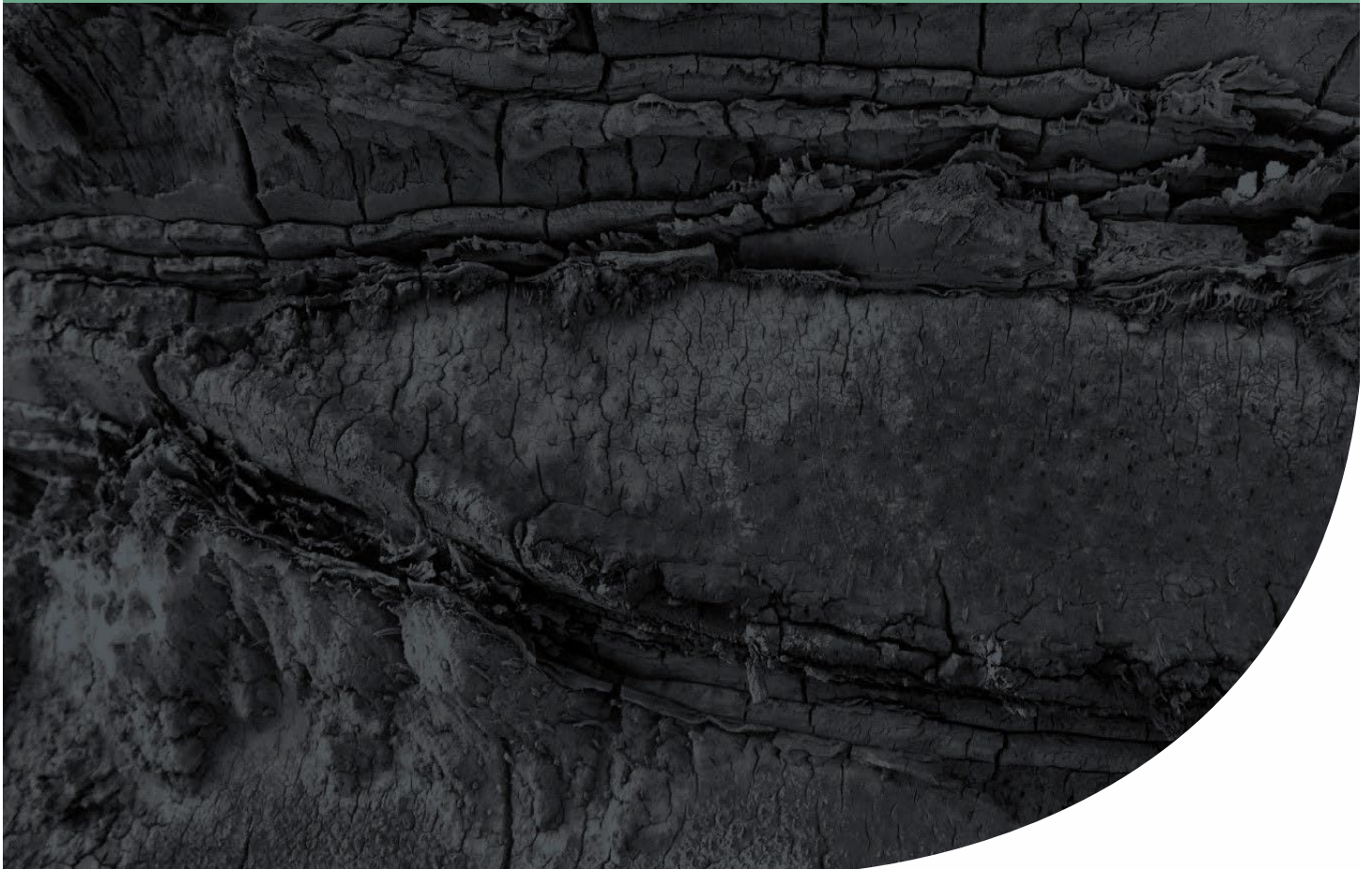


Bushfire Management Plan

Lot 202, Lot 203 and Lot 204 Wanneroo Road,
Wanneroo

Project No: EP24-008(01)

**Prepared for Bella Build & Design WA Pty Ltd
February 2024**



Bushfire Management Plan

Lot 202, Lot 203 and Lot 204 Wanneroo Road, Wanneroo



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				Anthony Rowe	AJR
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Disclaimer:

This document has been prepared in good faith and is derived from information sources believed to be reliable and accurate at the time of publication. Nevertheless, it is distributed on the terms and understanding that the author is not liable for any error or omission in the information sources available or provided to us, or responsible for the outcomes of any actions taken based on the recommendations contained herein. It is also expected that our recommendations will be implemented in their entirety, and we cannot be held responsible for any consequences arising from partial or incorrect implementation of the recommendations provided.

This document has been prepared primarily to consider the layout of development and/or the appropriate building construction standards applicable to development, where relevant. The measures outlined are considered to be prudent minimum standards only based on the standards prescribed by the relevant authorities. The level of bushfire risk mitigation achieved will depend upon the actions of the landowner or occupiers of the land and is not the responsibility of the author. The relevant local government and fire authority (i.e. Department of Fire and Emergency Services or local bushfire brigade) should be approached for guidance on preparing for and responding to a bushfire.

Notwithstanding the precautions recommended in this document, it should always be remembered that bushfires burn under a wide range of conditions which can be unpredictable. An element of risk, no matter how small, will always remain. The objective of the Australian Standard AS 3959:2018 is to “prescribe particular construction details for buildings to reduce the risk of ignition from a bushfire” (Standards Australia 2018). Building to the standards outlined in AS 3959 does not guarantee a building will survive a bushfire or that lives will not be threatened by the effects of bushfire attack.

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Executive Summary

Bella Build & Design WA Pty Ltd (the proponent) are seeking to progress the development of Lot 202, Lot 203 and Lot 204 Wanneroo Road, Wanneroo (herein referred to as 'the site') to establish a mixed commercial development. The site is 0.66 hectares (ha) in size and is bounded by Liberty Oil Tapping service station and Mowatt Close to the north, Wanneroo Road to the east, and vacant land to the immediate south and west (which is zoned for future commercial development).

The entirety of the site is zoned 'Urban' under the Metropolitan Region Scheme and 'Service commercial' under the *City of Wanneroo Local Planning Scheme No. 2*. The zoning is able to support the proposed development.

The entire site is located within a 'bushfire prone area' under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2021). The identification of a site within an area declared as bushfire prone necessitates further assessment of the determined bushfire risk affecting the site in accordance with *Australian Standard 3959:2018 Construction of buildings in bushfire prone areas* (AS 3959), and compliance with the policy measures (risk treatments) described in *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7) (WAPC 2015) and the *Guidelines for Planning in Bushfire Prone Areas Version 1.4* (the Guidelines) (DPLH & WAPC 2021).

The purpose of this BMP is to assess the bushfire hazards affecting the site (risk), and identify the 'management' strategies (risk treatments) required to ensure the development can achieve the intent of SPP 3.7, which is "to preserve life and reduce the impact of bushfire on property and infrastructure".

As part of assessing the risk, a Bushfire Attack Level (BAL) assessment involving the classification of vegetation and effective slope (topography) within 150 m of the site has been undertaken in accordance with AS 3959.

