services	Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	<ul style="list-style-type: none"> <li>Where practicable, electrical transmission lines are underground; and</li> <li>Where overhead, electrical transmission lines are proposed as follows:</li> </ul>	<p>Comply with the acceptable solution.</p> <ul style="list-style-type: none"> <li>All upgrades and new electricity supply services and installation shall be undertaken in accordance with the acceptable solutions.</li> </ul>



BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
		<ul style="list-style-type: none"> <li>Lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and</li> <li>No part of a tree is closer to a power line than the distance set out in ISSC3 <i>Guideline for Managing Vegetation Near Power Lines</i>.</li> </ul>	
Gas Services	Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	<ul style="list-style-type: none"> <li>Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - <i>The storage and handling of LP Gas</i>, the requirements of relevant authorities, and metal piping is used.</li> <li>All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side.</li> <li>Connections to and from gas cylinders are metal.</li> <li>Polymer-sheathed flexible gas supply lines are not used; and</li> <li>Above-ground gas service pipes are metal, including and up to any outlets.</li> </ul>	Comply with the acceptable solutions where installed.

**s.7.4 Intent of measures:** To minimise the risk of bushfire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities.

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
Construction Standards	<ul style="list-style-type: none"> <li>The proposed building can withstand bush fire attack in the form of embers, radiant heat, and flame contact.</li> </ul>	<ul style="list-style-type: none"> <li>BAL is determined in accordance with Tables A1.12.5 to A1.12.7; and</li> <li>Construction provided in accordance with the NCC and as modified by section 7.5 (please see advice on construction in the flame zone).</li> </ul>	<p>Comply with the acceptable solutions and the NSW variations to AS3959 as follows:</p> <ul style="list-style-type: none"> <li>The BAL was determined in accordance with Table A1.12.6;</li> <li>The min. recommended BAL rating is: <ul style="list-style-type: none"> <li>BAL-12.5 (entire structure);</li> <li>Pursuant to requirements set out in s.3 – construction general and s.5 construction for BAL-12.5 (AS3959-2018); and</li> </ul> </li> <li>Non-combustible Gutter Guards shall be installed on the entire building/s.</li> <li>Horizontal louvres: All horizontal louvres less than 50cm from planted vegetation (including window boxes) shall be constructed from non-combustible material only (NB: all horizontal louvres are currently referenced as timber on the attached plans).</li> </ul> <p>The following NSW variations for construction must be applied:</p> <ul style="list-style-type: none"> <li>Clause 3.10 of AS3959 is deleted and any sarking used for BAL-12.5, BAL-19, BAL-29 or BAL-40 shall: <ul style="list-style-type: none"> <li>Be non-combustible; or</li> <li>Comply with AS/NZS 4200.1, be installed on the outside of the frame, and have a flammability index of not more than 5 as determined by AS1530.2; and</li> </ul> </li> <li>Clause 5.2 and 6.2 of AS3959 is replaced by Clause 7.2 of AS3959, except that any wall enclosing the</li> </ul>

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
			<p>subfloor space need only comply with the wall requirements for the respective BAL; and</p> <ul style="list-style-type: none"> <li>• Clause 5.7 and 6.7 of AS3959 is replaced by clause 7.7 of AS3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL.</li> </ul>

## 5 CONCLUSION

The combination of BPMs and recommendations contained within this document, aim to reduce the impacts of a bushfire attack to the occupants, firefighters, building/s and environment. With the aim to reduce consequences of ember attack and direct flame contact with building/s able to be constructed within the proposed BLE. Acceptable and performance solutions (where applicable) in relation the bushfire protection measures in combination were used to demonstrate compliance against the performance criteria of PBP.

This report makes the determination through a detailed Bushfire Risk Assessment that the proposed development does not appear to negatively affect the indicative BLE, situated in an area where radiant heat levels are unlikely to exceed critical limits ( $29\text{kW/m}^2$ ). The results of which are based on the proviso the recommended APZ distances and ongoing maintenance in perpetuity is undertaken.

As a qualified consultant in Bushfire Risk Assessment as recognised by the NSW Rural Fire Service, this report has considered all elements of bushfire attack and BPMs in combination. Provided the development proposal is carried out in accordance with the recommendations contained herein, the development, in my professional opinion, shall satisfy the objectives and performance criteria of PBP (2019).

It is concluded that this report has satisfactorily demonstrated that the proposed multi-storey development achieves the requirements set out in PBP including additional criteria relevant to multi-storey buildings (2019).

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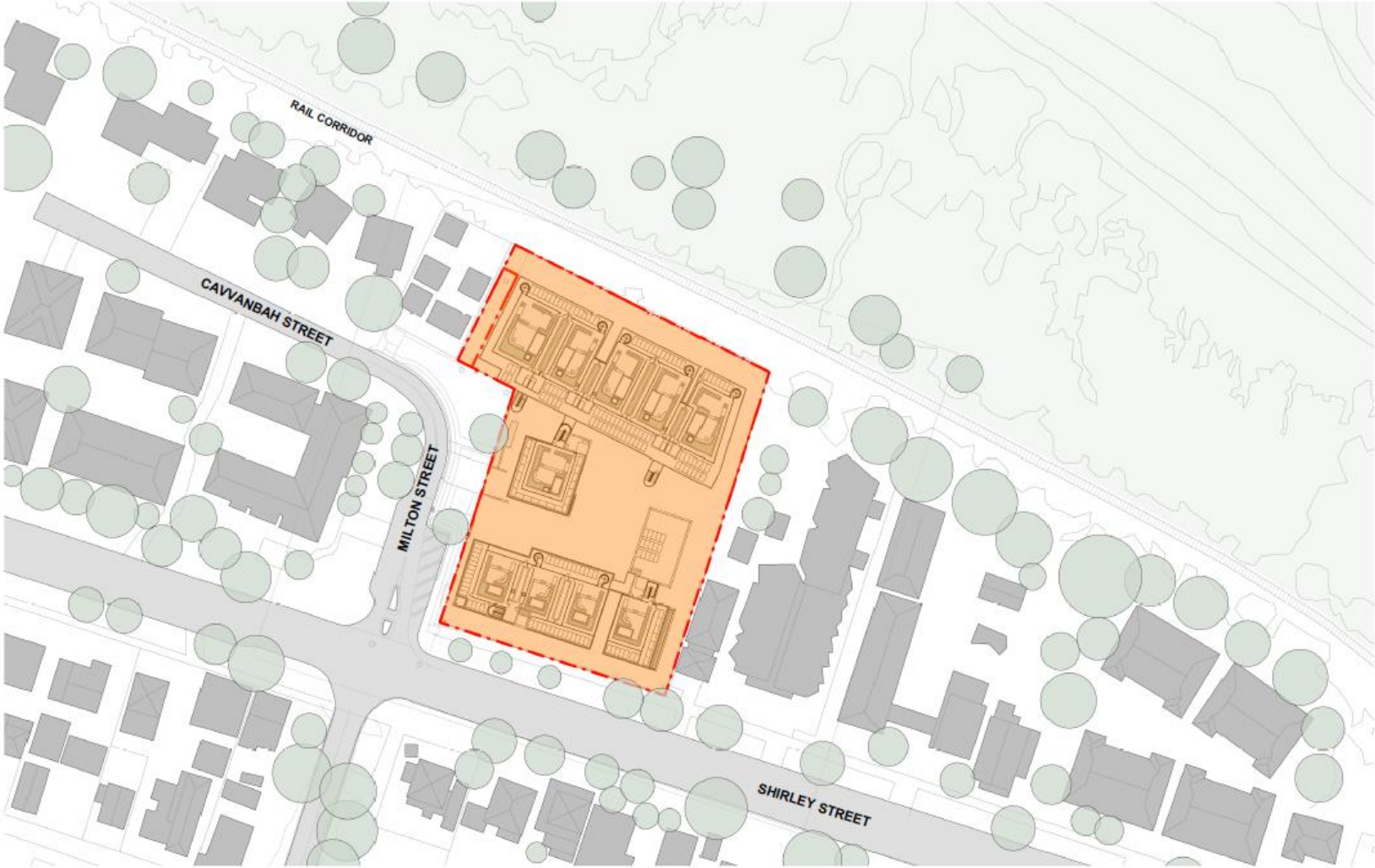
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## APPENDIX A – SITE PLANS

