



BUSHFIRE ASSESSMENT REPORT

MAITLAND PRIVATE HOSPITAL ADDITIONS

173 – 175 Chisholm Road, Ashtonfield

Prepared for Healthe Care Surgical Pty Ltd



Bushfire Planning Australia

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BPA Reference: 2307 Maitland Private

Prepared for Healthe Care Surgical Pty Ltd

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Disclaimer and Limitation

This report is prepared solely for Health Care Surgical Pty Ltd (the 'Client') for the specific purposes of only for which it is supplied (the 'Purpose'). This report is not for the benefit of any other person; either directly or indirectly and is strictly limited to the purpose and the facts and matters stated in it and will not be used for any other application.

This report is based on the site conditions surveyed at the time the document was prepared. The assessment of the bushfire threat made in this report is made in good faith based on the information available to Bushfire Planning Australia at the time.

The recommendations contained in this report are considered to be minimum standards and they do not guarantee that a building or assets will not be damaged in a bushfire. In the making of these comments and recommendations it should be understood that the focus of this document is to minimise the threat and impact of a bushfire.

Finally, the implementation of the adopted measures and recommendations within this report will contribute to the amelioration of the potential impact of any bushfire upon the development, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

Document Status: 2307 - SFPP Hospital

Version	Status	Purpose	Author	Review Date
1	Draft	Draft for Review	Katrina Mukevski	19 March 2023
2	Draft	Draft for Client Review	Stuart Greville	27 March 2023
3	Final	Final for Submission	Stuart Greville	27 March 2023

Certification

As the author of this Bushfire Threat Assessment (BAR), I certify this BAR provides the detailed information required by the NSW Rural Fire Service under Clause 44 of the Rural Fires Regulation 2013 and Appendix 1 of Planning for Bushfire Protection 2019 for the purposes of an application for a bush fire safety authority under section 100B(4) of the Rural Fires Act 1997.

Stuart Greville

Accredited Bushfire Practitioner

BPAD-26202

Date: 27 March 2023



In signing the above, I declare the report is true and accurate to the best of my knowledge at the time of issue



Executive Summary

Bushfire Planning Australia (BPA) has been engaged by Health Care Surgical Pty Ltd (the 'Proponent') to undertake a Bushfire Assessment Report (BAR) for a proposed additions to the existing Maitland Private Hospital located at 173-175 Chisholm Road, Ashtonfield.

A hospital is defined as a Special Fire Protection Purpose (SFPP) under the NSW Rural Fire Service (RFS) document Planning for Bushfire Protection 2019 (PBP 2019). An assessment of the bushfire hazards the entire site is exposed to has been undertaken and an appropriate combination of bushfire protection measures are recommended to provide a better bushfire outcome for the current occupants.

This BAR found the site was exposed to a low bushfire hazard located primarily to the north-east and east of the site, which is identified as a *forest*, namely *Hunter Macleay Dry Sclerophyll Forest* and is mapped as Category 1 Vegetation in the Central Coast Bush Fire Prone Land Map.

This BAR has been prepared in accordance with the submission requirements detailed in Appendix 2 of PBP 2019 and has demonstrated the proposed expansion satisfies the Aims and Objectives of PBP 2019, including the Specific Objectives for SFPP developments.

Additionally, this BAR has considered the impending changes and implications of additional bushfire protection measures for Class 9 buildings (including hospitals) described in G5D4 of the National Construction Code 2022 (NCC 2022) and the associated Addendum to PBP 2019 that will both become effective on 1 May 2023.

The following key recommendations have been designed to enable the proposed development to achieve Performance Criteria for SFPP developments detailed in Section 6.8 of PBP 2019:

1. The entire site is to be managed as an Inner Protection Area (IPA) as outlined within Appendix 4 of PBP 2019 and the RFS document *Standards for asset protection zones*;
2. All future buildings to be constructed on the proposed sites shall have due regard to the specific considerations given in the National Construction Code: Building Code of Australia (NCC) which makes specific reference to Australian Standard AS3959-2018 Construction of buildings in bushfire prone areas (AS3959-2018) and the NASH Standard Steel Framed Construction in Bushfire Prone Areas. The proposed additions shall be constructed in accordance with Section 3 and 6 of AS3959-2018; being BAL-19;
3. The proposed additions to the existing building are to be connected to a reliable water supply network and that suitable fire hydrants are located throughout the development site that are clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure shall comply with AS2419.1 2005 and section 6.8.3 of PBP 2019;
4. Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site; and
5. A Bushfire Emergency Management and Evacuation Plan (BEMEP) shall be prepared that is consistent with the RFS Guidelines 'Development Planning – A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan December 2014'.

This assessment has been made based on the bushfire hazards observed in and around the site at the time of inspection and production (March 2023).

Should the above recommendations be implemented, the proposed modification to the approved development will result in a better bushfire outcome as the existing bushfire risk should be suitably mitigated to offer an acceptable level of protection to life and property for those persons and assets occupying the site but they do not and cannot guarantee that the area will not be affected by bushfire at some time.



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Terms and Abbreviations

Abbreviation	Meaning
APZ	Asset Protection Zone
AS2419-2005	Australian Standard – Fire Hydrant Installations
AS3959-2018	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BAR	Bushfire Assessment Report
BCA	Building Code of Australia
BC Act	NSW Biodiversity Act 2016
BDAR	Biodiversity Development Assessment Report
BMP	Bush Fire Management Plan
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BPL	Bush Fire Prone Land
BPLM	Bush Fire Prone Land Map
BPM	Bush Fire Protection Measures
DoE	Commonwealth Department of the Environment
DPI Water	NSW Department of Primary Industries – Water
EPA Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LGA	Local Government Area
MCC	Maitland City Council
NPWS	NSW National Parks and Wildlife Service
OPA	Outer Protection Area
OEH	NSW Office of Environment and Heritage
PBP 2019	Planning for Bushfire Protection 2019
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation
RFS	NSW Rural Fire Service
SFPP	Special Fire Protection Purposes
TSC Act	NSW Threatened Species Conservation Act 1995 (as repealed)
VMP	Vegetation Management Plan

1. Introduction

Bushfire Planning Australia (BPA) has been engaged by Health Care Surgical Pty Ltd (the 'Proponent') to undertake a Bushfire Assessment Report (BAR) for a proposed additions to the existing Maitland Private Hospital located at 173-175 Chisholm Road, Ashtonfield, legally known as SP64139 and Lot 102 DP1010923. This includes an addition to Level 2 of the existing Maitland Private Hospital and additional parking spaces within the existing carpark in south east corner of the site.

The assessment aims to consider and assess the bushfire hazard and associated potential bushfire threat relevant to the proposed development, and specific objectives for Special Fire Protection Services (SFPP), and to outline the minimum mitigative measures which would be required in accordance with the provisions of the New South Wales Rural Fire Service (RFS) publication *Planning for Bushfire Protection 2019* (PBP 2019) that has been released and adopted through the *Environmental Planning and Assessment Amendment (Planning for Bushfire Protection) Regulation 2007* and the *Rural Fires Regulation 2013*.

Additionally, this BAR will also consider the impending changes and implications of additional bushfire protection measures for Class 9 buildings (including hospitals) described in G5D4 of the National Construction Code 2022 (NCC 2022) and the associated Addendum to PBP 2019 that will both become effective on 1 May 2023.

1.1. Aims and Objectives

The assessment aims to consider and assess the bushfire hazard and associated potential bushfire threat relevant to the proposed development, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the New South Wales Rural Fire Service (RFS) publication *Planning for Bushfire Protection 2019* (PBP 2019) and the *Rural Fires Regulation 2013*.

This assessment has been undertaken in accordance with clause 45 of the Rural Fires Regulation 2013. This BAR also addresses the aims and objectives of PBP 2019, being:

- Afford buildings and their occupants protection from exposure to a bushfire;
- Provide a defendable 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 bushfire protection measures (BPMs); and
- Ensure that utility services are adequate to meet the needs of firefighters.

A compliance table demonstrating compliance with PBP 2019 is provided in **Appendix B**.

1.2. Specific Objectives for Special Fire Protection Purposes

The aims and objectives listed in section 1.1 of PBP 2019 remain applicable to SFPP developments, however further consideration has been given to SFPP developments due to the nature of these environments and the occupants they accommodate. Occupants of SFPP developments are generally more vulnerable to bushfire attack therefore specific objectives have been put in place to ensure greater protection is provided (section 6.2 PBP 2019). Specific objectives include:

- Minimise levels of radiant heat, localised smoke and ember attack through increased APZ, building design and siting;
- Provide for an appropriate operational environment for emergency service personnel during firefighting and emergency management;
- Ensure the capacity of existing infrastructure (such as roads and utilities) can accommodate the increase in demand during emergencies as a result of the development; and
- Ensure emergency evacuation procedures and management which provides for the special characteristics and needs of occupants.

As the manufactured home estate is classified as a SFPP development, the specific objectives and acceptable solutions for a SFPP development have been considered.

1.3. National Construction Code 2022

The BAR will also consider the implications of additional bushfire protection measures for Class 9 buildings (including hospitals) described in G5D4 of the National Construction Code 2022 (NCC 2022). The changes to NCC 2022 were made available on 1 October 2022 and will become effective on 1 May 2023. These additional measures are contained in Specification 43 and are intended to operate in conjunction with other bushfire safety measures that lie outside the scope of the NCC 2022. It is noted NCC 2022 includes a NSW variation to G5D4 which allows for compliance with the NCC 2022 using alternative approaches as modified by the development consent with a bushfire safety authority issued by the RFS under s100b of the Rural Fires Act 1997. Given the potential challenges associated with strict compliance with all additional matters, each measure has been considered for relevance and ease of compliance.

The additional bushfire protection measures described in G5D4 are set out in Specification 43. The measures set out in Specification 43 are intended to operate in conjunction with other bushfire safety measures that lie outside the scope of the NCC; such as PBP 2019.

The additional measures include:

- S43C1 – Scope
- S43C2 – Separation from classified vegetation
- S43C3 – Separation between buildings
- S43C4 – Separation from allotment boundaries and carparking areas
- S43C5 – Separation from hazards
- S43C6 – Non-combustible path around building
- S43C7 – Access pathways
- S43C8 – Exposed external areas
- S43C9 – Internal tenability
- S43C10 – Building envelope
- S43C11 – Supply of water for fire-fighting purposes
- S43C12 – Emergency power supply
- S43C13 – Signage
- S43C14 – Vehicular access

1.4. Planning for Bushfire Protection - Addendum 2022

To ensure the application of PBP is consistent with NCC 2022, the RFS prepared an Addendum to PBP 2019 to align with NCC 2022. The Addendum addresses the Class 9 Provisions in NCC 2022 within the context of PBP 2019, since these classes of buildings have been previously addressed as a SFPP developments in PBP 2019.

Additional Performance Criteria and Acceptable Solutions relevant to bushfire protection measures (BPMs) within PBP 2019 for SFPP Class 9 buildings have been introduced in the Addendum to ensure consistency with the relevant provisions of NCC 2022.

The NSW Variation to NCC 2022 immediately set asides some provisions of Specification 43; including S43C2 – Separation from classified vegetation. The minimum distances for APZs for SFPP development as prescribed in PBP 2019 prevail. As such, S43C2 does not apply to the proposed expansion to the existing hospital.

It is noted Addendum 2022 or the additional bushfire protection measures to be introduced with NCC 2022 DO NOT apply until 1 May 2023, however, all provisions of the NCC 2022 will apply to approved developments that have yet to enter into a construct contract prior to 1 May 2023. It is therefore recommended the proposed development is assessed for compliance with all forthcoming requirements.

2. Site Description

Table 1: Site Details

Address	173 & 175 Chisholm Road, Ashtonfield
Title	CP/SP64139 and Lot 102 DP1010923
LGA	Maitland City Council
Site Area	1.78 ha
Land Use Zone	R1 General Residential (Figure 1)
Context	<p>The site, Maitland Private Hospital, is located on the corner of Chisholm Road (north-west) and New England Highway (north-east). There are multiple carparks on site to accommodate employees and visitors. Minimal vegetation exists on and surrounding the site.</p> <p>An isolated corridor of vegetation exists on the northern side of the New England Highway and a second, much smaller, isolated portion of vegetation exists to the immediate east of the site. Surrounding the remainder of the site to the east, south and west, are existing residential properties.</p>
Fire History	The site lies within a local government area with a Fire Danger Index (FDI) rating of 100.

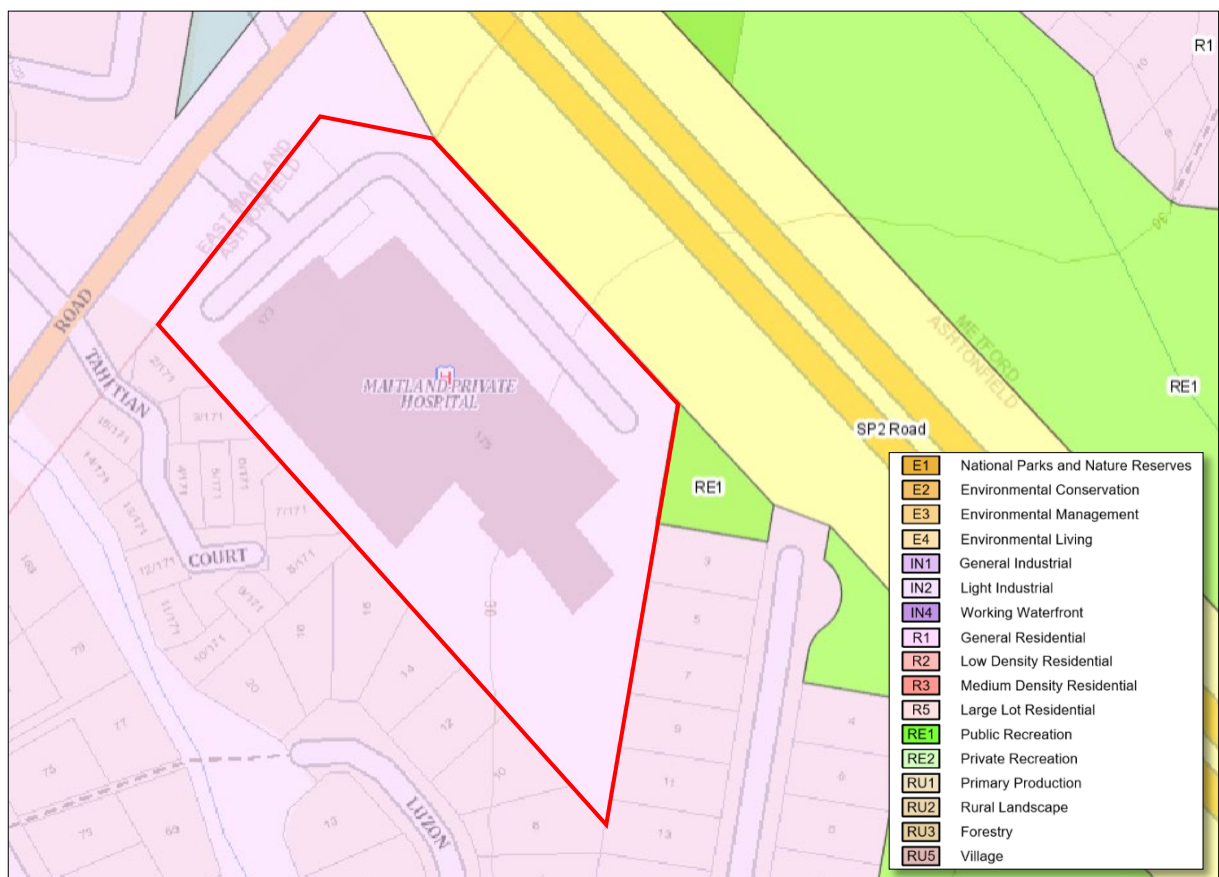


Figure 1: Maitland Local Environmental Plan 2011 (Land Zoning Map Sheet)

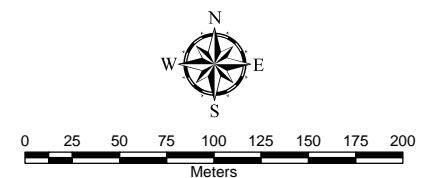
Figure 2

Site Location



- Subject Site
- 100m Buffer
- 140m Buffer

SOURCE:
 Cadastral Boundary: NSW Department of Finance, Services and Innovation 2020
 Watercourse: GeoScience Australia 2015
 Aerial Photo: NearMap 20/12/19

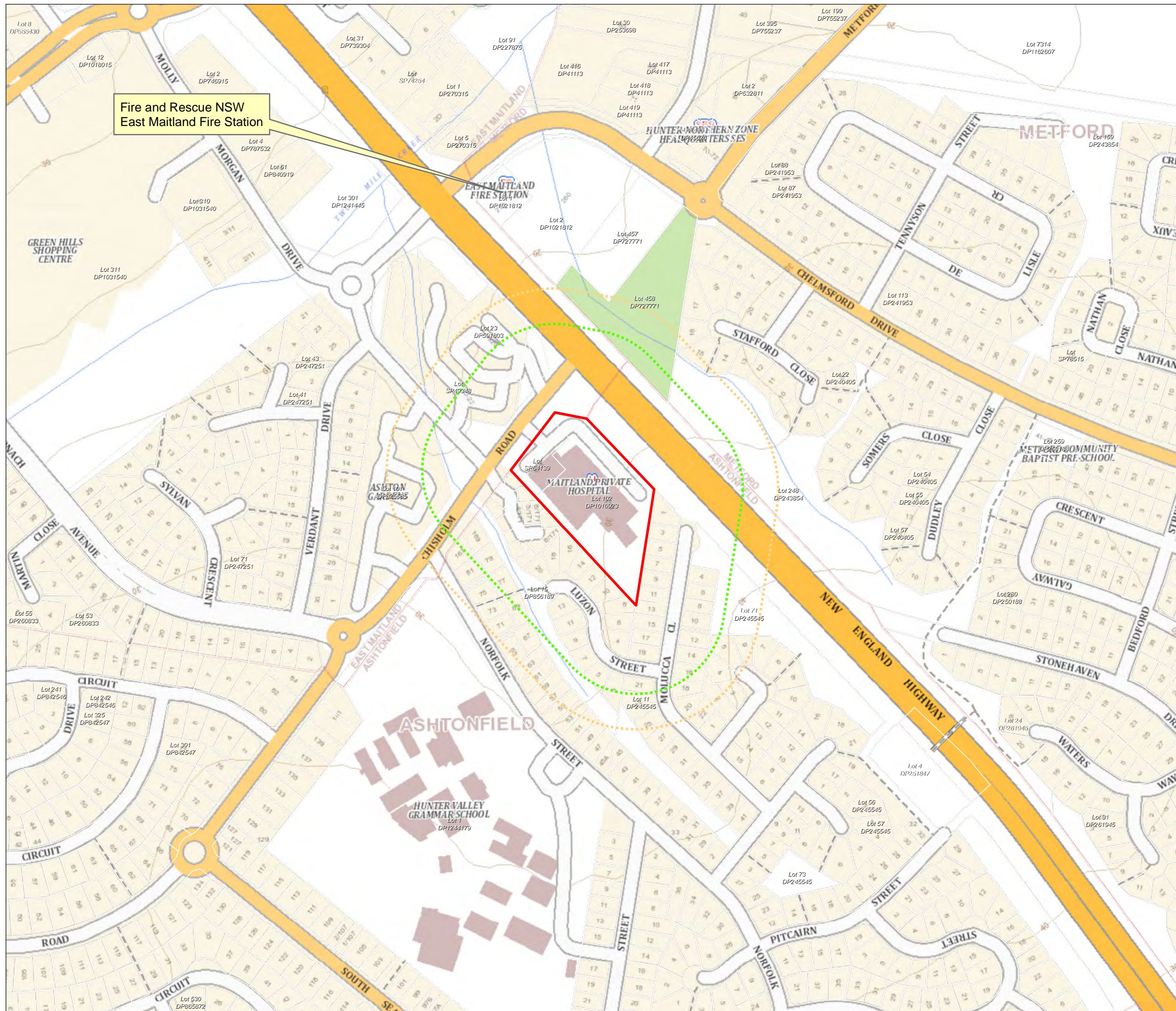


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Fire and Rescue NSW
East Maitland Fire Station

2.1. Bushfire Prone Land

Bushfire activity is prevalent in landscapes that carry fuel and the two predominant bushfire types are grassland and forest fires. Factors such as topographic characteristics and quantity of fuel loads influence the intensity and spread of fire. The scale of a bushfire hazard is tailored to the characteristics of the hazard, the size and characteristics of the affected population, types of land use exposed to bushfire, predicted development growth pressures and other factors affecting bushfire risk.