The following bushfire hazards were identified as applicable to the site following development:

- Forest (Class A) vegetation to the west, associated with the Yellagonga Regional Park, as well as planted and remnant vegetation to the south associated with private landholdings. The majority of this vegetation is more than 100 m from the site.
- Scrub (Class D) vegetation to the west, associated with the wetland vegetation fringing areas of Yellagonga Regional Park. The majority of this vegetation is more than 100 m from the site.
- Patches of scrub (Class D) vegetation to the south, within the Wanneroo Road reserve.
- Grassland (Class G) vegetation, which is associated with vacant lots to the north subject to future development by others, as well as drainage areas within the Wanneroo Road reserve to the east and south and vacant landholdings further to the east.

All low threat and classified vegetation outside the site has been assumed to remain in its existing condition for the purposes of this BMP. The site will be modified or converted to non-vegetated (exclusion 2.2.3.2(e)) or low threat vegetation (exclusion 2.2.3.2(f)) and therefore will not be a bushfire hazard. Future landscaped areas within the site will be installed and then maintained by the proponent/occupiers to achieve low threat in accordance with Section 2.2.3.2 of AS 3959.

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Compliance Assessment

The bushfire protection criteria provided in the Guidelines represents the risk treatments applicable to achieving the intent and the objectives listed in SPP 3.7. The bushfire protection criteria are divided into four subsystems (elements), plus a standalone element for tourism. Each subsystem is provided with an intent and solution methods, either performance principle or acceptable solution (predetermined solution). Compliance with each subsystem (as a risk treatment) is required to demonstrate to the decision maker that the risk is within acceptance.

This BMP has identified that as development progresses, it will comply with the 'acceptable solution' for each element of the applicable bushfire protection criteria outlined in the Guidelines.

This includes:

- **Location:** All development is located within an area that is surrounded by existing developed land or land cleared of hazards and is identified for future development. The site itself will have a 'moderate' bushfire hazard level due to being within 100 m of grassland hazards within the Wanneroo Road reserve.
- **Siting and Design:** All habitable buildings can be sited so that BAL-29 or less can be achieved, with the buildings located in an area subject to BAL-12.5. The entire site including future landscaping areas are required to be managed to achieve low threat. Siting is based on the conservative assumption that areas of existing exposed ground within the drainage reserve east of the site could become grassland similar to other areas not disturbed by recent works.
- **Vehicular Access:** The proposed internal development layout provides for multiple egress points to the existing public road network, specifically Herdsman Lane to the west and Wanneroo Road to the east. Herdsman Lane provides a connection to Mowatt Close to the north, which then connects to Wanneroo Road. Wanneroo Road is a major regional road, providing egress options to the north and south and linking to Yanchep in the north and Yokine in the south. The private driveway requirements are not applicable given the most distant external part of the development site (habitable building) is within a lot serviced by reticulated water, is accessed via a public road with a speed limit of 70 km/hr or less, and is no greater than 70 m (measured as a hose lay) from a public road.
- **Water:** all development is to have water available to defend from bushfire. The development is serviced by a reticulated water supply with hydrants already present immediately adjacent to the site along Wanneroo Road.

The management/mitigation measures to be implemented through the proposed development of the site have been outlined as part of this BMP, and through these, the site can be appropriately manage risk in accordance with SPP 3.7 and the Guidelines.

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Appendices

Appendix A

Proposed Site Plan

Bushfire Management Plan

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List of Abbreviations

Table A1: Abbreviations – General terms

General terms	
AHD	Australian Height Datum
AS	Australian Standard
APZ	Asset Protection Zone
BAL	Bushfire Attack Level
BMP	Bushfire Management Plan
BPAD	Bushfire Planning and Design
ESA	Environmentally sensitive area
FDI	Fire Danger Index
FZ	Flame Zone
TEC	Threatened ecological community

Table A2: Abbreviations – Organisations

Organisations	
CoW	City of Wanneroo
DBCA	Department of Biodiversity, Conservation and Attractions
DWER	Department of Water and Environmental Regulation
DFES	Department of Fire and Emergency Services
DPLH	Department of Planning, Lands and Heritage
OBRM	Office of Bushfire Risk Management
WAPC	Western Australian Planning Commission

Table A3: Abbreviations – Legislation and policies

Legislation	
AS 3959	AS 3959:2018 Construction of buildings in bushfire-prone areas
Guidelines	Guidelines for Planning in Bushfire Prone Areas version 1.4 (DPLH & WAPC 2021)
SPP 3.7	State Planning Policy 3.7 Planning in Bushfire Prone Areas (WAPC 2015)

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Table A4: Abbreviations – Planning and building terms

Planning and building terms	
LPS	Local Planning Scheme
MRS	Metropolitan Region Scheme
NCC	National Construction Code

Table A4: Abbreviations – units of measurement

Units of measurement	
cm	centimetre
ha	hectare
m	metre
m ²	square metre
m AHD	m in relation to the Australian height datum
mm	millimetre
km/h	kilometers per hour

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1 Introduction

1.1 Background

Bella Build & Design WA Pty Ltd (the proponent) are seeking to progress commercial development over Lot 201, Lot 202 and Lot 203 Wanneroo Road, Wanneroo (herein referred to as 'the site'). The site is proposed to be developed into food and beverage outlets, with the site plan provided in **Appendix A**. The site is approximately 0.66 ha in size and is located in the City of Wanneroo. It is bounded by Liberty Oil Tapping service station and Mowatt Close to the north, Wanneroo Road to the east, and vacant land to the south and west (which is zoned for future commercial development) as shown in **Figure 1**.

The entire site is located within a 'bushfire prone area' as designated under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2021) and shown in **Plate 1**. The identification of a site within an area declared as bushfire prone necessitates a further assessment of the determined bushfire risk affecting the site in accordance with *Australian Standard 3959:2018 Construction of buildings in bushfire prone areas* (AS 3959), and the satisfactory compliance of the proposal with the policy measures described in *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7) (WAPC 2015) and the *Guidelines for Planning in Bushfire Prone Areas Version 1.4* (the Guidelines) (DPLH & WAPC 2021).

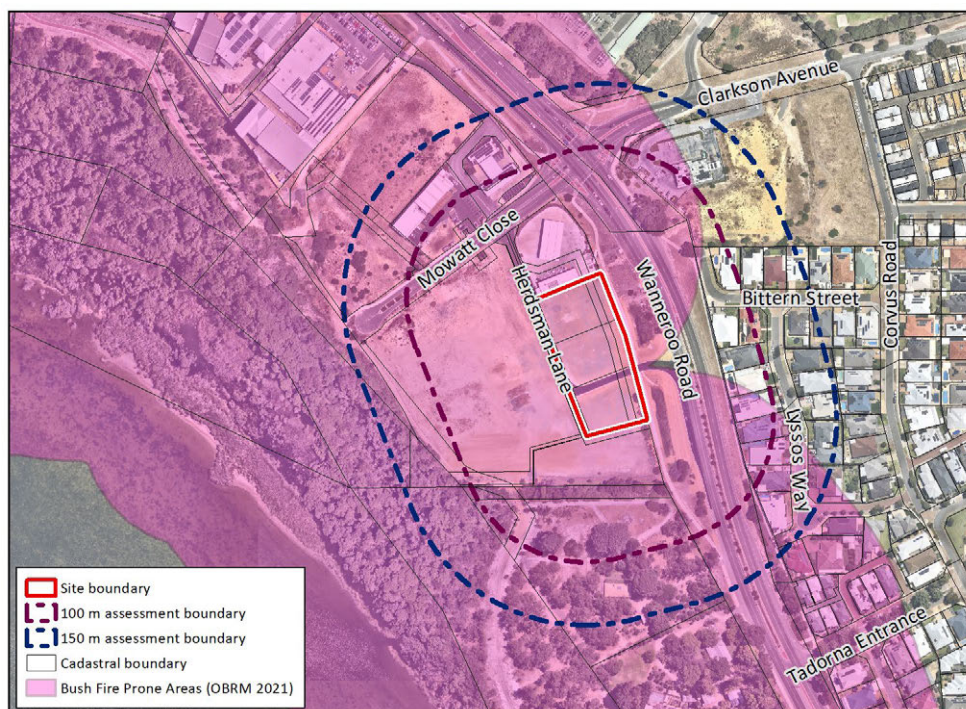


Plate 1: Areas within and nearby the site identified as 'bushfire prone areas' (as indicated in purple) under the state-wide *Map of Bush Fire Prone Areas* (OBRM 2021).