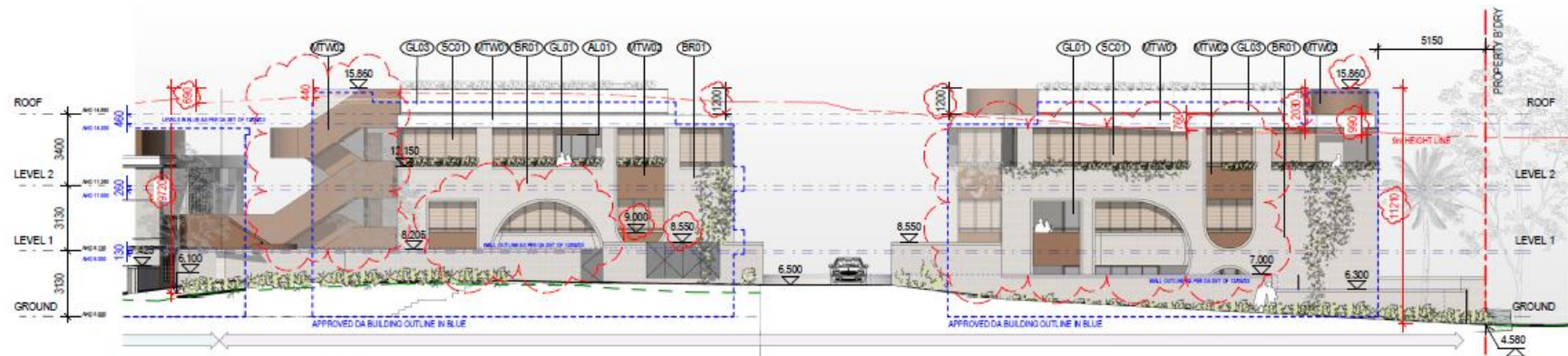
Building Plans by Hayball; date: 15/05/20/24.

A full set of plans shall be provided by the applicant to accompany the DA. All design and site plans must ensure compliance with the minimum building setbacks in relation to this development as proposed and the recommendations contained herein.

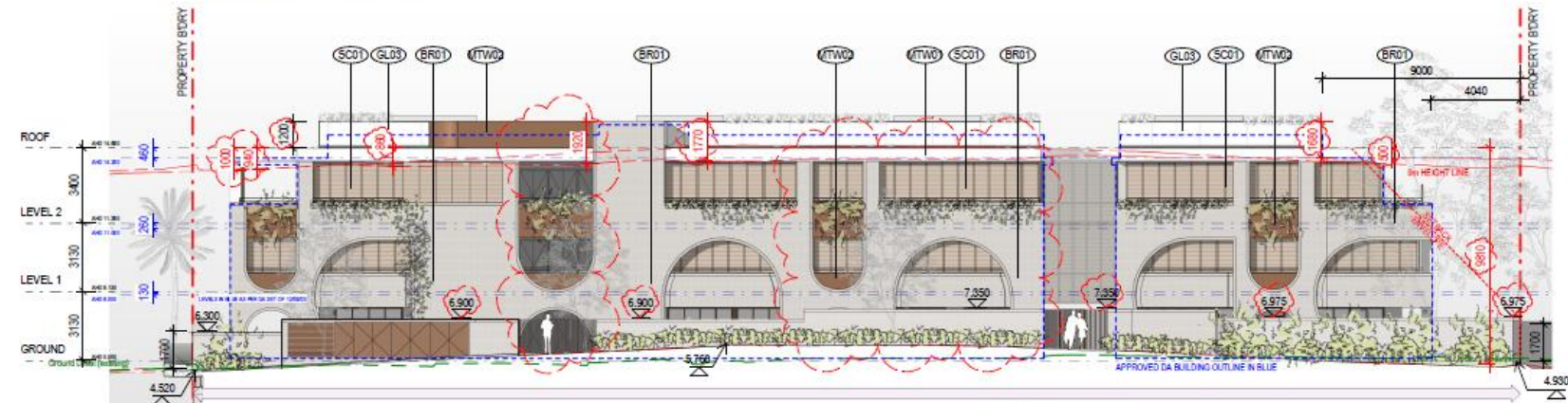


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Builders/Contractors shall verify job dimensions before any job commences. Figured dimensions shall take precedence over scaled work. Work shall also conform to the specification, other drawings and job dimensions. All shop drawings shall be submitted to the Architect/Consultant and manufacture shall not commence prior to the return of inspected shop drawings signed by the Architect/Consultant. Hayball retains copyright and grants the client a license to use the Design for the purposes of this project and for the particular stage of services for which the Hayball has been commissioned only. © Copyright 2024 All rights reserved.



WEST ELEVATION - MILTON STREET



SOUTH ELEVATION - SHIRLEY STREET

- KEY**
- 9m LINE ABOVE LEVELS SHOWN ON SURVEY DRAWING BYR111 Rev D DATED FEBRUARY 22ND 2023 BY BYRON BAY SURVEYING
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  - DM - DEFERRED MATTER AMMENDMENT #18 ZONE
  - R3 - MEDIUM DENSITY RESIDENTIAL

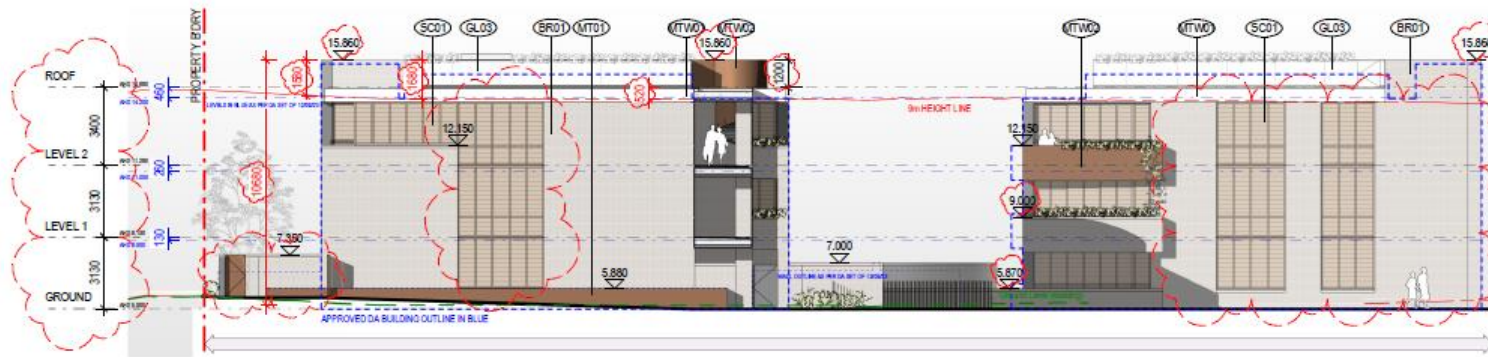
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- GL01 PERFORMANCE GLAZING
- GL02 TRANSLUCENT PRIVACY GLAZING
- GL03 GLASS BALUSTRADE
- MTW01 BRONZE SHEET CLADDING
- MTW02 ALUMINIUM PLATE PROFILE - WHITE POWDERCOAT FINISH
- MTW03 ALUMINIUM BALUSTRADE - MEDIUM BRONZE POWDERCOAT FINISH
- AL01 ALUMINIUM FRAMED DOORS AND WINDOWS - MEDIUM BRONZE POWDERCOAT FINISH
- SC01 ALUMINIUM LOUVER SCREEN