Figure 3 demonstrates the site is partially mapped as Vegetation Buffer bushfire prone land along the northern, north-eastern and a portion of the eastern boundary. The remainder of the site and the surrounding land to the east, south-east and west, is not mapped as bushfire prone land.

Vegetation Category 1 bushfire prone land exists within and beyond 140m from the proposed site to the north-east and east of the site, although separated by the New England Highway. This is identified as the primary bushfire hazard.

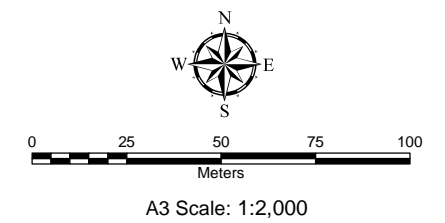
Figure 3

NSW Bush Fire Prone Land



- Subject Site
- 100m Buffer
- 140m Buffer
- Bushfire Prone Land**
 - Vegetation Category 1
 - Vegetation Category 2
 - Buffer

SOURCE:
Cadastral Boundary: NSW Department of Finance,
Services and Innovation 2022
NSW Bush Fire Prone Land: NSW Rural Fire Service
2021
Aerial photo: NearMap 05/12/2022



File:2307-MaitlandPrivateHospital-Fig2-BFPL-230323 Date: 23/03/2023

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2.2. Proposed Development

The proposed development seeks to extend the existing Maitland Private Hospital and provide additional parking spaces within the existing carpark.

The proposed addition of the Maitland Private Hospital includes an additional second level to the existing Oncology building located in the northern corner of the existing site. This also includes the demolition and relocation of existing plant onto the roof of the newly constructed second level.

This development also seeks to provide additional parking spaces within the existing carpark, located in the southern corner of the site, by constructing an upper level (second level).

The proposed development will continue to utilise existing roads for access and egress (i.e. no new roads are required).

Plans of the existing site and proposed development are contained in **Appendix A** and shown in **Figure 4** and **Figure 5**.



Figure 4: Existing Site Plan



Figure 5: Proposed Development

3. Bushfire Hazard Assessment

3.1. Vegetation Assessment

Vegetation classification over the site and surrounding area has been carried out as follows:

- ❑ Aerial Photograph Interpretation to map the vegetation classification
- ❑ Reference to NSW State Vegetation Type, Department of Planning and Environment 2022 (**Figure 6**); and
- ❑ Site inspection completed by Stuart Greville on 20 March 2023 (**Plates 1-8**).

In accordance with PBP 2019, an assessment of the vegetation over a distance of 100m in all directions from the site was undertaken. Vegetation that may be considered a bushfire hazard was identified in all directions from the development footprint. The vegetation classification is based on the revised Table 2.3 in AS3959-2018 and Appendix 1 of PBP 2019. The unmanaged fuel loads detailed in the *RFS Comprehensive Fuel Loads Fact Sheet* (March 2019) have been adopted for the purpose of assessing the bushfire hazard. The findings of the site inspection were compared to the available vegetation mapping. The inconsistencies between the mapping sources and hazardous vegetation mapped on the NSW RFS Bushfire Prone Land maps were quantified during the site inspection.

3.1.1. Reliability Assessment

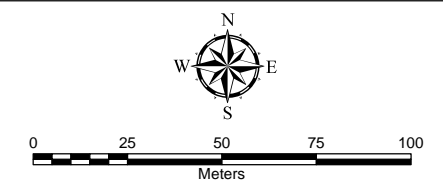
Although the bushfire prone land mapping is intended to be regularly updated, land use and vegetation cover that contribute to bushfire hazards are subject to change. A reliability assessment was undertaken for the subject site and all land within 140m. In this instance the bushfire prone land mapping is not consistent with existing vegetation present within the site.

Figure 6
**NSW State
Vegetation
Type (Class)**



- Subject Site
 - 100m Buffer
 - 140m Buffer
- Vegetation Class**
- Coastal Floodplain Wetlands
 - Hunter-Macleay Dry Sclerophyll Forests
 - Northern Hinterland Wet Sclerophyll Forests
 - Not native vegetation

SOURCE:
Cadastral Boundary: NSW Department of Finance,
Services and Innovation 2022
NSW Vegetation Type: NSW Department of
Planning, Industry and Environment 2022
Aerial Photo: NearMap 05/12/2022



A3 Scale: 1:2,000

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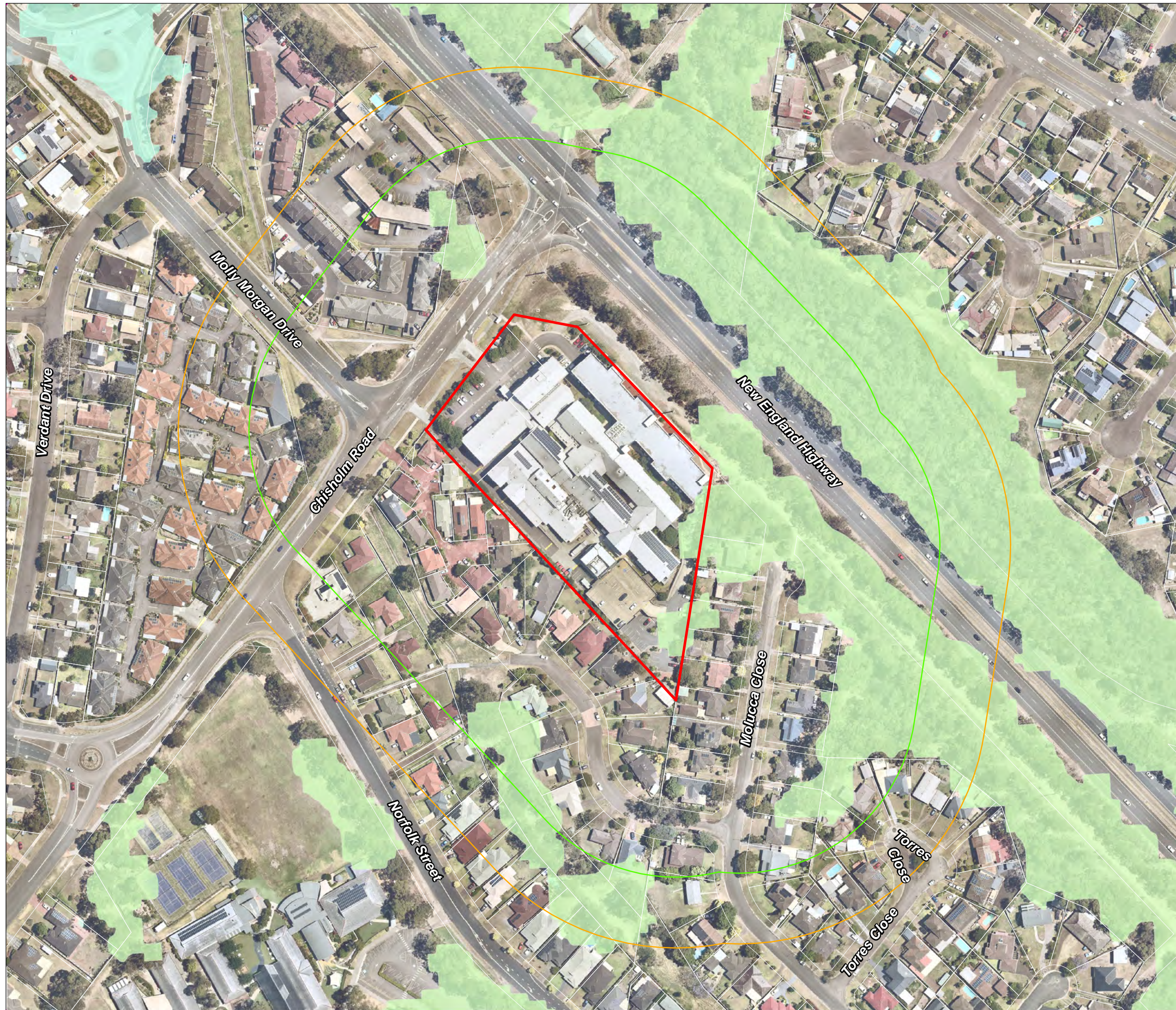




Plate 1: Northern boundary – emergency vehicle access available between highway and hospital



Plate 2: Narrow corridor of forest vegetation between site and New England Highway (within road reserve – T5)



Plate 3: Proposed additions located above the existing north west corner of Hospital



Plate 4: Primary *forest* bushfire hazard located on the northern side of the New England Highway



Plate 5: The New England Highway separates the primary forest hazard from the site (T1)



Plate 6: Direct access from the main Hospital car park to the track north of the building is available



Plate 7: Unauthorised access to the northern access track is able to prevented by a lockable gate



Plate 8: Direct access to Molucca Close from the access track – providing a continuous path from the Hospital car park to a public road

3.2. Slope Assessment

The slope assessment was undertaken as follows:

- ❑ Review of LiDAR point cloud data – including DEM (NSW LPI);
- ❑ Detail survey of existing and design contours; and
- ❑ Site inspection on 20 March 2023 completed by Stuart Greville (BPA).

An assessment of the slope over a distance of 140m in the hazard direction from the site boundary was undertaken. The effective slope was then calculated under the classified vegetation where there was a fire run greater than 50m. The topography of the site has been evaluated to identify both the average slope and by identifying the maximum slope present. These values help determine the level of gradient which will most significantly influence the fire behaviour of the site.

The effective slope in all directions is shown in **Figure 7**, **Figure 8** and **Table 2**.

The final bushfire hazard assessment defining vegetation classifications and effective slope is shown in **Figure 9**.

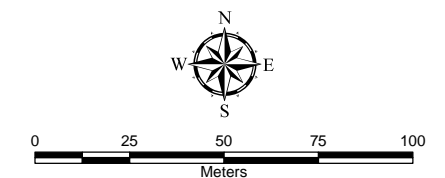
Figure 7

Digital Elevation Model



- Subject Site
- 100m Buffer
- 140m Buffer
- Contour (10m)
- Contour (2m)
- Elevation (AHD)
 - High : 49m
 - Low : 13m

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Surface analysis: Derived from Newcastle201202-LID1-AHD_3686372_56_0002_0002_1m: © Department Finance, Services and Innovation 2012



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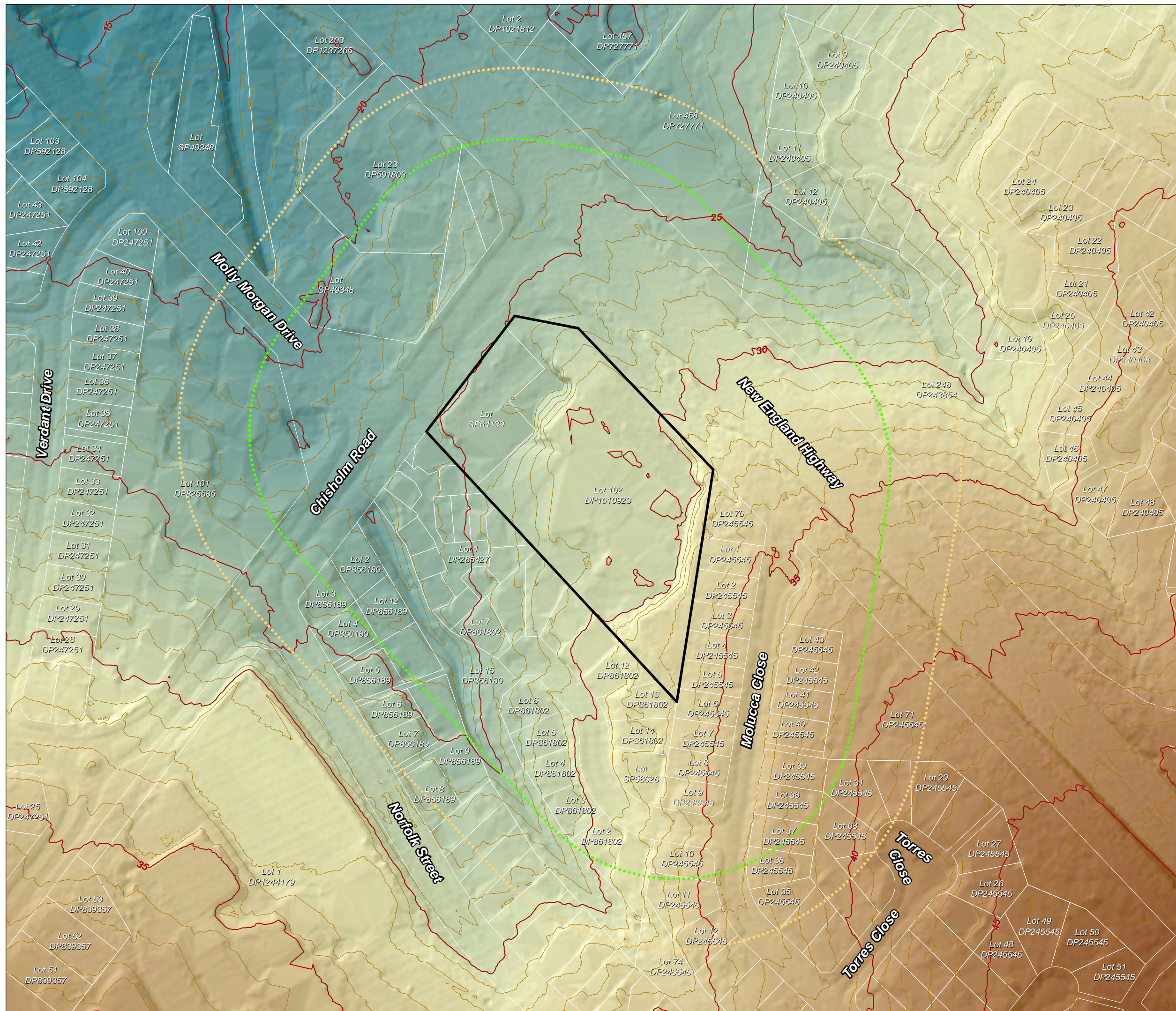
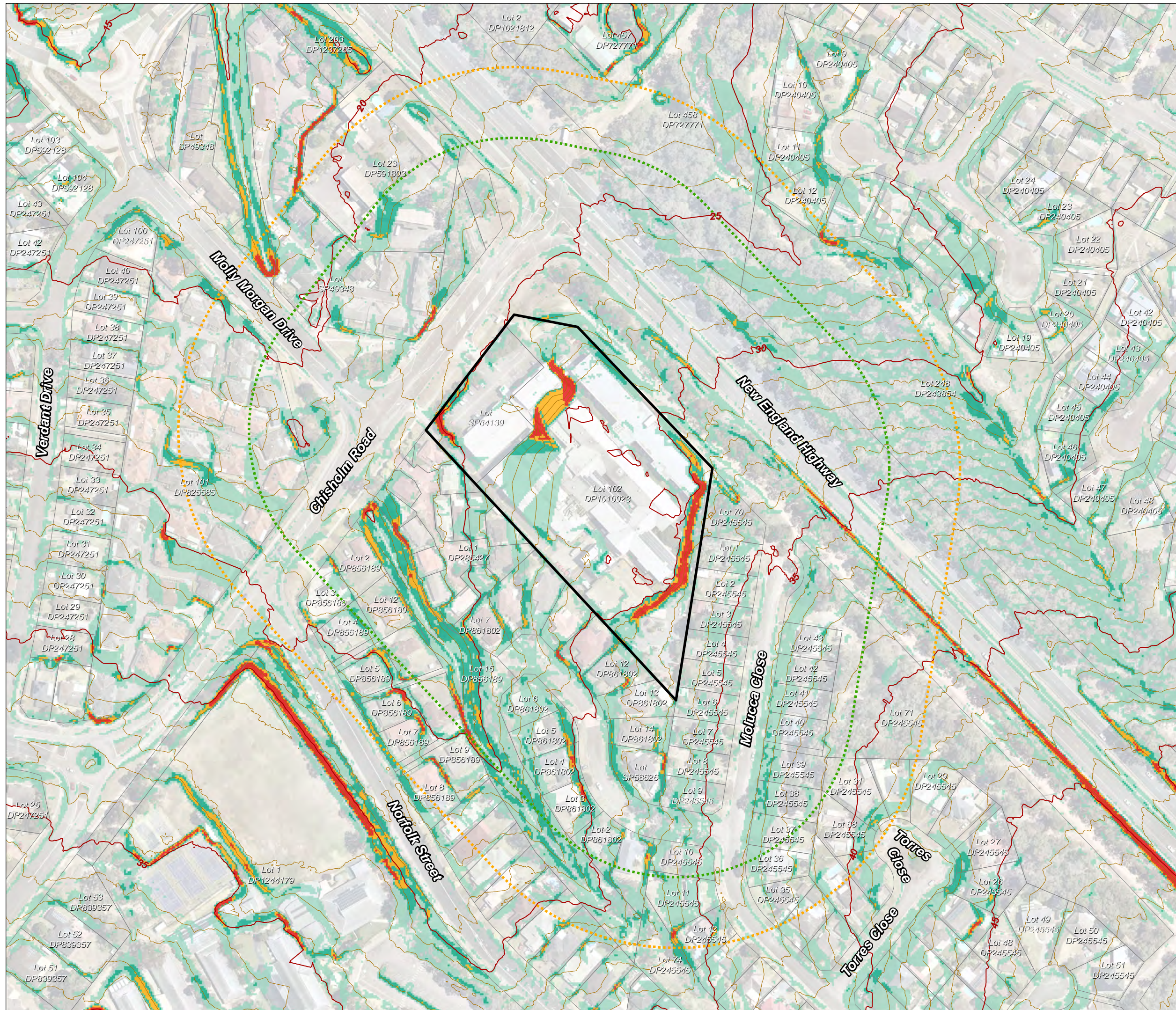


Figure 8

Slope Analysis: LiDAR



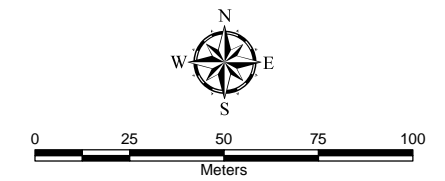
Legend

- Subject Site
- 100m Buffer
- 140m Buffer
- Contour (10m)
- Contour (2m)

Slope

- 0° - 5°
- 5° - 10°
- 10° - 15°
- 15° - 20°
- >20°

SOURCE:
 Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
 Aerial Photo: Nearmap 05/12/2022
 Surface analysis: Derived from Newcastle201202-LID1-AHD_3686372_56_0002_0002_1m; © Department Finance, Services and Innovation 2012



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3.3. Significant Environmental Features

The recommended bushfire protection measures have been designed to avoid any unacceptable impacts on a significant environmental feature. All recommended APZs do not disturb remnant forest vegetation and contained within the modified portions of the site; currently exotic grassland.