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The purpose of SPP 3.7 and its policy intent is to preserve life and reduce the impact of bushfire on property and infrastructure through effective risk-based land use planning. Importantly, it is risk-based, requiring a methodical approach to identify and evaluate the hazards and provide the treatments to ameliorate these hazards to an acceptable level. SPP 3.7 requires the determining authority, where compliance with the acceptable solution is not achieved, give consideration to the precautionary principle (clause 6.11 in SPP 3.7) and they must be satisfied that the potential for significant adverse impacts can be adequately reduced or managed. In particular:

*SPP 3.7 does not require that there be no increase at all in the threat of bushfire to people property or infrastructure. Rather, as is seen in clause 2 of SPP 3.7, the intention of the policy is to 'implement effective, risk-based land use planning and development to preserve life and **reduce the impact of bushfire on property and infrastructure**'. (emphasis added) ¹*

1.2 Aim of this report

This BMP has been prepared to support the proposed development of the site and addresses the requirements of SPP 3.7 (WAPC 2015), the Guidelines (DPLH & WAPC 2021) and AS 3959 (Standards Australia 2018). The document includes:

- An assessment of the existing classified vegetation in the vicinity of the site (within 150 m) and consideration of bushfire hazards that will exist in the post development scenario (**Section 3**).
- Commentary on how the future development can achieve the bushfire protection criteria outlined within the Guidelines including an indication of BAL ratings likely to be applicable to future habitable buildings (**Section 5**).
- An outline of the roles and responsibilities associated with implementing this BMP (see **Section 6**).

1.3 Statutory policy and framework

The following key legislation, policies and guidelines are relevant to the preparation of a bushfire management plan:

- *Bush Fires Act 1954*
- *Fire and Emergency Services Act 1998*
- *Planning and Development Act 2005* and associated regulations
- *Building Act 2011* and associated regulations
- *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (WAPC 2015)
- *Guidelines for Planning in Bushfire Prone Areas Version 1.4* (DPLH & WAPC 2021)
- *Australian Standard AS 3959 – 2018 Construction of buildings in bushfire prone areas* (Standards Australia 2018)

¹ Harmanis Holdings No. 2 Pty Ltd and Western Australian Planning Commission [2019] WASAT 43 (Harmanis).

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1.4 Description of the proposed development

The site is proposed to be developed for commercial purposes, in line with the proposed development plan provided in **Appendix A**. The development within the site will include:

- Commercial building for multiple outlets, which will comprise food and beverage and/or retail outlets;
- Internal vehicle circulation and parking areas connected to the public road network;
- Landscaped areas throughout the site.

The entirety of the site is zoned 'Urban' under the Metropolitan Region Scheme (MRS), as shown in **Plate 2** below. Additionally, the site is zoned 'Service Commercial' under the *City of Wanneroo Local Planning Scheme No. 2*. (LPS). The proposed development is consistent with the MRS and LPS zonings.

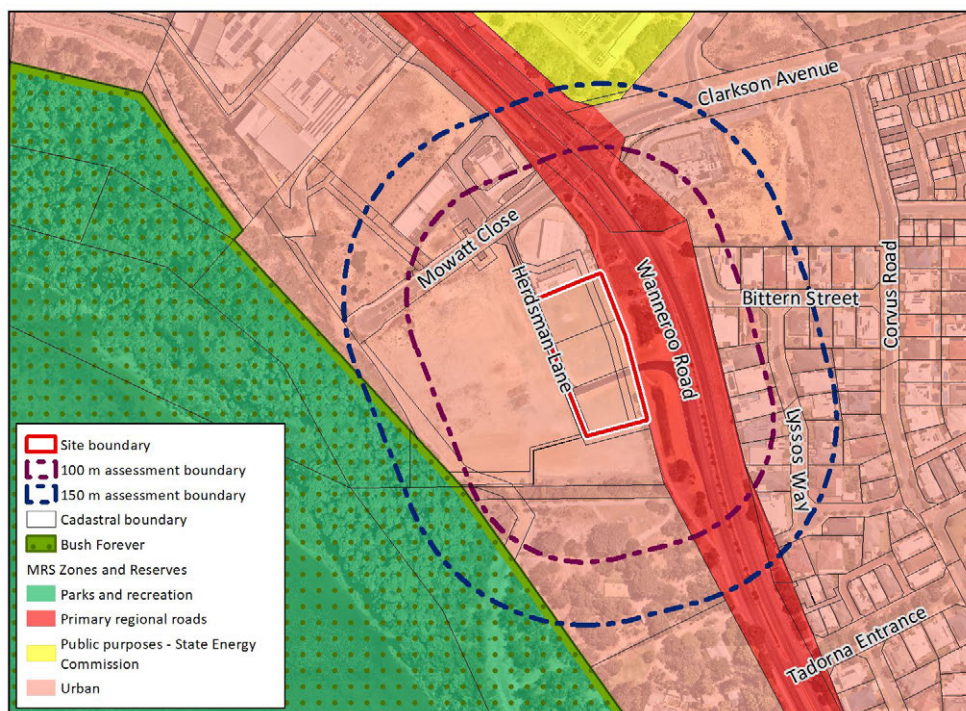


Plate 2: Metropolitan Region Scheme zoning, in and surrounding the site.

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1.5 Description of land characteristics

Based on a review of publicly available historic aerial imagery (WALIA 2023), the majority of the site was historically cleared of native vegetation prior to 1953 to support rural residential land uses. Scattered mature paddock trees remained until March 2020, after which they were removed in association with the subdivision of the broader area.

Surrounding land uses include:

- Wanneroo Road to the east of the site.
- Liberty Oil service station adjoining the northern portion of the site, with Mowatt Close further north.
- Vacant land to the south and west that is proposed for future commercial development. Yellagonga Regional Park is located further to the west.

The natural topographical contours indicate that the site is largely flat and varies from approximately 19 m Australian Height Datum (m AHD) in the west and central portions, to 20 m AHD to the north-east (DoW 2008), as shown in **Figure 1**.

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2 Environmental Considerations

In accordance with the *Bushfire Management Plan – BAL Contour* template prepared by the Department of Planning, Lands and Heritage (2018), this BMP has considered whether there are any environmental assets at or adjoining the site, that may affect the options for the protection of the proposed development from bushfire. To support this, a review of publicly available databases has been undertaken, with particular reference to the Shared Location Information Platform (SLIP) databases. A summary of the search results has been provided in **Table 1**.