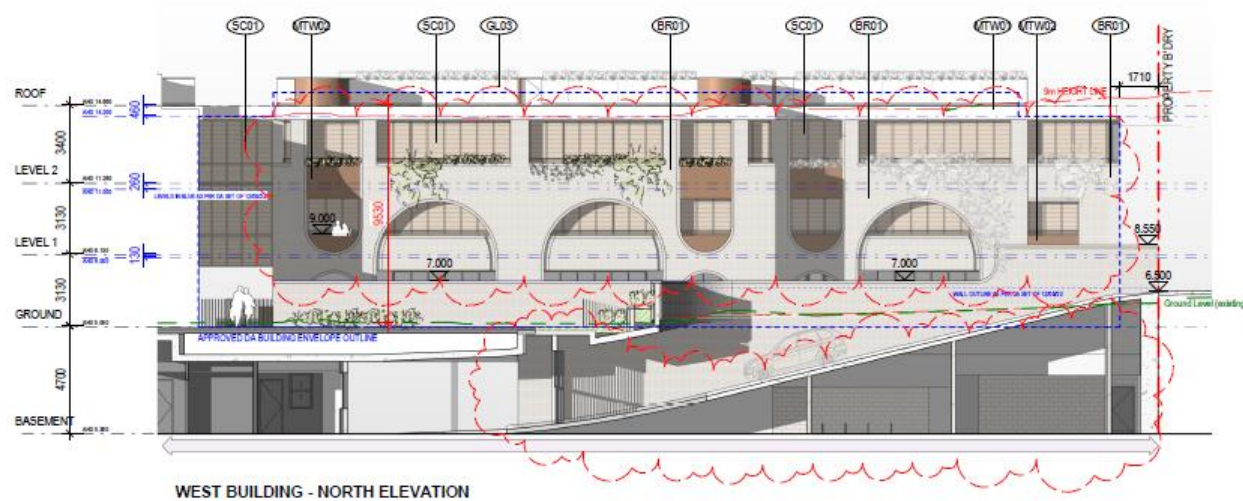


<p>Project Title</p> <p>VITALE PROPERTY GROUP</p> <p>29 SHIRLEY STREET &amp; 2-4 MILTON STREET, BYRON BAY NSW 2481</p>	<p>Melbourne</p> <p>Level 1</p> <p>250/260s Lane</p> <p>Melbourne VIC 3000</p> <p>T +61 3 9659 3644</p> <p>ASB: 94000304081 NSW</p> <p>Richard Leonard 7522, David Tordoff 8028</p>	<p>Sydney</p> <p>Ground Floor</p> <p>11-17 Buckingham Street</p> <p>Surry Hills NSW 2010</p> <p>T +61 2 9690 9029</p>	<p>Brisbane</p> <p>Level 12</p> <p>324 Queen Street</p> <p>Brisbane QLD 4000</p> <p>T +61 7 3211 9821</p> <p>ASB: 94000304081 NSW</p> <p>Richard Leonard 7522, David Tordoff 8028</p>	<p>hayball</p> <p>Date Printed 15/05/2024 5:03:43 PM</p> <p>Scale As indicated @ A3</p>	<p>Rev Date Description</p> <p>1 15/05/2024 ISSUED FOR ENDORSEMENT</p>	<p>Drawing Title</p> <p>STREET ELEVATIONS</p>	<p>Project No Drawing No Revision</p> <p>2555 DA7.01 1</p>
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SOUTH BUILDING - EAST ELEVATION\_DA



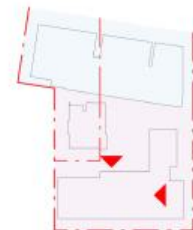
WEST BUILDING - NORTH ELEVATION

#### MATERIAL KEY

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- (GL02) TRANSLUCENT PRIVACY GLAZING
- (GL03) GLASS BALUSTRADE
- (MT01) BRONZE SHEET CLADDING
- (MTW0) ALUMINIUM PLATE PROFILE - WHITE POWDERCOAT FINISH
- (MTW0) ALUMINIUM BALUSTRADE - MEDIUM BRONZE POWDERCOAT FINISH
- (AL01) ALUMINIUM FRAMED DOORS AND WINDOWS - MEDIUM BRONZE POWDERCOAT FINISH
- (SC01) ALUMINIUM LOUVER SCREEN

#### KEY

- 9m LINE ABOVE LEVELS SHOWN ON SURVEY DRAWING BYR111 Rev D DATED FEBRUARY 22ND 2023 BY BYRON BAY SURVEYING
- GROUND LEVEL (EXISTING)
- DM - DEFERRED MATTER AMENDMENT #18 ZONE
- R3 - MEDIUM DENSITY RESIDENTIAL

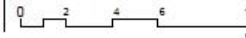


Project Title  
VITALE PROPERTY GROUP  
29 SHIRLEY STREET & 24 MILTON STREET, BYRON BAY NSW 2481

Melbourne Sydney Brisbane  
Level 1 Ground Floor Level 12  
250 Flinders Lane 11-17 Buckingham Street 324 Queens Street  
Melbourne VIC 3000 Surry Hills NSW 2010 Brisbane QLD 4000  
T +61 3 9603 3644 T +61 2 9955 9329 T +61 7 3211 9621  
ABN: 64009394281 NSW Nominated Architects: Tom Jordan 7521, Richard Leonard 7522, David Tordoff 8028



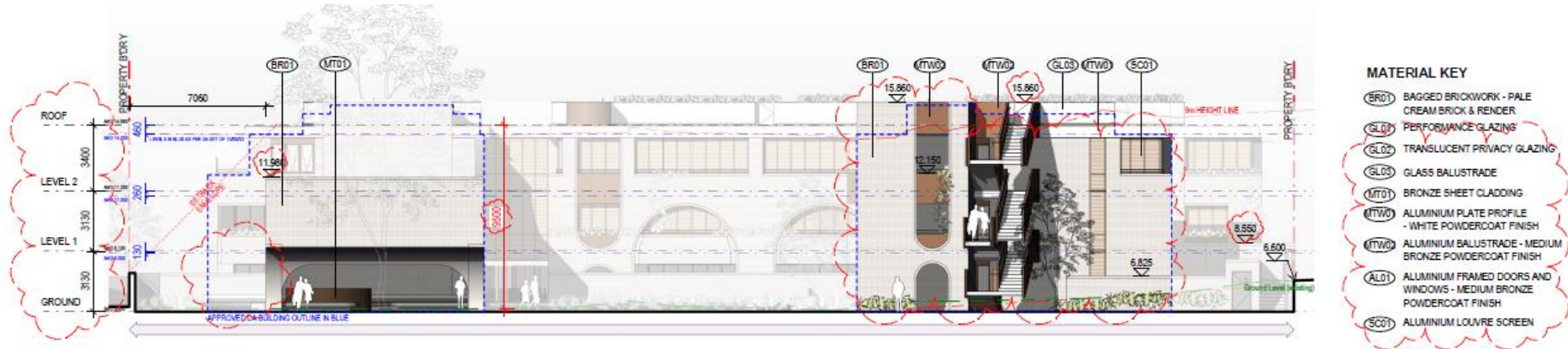
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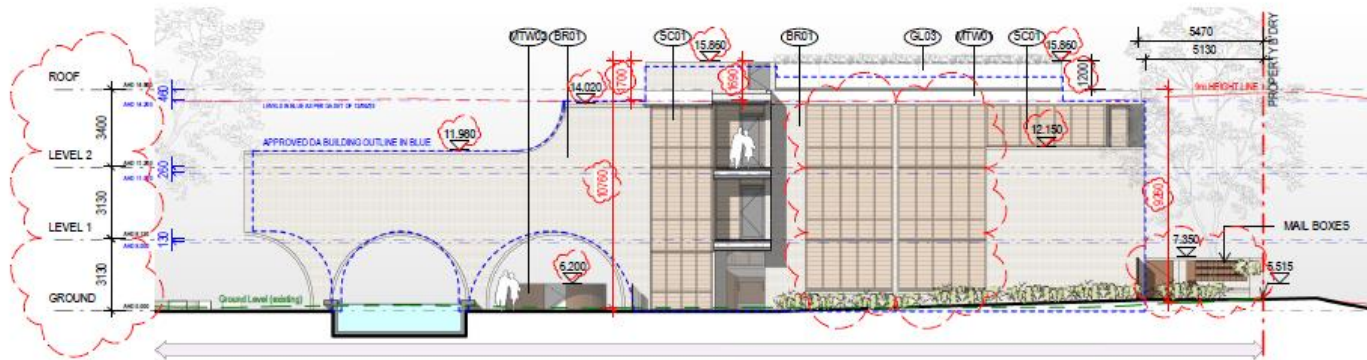
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#### MATERIAL KEY

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- (GL02) TRANSLUCENT PRIVACY GLAZING
- (GL03) GLASS BALUSTRADE
- (MT01) BRONZE SHEET CLADDING
- (MTW0) ALUMINIUM PLATE PROFILE - WHITE POWDERCOAT FINISH
- (MTW0) ALUMINIUM BALUSTRADE - MEDIUM BRONZE POWDERCOAT FINISH
- (AL01) ALUMINIUM FRAMED DOORS AND WINDOWS - MEDIUM BRONZE POWDERCOAT FINISH
- (SC01) ALUMINIUM LOUVER SCREEN

#### KEY

- 9m LINE ABOVE LEVELS SHOWN ON SURVEY DRAWING BYR111 Rev D DATED FEBRUARY 22ND 2023 BY BYRON BAY SURVEYING
- GROUND LEVEL (EXISTING)
- DM - DEFERRED MATTER AMMENDMENT #18 ZONE
- R3 - MEDIUM DENSITY RESIDENTIAL