3.4. Threatened Species, populations or ecological communities

The area of the site to be affected by the proposed development has been identified to avoid impact on any threatened species, population or EEC. All bushfire mitigation measures; including APZs will consider the existing and potential biodiversity values to avoid impact where possible.

3.5. Aboriginal Objects

A search of the AHIMS database (results contained in **Appendix C**) revealed there are no Aboriginal sites or places recorded within 200m of the site. All bushfire mitigation measures, such as APZs have considered this and been designed to avoid disturbing any artefacts if identified.

3.6. Results

All vegetation identified within the current Bush Fire Prone Land map was confirmed during the site inspection.

Vegetation located to the north- east and east within 140m of the site was confirmed as a *forest* formation, namely *Hunter Macleay Dry Sclerophyll Forest*. Whilst the forest is separated from the site by the New England Highway, it remains the primary bushfire hazard.

An approximately 13m wide corridor of *forest* vegetation identified as *Hunter Macleay Dry Sclerophyll Forest*, also exists approximately 20m from the sites north-eastern boundary, lining the southern side of the New England Highway. Additionally, an isolated section of *forest*, approximately 812m², exists to the immediate east of the site, is separated by Molucca Close, before continuing further east within and beyond 140m of the site.

Residential properties exist to the east, south, west and north-west within and beyond 140m of the site. According to PBP 2019, this is deemed cleared / managed land and does not require consideration of an assessment.

The results of hazard assessment are detailed in **Table 2** and shown in **Figure 9**.



Table 2: Slope and Vegetation Assessment Results

Transect	Vegetation or Other Infrastructure	Vegetation Classification (PBP 2019)	Slope
T1 North-east	Forest vegetation north-east of the site separated by the New England Highway, identified as the primary bushfire hazard	<i>Forest</i> (Hunter Macleay Dry Sclerophyll Forest)	3.3° Downslope
T2 East	Forest vegetation to the east of the site, separated by the New England Highway, identified as the primary bushfire hazard	<i>Forest</i> (Hunter Macleay Dry Sclerophyll Forest)	3.2° Downslope
T3 East	Corridor of forest vegetation south-east of the site separated by residential properties and Molucca Close	<i>Forest</i> (Hunter Macleay Dry Sclerophyll Forest)	-3.1° Upslope
T4 North-east	Edge of the forest vegetation on the southern side of the New England Highway to the edge of forest vegetation on the northern side of the New England Highway	Excluded (Existing Road)	-0.5° Upslope
T5 South	Narrow corridor approximately 13m wide of forest vegetation lining the New England Highway	<i>Forest</i> (Hunter Macleay Dry Sclerophyll Forest)	2.2° Downslope
T6 South	Cleared land approximately 20m wide under the existing overhead electricity transmission lines that separates the site and a narrow corridor of forest vegetation	Excluded (Existing Road)	2.0° Downslope
T7 South	Cleared land under the existing overhead electricity transmission lines and forest vegetation from the sites north-eastern boundary to the primary bushfire hazard on the northern side of the New England Highway	<i>Forest</i> (Hunter Macleay Dry Sclerophyll Forest)	2.2° Downslope

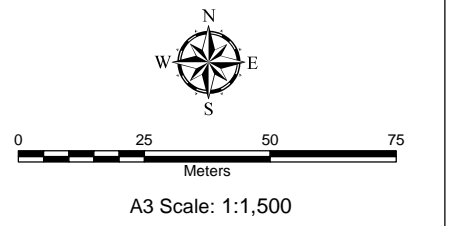
Figure 9

Slope and Vegetation Assessment



- Subject Site
- 100m Buffer
- 140m Buffer
- Contour (5m)
- Contour (1m)
- Proposed Extension
- Cleared / Managed Land
- Forest (Hunter Macleay DSF and Grassland)

SOURCE:
 Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
 Aerial Photo: Nearmap 05/12/2022
 Vegetation: Department of the Environment and Energy by Parsons Brinckerhoff Pty Ltd 2014
 Surface analysis: Derived from Newcastle201202-LID1-AHD_3686372_56_0002_0002_1m: © Department Finance, Services and Innovation 2012



File:2307-MaitlandPrivateHospital-Fig6-SlopeVeg-230323 Date: 23/03/2023

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4. Bushfire Protection Measures

This Bushfire Assessment Report (BAR) has adopted the methodology to determine the appropriate Bushfire Protection Measures (BPMs) detailed in PBP 2019. As part of the BAR, the recommended BPMs demonstrate the aims and objectives of PBP 2019 have been satisfied; including the matters considered by the RFS necessary to protect persons, property and the environment from the danger that may arise from a bushfire.

- APZs
- Access
- Water Supply and Utilities
- Building Construction and Design
- Landscaping
- Emergency Management Arrangements

4.1. Asset Protection Zones

An APZ is an area surrounding a development that is managed to reduce the bushfire hazard to an acceptable level to mitigate the risk to life and property. The required width of the APZ varies with slope and the type of hazard. An APZ can consist of both an inner protection area (IPA) and an outer protection area (OPA). In this instance the entire APZ and the balance of the development site shall be managed as an IPA.

An APZ can include the following:

- Lawns;
- Discontinuous gardens;
- Swimming pools;
- Roads, driveways and managed verges;
- Unattached non-combustible garages with suitable separation from the dwelling;
- Open space / parkland; and
- Car parking.

The presence of a few shrubs or trees in the APZ is acceptable provided that they:

- Do not touch or overhang any buildings;
- Are well spread out and 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 any dwelling so that they will not ignite the dwelling by direct flame contact or radiant heat emission.

Woodpiles, wooden sheds, combustible material storage areas, large areas / quantities of garden mulch, stacked flammable building materials etc. are not recommended in the APZ.

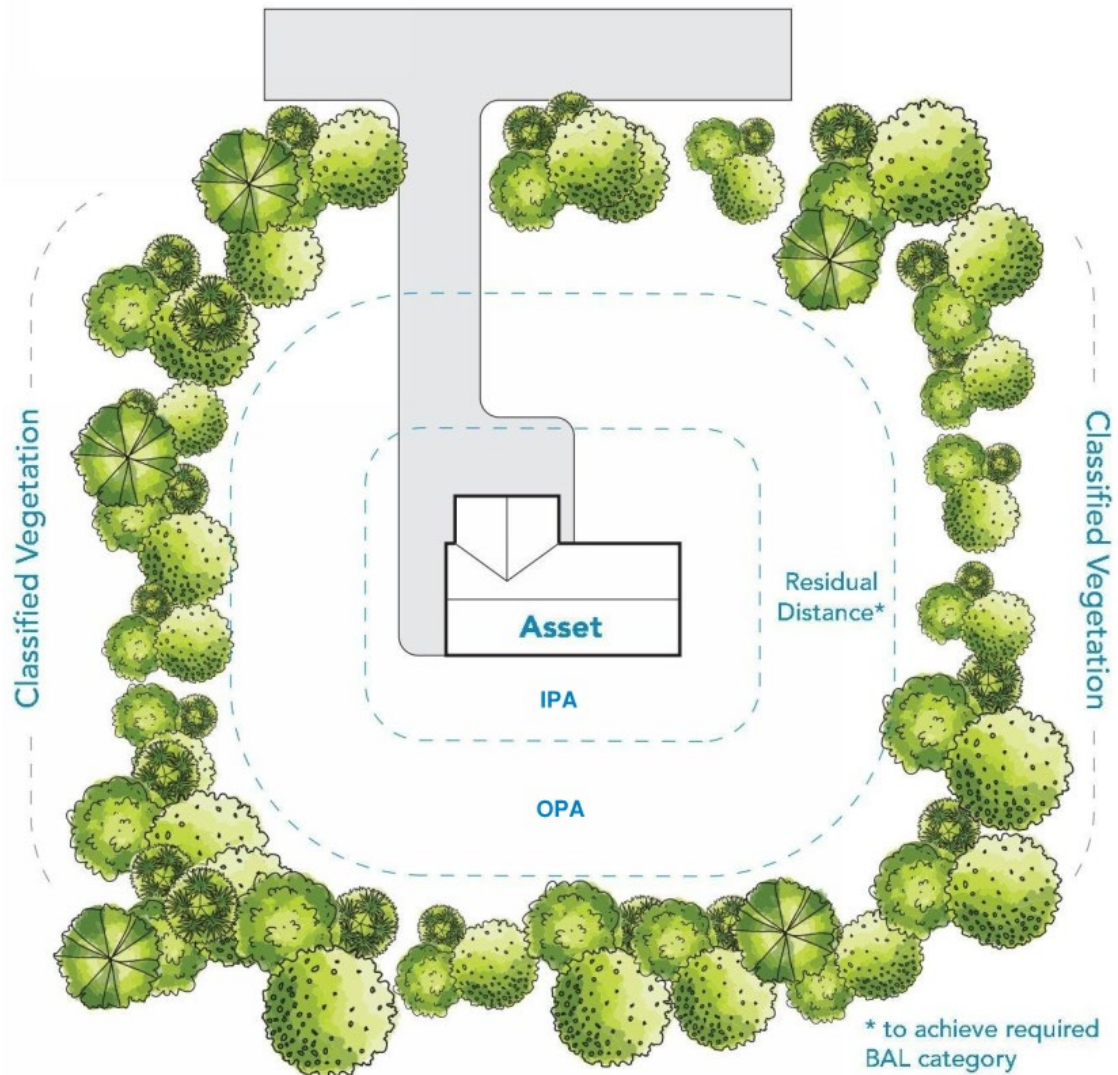


Figure 10: Inner and Outer Asset Protection Zones

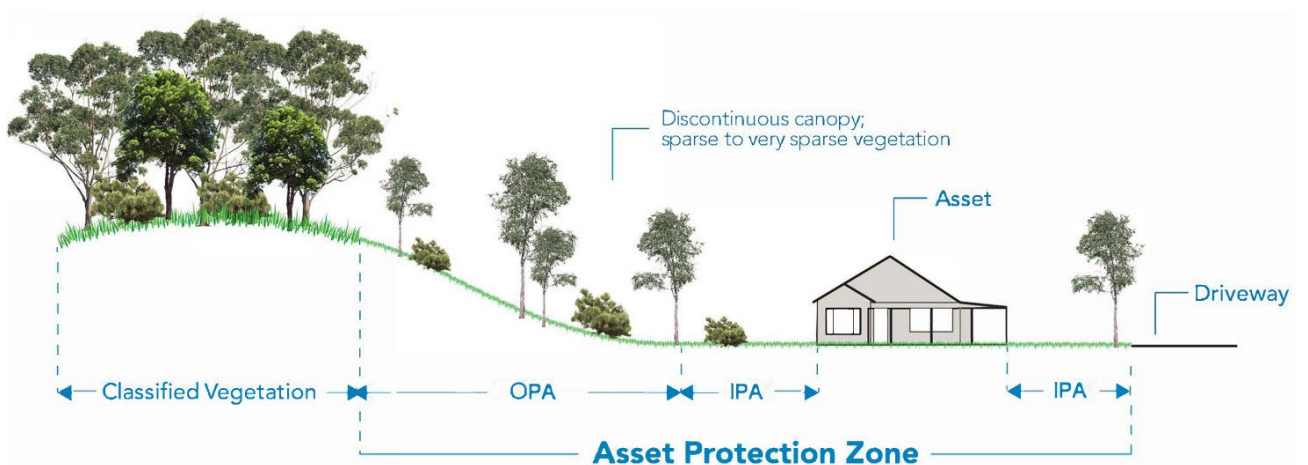


Figure 11: Example of the APZ profile

4.1.1. Special Fire Protection Purposes

Special Fire Protection Purposes (SFPP) developments mean the occupants of the proposed development may be more vulnerable to bush fire attack and therefore may require greater protection from such threats as well as assisted evacuation. SFPPs include hospitals, schools, seniors housing, child care centres and tourist accommodation.

Section 6.8 of PBP 2019 provides protection measures for SFPP developments. In comparison to a standard residential development where radiant heat levels of no greater than 29kW/m^2 are acceptable, radiant heat levels of greater than 10kW/m^2 must not be experienced by on any part of the buildings. To achieve radiant heat levels of less than 10kW/m^2 , APZs of 67m or greater are typically required (based on Table A1.12.1 of PBP 2019) for a *forest* vegetation formation.

Objectives for SFPP developments place emphasis on the space surrounding buildings (as defensible space and APZs) and less reliance on construction standards. SFPP developments are highly dependent on suitable emergency evacuation arrangements, which require greater separation from bush fire threats.

4.1.2. Determining the Appropriate Setbacks

To achieve compliance with the performance criteria for APZs (Table 6.3a), the Acceptable Solutions outlined in Table A1.12.1 of PBP 2019 may be adopted as a deemed-to-satisfy solution.

Alternatively, the appropriate APZ setback may be determined to achieve the Performance Criteria by adopting a performance-based solution. Based on the unique site characteristics identified by the BAR, the intensity of a bushfire event presented as the radiant heat exposure was calculated at several locations throughout the development site using the NBC Bushfire Attack Assessor V4.1. The nominated fuel loads for the respective vegetation classifications as published by the RFS in March 2019 have been used to determine the APZs and the effective slope obtained from the Digital Elevation Model (DEM) for each transect.

As the site lies within the Maitland City Council LGA, it is assessed under a FDI rating of 100. The Detailed Method (Method 2) outlined in Australian Standard *AS3959-2018 Construction of buildings in bushfire prone areas* was used to calculate the potential level of radiant heat flux generated at the nominated locations (see transects T1-T7). To ensure the APZs achieve the intent of Section 6.3 of PBP 2019, the APZs have been determined to ensure all lots are able to accommodate a building that will not be exposed to radiant heat levels exceeding 29kW/m^2 . The NBC Bushfire Attack Assessor report detailing the inputs used is contained in **Appendix D**.

Refer to **Table 3** and **Figure 15** for the required APZs.

Table 3: Required APZ setbacks

Transect	Vegetation Classification (PBP 2019)	Slope	APZ Table A1.12.1	APZ 10kW/m ²
T1 North-east	<i>Forest</i> (Hunter Macleay Dry Sclerophyll Forest)	3.3° Downslope	79m	57m
T2 East	<i>Forest</i> (Hunter Macleay Dry Sclerophyll Forest)	3.2° Downslope	79m	57m
T3 East	<i>Forest</i> (Hunter Macleay Dry Sclerophyll Forest)	-3.1° Upslope	67m	45m
T4 North-east	Excluded (Existing Road)	-0.5° Upslope	N/A	N/A
T5 South	<i>Forest</i> (Hunter Macleay Dry Sclerophyll Forest)	2.2° Downslope	79m	55m
T6 South	Excluded (Existing Road)	2.0° Downslope	N/A	N/A
T7 South	<i>Forest</i> (Hunter Macleay Dry Sclerophyll Forest)	2.2° Downslope	79m	55m

4.3. Access

In the unlikely event of a serious bushfire, it will be essential to ensure that adequate ingress / egress and the provision of defensible space are afforded in the layout. The following design specifications detailed in PBP 2019 are relevant to the proposed development:

- ❑ Internal roads are two-wheel drive all weather roads;
- ❑ internal perimeter roads are provided with a minimum carriageway width of 8m;
- ❑ be through roads, but if unavoidable then dead ends should be not more than 100 metres in length, incorporate a minimum 12 metres turning circle (either in cul-de-sac or T-head formation) and should be clearly sign posted as dead ends;
- ❑ the capacity of road surfaces is sufficient to carry fully loaded fire fighting vehicles (15 tonnes);
- ❑ curves of roads (other than perimeter roads) are a minimum inner radius of 6 metres and minimal in number, to allow for rapid access and egress;
- ❑ maximum grade for sealed roads do not exceed 12.5°;
- ❑ have a minimum vertical clearance to a height of four metres at all times;

There are two access points provided from Chisholm Road to the site, one being the existing main hospital entrance and the other being the existing service entry also on Chisholm Road. Whilst the existing main hospital entrance provides access to all existing and proposed building it remains independent of the service entry / road. The service entry runs along the south-western boundary providing access to the service loading dock. Due to the height of the existing elevated car park, access beyond the loading dock to the rear car park is only accessible for vehicles less than 2.2m high.

In an emergency incident (bushfire), emergency vehicles would utilise the existing entrances to the hospital as well as the 20m wide cleared land (under the existing overhead electricity transmission lines) along the sites north-eastern boundary. It was observed on site that the rear area of the site including the new car park is inaccessible by large (tall) vehicles; including RFS category 1 appliances. Access is restricted by the low clearance created from the existing two level car park on the southern side of the site, and the recent additions to the hospital on the north east corner.

Notwithstanding, direct and immediate access to the proposed additions to the Hospital is available from the front car park and the adjoining access track.