The site has been cleared of vegetation and is composed mineral earth with the exception of several small shrubs. As a result, the site contains limited environmental values and none are of conservation significance.

Table 1: Summary of potential environmental considerations that may be associated with the site (based on a search of the SLIP databases)

Key environmental feature (information in brackets refers to mapping data source)	Yes / no / potentially occurring within the site	If yes / potentially, describe value that may be impacted
Conservation category wetlands and buffer (Geomorphic wetlands, Swan Coastal Plain (DBCA-019))	No	No conservation category wetlands (CCWs) are mapped within the site. Lake Joondalup, a mapped CCW (UFI 7954) is located to the west of the site. There are no other geomorphic wetlands within 1 km of the site.
RAMSAR wetlands (DBCA-010)	No	No RAMSAR wetlands are identified within the mapping as occurring within the site or in close proximity.
Threatened and priority flora (DBCA-036)	No	Due to the historical clearing and disturbance across the site, it the site does not support any threatened or priority flora species.
Threatened and priority fauna (DBCA-037)	No	Several conservation significant fauna species were identified as potentially occurring within 2 km of the site according to database searches, the majority of which are migratory bird species. The site contains no fauna habitat due as the site being cleared of vegetation.
Threatened ecological communities (DBCA-038)	No	Due to the historical clearing, no threatened or priority ecological communities occur within the site.
Bush Forever areas (DPLH-019)	No	Not applicable. No Bush Forever sites are located within the site, however Bush Forever Site No. 299 is located approximately 100 m west of the site associated with the Yellagonga Regional Park.
Clearing regulations – environmentally sensitive areas (DWER-046)	No	No environmentally sensitive areas (ESAs) are identified within the site, however one ESA is located 100 m to the west of the site, associated with the mapped extent of Lake Joondalup, a CCW (UFI 7954) and its buffer.
Swan Bioplan Regionally Significant Natural Areas 2010 (DWER-070)	No	Not applicable. No regionally significant natural areas are identified within the site.

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2.1 Native vegetation – modification and clearing

As outlined above, the site has been previously cleared and now comprises bare mineral earth, with the exception several small shrubs within the southern portion of the site. The existing shrubs within the site generally align with areas identified as future landscaping and may be able to be retained (but do not need to be). All vegetation outside the site, is assumed to remain in its existing condition. No areas of native vegetation outside the site are proposed or required to be cleared by the proponent as part of the proposed development.

With regard to bushfire management, vegetation clearing within the site may be required to enable the relevant siting and access requirements of the Guidelines to be achieved and would be associated with clearing to establish the future habitable buildings, driveways and any associated asset protection zones (APZs). As the site is already cleared, this will be limited to the isolated shrubs.

Where clearing/modification of native vegetation is required, this will need to be undertaken with a valid clearing permit or through exemptions pursuant to the *Environmental Protection Act 1986* or the Environmental Protection (Clearing of Native Vegetation) Regulations 2004. Such exemptions (in accordance with the regulations) include clearing associated with constructing a building (or other structure), a vehicle cross-over, or through compliance with Section 33 of the *Bush Fires Act 1954*.

2.2 Revegetation and landscape plans

No revegetation is proposed as part of the development.

Areas of landscaped garden and turf areas are proposed to be developed within the site. These areas will be designed to achieve low threat vegetation in accordance with Section 2.2.3.2 of AS 3959.

Ongoing management is likely to include:

- Irrigation of grass and garden beds (where required).
- Regular removal of weeds and built-up dead material (such as fallen branches, leaf litter etc.)
- Low pruning of trees (branches below 2 m in height removed where appropriate).
- Application of ground/surface covers such as mulch or non-flammable materials as required.
- Regular mowing/slashing (or grazing) of grass to less than 100 mm in height.

The proponent (or future occupiers) will be responsible for the ongoing maintenance of the landscaping areas within the site.

3 Bushfire Assessment Results

Bushfire risk for the site has been appropriately considered both in context to the site and potential impact upon the site using AS 3959 and the Guidelines.

The objective of AS 3959 is to reduce the risk of ignition and loss of a building to bushfire. It provides a consistent method for determining a radiant heat level (radiant heat flux) as a primary consideration of bushfire attack. AS 3959 measures the Bushfire Attack Level (BAL) as the radiant heat level (kW/m²) over a distance of 100 m. AS 3959 also prescribes deemed-to-satisfy construction responses that can resist the determined radiant heat level at a given distance from the fire. It is based on six BAL ratings: BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL-FZ.

A BAL contour plan has been prepared in accordance with Appendix Three of the Guidelines and Method 1 of AS 3959 to determine the BAL ratings likely to be applicable to future buildings. Class 1, 2 and 3 buildings and associated 10a structures are required to be constructed in accordance with the assessed BAL rating.

3.1 Assessment inputs

The BAL assessment was undertaken in accordance with Method 1 of AS 3959. Vegetation classifications and effective slope have been detailed in **Table 2** and **Figure 2**, and a site visit was undertaken on 5 February 2024.

3.1.1 Assumptions

The BAL assessment is based on the following assumptions:

- **Designated FDI:** 80
- **Flame temperature:** 1090 K
- **Effective slope beneath classified vegetation:** flat/upslope (**Figure 2**)
- The site will be implemented and managed to be largely clear of vegetation and excluded as non-vegetated in accordance with 2.2.3.2 (e) of AS 3959, or where landscaping is present, this will be implemented and managed to achieve low threat in accordance with 2.2.3.2 (f).
- Areas of low threat vegetation outside the site will continue to be managed and/or considered to achieve low threat (in accordance with Section 2.2.3.2 of AS 3959) based on the existing maintenance regimes.
- Classified vegetation that has been identified outside of the proponent's landholdings has been assumed to remain in its current state (unless stated otherwise) and will therefore continue to be a bushfire hazard to development within the site.
- Areas of grassland can include up to 10% foliage cover from shrubs and trees, as per AS 3959.

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3.1.2 Vegetation classification

All vegetation within 150 m of the site was classified or excluded in accordance with Section 2.2.3 of AS 3959. Each distinguishable vegetation plot is described in **Table 2** and shown in **Figure 2**. The assignment of the vegetation classifications (or exclusions) is based on consideration of the fuel layers of different vegetation types, which can be broken down into five segments as illustrated in **Plate 3** below.