EAST BUILDING - WEST ELEVATION\_DA

Project Title  
VITALE PROPERTY GROUP  
29 SHIRLEY STREET & 2-4 MILTON STREET, BYRON BAY NSW 2481

Melbourne  
Level 1  
250 Flinders Lane  
Melbourne VIC 3000  
T +61 3 9606 3644  
ASB: 54005394281 NSW Nominated Architects: Tom Jordan 7521, Richard Leonard 7522, David Torsoff 6028

Sydney  
Ground Floor  
11-17 Buckingham Street  
Surry Hills NSW 2010  
T +61 2 9950 6259

Brisbane  
Level 12  
324 Queen Street  
Brisbane QLD 4000  
T +61 7 3251 9821

hayball

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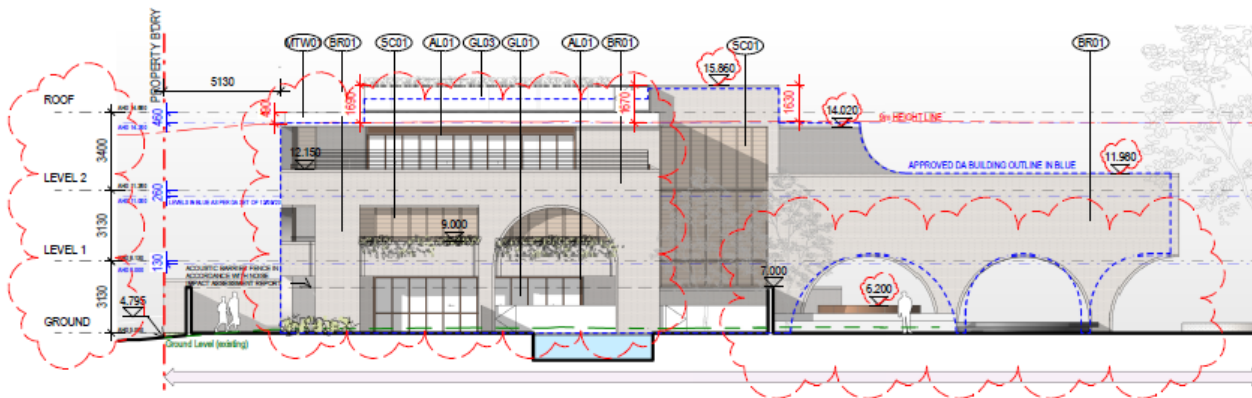


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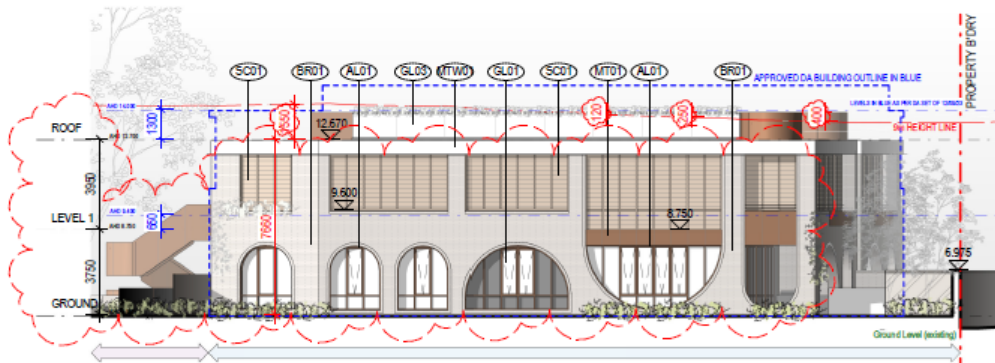
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EAST BUILDING - EAST ELEVATION\_DA



NORTH BUILDING - EAST ELEVATION\_DA

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- (GL01) PERFORMANCE GLAZING
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- (SC01) ALUMINIUM LOUVRE SCREEN

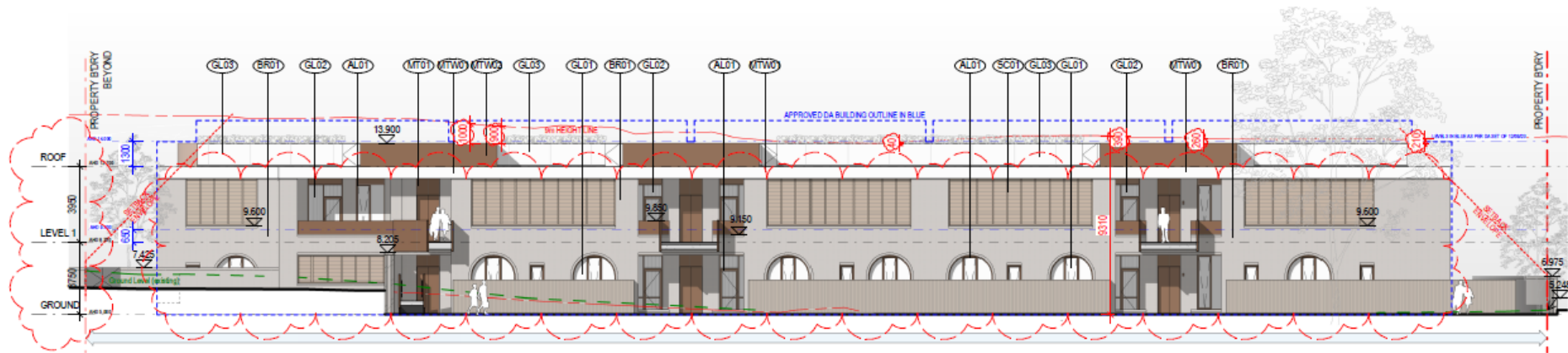
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RESIDENTIAL

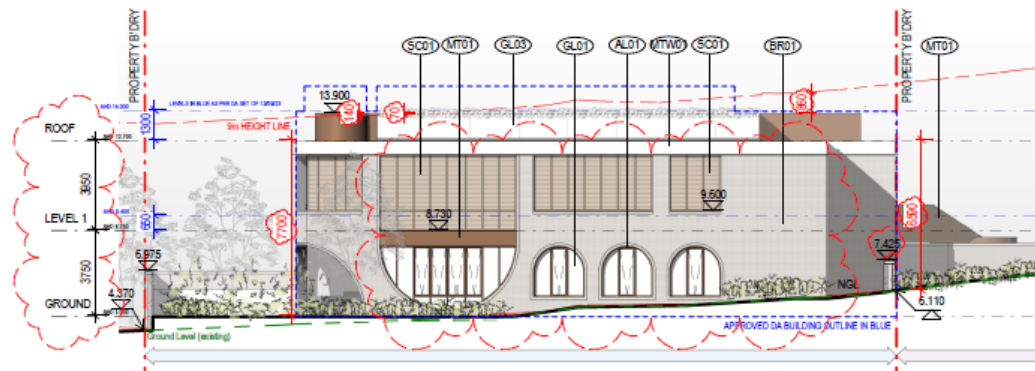


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NORTH BUILDING - SOUTH ELEVATION



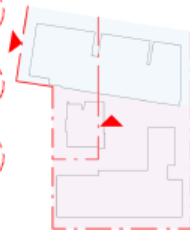
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#### MATERIAL KEY

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- (AL01) ALUMINIUM FRAMED DOORS AND WINDOWS - MEDIUM BRONZE POWDERCOAT FINISH
- (SC01) ALUMINIUM LOUVER SCREEN

#### KEY

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- - - GROUND LEVEL (EXISTING)
- DM - DEFERRED MATTER AMMENDMENT #18 ZONE
- R3 - MEDIUM DENSITY RESIDENTIAL

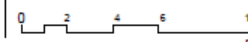


Project Title  
VITALE PROPERTY GROUP  
29 SHIRLEY STREET & 24 MILTON  
STREET, BYRON BAY NSW 2481

Melbourne Sydney Brisbane  
Level 1 Ground Floor Level 12,  
250 Flinders Lane 11-17 Buckingham Street, 324 Queens Street,  
Melbourne VIC 3000 Surry Hills NSW 2010 Brisbane Q4 4000  
T +61 3 9659 3644 T +61 2 9690 9229 T +61 7 3211 9621  
ABN: 9400554281 NSW Homestead Architects Tom Jordan 7521,  
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hayball