In this instance the proposed access arrangements are considered to be acceptable and complies with the relevant Performance Criteria; with regard to PBP 2019

Refer to **Appendix A** for proposed development showing access.

4.3.1. SFPP Development Access – PBP Addendum 2022

An additional specific requirement for certain Class 9 buildings; including the proposed development (*health-care building*) has been introduced to align with the NCC 2022. The 2022 Addendum to PBP 2019 requires firefighting vehicles to have safe, all-weather access to structures and hazardous vegetation. Table 3 of the 2022 Addendum outlines the Acceptable Solutions to meet the Performance Criteria.

In this instance, the existing Maitland Private Hospital is already unable to provide suitable access around the entire building in accordance with the Acceptable Solutions; specifically, continuous access for emergency vehicles around the entire building is not possible. This is primarily due to the low level parking areas on the northern boundary and into the rear southern carpark.

The proposed development will not improve or worsen the current situation as the proposed additions are located above existing structures. An existing informal track located within the New England Highway lies under and beside the overhead electricity (OHE) transmission lines directly to the north of the site; as indicated by the blue dashed line in **Figure 12**. The access track is required to be

maintained to provide access for maintenance to the OHE. The track is variable in width, but no less than 4m in most areas. The cleared area alongside the track is on average 20m or greater. The cleared width of the track narrows where it re-enters the Hospital car park to the north (**Plate 9**) and Molucca Close to the south (**Plate 10**).

Whilst the access track may also function as a fire trail, it is not located within the subject site. Nevertheless, it does provide immediate access to the existing (and proposed) building including emergency exits and fire hydrants. The track provides defensible space between the nearest threat and is accessible from multiple routes; including Chisholm Road to the north and Pitcairn Street further to the south.

Overall, the access track north of the subject site is greater than 6m wide and is within 18m of the building. Direct pedestrian access is available to the car park and external emergency exits. However, the access tracks cannot provide a continuous path of travel around the entire building and the track is not within the subject site. Furthermore, the load capacity of the unformed track cannot be verified.

This being said, the access track is the safest available option to provide firefighting vehicles with a safe vantage to the buildings (existing and proposed) and is separated from the nearest hazardous vegetation. As an alternative to the Acceptable Solutions, it is considered the available option being the use of the access track satisfies the Performance Criteria in this instance.



Figure 12: Indicative location of emergency vehicle access around Maitland Private Hospital



Plate 9: Access to the northern 'fire trail' is provided directly from the north carpark.



Plate 10: The 'fire trail' is directly accessible (with no gates) to Molucca Close



Plate 11: The fire trail adjoining the northern elevation is roughly formed and unsealed, but a minimum 6m wide in most areas



Plate 12: The fire trail adjoining the site is serviceable for use by emergency services



Plate 13: A double head fire hydrant is located on the northern façade of the existing building

4.4. Emergency Services

There is a NSW Fire and Rescue service located at 1 Chelmsford Drive, Metford, approximately 400m (1 min) drive away from the site (**Figure 12**). A second NSW Rural Fire Service station is located at 110 Mount Vincent Road, East Maitland approximately 3.7km (6 mins) from the site (**Figure 13**). In an emergency, either or both of these services could attend the site.

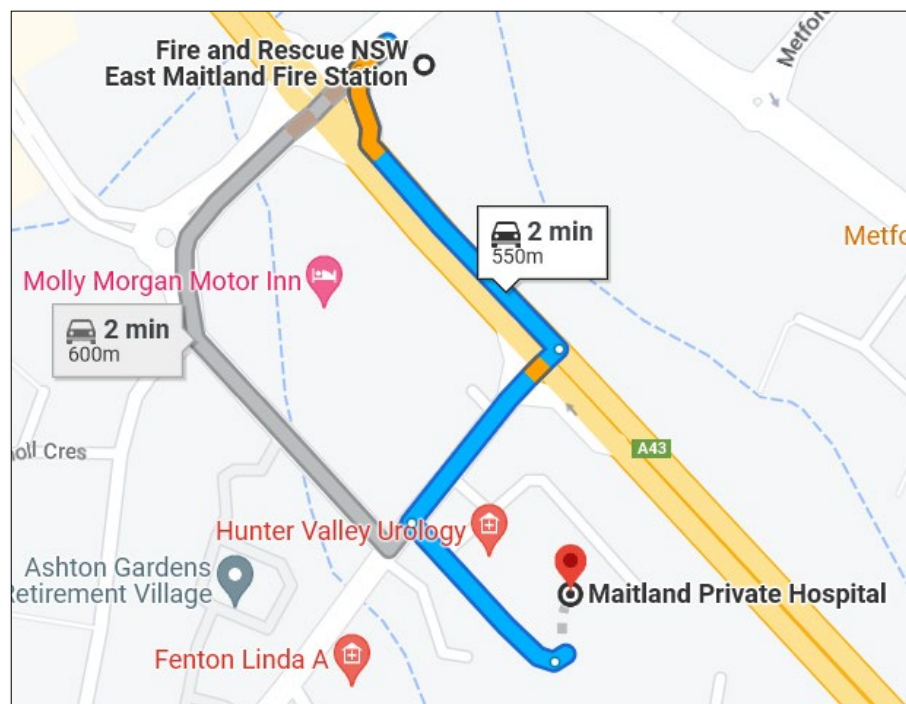


Figure 13: NSW Fire & Rescue - East Maitland

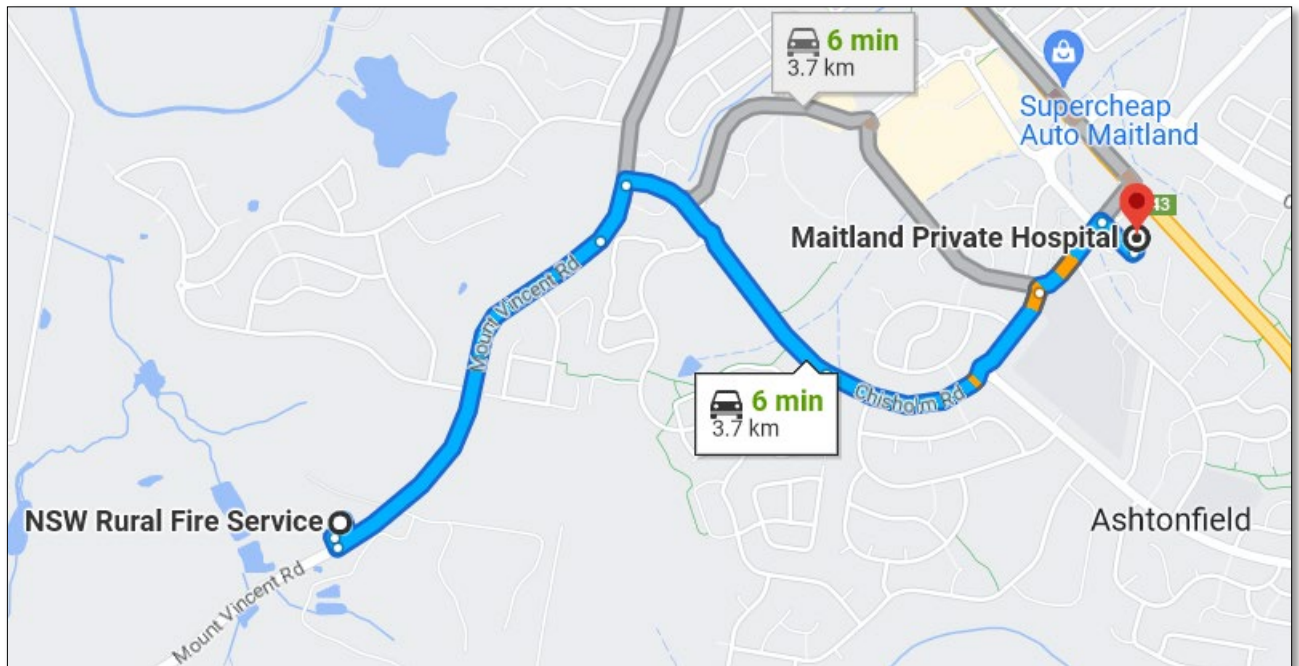


Figure 14: NSW Rural Fire Service - East Maitland

4.5. Services - water, electricity and gas

4.5.1. Water

Fire hydrant spacing, sizing and pressure should comply with AS 2419.1-2005. Hydrants are not to be located within any road carriageway.

Multiple double head hydrants are located throughout the site; including a hydrant on the northern elevation of the building.

The new additions will be connected to the internal reticulated water supply.

4.5.2. Water Supply – PBP Addendum 2022

Further to compliance with Table 6.8c of PBP 2019, the proposed additions are able to comply with Table 4 of PBP Addendum 2022 as a reticulated water supply is provided.

4.5.3. Electricity

All new electricity services will be located underground.

4.5.4. Gas

Any reticulated or bottled gas should be installed and maintained according to the requirements of the relevant authorities and AS 159-2002. It is expected that the location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.

4.6. Construction Standards - Bushfire Attack Level

All buildings constructed within the site are recommended to satisfy the Performance Requirements of the National Construction Code: Building Code of Australia (BCA).

Accordingly, all forthcoming habitable buildings shall satisfy the requirements of Part 3.7.4 of the BCA. The *Deemed-to-Satisfy* (DTS) provision of the NCC can only be achieved if buildings in bushfire prone areas are constructed in accordance with Australian Standard *AS3959-2018 Construction of buildings in bushfire prone areas*. Alternatively, the DTS provisions can also be achieved if the habitable building is constructed in accordance with the NASH Standard 'Steel Framed Construction in Bushfire Areas'.

Building design and the materials used for construction of future dwellings should be chosen based on the information contained within AS3959-2018, and accordingly the designer/architect should be made aware of this recommendation.

The determinations of the appropriate bushfire attack level (BAL) is based on the maximum potential radiant heat exposure. BALs are based upon parameters such as weather modelling, fire-line intensity, flame length calculations, as well as vegetation and fuel load analysis. The determination of the BAL is derived by assessing the:

- ❑ Relevant FDI = 100;
- ❑ Flame temperature = 1090K;
- ❑ Slope = variable;
- ❑ Vegetation classification = *forest*; and
- ❑ Building location.

The Detailed Method (Method 2) outlined in AS3959-2018 was used to calculate the Bushfire Attack Level (BAL) for the development. The NBC Bushfire Attack Assessor V4.1 was used to model the bushfire radiant heat exposure which determined the applicable BAL. All sites with the development layout are exposed to BAL-29 or less.

The greatest bushfire hazard was found to the north-east and east of the site being a *forest*.

4.6.1. Construction Standards – PBP Addendum 2022

In accordance with Table 2 of the PBP Addendum 2022, a construction level of BAL-19 is applied to all new additions. Accordingly, the proposed additions shall be constructed in accordance with Sections 3 and 6 of AS3959-2018.

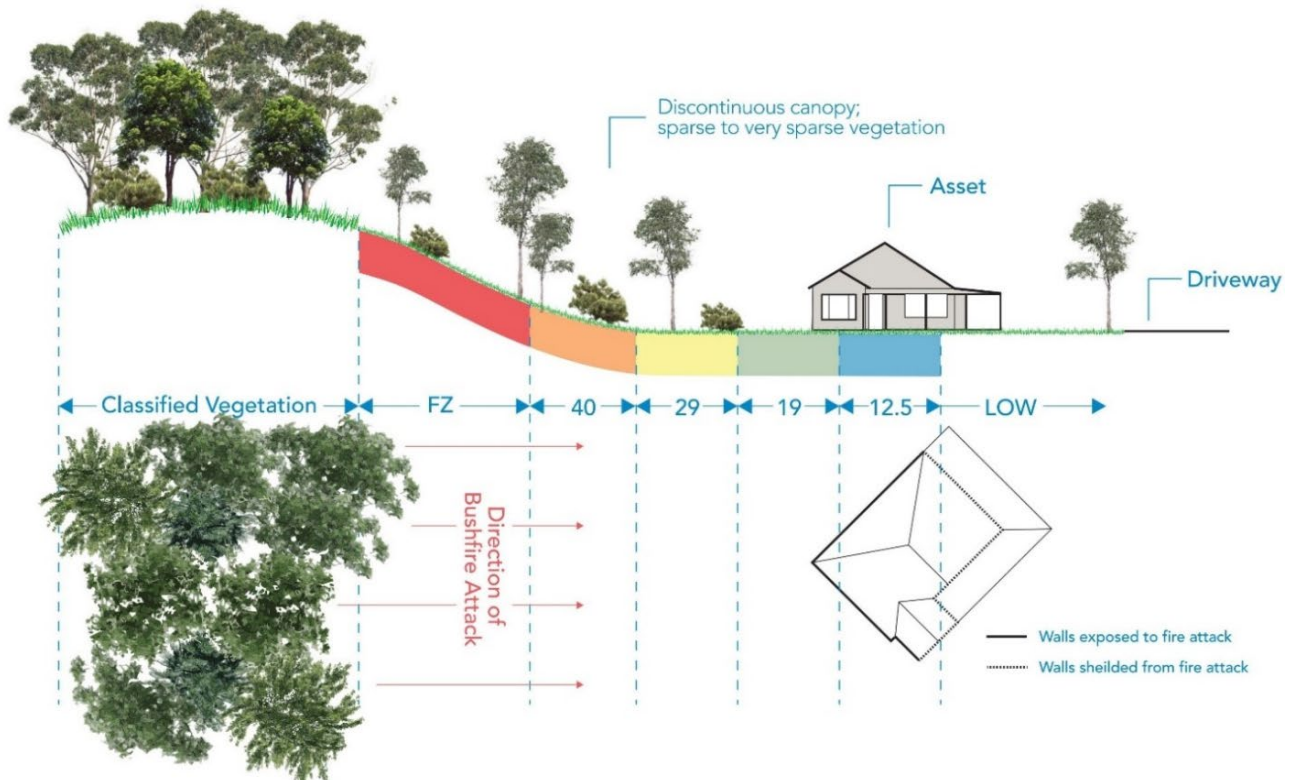


Figure 15: BAL example



Table 4: Bushfire Attack Levels

Transect	Vegetation Classification (PBP 2019)	Slope	APZ Required (10kW/m ²)	Distance from Hazard	Bushfire Attack Level (BAL)
T1 North-east	Forest (Hunter Macleay DSF)	3.3° Downslope	57m	0m-<17m	BAL-FZ
				17m-<19m	BAL-40
				19m-<27m	BAL-29
				27m-<37m	BAL-19
				37m-<100m	BAL-12.5
				57m	10kW/m ²
T2 East	Forest (Hunter Macleay DSF)	3.2° Downslope	57m	0m-<17m	BAL-FZ
				17m-<19m	BAL-40
				19m-<27m	BAL-29
				27m-<37m	BAL-19
				37m-<100m	BAL-12.5
				57m	10kW/m ²
T3 East	Forest (Hunter Macleay DSF)	-3.1° Upslope	45m	0m-<12m	BAL-FZ
				12m-<14m	BAL-40
				14m-<20m	BAL-29
				20m-<28m	BAL-19
				28m-<100m	BAL-12.5
				45m	10kW/m ²
T5 South	Forest (Hunter Macleay DSF)	2.2° Downslope	55m	0m-<16m	BAL-FZ
				16m-<18m	BAL-40
				18m-<25m	BAL-29
				25m-<35m	BAL-19
				35m-<100m	BAL-12.5
				55m	10kW/m ²
T7 South	Forest (Hunter Macleay DSF)	2.2° Downslope	55m	0m-<16m	BAL-FZ
				16m-<18m	BAL-40
				18m-<25m	BAL-29
				25m-<35m	BAL-19
				35m-<100m	BAL-12.5
				55m	10kW/m ²
T4 & T6	Excluded (Existing Roads)	Varied	N/A	N/A	BAL-LOW

Figure 16

BAL Contour Plan

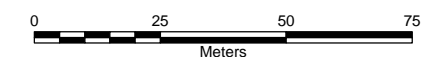


- Subject Site
- 100m Buffer
- 140m Buffer
- 10kW/m2

Required Bushfire Attack Levels (AS3959-2018)

- BAL - FZ
- BAL - 40
- BAL - 29
- BAL - 19
- BAL - 12.5

SOURCE:
 Cadastral Boundary: NSW Department of Finance,
 Services and Innovation 2022
 Aerial photo: NearMap 05/12/2022

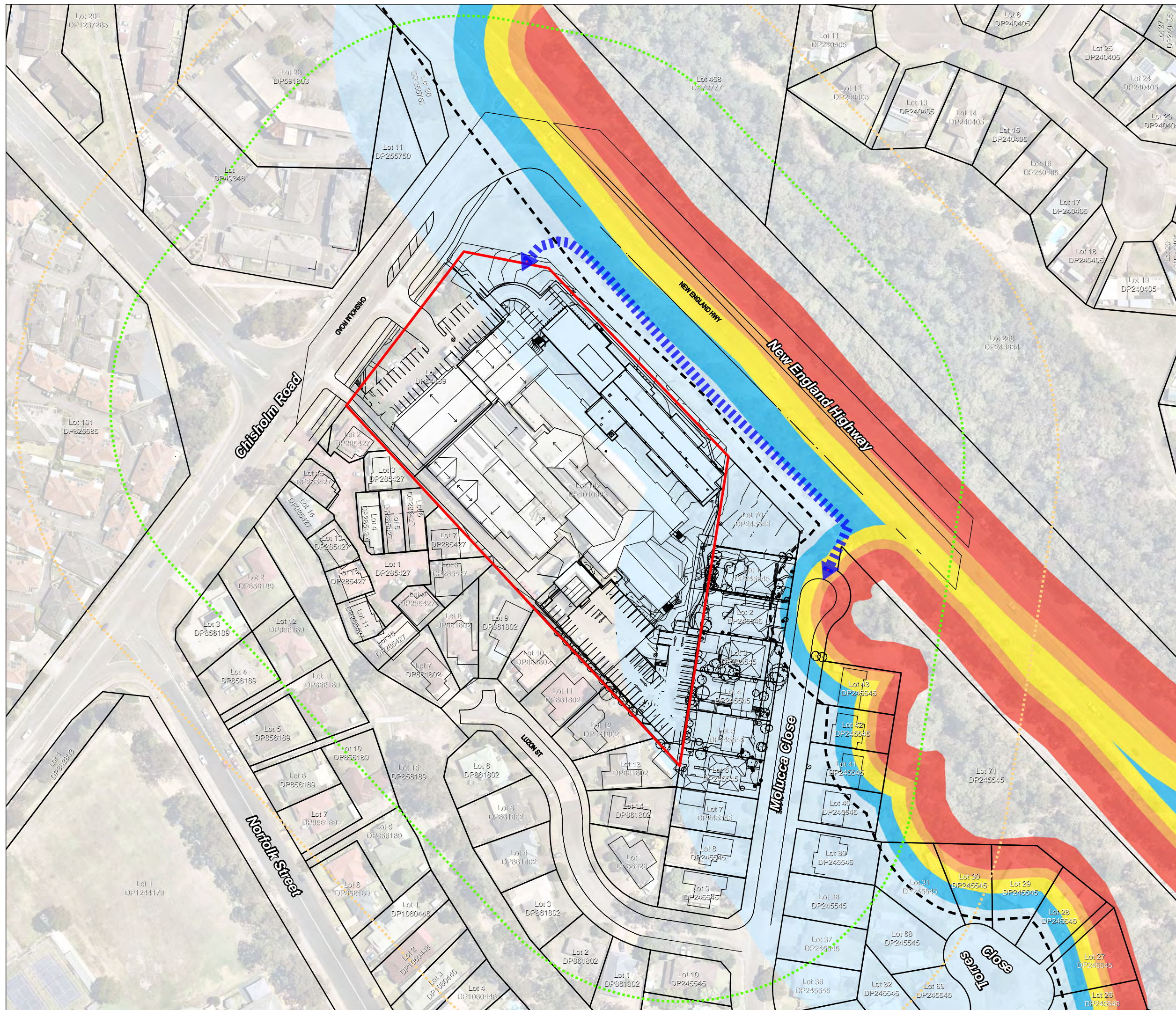


A3 Scale: 1:1,500

File:2307-MaitlandPrivateHospital-Fig7-BALs_230323 Date: 23/03/2023

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4.7. Landscaping and Vegetation Management

In APZs and IPAs, the design and management of the landscaped areas in the vicinity of buildings have the potential to improve the chances of survival of people and buildings. Reduction of fuel does not require the removal of all vegetation. Trees and plants can provide some bushfire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns.