Not all vegetation is classified as a bushfire risk. Vegetation and ground surfaces that are exempt from classification as a potential hazard are identified as a low threat under Section 2.2.3.2 of AS 3959. Low threat vegetation includes the following:

- a) *Vegetation of any type that is more than 100 m from the site.*
- b) *Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified.*
- c) *Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other or of other areas of vegetation being classified.*
- d) *Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified.*
- e) *Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings, and rocky outcrops.*
- f) *Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves, and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and wind breaks.*






Plate 3: The five fuel layers in a forest environment that could be associated with fire behaviour (Gould et al. 2007)

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Table 2: AS 3959 vegetation classification (refer to Figure 2)

Photo ID:	1	Plot:	1	<p>DIRECTION 234 deg(T) 31.72145°S ACCURACY 5 m 115.78279°E DATUM WGS84</p>  <p>2024-02-05 07:54:36+08:00</p>
Vegetation Classification or Exclusion Clause and Effective Slope				
Forest (Class A) – Flat/upslope				
Description / Justification for Classification				
<p>Forest vegetation is identified west of the site associated with Yellagonga Regional Park. The vegetation comprises melaleuca reaching heights of approximately 8 m and eucalyptus to approximately 15 m in height over small native shrubs and grasses. Multi-tiered vegetation structure with canopy cover greater than 30% is evident.</p>				
Photo ID:	2	Plot:	1	<p>DIRECTION 173 deg(T) 31.72184°S ACCURACY 3 m 115.78311°E DATUM WGS84</p>  <p>2024-02-05 07:55:17+08:00</p>
Vegetation Classification or Exclusion Clause and Effective Slope				
Forest (Class A) – Flat/upslope				
Description / Justification for Classification				
<p>Forest vegetation is identified south west of the site associated with Yellagonga Regional Park. The vegetation comprises melaleuca reaching heights of approximately 8 m and eucalyptus to approximately 15 m in height over small native shrubs and grasses. Multi-tiered vegetation structure with canopy cover greater than 30% is evident.</p>				
Photo ID:	3	Plot:	2	<p>DIRECTION 211 deg(T) 31.72197°S ACCURACY 3 m 115.78451°E DATUM WGS84</p>  <p>2024-02-05 07:39:36+08:00</p>
Vegetation Classification or Exclusion Clause and Effective Slope				
Forest (Class A) – Flat/upslope				
Description / Justification for Classification				
<p>Forest vegetation is identified south of the site associated with private landholdings. The vegetation comprises planted Eucalyptus species approximately 15 m in height over native shrubs, ferns and grasses. Multi-tiered vegetation structure with canopy cover greater than 30% is evident.</p>				

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Table 2: AS 3959 vegetation classification (refer to **Figure 2**) (continued)

Photo ID:	4	Plot:	2	
Vegetation Classification or Exclusion Clause and Effective Slope				
Forest (Class A) – Flat/upslope				
Description / Justification for Classification				
<p>Forest vegetation is identified south of the site associated with remnant vegetation within private landholdings. The vegetation comprises Eucalyptus species approximately 15 m in height over native shrubs, ferns and grasses. Multi-tiered vegetation structure with canopy cover greater than 30% is evident.</p>				
Photo ID:	5	Plot:	3	
Vegetation Classification or Exclusion Clause and Effective Slope				
Forest (Class A) – Flat/upslope				
Description / Justification for Classification				
<p>Forest vegetation is identified north of the site associated with remnant vegetation within private landholdings. The vegetation comprises Eucalyptus species approximately 20 m in height over shrubs and grasses. Multi-tiered vegetation structure with canopy cover greater than 30% is evident.</p>				
Photo ID:	6	Plot:	4	
Vegetation Classification or Exclusion Clause and Effective Slope				
Scrub (Class D) – Flat/upslope				
Description / Justification for Classification				
<p>Scrub vegetation (in the foreground of the photo) has been identified west of the site. The vegetation is characterised by Typha species (greater than 2m in height) intermixed with small native shrubs expected to reach a maximum height of up to 6 m.</p>				

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Table 2: AS 3959 vegetation classification (refer to **Figure 2**) (continued)

Photo ID:	7	Plot:	5	<p>DIRECTION 157 deg(T) 31.72181°S ACCURACY 5 m</p> <p>115.78491°E DATUM WGS84</p> <p>2024-02-05 07:44:28+08:00</p>
Vegetation Classification or Exclusion Clause and Effective slope				
Scrub (Class D) – Flat/upslope				
Description / Justification for Classification				
Scrub vegetation is identified south east of the site within the drainage areas in portions of the Wanneroo Road reserve. Vegetation is dominated by Acacia species and <i>Rininus communis</i> (castor oil plant) reaching heights up to 6 m.				
Photo ID:	8	Plot:	6	<p>DIRECTION 354 deg(T) 31.72109°S ACCURACY 14 m</p> <p>115.78476°E DATUM WGS84</p> <p>2024-02-05 07:46:56+08:00</p>
Vegetation Classification or Exclusion Clause and Effective Slope				
Grassland (Class G) – Flat/upslope				
Description / Justification for Classification				
Grassland vegetation has been identified within the Wanneroo Road reserve external to the east of the site. This area contains a drain predominantly comprised of paddock grasses, sedge grasses and occasional shrubs comprising less than 10% foliage cover. It is possible vegetation within the road reserve will be managed in the future following the introduction of managed landscaping within the site. However, no management has been assumed in this area to support this BMP.				
Photo ID:	9	Plot:	6	<p>DIRECTION 343 deg(T) 31.72182°S ACCURACY 3 m</p> <p>115.78490°E DATUM WGS84</p> <p>2024-02-05 07:44:23+08:00</p>
Vegetation Classification or Exclusion Clause and Effective Slope				
Grassland (Class G) – Flat/upslope				
Description / Justification for Classification				
Grassland vegetation has been identified within the Wanneroo Road reserve external to the south-east of the site. This area contains a drain predominantly comprised of paddock grasses, sedge grasses and occasional shrubs comprising less than 10% foliage cover. It is possible vegetation within the road reserve will be managed in the future following introduction of manage landscaping within the site. However, no management has been assumed in this area to support this BMP.				

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Table 2: AS 3959 vegetation classification (refer to **Figure 2**) (continued)

Photo ID:	10	Plot:	7	DIRECTION 294 deg(T)	31.71992°S 115.78613°E	ACCURACY 5 m DATUM WGS84	<p>2024-02-05 08:20:59+08:00</p>
Vegetation Classification or Exclusion Clause and Effective Slope							
Grassland (Class G) – Flat/upslope							
Description / Justification for Classification							
Areas composed of pasture grasses have been identified within private landholdings external to the north west, north east, and south of the site. These areas are predominantly composed of paddock grasses, with scattered trees or shrubs comprising less than 10% foliage cover.							
Photo ID:	11	Plot:	8	DIRECTION 63 deg(T)	31.72119°S 115.78443°E	ACCURACY 11 m DATUM WGS84	<p>2024-02-05 07:46:19+08:00</p>
Vegetation Classification or Exclusion Clause and Effective Slope							
Exclusion 2.2.3.2 (e) – not applicable							
Description / Justification for Classification							
Non-vegetated areas including roads surrounding the site have been excluded in accordance with exclusion 2.2.3.2 (e). Whilst excluded in accordance with exclusion 2.2.3.2 (e) these areas may contain scattered or isolated vegetation/gardens, which are managed to achieve low threat, however, the areas primarily consist of the built form or mineral earth and have been excluded as non-vegetated.							
Photo ID:	12	Plot:	8	DIRECTION 246 deg(T)	31.72094°S 115.78376°E	ACCURACY 10 m DATUM WGS84	<p>2024-02-05 07:49:26+08:00</p>
Vegetation Classification or Exclusion Clause and Effective Slope							
Exclusion 2.2.3.2 (e) – not applicable							
Description / Justification for Classification							
Non-vegetated areas consisting of roads and residential areas surrounding the site have been excluded in accordance with exclusion 2.2.3.2 (e). Whilst excluded in accordance with exclusion 2.2.3.2 (e) these areas also contain vegetation/gardens, which are managed to achieve low threat, however, the areas primarily consist of the built form and have been excluded as non-vegetated.							