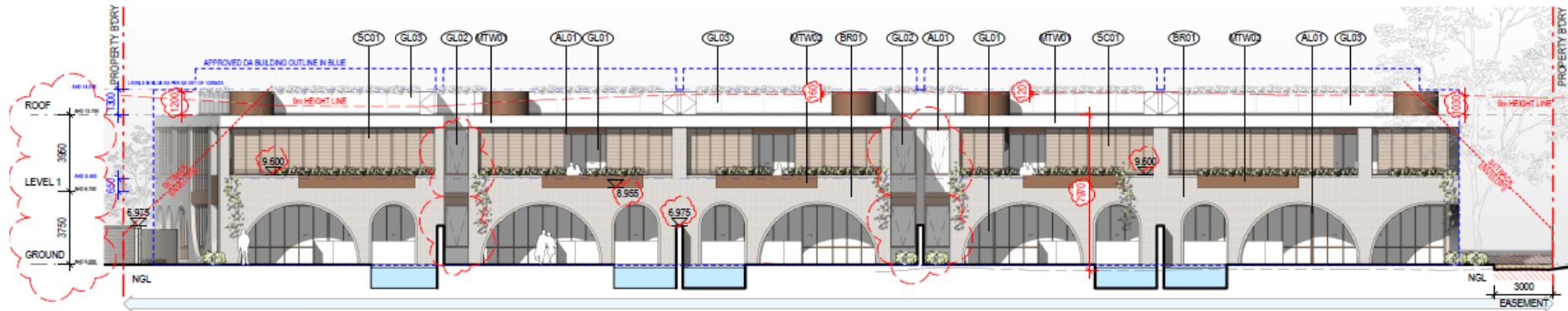
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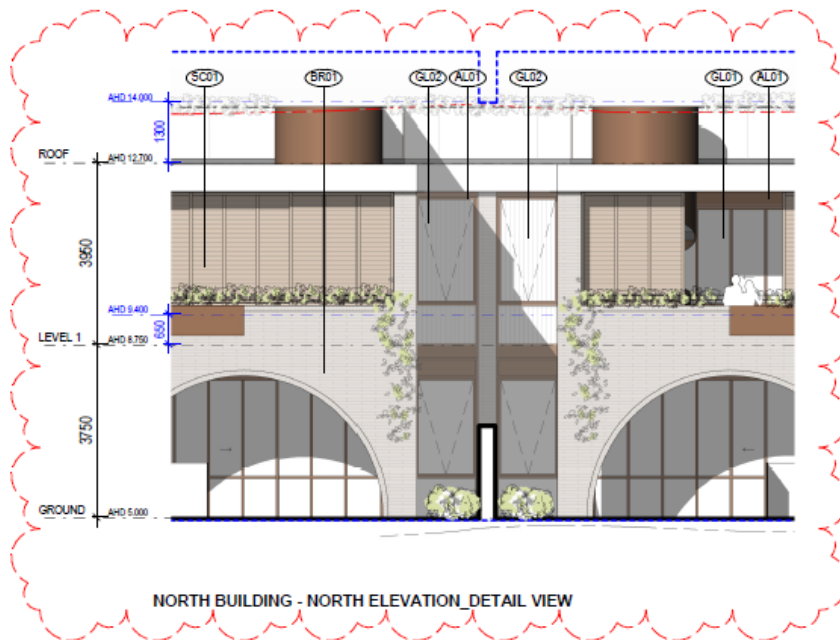
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Project No Drawing No Revision  
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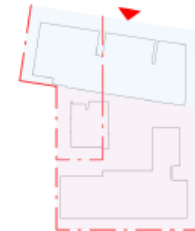
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**MATERIAL KEY**

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- (SC01) ALUMINIUM LOUVE SCREEN

**KEY**

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- - - GROUND LEVEL (EXISTING)
- DM - DEFERRED MATTER AMMENDMENT #18 ZONE
- R3 - MEDIUM DENSITY RESIDENTIAL



Project Title  
VITALE PROPERTY GROUP  
29 SHIRLEY STREET & 24 MILTON STREET, BYRON BAY NSW 2481

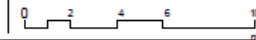
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Melbourne VIC 3000  
T +61 3 9650 3644  
ABN: 9400534281 NSW Nominated Architects: Tom Jordan 7521, Richard Leonard 7522, David Tordoff 9028

Sydney  
Ground Floor  
11-17 Buckingham Street  
Surry Hills NSW 2010  
T +61 2 9650 3629

Brisbane  
Level 12  
304 Queen Street  
Brisbane QLD 4000  
T +61 7 3211 9621



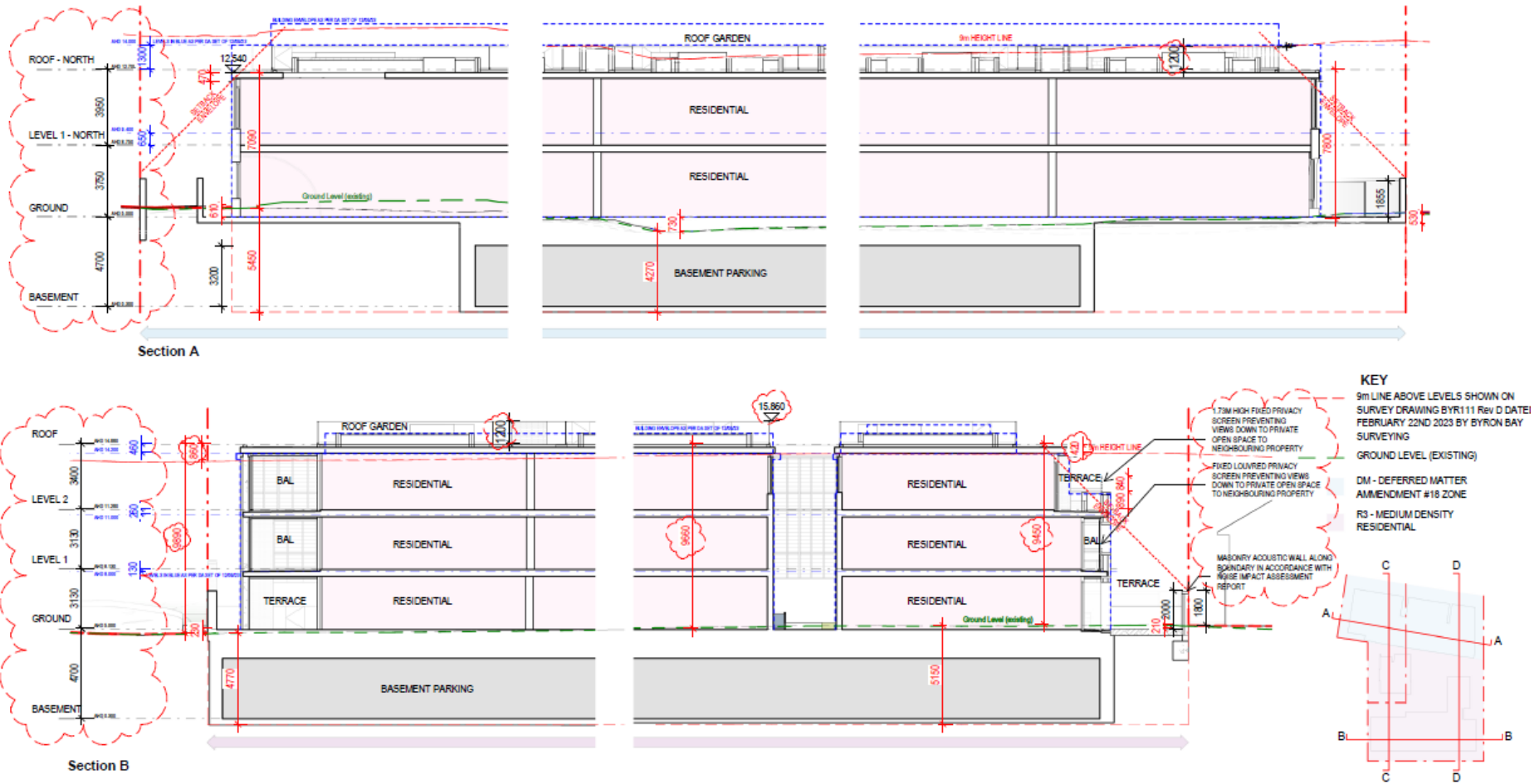
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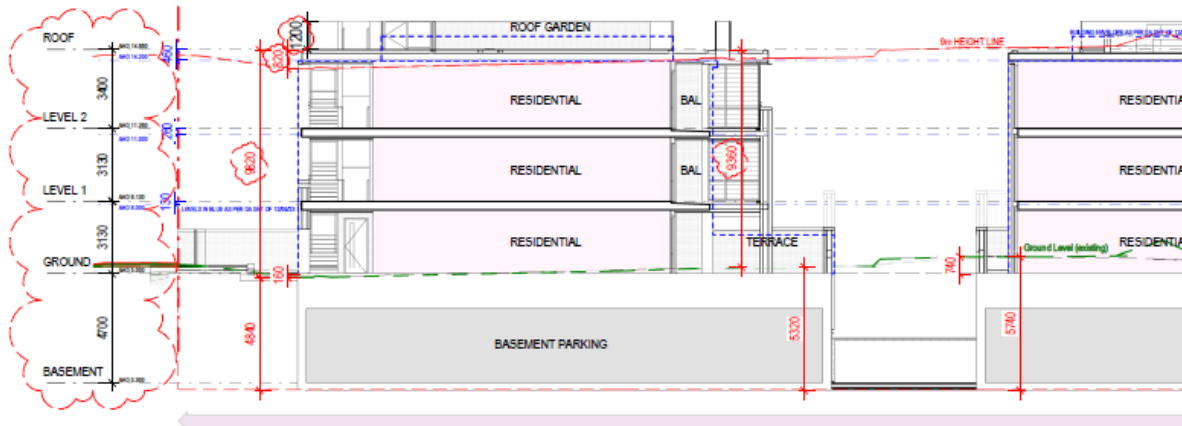
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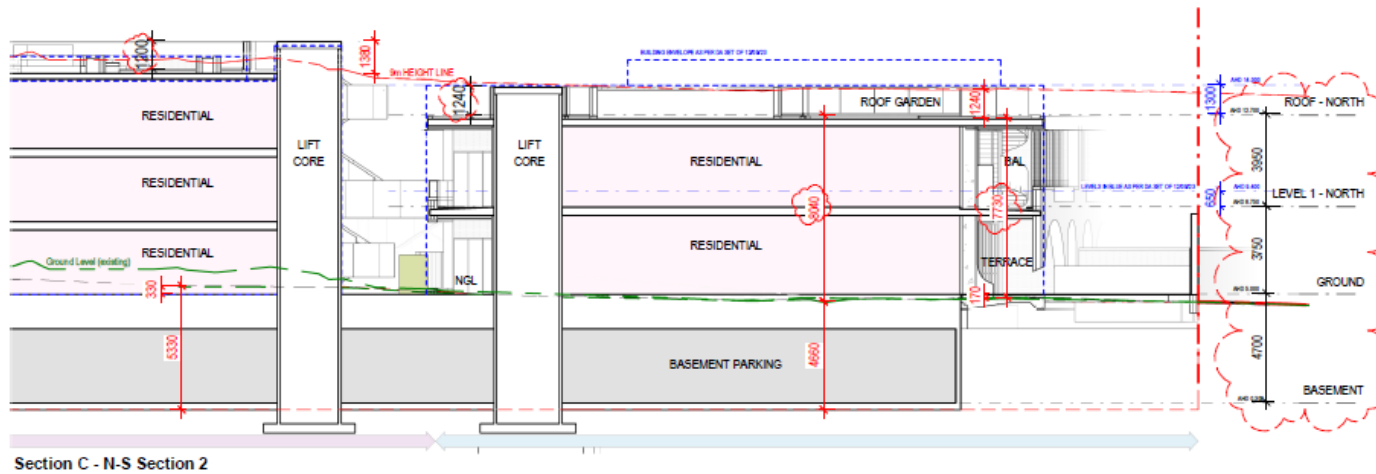
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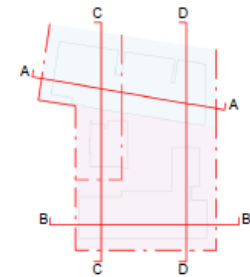
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Section C - N-S Section 1