Generally landscaping in and around a bushfire hazard should consider the following:

- Priority given to retaining species that have a low flammability;
- Priority given to retaining species which do not drop much litter in the bushfire season and which do not drop litter that persists as ground fuel in the bush fire season;
- Priority given to retaining smooth barked species over stringy bark; and
- Create discontinuous or gaps in the vegetation to slow down or break the progress of fire towards the dwellings.

Landscaping within APZs and IPAs should give due regard to fire retardant plants and ensure that fuel loads do not accumulate as a result of the selected plant varieties.

The principles of landscaping for bushfire protection aim to:

- Prevent flame impingement on dwellings;
- Provide a defendable space for property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed.

Plants that are less flammable have the following features;

- High moisture content;
- High levels of salt;
- Low volatile oil content of leaves;
- Smooth barks without 'ribbons' hanging from branches or trunks; and
- Dense crown and elevated branches.

Avoiding understorey planting and regular trimming of the lower limbs of trees also assists in reducing fire penetration into the canopy. Rainforest species such as Syzygium and figs are preferred to species with high fine fuel and/or oil content.

Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage ground fire to spread up to, and then through the crown of trees.

Consideration should be given to vegetation fuel loads present on site with particular attention to APZs.

Careful thought must be given to the type and physical location of any proposed site landscaping. Inappropriately selected and positioned vegetation has the potential to 'replace' any previously removed fuel load.

Bearing in mind the desired aesthetic and environment sought by site landscaping, some basic principles have been recommended to help minimise the chance of such works contributing to the potential hazard on site.

Whilst it is recognised that fire-retardant plant species are not always the most aesthetically pleasing choice for site landscaping, the need for adequate protection of life and property requires that a suitable balance between visual and safety concerns be considered.

It is reiterated again that it is essential that any landscaped areas and surrounds are subject to ongoing fuel management and reduction to ensure that fine fuels do not build up.

5. Conclusion and Recommendations

Bushfire Planning Australia has prepared a Bushfire Assessment Report for the proposed additions to the existing Maitland Private Hospital located at 173 -175 Chisholm Road, Ashtonfield.

This BAR found the site was exposed to a low bushfire hazard located primarily to the north-east and east of the site which is mapped as Category 1 Vegetation in the Maitland City Council Bush Fire Prone Land Map.

This BAR has been prepared in accordance with the submission requirements detailed in Appendix 2 of PBP 2019 and has demonstrated the proposed expansion satisfies the Aims and Objectives of PBP 2019, including the Specific Objectives for SFPP developments, in addition to the impending changes and implications of additional bushfire protection measures for Class 9 buildings (including hospitals) described in G5D4 of the National Construction Code 2022 (NCC 2022) and the associated Addendum to PBP 2019 that will both become effective on 1 May 2023.

The following key recommendations have been designed to enable the proposed development to achieve Performance Criteria for SFPP developments detailed in Section 6.8 of PBP 2019:

1. The entire site is to be managed as an Inner Protection Area (IPA) as outlined within Appendix 4 of PBP 2019 and the RFS document *Standards for asset protection zones*;
2. All future buildings to be constructed on the proposed sites shall have due regard to the specific considerations given in the National Construction Code: Building Code of Australia (NCC) which makes specific reference to Australian Standard AS3959-2018 Construction of buildings in bushfire prone areas (AS3959-2018) and the NASH Standard Steel Framed Construction in Bushfire Prone Areas. The proposed additions shall be constructed in accordance with Section 3 and 6 of AS3959-2018; being BAL-19;
3. The proposed additions to the existing building are to be connected to a reliable water supply network and that suitable fire hydrants are located throughout the development site that are clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure shall comply with AS2419.1 2005 and section 6.8.3 of PBP 2019;
4. Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site; and
5. A Bushfire Emergency Management and Evacuation Plan (BEMEP) shall be prepared that is consistent with the RFS Guidelines 'Development Planning – A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan December 2014'.

This assessment has been made based on the bushfire hazards observed in and around the site at the time of inspection and production (March 2023).

Should the above recommendations be implemented, the proposed modification to the approved development will result in a better bushfire outcome as the existing bushfire risk should be suitably mitigated to offer an acceptable level of protection to life and property for those persons and assets occupying the site but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

6. References

- ❑ NSW Rural Fire Service (2005). Standards for Asset Protection Zones. NSW Rural Fire Service.
- ❑ NSW Rural Fire Service (2019). Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.
- ❑ Ramsay, GC and Dawkins, D (1993). Building in Bushfire-prone Areas – Information and Advice. CSIRO and Standards Australia.
- ❑ Rural Fires and Environmental Assessment Legislation Amendment Act 2002.
- ❑ Standards Australia (2018). AS 3959 – 2018: Construction of Buildings in Bushfire-prone Areas.

Appendix A: Architectural Drawings



Sheet List	
Sheet Number	Sheet Name
DA000	COVER PAGE AND DRAWING LIST
DA001	SITE CONTEXT
DA002	EXISTING SITE PLAN
DA010	DEMOLITION PLAN
DA020	PROPOSED - SITE PLAN
DA023	PROPOSED - SECOND FLOOR PLAN
DA024	EXISTING - GL CARPARK
DA025	PROPOSED - UPPER DECK CAR PARK
DA026	PROPOSED - ROOF PLAN
DA030	PROPOSED - ONCOLOGY ELEVATIONS
DA031	PROPOSED - CARPARK ELEVATIONS
DA032	PROPOSED - CARPARK SECTIONS
DA050	PROPOSED - MATERIALS SCHEDULE
DA060	EXISTING - 22 DEC SHADOW DIAGRAMS
DA062	PROPOSED - 22 DEC SHADOW DIAGRAM
DA063	EXISTING - 22 JUNE SHADOW DIAGRAMS
DA064	PROPOSED - 22 JUNE SHADOW DIAGRAM
DA065	EXISTING - 23 SEPT SHADOW DIAGRAMS
DA066	PROPOSED - 22 SEPT SHADOW DIAGRAM
DA067	COMPARISON RENDER

DEVELOPMENT SUMMARY		
GFA		
EXISTING GFA	12145	m ²
PROPOSED GFA	675	m ²
TOTAL GFA	12820	m ²
CAR PARK		
EXISTING CAR PARK	229	
EXISTING ACCESSIBLE CAR PARK	7	
LOST CAR PARK	0	
PROPOSED CAR PARK	63	
PROPOSED ACCESSIBLE CAR...		
TOTAL CAR SPACE	299	
BED NUMBERS		
EXISTING BED	172	
LOST BED		
PROPOSED BED	3	
TOTAL BED	175	

ISSUE	REVISION	DRN	CHK / APP	DATE
ISSUE FOR DA		TC	SS	14.12.2022

CONSULTANTS:




REASON FOR ISSUE
PRELIMINARY

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING ANY WORK OR MARKING OF ANY SHOP DRAWINGS. FIGURED DIMENSIONS MUST BE USED IN PREFERENCE TO SCALED DIMENSIONS. ALL SCALED DIMENSIONS MUST BE VERIFIED ON SITE. THIS DRAWING IS COPYRIGHT AND REMAINS THE PROPERTY OF THE ARCHITECT.

PROJECT No.:
9-19-0020

PROJECT:
MAITLAND STAGE 7

PROJECT ADDRESS:
173-175 Chisholm Rd
Ashtonfield NSW 2323
CLIENT:
HealthCare Australia

DRAWING TITLE:
COVER PAGE AND DRAWING LIST

SCALE:
@ A1

DRAWING No.:
DA000

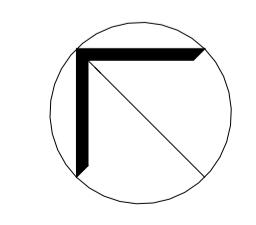
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Issue Date

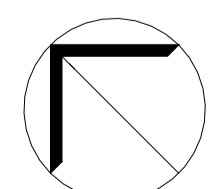
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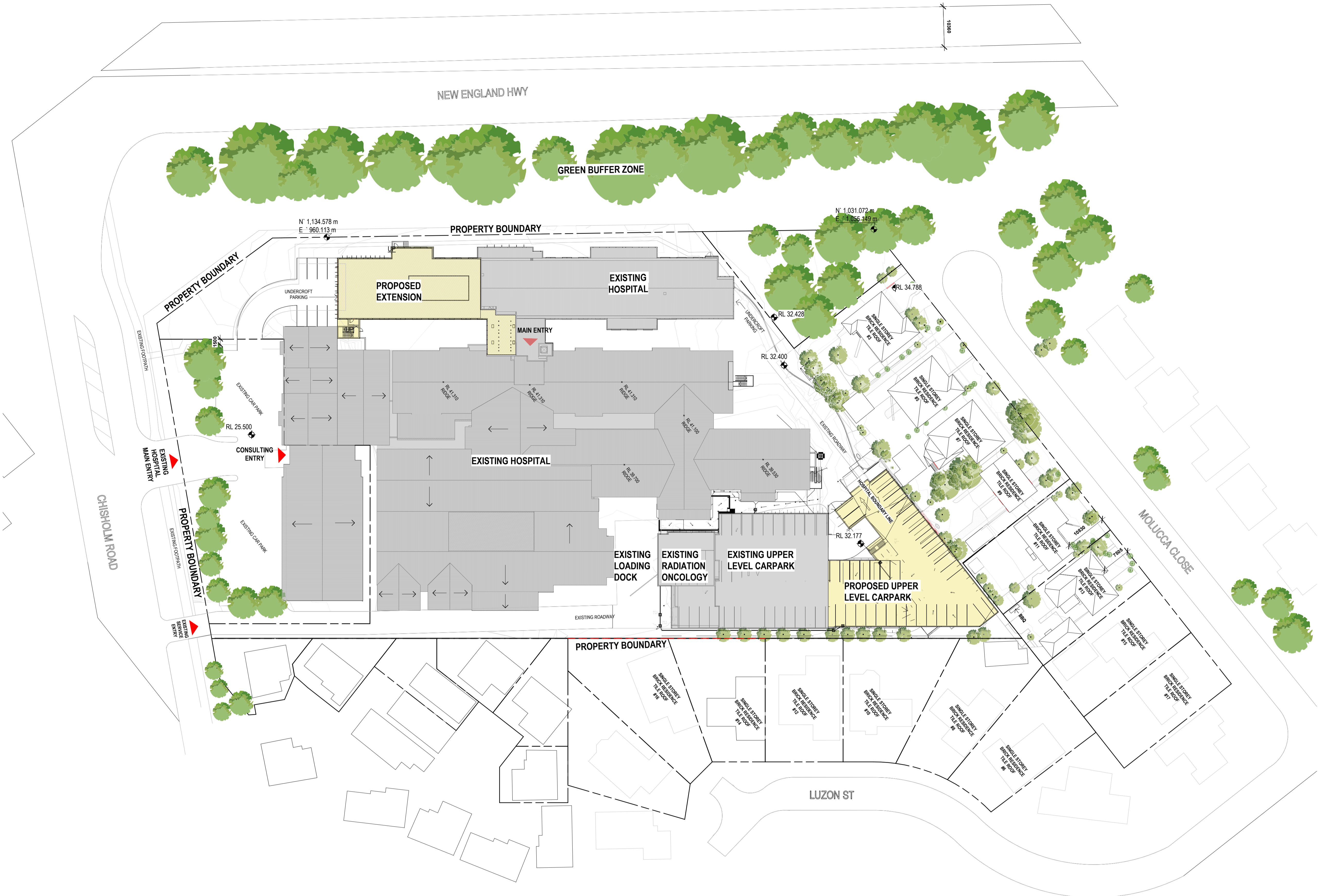
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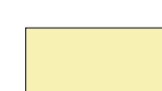


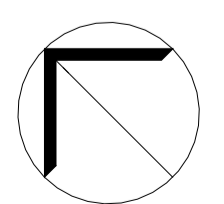
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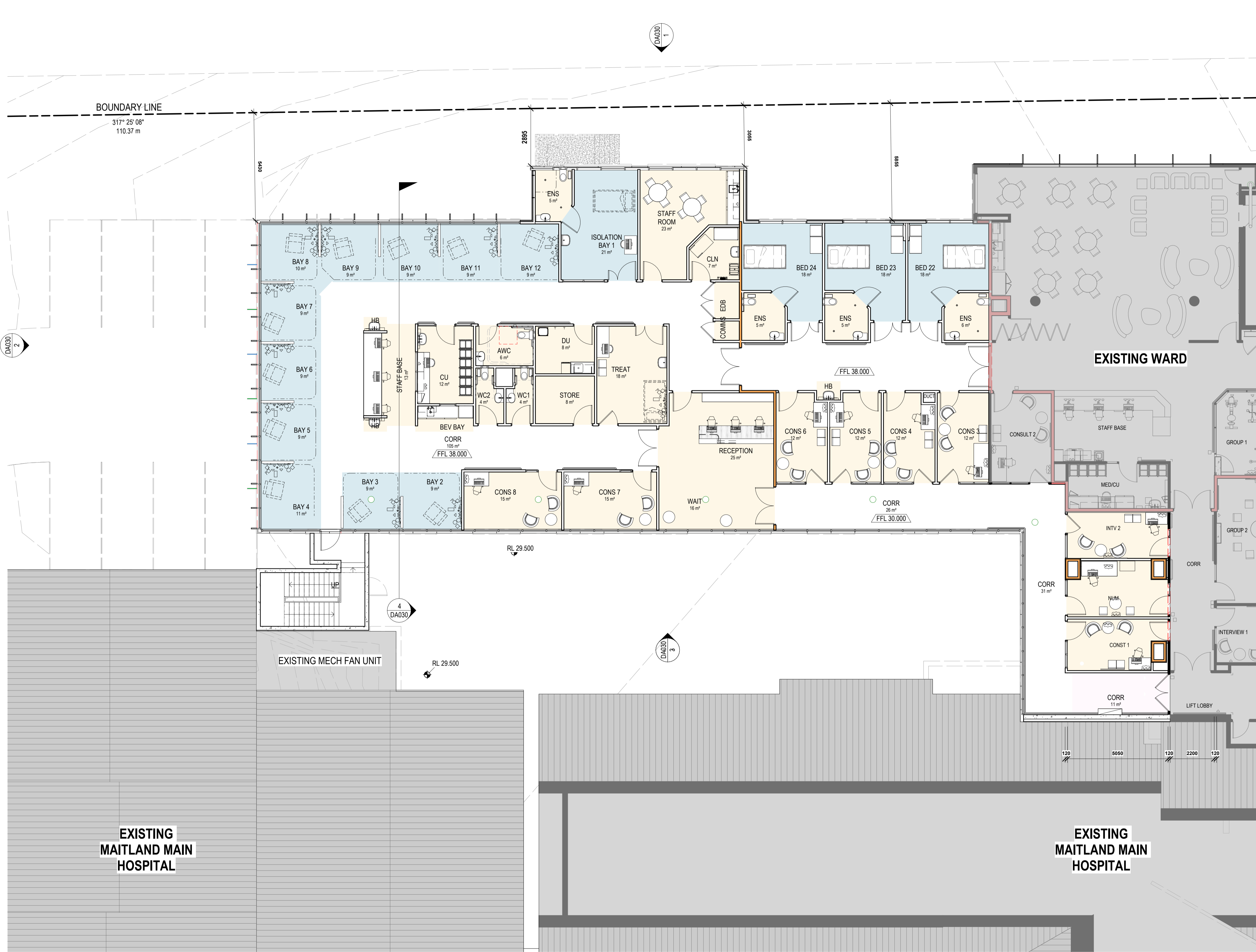