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Table 2: AS 3959 vegetation classification (refer to **Figure 2**) (continued)

Photo ID:	13	Plot:	8	DIRECTION 184 deg(T)	31.72144°S 115.78591°E	ACCURACY 4 m DATUM WGS84
Vegetation Classification or Exclusion Clause and Effective Slope				<p>2024-02-05 08:24:22+08:00</p>		
Exclusion 2.2.3.2 (e) – not applicable						
Description / Justification for Classification						
Non-vegetated areas consisting of roads and residential areas surrounding the site have been excluded in accordance with exclusion 2.2.3.2 (e). Whilst excluded in accordance with exclusion 2.2.3.2 (e) these areas also contain vegetation/gardens, which are managed to achieve low threat, however, the areas primarily consist of the built form and have been excluded as non-vegetated.						
Photo ID:	14	Plot:	9	DIRECTION 353 deg(T)	31.72001°S 115.78469°E	ACCURACY 8 m DATUM WGS84
Vegetation Classification or Exclusion Clause and Effective Slope				<p>2024-02-05 08:06:05+08:00</p>		
Exclusion 2.2.3.2 (f) – not applicable						
Description / Justification for Classification						
Existing low threat vegetation has been identified north east of the site, associated with managed portions of Wanneroo Road reserve. The area contains well managed garden and grass areas with debris removed and regularly mown grasses. These areas have been excluded in accordance with 2.2.3.2 (f).						
Photo ID:	15	Plot:	9	DIRECTION 336 deg(T)	31.72059°S 115.78454°E	ACCURACY 5 m DATUM WGS84
Vegetation Classification or Exclusion Clause and Effective Slope				<p>2024-02-05 08:03:16+08:00</p>		
Exclusion 2.2.3.2 (f) – not applicable						
Description / Justification for Classification						
Existing low threat vegetation has been identified east of the site associated with managed portions of Wanneroo Road reserve. This area contains well managed garden and grass areas with debris removed and regularly mown grasses. This area has been excluded in accordance with 2.2.3.2 (f).						

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3.2 Assessment outputs

The vegetation classifications determined in **Section 3.1** are summarised in **Table 3** and incorporates and changes assumed changes to vegetation post-development as well as the determined effective slope applicable to each vegetation plot. The resultant BALs are shown in **Figure 3**.

The BAL ratings are based on the minimum distance outlined in Table 2.5 of AS 3959, which have been summarised in **Table 4** for ease of reference.

Table 3: AS 3959 Vegetation classification and effective slope

Plot	Applied vegetation classification	Effective slope
1	Class A – Forest	Flat/upslope
2	Class A – Forest	Flat/upslope
3	Class A – Forest	Flat/upslope
4	Class D – Scrub	Flat/upslope
5	Class D – Scrub	Flat/upslope
6	Class G - Grassland	Flat/upslope
7	Class G - Grassland	Flat/upslope
8	Exclusion 2.2.3.2 (e) – existing non-vegetated area surrounding the site.	N/A
9	Exclusion 2.2.3.2 (f) – existing areas surrounding the site managed to low threat and associated with private landholdings and areas of road reserve.	N/A
10	Exclusion 2.2.3.2 (e) – areas of built form within the site to be modified to a non-vegetated state.	N/A

The BAL assessment demonstrates that while a small portion of the site is subject to BAL-FZ and BAL-40 (approximately a 7 m-wide extent within the southern portion of the site), the proposed habitable buildings are all sited to achieve BAL-29 or less. The four habitable buildings and the majority of the site are subject to BAL-12.5.

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Table 4: Setback distances based on vegetation classification and effective slope and Table 2.5 of AS 3959, as determined by the method 1 BAL assessment

Plot number (Figure 2)	Vegetation classification (see Figure 2)	Effective slope (see Figure 2)	Distance to vegetation (from Table 2.5 of AS 3959)	BAL rating (see Figure 3)
Plot 1, Plot 2 and Plot 3	Forest (Class A)	Flat/upslope	< 16 m	BAL-FZ
			16 - < 21 m	BAL-40
			21 - < 31 m	BAL-29
			31 - < 42 m	BAL-19
			42 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
Plot 4 and Plot 5	Scrub (Class D)	Flat/upslope	< 10 m	BAL-FZ
			10 - < 13 m	BAL-40
			13 - < 19 m	BAL-29
			19 - < 27 m	BAL-19
			27 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
Plot 6 and Plot 7	Grassland (Class G)	Flat/upslope	< 6 m	BAL-FZ
			6 - < 8 m	BAL-40
			8 - < 12 m	BAL-29
			12 - < 17 m	BAL-19
			17 - < 50 m	BAL-12.5
			> 50 m	BAL-LOW

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4 Identification of Bushfire Hazard Issues

The key hazard issues with potential to impact the site include ember attack (particularly from nearby forest vegetation to the west of the site) and grassland within the drainage reserve to the east of the site. From a bushfire hazard management perspective, based on the requirements of SPP 3.7 and the Guidelines with consideration for potential hazards, future development is likely to require the following management and/or consideration:

- Provision of appropriate separation distance from bushfire hazards to ensure a BAL rating of BAL-29 or less can be achieved at future habitable buildings.
- Ensuring that site access is designed, constructed and managed to ensure safe access and egress for fire fighting vehicles and occupants.
- Ensuring that site landscaping is designed, implemented and managed to achieve low threat standards to reduce the risk of fires starting onsite.
- Ensuring that the provision of water for firefighting is sufficient and accessible by firefighting services.

4.1 Permanent hazards

The *Building Act 2011* does not apply a bushfire construction standard to commercial buildings such as a retail sale room or restaurant, but SPP 3.7 provides (encourages) the adoption of equivalent construction standards and risk treatments at the applicant's discretion (Section 5.8.3 of the Guidelines).

The site and majority of surrounding 150 m comprises areas of non-vegetated area and/or areas managed to achieve low threat in accordance with Section 2.2.3.2 of AS 3959. Areas of classified vegetation include forest to the west and south of the site, and grassland identified within the Wanneroo Road reserve to the east. This vegetation is associated with areas of reserve not under the control of the proponent and is therefore not able to be modified by the landholder and is therefore identified as a bushfire hazard.

4.2 Temporary hazards

Vacant land to the immediate west and south of the site and well as areas north of Mowatt Close are identified for future development. The majority of vegetation has already been removed from these areas following subdivision approvals, with the remaining grassland and scrub hazards likely to be removed permanently as development progresses. Remaining vegetation associated with these areas have been identified as a hazard for this BMP given the timing for completion of these works are not known.

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4.3 Vulnerable or high-risk land use

The definition of a vulnerable land use is where occupants are less able to respond in a bushfire emergency. The types of land use considered vulnerable includes *“facilities that, due to the building design or use, or the number of people accommodated, are likely to present evacuation challenges.”* This generally includes (but is not limited to) schools, hospitals, aged care facilities and similar. The identification of a land use as a vulnerable use is at the discretion of the decision maker.

A high-risk land use is one where practices that occur within the site may lead to a potential ignition and spread of a fire from the site or could prolong the duration or intensity of a bushfire should a fire arrive from outside the site. The Guidelines indicate that high risk land uses may include but are not limited to; service stations, landfill sites, bulk storage of hazardous materials, fuel depots and certain heavy industries as well as military bases, power generating land uses, saw-mills, highways and railways, among other uses meeting the definition.

No vulnerable or high-risk land use are proposed as part of the development.