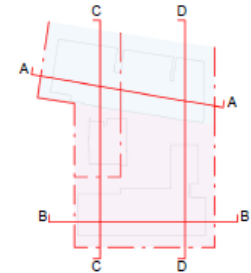
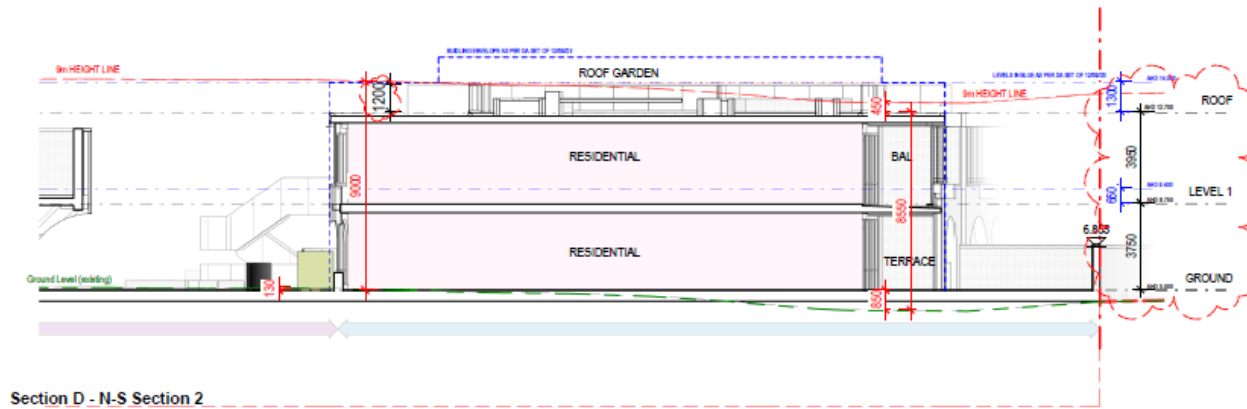
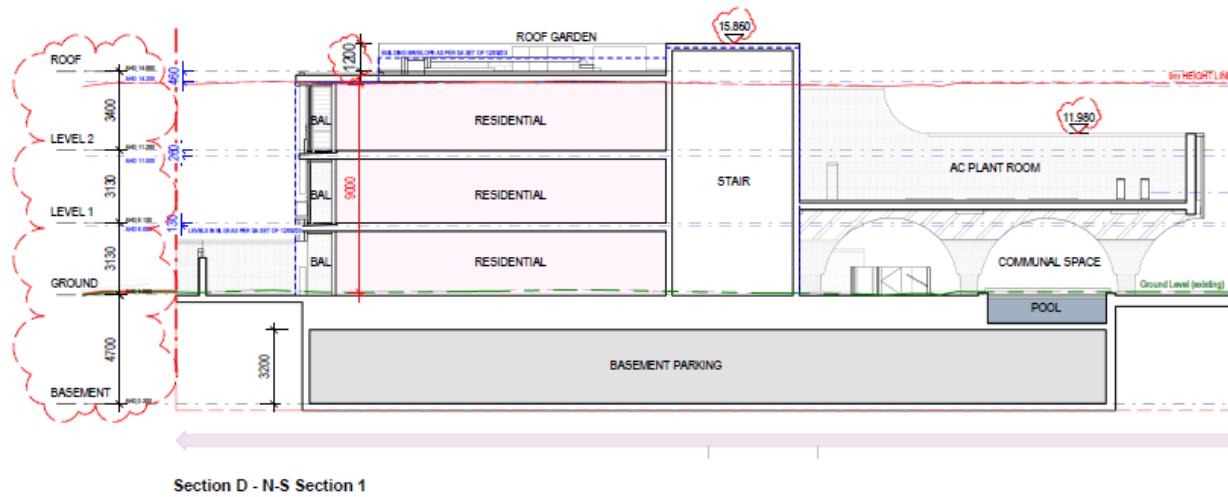