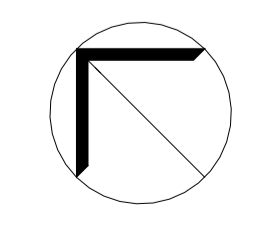
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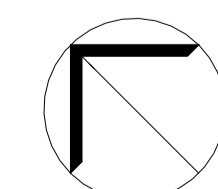
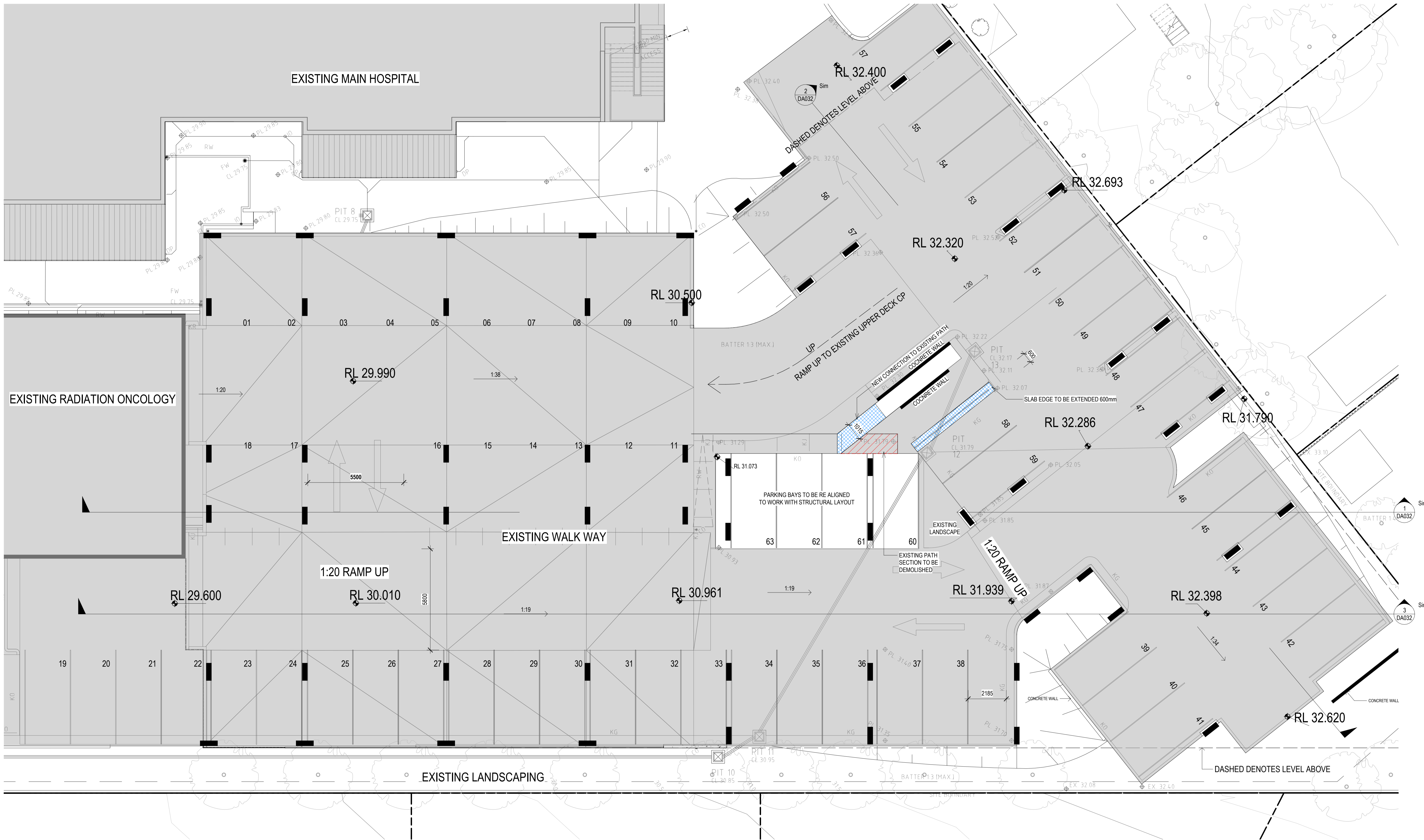


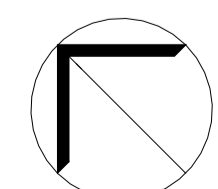
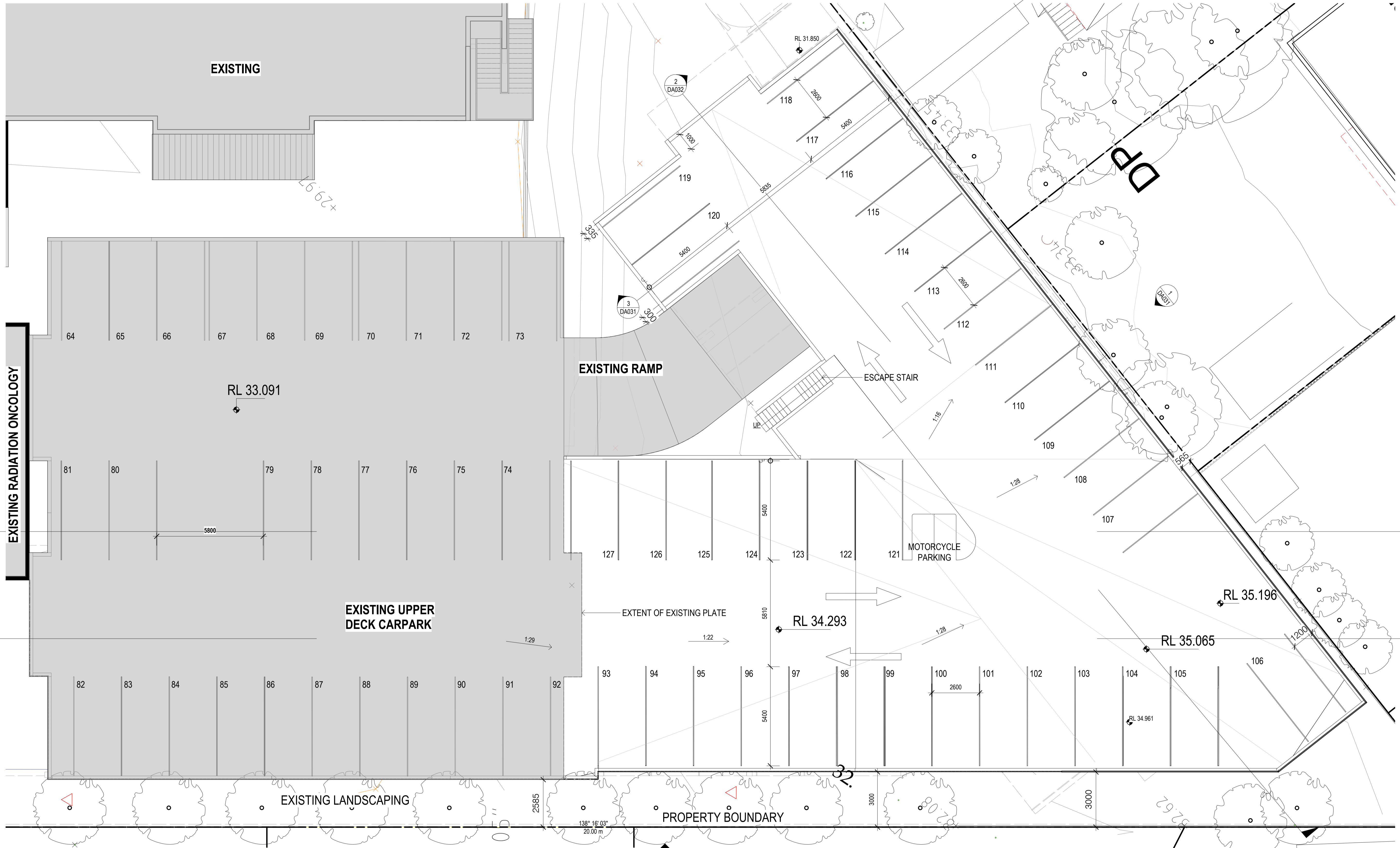
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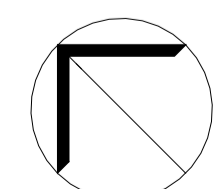
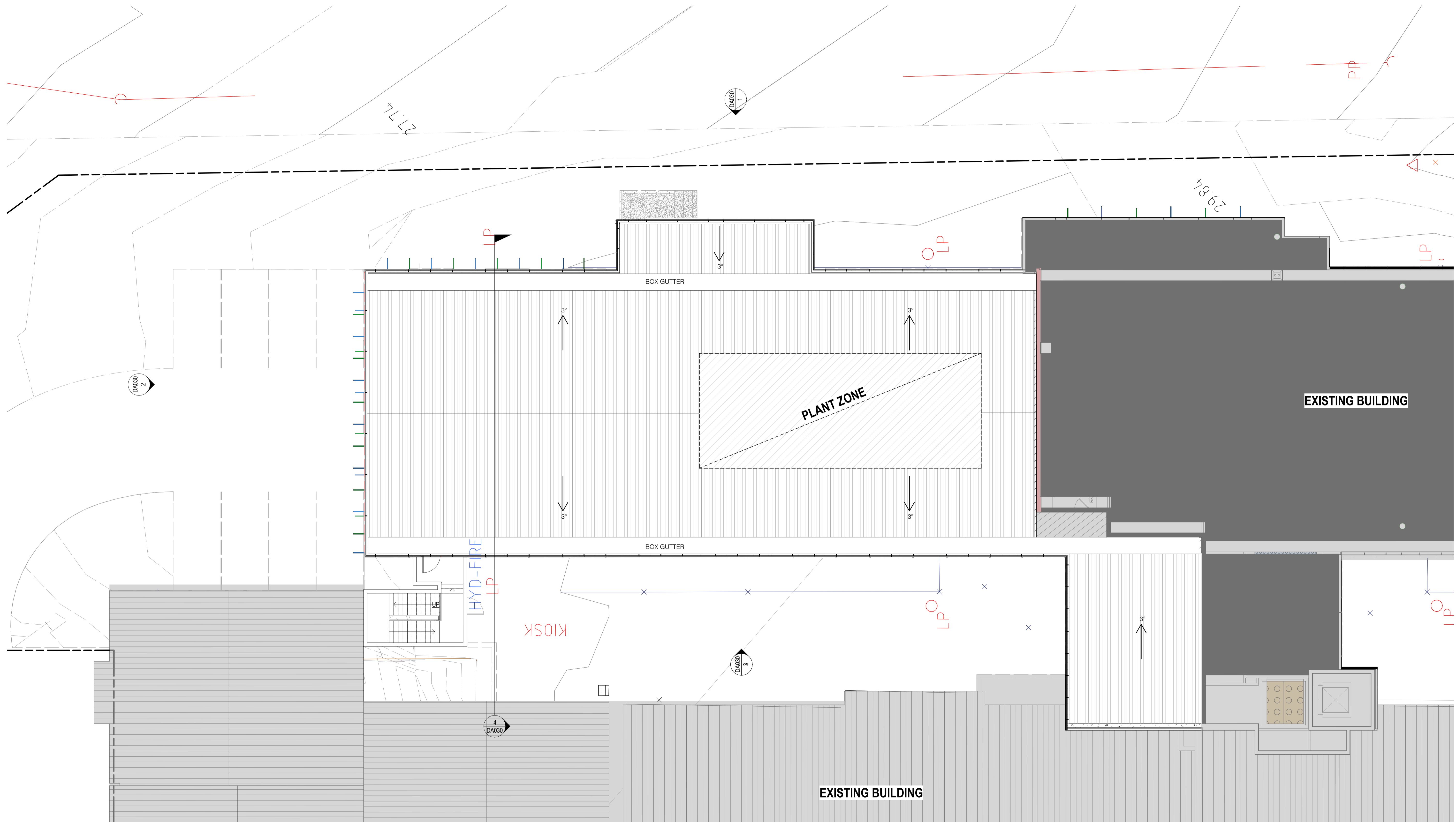


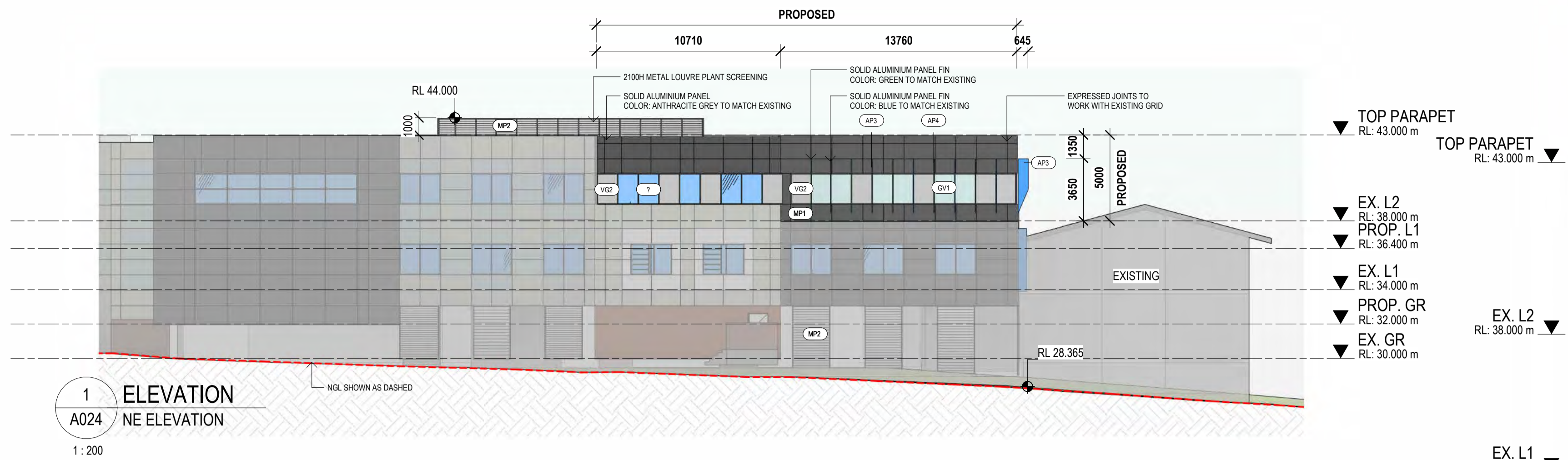
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- SUPPORT
- EXISTING