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5 Assessment Against the Bushfire Protection Criteria

The bushfire protection criteria provided in the Guidelines represents the risk treatments applicable to achieving the intent and the objectives listed in SPP 3.7. The bushfire protection criteria are divided into four subsystems (elements), plus a standalone element for tourism. Each subsystem is provided with an intent and solution methods, either performance principle or acceptable solution (predetermined solution). Compliance with each subsystem (as a risk treatment) is required to demonstrate to the decision maker that the risk is within acceptance.

The applicable bushfire protection criteria identified in the Guidelines and addressed as part of this BMP are:

- Element 1: Location of the development
- Element 2: Siting and design of the development
- Element 3: Vehicular access
- Element 4: Water supply.

As part of future development, an ‘acceptable solution’ will be able to address the intent of all four bushfire protection criteria as part of the future development of the site. A summary of how this can be achieved and an associated compliance statement for each has been provided in **Table 5**. The key measures have also been summarised in **Figure 4**.

Table 5: Assessment against the bushfire protection criteria from the Guidelines

Bushfire protection criteria	Proposed bushfire management strategies
Element 1: Location	
A1.1 Development location	The site will be subject to a moderate bushfire hazard as it is within 100 m of classified vegetation (predominantly grassland vegetation). The proposed development is located in an area that will, upon completion, be subject to BAL-29 or less, with the exception of a small portion of the carpark area. The proposal complies with A1.1 .
Element 2: Siting and design	
A2.1 Asset Protection Zone	<p>The development area is required to be managed to a low threat condition with a minimum Asset Protection Zone (APZ) equivalent to enable BAL-29 to be achieved at the habitable building. APZs are typically contained within a lot but can also include areas external to a lot (or building) that achieve low threat in accordance with Section 2.2.3.2 of AS 3959 where the APZ cannot be contained within the lot boundaries (such as managed road reserves, carparks, public open space or similar).</p> <p>The proposed habitable buildings are able to achieve an APZ with sufficient separation from classified vegetation to achieve BAL-29 or below. The entire site will be managed to achieve low threat in accordance with Section 2.2.3.2 of AS 3959. The BAL contour plan provided in Figure 3 demonstrates that the proposed habitable buildings can achieve a BAL rating of BAL-29 or less. The proposal complies with A2.1.</p>
Element 3: Vehicular access	
A3.1 Public roads	The site will be serviced by the existing public road network. The adjacent surrounding public road (Wanneroo Road to the east, Mowatt Close to the north and Herdsman Lane to the west) complies with the minimum technical standards outlined in Appendix Four of the Guidelines (DPLH & WAPC 2021) and the IPWEA Subdivisional Guidelines, with an excerpt of the requirements provided in Plate 4 . The proposed development complies with A3.1 .

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Table 5: Assessment against the bushfire protection criteria from the Guidelines (continued)

Bushfire protection criteria	Proposed bushfire management strategies
Element 3: Vehicular access (continued)	
A3.2a Multiple access routes.	The proposed development provides at least two connections to the existing public road network, namely via Herdsman Lane which connects to Mowatt Close and the intersection of Wanneroo Road and Clarkson Avenue to the north. There is also a direct connection from the site to Wanneroo Road in the east (see Figure 4). Wanneroo Road is a major regional road, providing egress options to the north and south and linking to the suburbs of Yanchep in the north and Yokine in the south. The proposed development complies with A3.2 .
A3.2b Emergency access way	Not applicable. No emergency way is proposed or required to achieve compliance with any other criterion.
A3.3 Through-roads	Not applicable. This criterion is applicable to subdivision applications (or higher order strategic planning stage), where the planning of a road layout is under assessment.
A3.4a Perimeter roads	Not applicable. This criterion is not applicable to development applications.
A3.4b Fire service access route	Not applicable. This criterion is not applicable to development applications.
A3.5 Battle-axe access legs	Not applicable. This criterion is not applicable to development applications.
A3.6 Private driveway longer than 70 metres	Not applicable. As the site is surrounded by public roads, no portion of the site is more than 70 m from an external public road; the site is within an area serviced by reticulated water; and the road speed limit is no greater than 70 km/h; this criterion is not applicable. The internal road network and carpark provide for two way access, with the driveway portion at least 6 m-wide.
Element 4: Water	
A4.1 Reticulated areas	Not applicable. This criterion is not applicable to development applications.
A4.2 Provision of water for fire fighting purposes	The site is serviced by reticulated water supply. Existing hydrant locations are shown in Figure 4 , and achieve the relevant water authority requirements. The proposed development can comply with A4.2.

Table 6: Vehicular access technical requirements

TECHNICAL REQUIREMENTS	1 Public roads	2 Emergency access way ¹	3 Fire service access route ¹	4 Battle-axe and private driveways ²
Minimum trafficable surface (metres)	In accordance with A3.1	6	6	4
Minimum horizontal clearance (metres)	N/A	6	6	6
Minimum vertical clearance (metres)	4.5			
Minimum weight capacity (tonnes)	15			
Maximum grade unsealed road ³	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%)		
Maximum grade sealed road ³		1:7 (14.3%)		
Maximum average grade sealed road		1:10 (10%)		
Minimum inner radius of road curves (metres)		8.5		

Notes:

¹ To have crossfalls between 3 and 6%.

² Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.

³ Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle.

Plate 4: Excerpt of Table 6 from The Guidelines

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5.1 Additional management strategies

5.1.1 Future approval considerations

The BAL assessment in this BMP assesses the potential bushfire risk posed to future habitable buildings within the site based on the proposed management of vegetation and assumptions outlined in **Section 3**.

The development will be subject to a building licence application as part of the construction. It is noted that the class of building (likely Class 5, 6 or 7) will not be subject to the requirements of AS 3959. However, commercial building construction generally exceeds the requirements of AS 3959. If required, it is recommended that the construction of commercial buildings to the assessed BAL rating and associated standards listed in Sections 3 and 5 of AS 3959 is incorporated.

5.1.2 Landscape management

5.1.2.1 Within the site

Landscaped areas within the site will be designed and developed as part of implementing the development approval. These areas will achieve low threat in accordance with Section 2.2.3.2 of AS 3959 and ongoing management will be the responsibility of the proponent/future occupants going forward. Management is likely to include:

- Irrigation of grass and garden beds (where required).
- Regular maintenance including removal of weeds and dead material.
- Low pruning of trees (branches below 2 m in height removed where appropriate).
- Application of ground covers such as mulch or non-flammable materials.
- Regularly mowing/slashing of grass to less than 100mm in height.

The proponent will be responsible for the implementation of the landscape areas, with future owners/occupiers responsible for the ongoing maintenance of the site, including all landscaped areas.

5.1.2.2 Surrounding the site

All classified vegetation and excluded areas surrounding the site are expected to remain in their current condition based on existing long-term management regimes, or for the purposes of this BMP have been conservatively assessed as unmanaged as detailed in **Section 3** above.

As indicated in **Figure 2**, all private landholdings identified as non-vegetated or low threat (exclusion 2.2.3.2 (e) or (f)) are assumed to continue to be managed this way until development progresses, as per existing maintenance regimes. All other vegetation will remain in its existing condition for the foreseeable future.

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5.1.3 City of Wanneroo Fire Compliance Notice

The City of Wanneroo releases a Fire Compliance Notice on an annual basis to provide a framework for bushfire management within the City. The City of Wanneroo are able to enforce this notice in accordance with Section 33 of the *Bush Fires Act 1954*. In addition, Section 33 1(b) also provides the City with additional power to direct landowners to undertake works to remedy conditions conducive to the outbreak or spread of bushfire. Until development is progressed within the site, the proponent will be required to comply with the Fire Compliance Notice.