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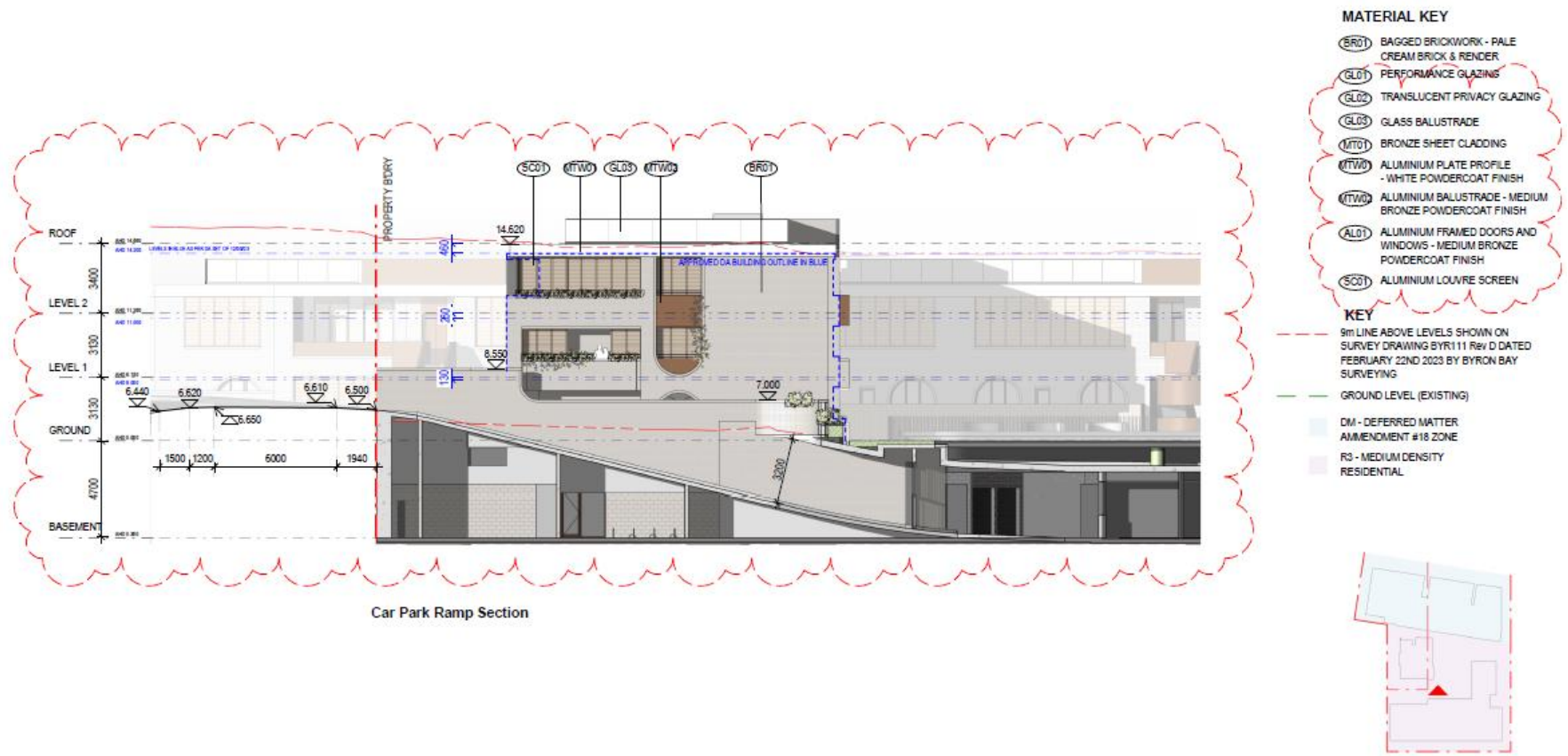


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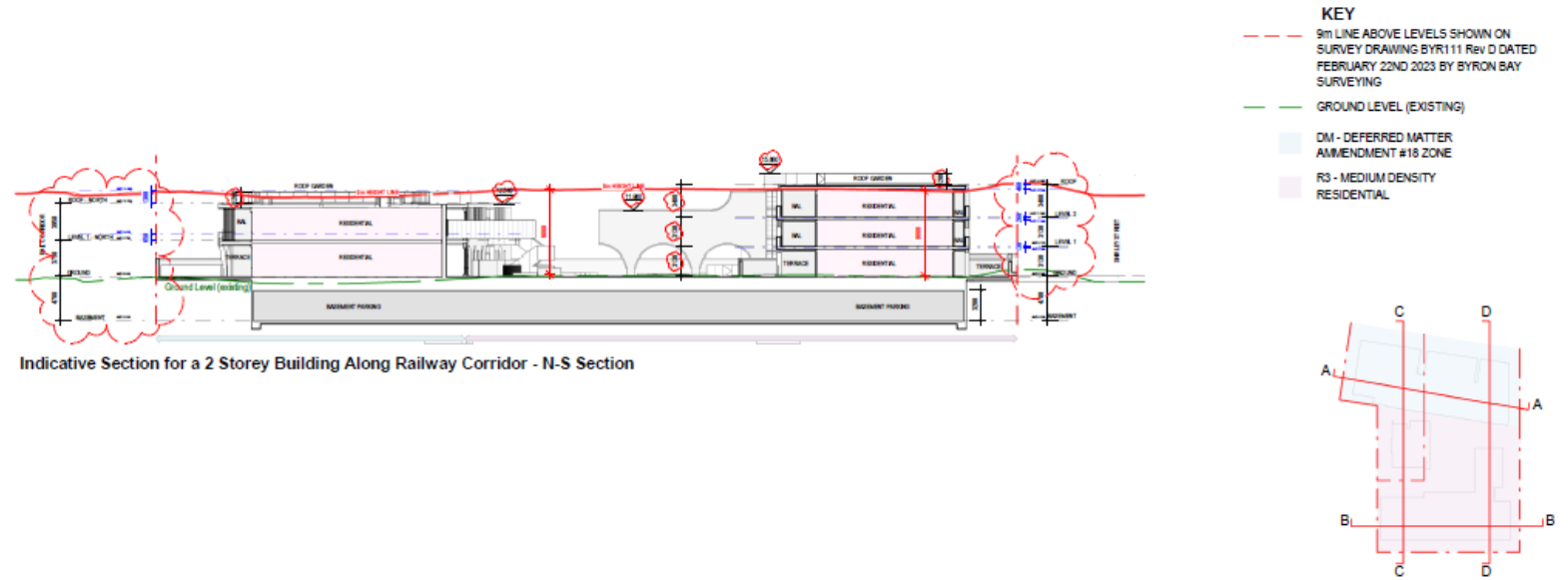




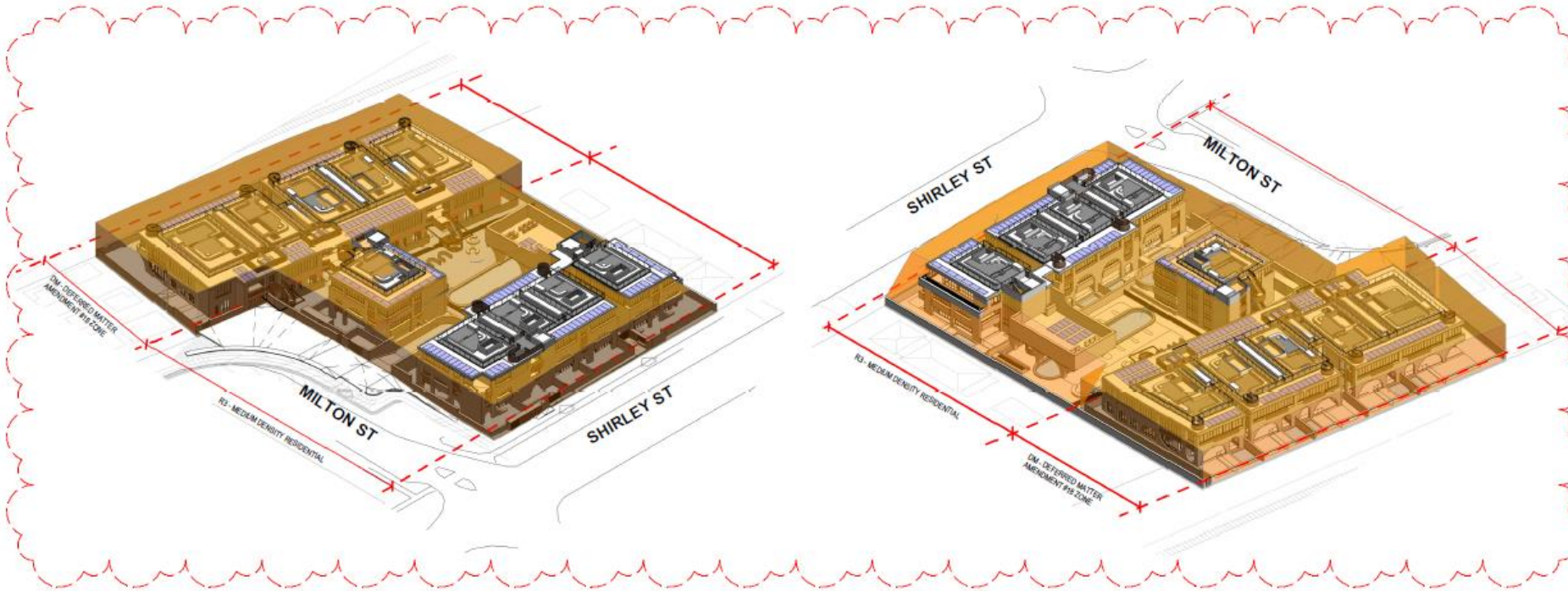
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29 SHIRLEY STREET & 2-4 MILTON STREET, BYRON BAY NSW 2481	250 Pindars Lane Melbourne VIC 3000 T +61 3 9659 3644 ABN: 54000394251 NSW Nominated Architects Tom Jordan 7521, Richard Leonard 7522, David Tordoff 9028	11-17 Buckingham Street Surry Hills NSW 2010 T +61 2 9690 9329	324 Queen Street Brisbane QLD 4000 T +61 7 3211 9821										