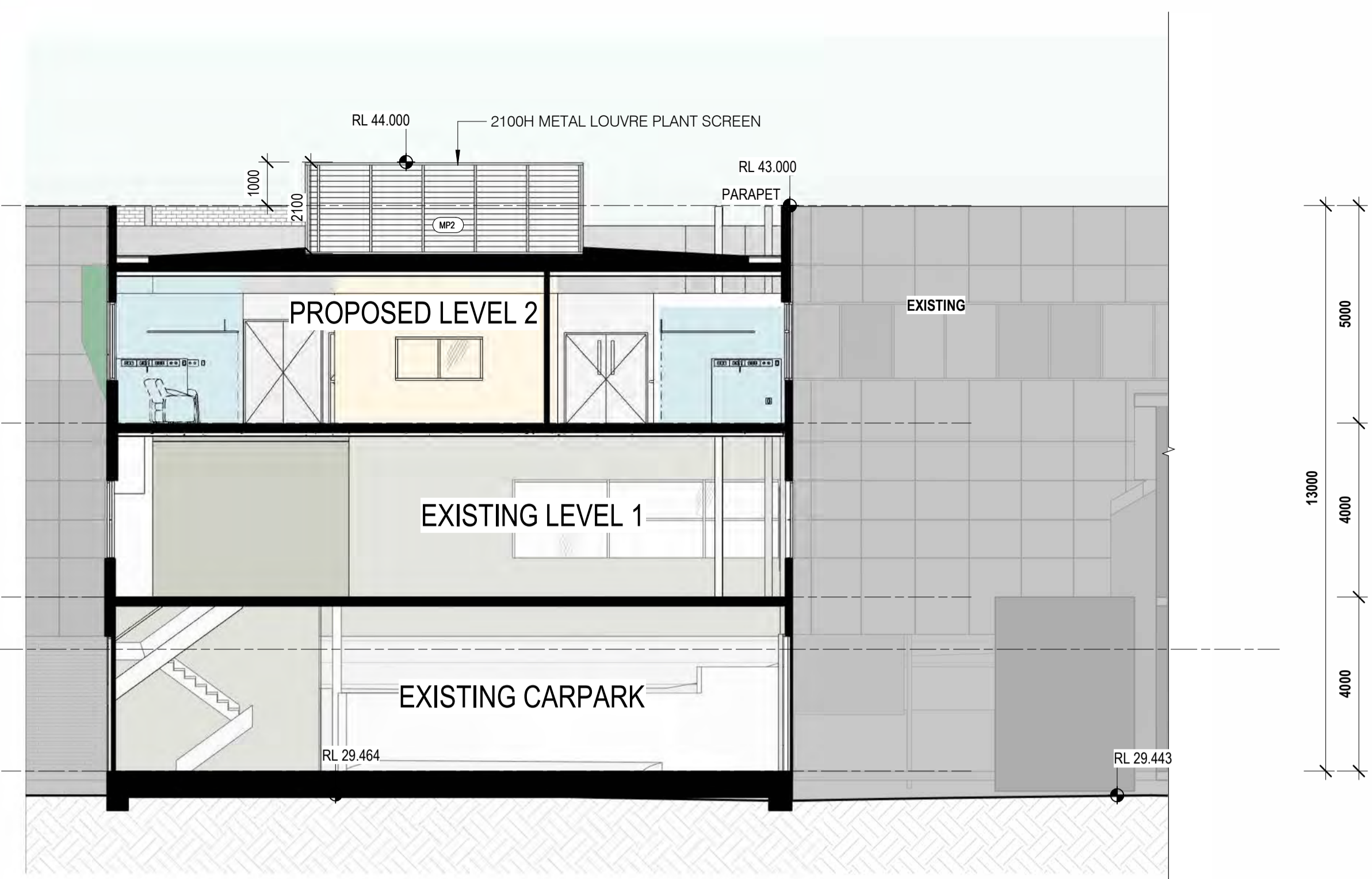






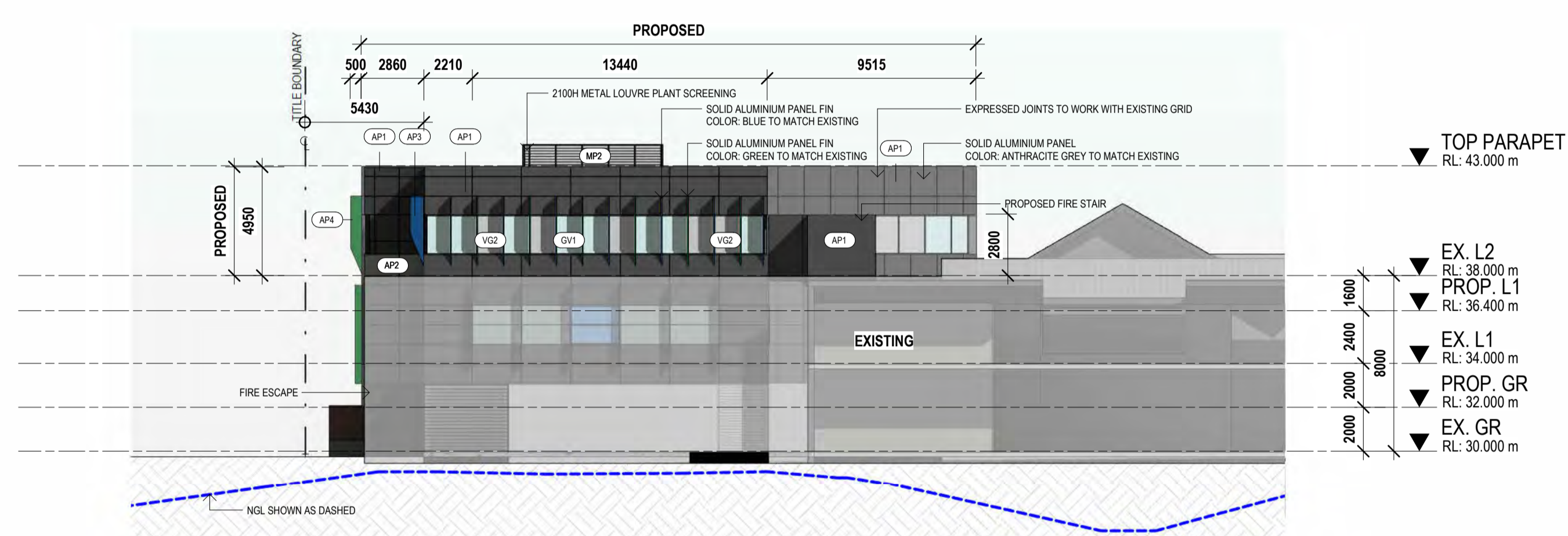


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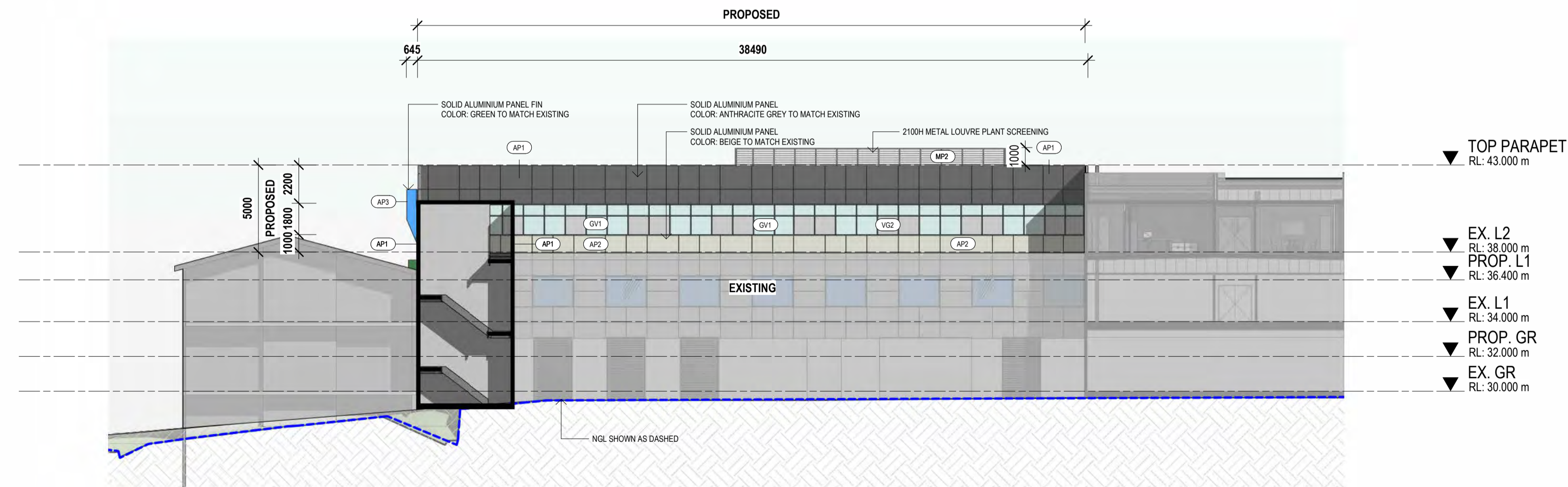


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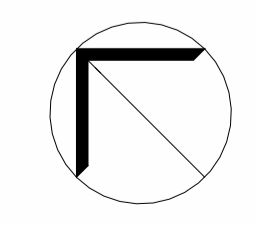
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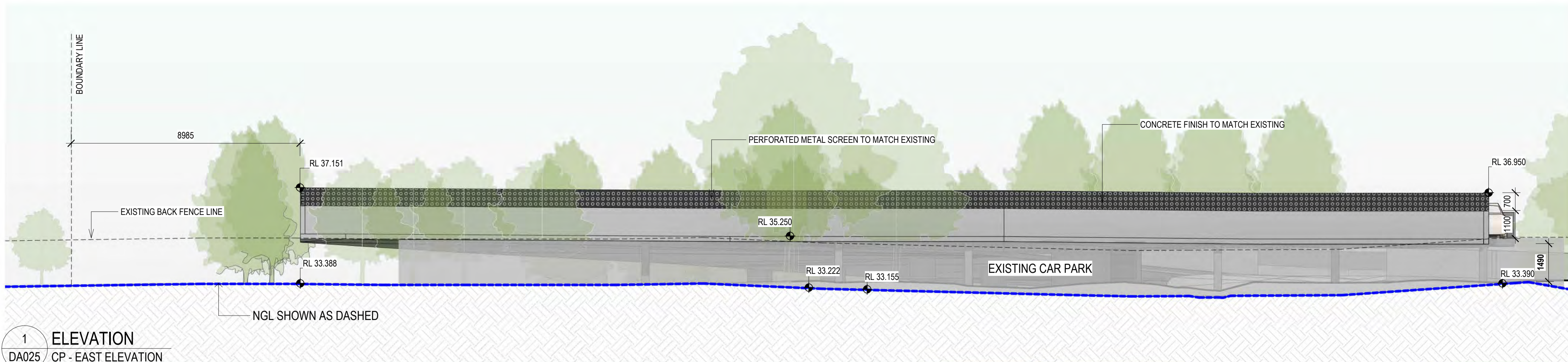


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A024 NORTH ELEVATION
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3 ELEVATION
A024 SW ELEVATION
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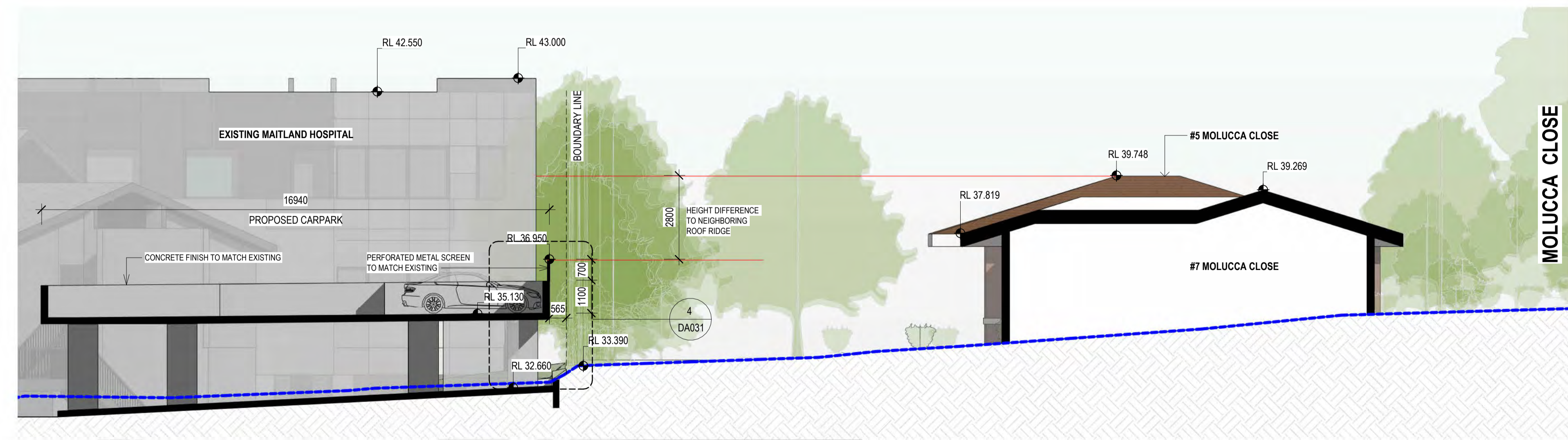


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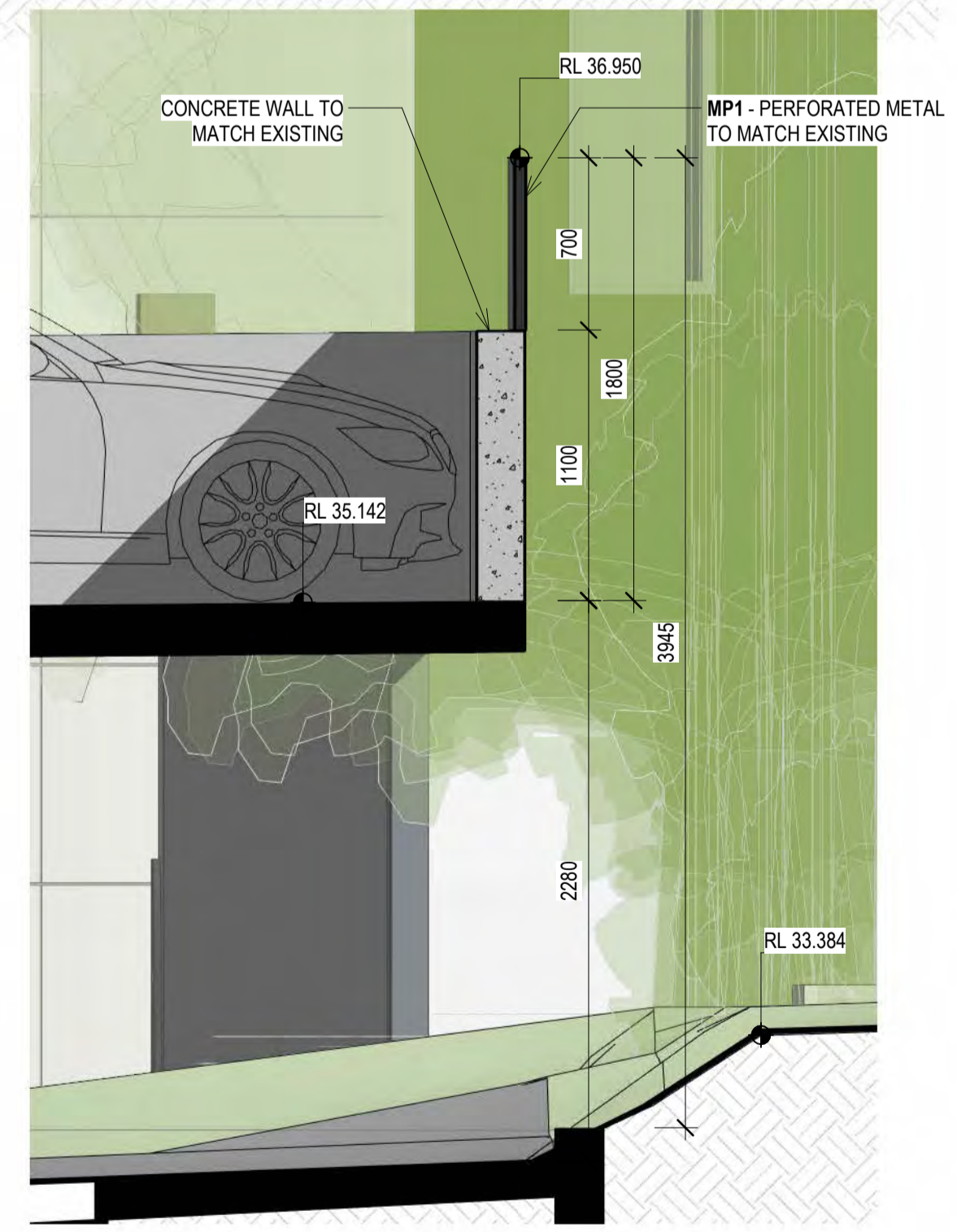
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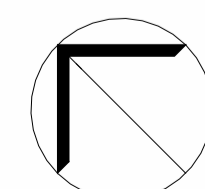
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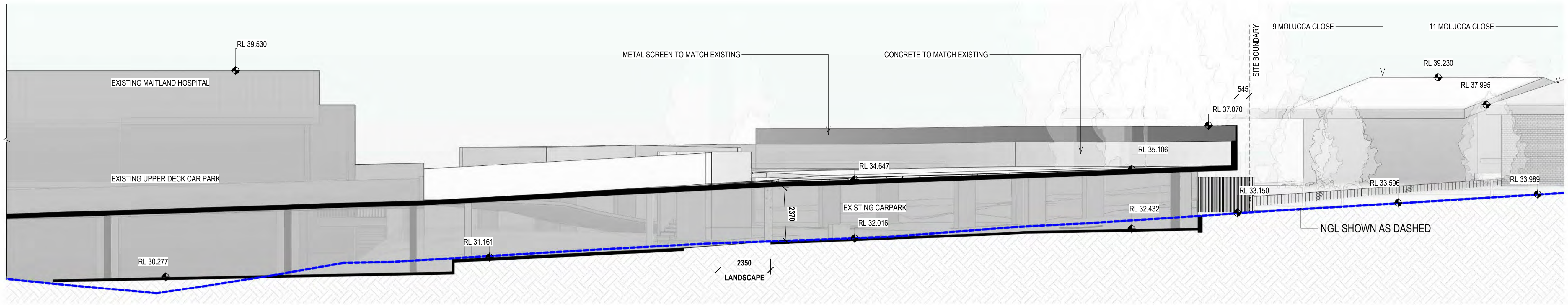


3 PROPOSED CARPARK HEIGHT DIAGRAM
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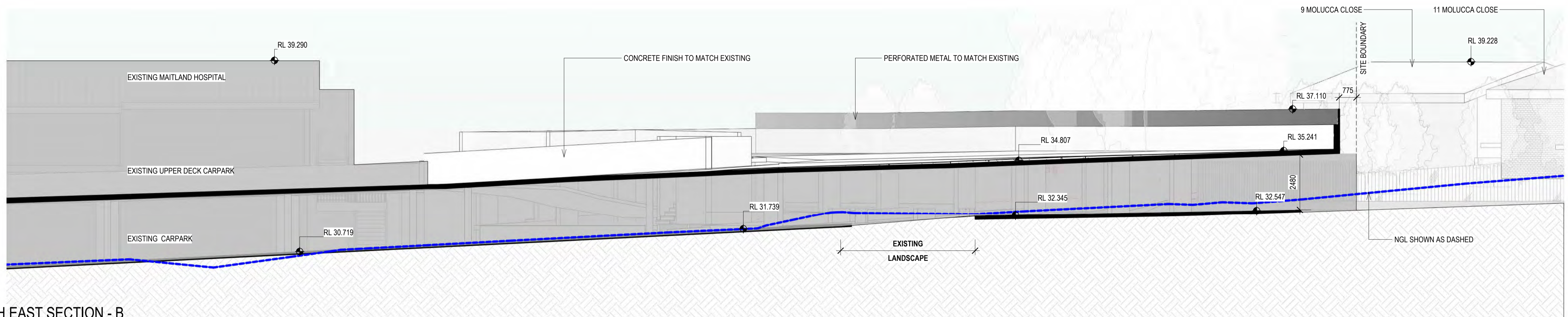


4 CARPARK SCREENING DETAIL
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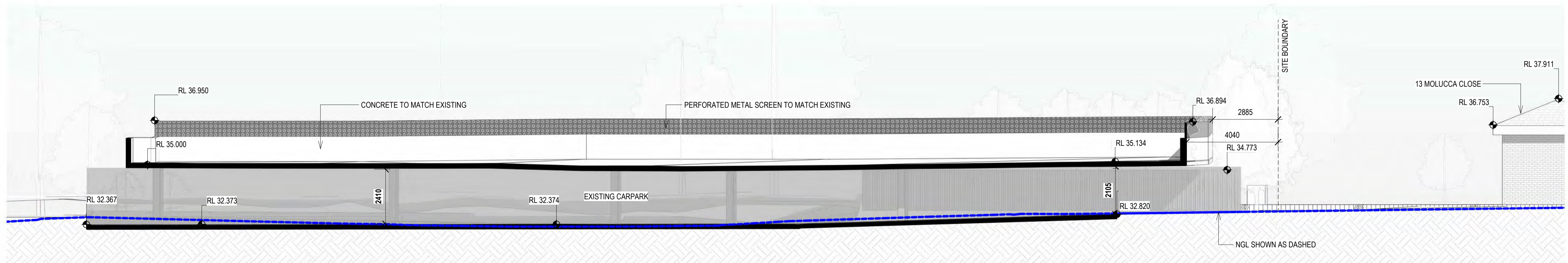




1 NORTH EAST SECTION - A
DA024 Scale 1:100



3 NORTH EAST SECTION - B
DA024 Scale 1:100



2 EAST SECTION
DA024 Scale 1:100

Appendix B: Planning for Bushfire Protection 2019 Compliance Tables

Table 1: Aims and Objectives of Planning for Bushfire Protection 2019

Objectives	Satisfied	Comment
<ul style="list-style-type: none"> ➤ Afford buildings and their occupants protection from exposure to a bush fire 	✓	It is unlikely that any occupants of the proposed MPH will be directly exposed to a prolonged bushfire attack as the pedestrian evacuation routes are all directed away from the hazard. Notwithstanding, the building will be constructed in accordance with BAL-19 which will also enable occupants to safely shelter within the proposed building.
<ul style="list-style-type: none"> ➤ Provide for a defendable space to be located around buildings 	✓	The proposed expansion is provided with an APZ greater than 60m (New England Highway) from the northern elevation. Furthermore, a the existing fire trail provides defendable space and separation from the bushfire hazard to the north.
<ul style="list-style-type: none"> ➤ Provide appropriate separation between a hazard and buildings, which, in combination with other measures, prevent the likely fire spread to buildings 	✓	The site is separated from the Category 1 bushfire prone vegetation by an APZ up to 61m from the existing building.
<ul style="list-style-type: none"> ➤ Ensure that safe operational access and egress for emergency service personnel and residents is available 	✓	Multiple pedestrian and vehicle egress paths are available to the occupants of the MPH. Although the preference for the Primary Response is likely to shelter many of the occupants within the building, two separate driveways direct traffic away from the nearest bushfire hazard, onto Chisholm Road.
<ul style="list-style-type: none"> ➤ Provide for ongoing management and maintenance of BPMs 	✓	The entire site is currently landscaping and all vegetation appropriately managed. The operator will be responsible to continue to maintain the property including the continued supply of essential services.
<ul style="list-style-type: none"> ➤ Ensure that utility services are adequate to meet the needs of firefighters 	✓	The proposed additions will be connected to all essential services. The existing MPH is provided with a network of fire hydrants in and around the building.