Project Title	Melbourne	Sydney	Brisbane		Date Printed	15/05/2024 5:05:05 PM	Rev	Date	Description	Drawing Title	Project No	Drawing No	Revision
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<b>Project Title</b> VITALE PROPERTY GROUP 29 SHIRLEY STREET & 2-4 MILTON STREET, BYRON BAY NSW 2481	<b>Melbourne</b> Level 1 250 Flinders Lane Melbourne VIC 3000 T +61 3 9659 3644 ABN: 5400534031 NSW	<b>Sydney</b> Ground Floor 11-17 Buckingham Street Surry Hills NSW 2010 T +61 2 9660 9329 Richard Leonard 7522, David Tordoff 8028	<b>Brisbane</b> Level 12, 324 Queen Street, Brisbane QLD 4000 T +61 7 3211 9821	 <b>Date Printed</b> 15/05/2024 5:05:09 PM <b>Scale</b> As indicated @ A3		<b>Rev</b> 1 <b>Date</b> 15.05.2024 <b>Description</b> ISSUED FOR ENDORSEMENT	<b>Drawing Title</b> SECTIONS <b>Project No</b> 2555 <b>Drawing No</b> DA8.05 <b>Revision</b> 1
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Project Title		Melbourne	Sydney	Brisbane		Date Printed	15/05/2024 5:05:20 PM		Rev	Date	Description	Drawing Title	Project No	Drawing No	Revision
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Builders/Contractors shall verify job dimensions before any job commences. Figured dimensions shall take precedence over scaled work. Work shall also conform to the specification, other drawings and job dimensions. All shop drawings shall be submitted to the Architect/Consultant and manufacture shall not commence prior to the return of inspected shop drawings signed by the Architect/Consultant. Hayball retains copyright and grants the client a licence to use the Design for the purposes of															



## APPENDIX B – LANDSCAPING PLAN

Statement of Landscape Intent by Urbis; date: 25 June 2024

Site Understanding  
1.1 Location & Context



25 June 2024 DA11 211113

29 Shirley Street, Byron Bay Vitale Property Group URBIS

## Site Understanding 1.2 Tree Identification



### Legend

 To Be Removed

- 1 Ficus obliqua (Small-leaved Fig)
- 2 Cocos nucifera (Coconut Palm)
- 3 Corymbia intermedia (Bloodwood)
- 4 Cupaniopsis anarcardoides (Tuckeroo)
- 5 Group of Corymbia intermedia (Bloodwood)
- 6 Pandanus Tectorius (Screw Pine)
- 7 Cupaniopsis anarcardoides (Tuckeroo)
- 8 Melaleuca quinquenervia (Paperbark)
- 9 Stenocarpus sinuatus (Firewheel)
- 10 Buckinghamia celsissima (Ivory Curl Tree)
- 11 Syzygium leuhmannii (Lilly Pilly)
- 12 Araucaria columnaris (Cook Island Pine)
- 13 Melaleuca quinquenervia (Paperbark)
- 14 Guioa semiglaucous (Wild Quince)
- 15 Corymbia intermedia (Bloodwood)
- 16 Cupaniopsis anarcardoides (Tuckeroo)



Landscape Design

### 3.1 Ground Level Master Plan



Legend

- 1 Pedestrian Building Entries
- 2 Driveway Entry from Milton St to Basement Level Carpark
- 3 Central Communal Open Space
- 4 Private Terraces
- 5 Upgraded verge works
- 6 4m Sewer Easement
- 7 Existing pine trees to be retained



## 3.2 Detail Plan - Southern Apartments



Key Plan | Ground Level

### Legend

- 1 Large shade trees and feature palms to planted verge
- 2 Entry water features
- 3 Private terraces
- 4 Private pool
- 5 Shade tree to private terrace
- 6 Lawn
- 7 Screening trees & shrubs
- 8 Existing pine trees to be retained
- 9 Driveway to basement
- 10 Stairs to Wellness Centre
- 11 Lounge space
- 12 Outdoor BBQ and dining
- 13 Sun lounges

25 June 2024 DA11 211113 North Scale 1:200 @ A3



29 Shirley Street, Byron Bay Vitale Property Group URBIS



Landscape Design

3.3 Detail Plan - Communal Recreation Area Plan





Landscape Design

3.4 Detail Plan - Northern Apartments



Landscape Design

3.5 Level 01 Masterplan



Legend

- 1 Communal Foyers
- 2 Private Terraces
- 3 Podium edge planters with coastal cascading species

25 June 2024 DA11 211113 North  Scale 1:1000 @ A3



Level 02 Masterplan



Legend

- 1 Private terraces
- 2 Private rooftop
- 3 Podium edge planters with coastal cascading species

29 Shirley Street, Byron Bay Vitale Property Group UBRIS



Landscape Design  
3.6 Detail Plan - Level 02

Legend

- 1 Shade tree in mounded garden
- 2 Pavers to pool terrace
- 3 Outdoor BBQ & dining
- 4 Plunge pool
- 5 Lounge
- 6 Screening trees & shrubs
- 7 Maintenance path
- 8 Sun loungers
- 9 Built in day bed



25 June 2024 DA11 211113 North Scale 1:400 @ A3



29 Shirley Street, Byron Bay Vitale Property Group URBIS

Landscape Design

### 3.7 Rooftop Master Plan



Legend

1 Private rooftop

Landscape Design  
3.8 Detail Plan - Roof



- Legend**
- 1** Shade tree in mounded garden
  - 2** Pavers to pool terrace
  - 3** Outdoor BBQ & dining
  - 4** Plunge pool
  - 5** Lounge
  - 6** Screening trees & shrubs
  - 7** Maintenance path
  - 8** Sun loungers
  - 9** Built in day bed

25 June 2024 DA11 211113 North 1 Scale 1:400 @ A3



29 Shirley Street, Byron Bay Vitale Property Group URBIS



Sections  
4.1 Section 01





Sections and Elevations  
4.2 Section 02



Key Plan | Level 1

Legend

- 1 Boundary wall
- 2 Screening trees & shrubs
- 3 Podium edge planters with coastal cascading species
- 4 Timber pool deck and walkway
- 5 Lounge space
- 6 Pool gate
- 7 Shade trees to private terrace
- 8 Driveway to basement
- 9 Stairs to Wellness Centre

25 June 2024 DA11 211113

Scale 1:100 @ A3



29 Shirley Street, Byron Bay Vitale Property Group UBRIS

Design Details

6.5 Tree Planting Diagram - Ground Floor



## APPENDIX C – RFS GUIDELINES & FAST FACTS

# APPENDIX 4

## ASSET PROTECTION ZONE REQUIREMENTS

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps to reduce vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

Careful attention should be paid to species selection, their location relative to their flammability, minimising continuity of vegetation (horizontally and vertically), and ongoing maintenance to remove flammable fuels (leaf litter, twigs and debris).

This Appendix sets the standards which need to be met within an APZ.

### A4.1 Asset Protection Zones

An APZ is a fuel-reduced area surrounding a building or structure. It is located between the building or structure and the bush fire hazard.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at the NSW RFS Website [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows for suppression of fire;
- an area from which backburning or hazard reduction can be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Bush fire fuels should be minimised within an APZ. This is so that the vegetation within the zone does not provide a path for the spread of fire to the building, either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the building;
- damage to the building asset from intense radiant heat; and
- ember attack.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type and bush fire threat. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an Inner Protection Area (IPA) and an Outer Protection Area (OPA).



#### A4.1.1 Inner Protection Areas (IPAs)

The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defensible space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

##### Trees

- tree 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 the ground;
- tree canopies should be separated by 2 to 5m; and
- 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 should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

##### Grass

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

#### A4.1.2 Outer Protection Areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

##### 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.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.

**Figure A4.1**

Typical Inner and Outer Protection Areas.