Table 2: Performance Criteria and Acceptable Solutions for SFPP Developments (Chapter 6 PBP 2019)

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment	
6.8.1 ASSET PROTECTION ZONES Table 6.8a To provide suitable building design, construction and sufficient space to ensure that radiant heat levels at buildings does not exceed critical limits for firefighters and other emergency services personnel undertaking operations, including supporting or evacuating occupants.	Radiant heat levels of greater than 10kW/m ² (1200K) are not experienced at any part of the building.	The building is provided with an APZ in accordance with Table A1.12.1. in Appendix 1.	✓	The required APZ was calculated using Method 2 of AS3959-2018 and was found to be a minimum of 57m. The APZ is primarily provided by the New England Highway with fire trails, low-threat vegetation and landscaped curtilage completing the required APZ.	
	APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is negated.	The APZ is not located on lands with a slope exceeding 18°	✓	All APZs are located on land with slopes 5° or less.	
	APZs are managed and maintained to prevent the spread of a fire towards the building.	The APZ is managed in accordance with the requirements of Appendix 4 of PBP 2019 and is wholly within the boundaries of the development site.	✓	There are no exceptional circumstances that would require an APZ to be located external to the development site. There is sufficient managed land (and reduced threat vegetation) between the proposed additions and the hazard to avoid requiring an APZ on adjoining private land.	
		The APZ is provided in perpetuity.	Mechanisms are in place to provide for the maintenance of the APZ over the life of the development.	✓	The manager of the MPH will be responsible to maintain the site to an APZ standard.
			Other structures located within the APZ need to be located further than 6m from the refuge building.	N/A	
LANDSCAPING	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 APZ standards (see Appendix 4). Fencing is constructed in accordance with section 7.6.	✓ N/A	Any new landscaping shall be designed in accordance with PBP 2019 requirements for landscaping and the APZ standards.	
CONSTRUCTION	The proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact.	A construction level of BAL-12.5 under AS3959 or NASH and Table 6.8a is applied	✓	The proposed additions will be constructed in accordance with Section 3 and 7 of AS3959-2018; being BAL-19 as required by Addendum 2022 to PBP 2019.	
6.8.2 ACCESS	Firefighting vehicles are provided with safe all weather	SFPP access roads are two-wheel drive, all-weather roads	N/A	There are no new roads proposed as part of the development.	



Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
Table 6.8b To provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area. FIREFIGHTING VEHICLES	access to structures and hazard vegetation.	Access is provided to all structures and hazard vegetation.		
		Traffic management devices are constructed to not prohibit access by emergency services vehicles.		
		Access roads must provide suitable turning areas in accordance with Appendix 3.		
ACCESS ROAD CAPACITY	The capacity of access roads is adequate for firefighting vehicles.	The capacity of 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.	N/A	There are no new roads proposed as part of the development.
ACCESS TO WATER	There is appropriate access to water supply.	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression.	✓	A new water supply main will be located within the defensible space and multiple hydrants will be located directly to the north of the MPH.
		Hydrants are provided in accordance with AS2419.1:2005	✓	
		There is suitable access for Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	✓	
PERIMETER ROADS	Perimeter access roads are designed to allow safe access and egress for medium rigid firefighting vehicles while occupants are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	There are two-way sealed roads.	N/A	There are no new roads proposed as part of the development.
		8m carriageway width kerb to kerb.		
		Hydrants are to be located clear of parking areas.		
		There are through roads, and these are linked to the internal road system at an interval of no greater than 500m.		
		Curves of roads have a minimum inner radius of 6m.		
		The maximum grade road is 15° and average grade is 10°.		
		The road crossfall does not exceed 3°.		
		A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; and		



Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
NON-PERIMETER ROADS	Non-perimeter access roads are designed to allow safe access and egress for medium rigid firefighting vehicles while occupants are evacuating.	Minimum 5.5m width kerb to kerb.	N/A	There are no new roads proposed as part of the development.
		Parking is provided outside of the carriageway.		
		Hydrants are to be located clear of parking areas.		
		There are through roads, and these are linked to the internal road system at an interval of no greater than 500m.		
		Curves of roads have a minimum inner radius of 6m.		
		The maximum grade road is 15° and average grade is 10°.		
		The road crossfall does not exceed 3°.		
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; and			
6.8.3 SERVICES Table 6.8c To provide adequate services for water for the protection of buildings during and after the passage of a bushfire, and not to locate gas and electricity so as not to contribute to the risk of fire to a building. WATER	A water supply is provided for firefighting purposes	Reticulated water is to be provided to the development, where available	✓	A reticulated water supply is provided.
		A static water supply is provided where no reticulated water is available	N/A	
	Water supplies are located at regular intervals	Fire hydrant spacing, design and sizing comply with AS2419.1:2005;	✓	A series of fire hydrants are located around the existing building, including on the northern elevation.
		Hydrants are not located within any road carriageway;	✓	
	The water supply is accessible and reliable for firefighting operations	Reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads.	N/A	The existing water supply provides a reliable water supply.
	Flows and pressures are appropriate	Fire hydrant flows and pressures comply with AS2419.1:2005.	✓	
	The integrity of the water supply is maintained	All above ground water service pipes are metal, including and up to any taps.	N/A	

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
ELECTRICITY	Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings.	Where practicable, electrical transmission lines are underground.	✓	An existing underground electricity service is provided to the site.
		Where overhead electrical transmission lines are proposed as follows: <ul style="list-style-type: none"> - lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines 	N/A	
GAS	Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas is installed and maintained in accordance with AS 1596:2014 and the requirements of relevant authorities, metal piping is to be used.	✓ Able to comply	
		All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side;	✓	All tanked gas stored on site will be sited and secured with appropriate shielding from the bushfire hazard.
		Connections to and from gas cylinders are metal:	✓	
		Polymer-sheathed flexible gas supply lines are not used; and	✓	
		Above-ground gas service pipes are metal, including and up to any outlets.	✓	
6.8.4 EMERGENCY MANAGEMENT PLANNING Table 6.8d To provide suitable emergency and evacuation arrangements for occupants of SFPP developments	A bush fire emergency and evacuation management plan is prepared.	Bush fire emergency management and evacuation plan is prepared consistent with the: <ul style="list-style-type: none"> ☐ the NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan; and ☐ AS3745:2010 Planning for emergencies in facilities. 	✓ Able to comply	A Bushfire Management Plan is recommended to be prepared for the new use of the existing building. Alternatively, the existing BMP will need to be updated to address the new additions.



Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
		The emergency and evacuation management plan should include a mechanism for the early relocation of occupants.	✓ Able to comply	
	Appropriate and adequate 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.	✓ Able to comply	Where required, consultation with staff and residents will be undertaken during the preparation of the Bushfire Management Plan.
		Detailed plans of all emergency assembly areas including 'on-site' and 'off-site' arrangements as started in AS3745 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted.	✓ Able to comply	

Table 3: Addendum PBP 2022 – Rural Fire Service

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution PS - Performance Solution	
Table 2: Construction Standards	The proposed building can withstand bushfire attack in the form of wind, embers, radiant heat and flame contact.	A construction level of BAL-19 or greater under AS3959 and section 7.5 of PBP is applied.	✓	The proposed additions to the Class 9 building will be designed and constructed in accordance with section 3 and 6 of PBP 2019 (BAL-19).
Table 3: Access	Firefighting vehicles are provided with safe all weather access to structures and hazardous vegetation.	Vehicular access must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building; and	✘	Continuous access is currently not provided around the entire building. The proposed additions to the hospital and car park will not improve or make the situation worse.
		Must have a minimum unobstructed width of 6m with no part of its furthest boundary more than 18m from the building and is no part of the 6m width be built upon or used for any purpose other than vehicular or pedestrian movement; and	PS	The existing access trail to the north of the building provided vehicle access along the entire length of the northern elevation between the nearest bushfire hazardous vegetation. The access track is within 6m and no greater than 18m from the building.
		Must provide reasonable pedestrian access from the vehicular access to the building; and	✓	The usable access track provides immediate access to the building, the car park, external emergency exit doors and a double-headed fire hydrant.
		Must have a load bearing capacity and unobstructed height to permit the operation and passage of fire fighting vehicles; and	PS	Load capacity of the unsealed track is unknown, however evidence of vehicle usage indicates the track would permit the passage and operation of fire fighting vehicles.
		Must be wholly within the allotment except that a public road complying with above may serve as the vehicular access or part thereof.	✘	The access track identified for use by emergency services is within the road reserve of the New England Highway. As it functions as a service road for the existing overhead electricity transmission lines, it is certain the access track will be maintained in a trafficable condition.



Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution PS - Performance Solution	
Table 4: Water Supply	An adequate water supply for firefighting purposes is installed and maintained.	Reticulated water is to be provided to the development, where available; and Water for fire fighting purposed must be made available and consist of: <ul style="list-style-type: none"> ➤ a fire hydrant system installed in accordance with AS2419.1; or ➤ where no reticulated water is available, a static water supply consisting of tanks, swimming pools, dams or the like, or a combination of these, together with suitable pumps, hoses and fittings, determined in consultation with NSW RFS that – <ul style="list-style-type: none"> ○ is capable of providing the required flow rate for a period of not less than 4 hours or ○ has a volume of 10,000 litres for each occupied building 	✓	A reticulated water supply is already provided to the site.

Appendix C: AHIMS Report

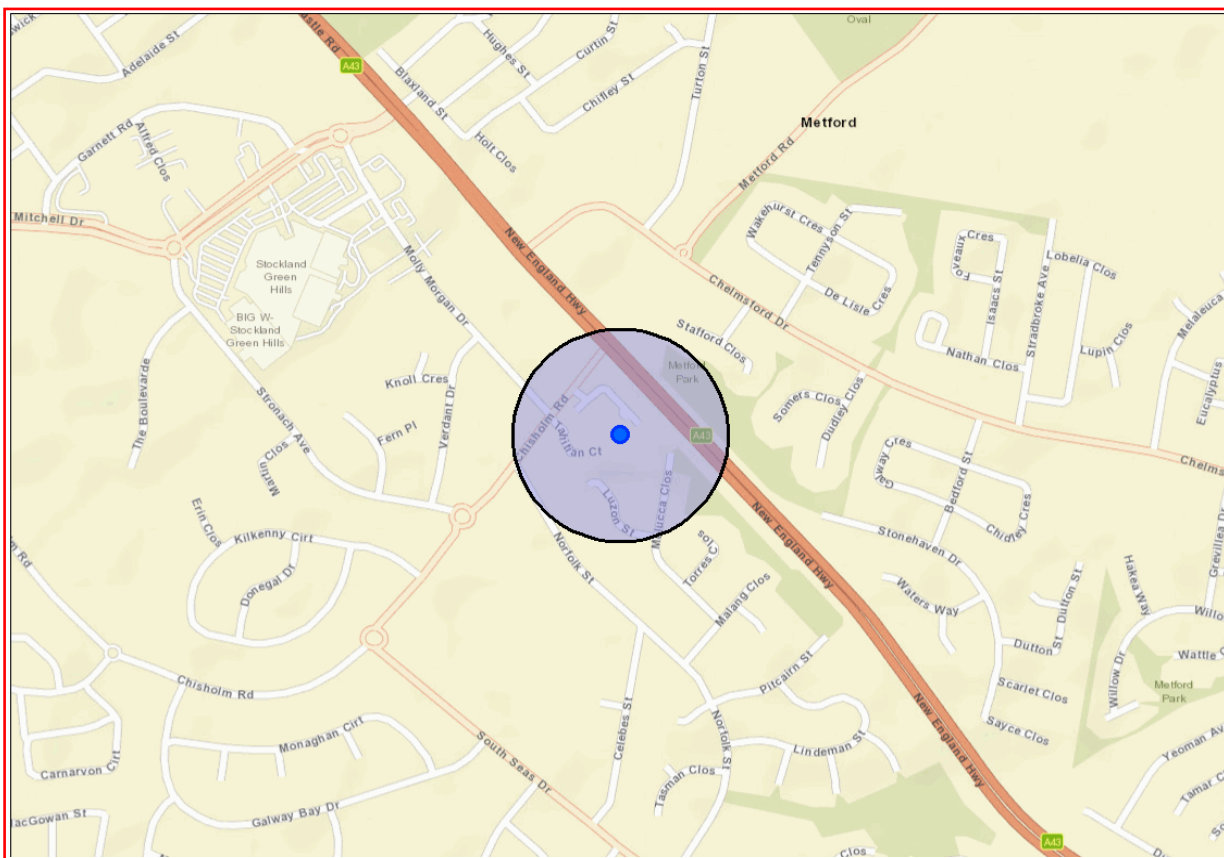
Katrina Greville
 21 Costata Crescent
 Adamstown New South Wales 2289
 Attention: Katrina Greville
 Email: klmukevski@bigpond.com

Date: 22 March 2023

Dear Sir or Madam:

AHIMS Web Service search for the following area at Address : 175 CHISHOLM ROAD ASHTONFIELD 2323 with a Buffer of 200 meters, conducted by Katrina Greville on 22 March 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

	0 Aboriginal sites are recorded in or near the above location.
	0 Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette \(https://www.legislation.nsw.gov.au/gazette\)](https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Appendix D: NBC Bushfire Attack Assessor V4.1 Report



NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 23/03/2023

Assessment Date: 23/03/2023

Site Street Address: 2307 Maitland Private Hospital, Ashtonfield

Assessor: Stuart Greville; Bushfire Planning Australia

Local Government Area: Maitland

Alpine Area: No

Equations Used

Transmissivity: Fuss and Hammins, 2002

Flame Length: RFS PBP, 2001/Vesta/Catchpole

Rate of Fire Spread: Noble et al., 1980

Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005

Peak Elevation of Receiver: Tan et al., 2005

Peak Flame Angle: Tan et al., 2005

Run Description: T1 North-east

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 3.3 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 14

Overall Fuel Load(t/ha): 24.6

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 19

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg): 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 7.36

Radiant Heat(kW/m²): 29

Flame Angle (degrees): 62

Flame Length(m): 16.67

Maximum View Factor: 0.45

Rate Of Spread (km/h): 2.11

Inner Protection Area(m): 0

Transmissivity: 0.848

Outer Protection Area(m): 0

Fire Intensity(kW/m): 26813

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m²: Elevation of Receiver:

Asset Protection Zone(m): 14 19 27 37 57 6

Run Description: T2 East

Vegetation Information

Vegetation Type: Hunter Macleay DSF
Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)
Vegetation Slope: 3.2 Degrees **Vegetation Slope Type:** Downslope
Surface Fuel Load(t/ha): 14 **Overall Fuel Load(t/ha):** 24.6
Vegetation Height(m): 0.9 Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees **Site Slope Type:** Downslope
Elevation of Receiver(m): Default **APZ/Separation(m):** 19

Fire Inputs

Veg./Flame Width(m): 100 **Flame Temp(K):** 1090

Calculation Parameters

Flame Emissivity: 95 **Relative Humidity(%):** 25
Heat of Combustion(kJ/kg) 18600 **Ambient Temp(K):** 308
Moisture Factor: 5 **FDI:** 100

Program Outputs

Level of Construction: BAL 29 **Peak Elevation of Receiver(m):** 7.33
Radiant Heat(kW/m2): 29 **Flame Angle (degrees):** 62
Flame Length(m): 16.6 **Maximum View Factor:** 0.449
Rate Of Spread (km/h): 2.1 **Inner Protection Area(m):** 0
Transmissivity: 0.849 **Outer Protection Area(m):** 0
Fire Intensity(kW/m): 26629

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:
Asset Protection Zone(m): 14 19 27 37 57 6

Run Description: T3 East

Vegetation Information

Vegetation Type: Hunter Macleay DSF
Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)
Vegetation Slope: 3.1 Degrees **Vegetation Slope Type:** Upslope
Surface Fuel Load(t/ha): 14 **Overall Fuel Load(t/ha):** 24.6
Vegetation Height(m): 0.9 Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees **Site Slope Type:** Downslope
Elevation of Receiver(m): Default **APZ/Separation(m):** 14

Fire Inputs

Veg./Flame Width(m): 100 **Flame Temp(K):** 1090

Calculation Parameters

Flame Emissivity: 95 **Relative Humidity(%):** 25
Heat of Combustion(kJ/kg) 18600 **Ambient Temp(K):** 308
Moisture Factor: 5 **FDI:** 100

Program Outputs

Level of Construction: BAL 29 **Peak Elevation of Receiver(m):** 5.25
Radiant Heat(kW/m2): 29 **Flame Angle (degrees):** 63
Flame Length(m): 11.79 **Maximum View Factor:** 0.442
Rate Of Spread (km/h): 1.36 **Inner Protection Area(m):** 0
Transmissivity: 0.862 **Outer Protection Area(m):** 0
Fire Intensity(kW/m): 17241

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:
Asset Protection Zone(m): 10 14 20 28 45 6

Run Description: T4 Excluded

Vegetation Information

Vegetation Type: Non-Hazard

Vegetation Group: Non-Hazard

Vegetation Slope: 0.5 Degrees

Vegetation Slope Type: Upslope

Surface Fuel Load(t/ha): 0

Overall Fuel Load(t/ha): 0

Vegetation Height(m): 0

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 1

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 0

Radiant Heat(kW/m2): 29

Flame Angle (degrees): 0

Flame Length(m): 0

Maximum View Factor: 0

Rate Of Spread (km/h): 0

Inner Protection Area(m): 0

Transmissivity: 0.905

Outer Protection Area(m): 0

Fire Intensity(kW/m): 0

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:

Asset Protection Zone(m): 0 0 0 0 0 6

Run Description: T5 South

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 2.2 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 14

Overall Fuel Load(t/ha): 24.6

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 18

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 6.93

Radiant Heat(kW/m2): 29

Flame Angle (degrees): 62

Flame Length(m): 15.69

Maximum View Factor: 0.448

Rate Of Spread (km/h): 1.96

Inner Protection Area(m): 0

Transmissivity: 0.851

Outer Protection Area(m): 0

Fire Intensity(kW/m): 24853

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:

Asset Protection Zone(m): 13 18 25 35 55 6

Run Description: T6 Excluded

Vegetation Information

Vegetation Type: Non-Hazard

Vegetation Group: Non-Hazard

Vegetation Slope: 2 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 0

Overall Fuel Load(t/ha): 0

Vegetation Height(m): 0

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 1

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 0

Radiant Heat(kW/m2): 29

Flame Angle (degrees): 0

Flame Length(m): 0

Maximum View Factor: 0

Rate Of Spread (km/h): 0

Inner Protection Area(m): 0

Transmissivity: 0.905

Outer Protection Area(m): 0

Fire Intensity(kW/m): 0

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:

Asset Protection Zone(m): 0 0 0 0 0 6

Run Description: T7 South

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 2.2 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 14

Overall Fuel Load(t/ha): 24.6

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 18

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 6.93

Radiant Heat(kW/m2): 29

Flame Angle (degrees): 62

Flame Length(m): 15.69

Maximum View Factor: 0.448

Rate Of Spread (km/h): 1.96

Inner Protection Area(m): 0

Transmissivity: 0.851

Outer Protection Area(m): 0

Fire Intensity(kW/m): 24853

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:

Asset Protection Zone(m): 13 18 25 35 55 6