5.1.4 Public education and preparedness

Community bushfire safety is a shared responsibility between individuals, the community, the government and fire agencies. DFES has an extensive Community Bushfire Education Program including a range of publications, a website and Bushfire Ready Groups. The DFES website (<https://www.dfes.wa.gov.au/bushfire/prepare/>) provides a range of materials to help the community prepare for and survive the bushfire season.

The City of Wanneroo provides bushfire safety advice to residents available from their website <https://www.wanneroo.wa.gov.au/bushfires>. Professional, qualified consultants also offer bushfire safety advice and relevant services to residents and businesses in high-risk areas in addition that provided in this BMP.

In the case of a bushfire in the area, advice would be provided to owners/occupants by DFES, the Department of Biodiversity Conservation and Attractions (DBCA) and/or the City of Wanneroo on any specific recommendations with regard to responding to the bushfire, including evacuation if required.

It is highly recommended that the proponent and future operators make themselves aware of their responsibilities with regard to preparing for and responding to a potential bushfire that may impact them, their occupants and property, regardless of the BAL rating their properties are subject to.

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6 Responsibilities for Implementation and Management of Bushfire Measures

Table 6 outlines the future responsibilities of the proponent (developer) and the City of Wanneroo associated with implementing this BMP. These responsibilities will need to be considered as part of implementation and ongoing operation.

Table 6: Responsibilities for the implementation of this BMP during development and ongoing management

Proponent/Operator/Occupier		Timing
No.	Implementation and management actions	
1	Undertake development of the site in accordance with the proposed development layout plan, or as otherwise agreed with the City of Wanneroo, ensuring habitable buildings are positioned to achieve BAL-29 or less.	As part of development
2	Design and implement landscaped areas to achieve a low threat in accordance with Section 2.2.3.2 of AS 3959. This can include consideration of the principles of Schedule 1 in Appendix Four of the Guidelines.	Prior to occupation
3	The entire site is to be managed on an ongoing basis to achieve low threat in accordance with Section 2.2.3.2 of AS 3959 in perpetuity. Management of the site (particularly the landscaped areas) will include (but is not limited to): <ul style="list-style-type: none"> • Irrigation of grass and garden beds (where required). • Regular removal of weeds and built-up dead material (such as fallen branches, leaf litter etc.) • Low pruning of trees (i.e. removal of branches less than 2 m in height). • Application of ground/surface covers such as mulch or non-flammable materials as required. • Where grass is present, this should be regularly cut and removed or otherwise disposed of so that the grass is maintained at or below 100 mm in height at all times, and there is no accumulation of fine fuel load. 	Ongoing, as required
4	Ensure fire hydrants remain accessible at all times.	Ongoing, as required
City of Wanneroo		Timing
No.	Management action	
1	Continue with existing controls to maintain fuel loads in existing public road reserves and public open space (under their management) in accordance with existing maintenance regimes, to minimise fuel loads.	Ongoing, as required
2	Continue with existing controls to monitoring vegetation fuel loads in private landholdings against the requirements of the City's Fire Compliance Notice and liaising with relevant stakeholders to maintain fuel loads at minimal/appropriate fuel levels, in accordance with the City's responsibilities under the <i>Bush Fires Act 1954</i> .	Ongoing, as required
Water Corporation		Timing
No.	Management action	
1	Ensure water hydrants in adjacent road reserve are maintained and accessible to fire services.	Ongoing, as required

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7 Applicant Declaration

7.1 Accreditation

This assessment has been prepared by Emerge Associates who have been providing bushfire risk management advice for more than 10 years, undertaking detailed bushfire assessments (and associated approvals) to support the land use development industry. Emerge Associates have a number of team members who have undertaken Bushfire Planning and Design (BPAD) Level 1 and Level 2 training and are Fire Protection Association of Australia (FPAA) accredited practitioners.

Anthony Rowe is a FPAA Level 3 BPAD accredited practitioner (BPAD No. 36690) in accordance with clause 6.12 of the Guidelines.

7.2 Declaration

I declare that the information provided is true and correct to the best of my knowledge.

Signature:

A handwritten signature in black ink, appearing to read "Anthony Rowe", written over a light grey dotted grid background.

Name: Anthony Rowe

Company: Envision Bushfire Protection/Emerge Associates

Date: 28/02/2024

BPAD Accreditation: Level 3 BPAD no. 36690

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8 References

8.1 General references

The references listed below have been considered as part of preparing this document.

Department of Biodiversity, Conservation and Attractions (DBCA) 2017, *Ramsar Sites (DBCA-010)*.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022a, *Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)*, Western Australia, <<https://catalogue.data.wa.gov.au/dataset/geomorphic-wetlands-swan-coastal-plain>>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022b, *Threatened Ecological Communities (DBCA-038)*, Perth, Western Australia <<https://catalogue.data.wa.gov.au/dataset/threatened-ecological-communities>>.

Department of Water (DoW) 2008, *LiDAR Elevation Dataset, Swan Coastal Plain*, Perth.

Department of Planning, Lands and Heritage, and Western Australian Planning Commission, (DPLH & WAPC) 2021, *Guidelines for Planning in Bushfire Prone Areas Version 1.4*, Perth, Western Australia.

Department of Water and Environmental Regulation (DWER) 2021, *Clearing Regulations - Environmentally Sensitive Areas (DWER-046)*, <<https://catalogue.data.wa.gov.au/dataset/clearing-regulations-environmentally-sensitive-areas-dwer-046>>.

Gould, J., McCaw, W., Cheney, N., Ellis, P. and Matthews, S. 2007, *Field Guide: Fuel Assessment and Fire Behaviour Prediction in Dry Eucalypt Forest*, CSIRO and Department of Environment and Conservation, Perth, Western Australia.

Office of Bushfire Risk Management (OBRM) 2021, *Map of Bush Fire Prone Areas*, Landgate, <https://maps.slip.wa.gov.au/landgate/bushfireprone/>.

Standards Australia 2018, *AS 3959:2018 Construction of buildings in bushfire-prone areas*, Sydney.

Western Australian Land Information Authority (WALIA) 2023, *Landgate Map Viewer Plus*.

Western Australian Planning Commission (WAPC) 2015, *State Planning Policy 3.7 Planning in Bushfire Prone Areas*, Perth.

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8.2 Online references

The online resources that have been utilised in the preparation of this report are referenced in **Section 8.1**, with access date information provided in **Table R-1**.

Table R 1 Access dates for online references

Reference	Date accessed	Website or dataset name
(OBRM 2021)	5 February 2024	Bush Fire Prone Areas
(WALIA 2023)	5 February 2024	Mapviewer Plus
(DBCA 2022a)	5 February 2024	Geomorphic Wetlands, Swan Coastal Plain
(DBCA 2017)	5 February 2024	Ramsar Sites
(DBCA 2022b)	5 February 2024	Threatened ecological communities
(DWER 2021)	5 February 2024	Environmentally Sensitive Areas

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Figures



Figure 1: Site Location and Topographic Contours

Figure 2: AS 3959 Vegetation Classifications and Effective Slope

Figure 3: Bushfire Attack Level Contour Plan

Figure 4: Spatial Representation of Bushfire Management Strategies

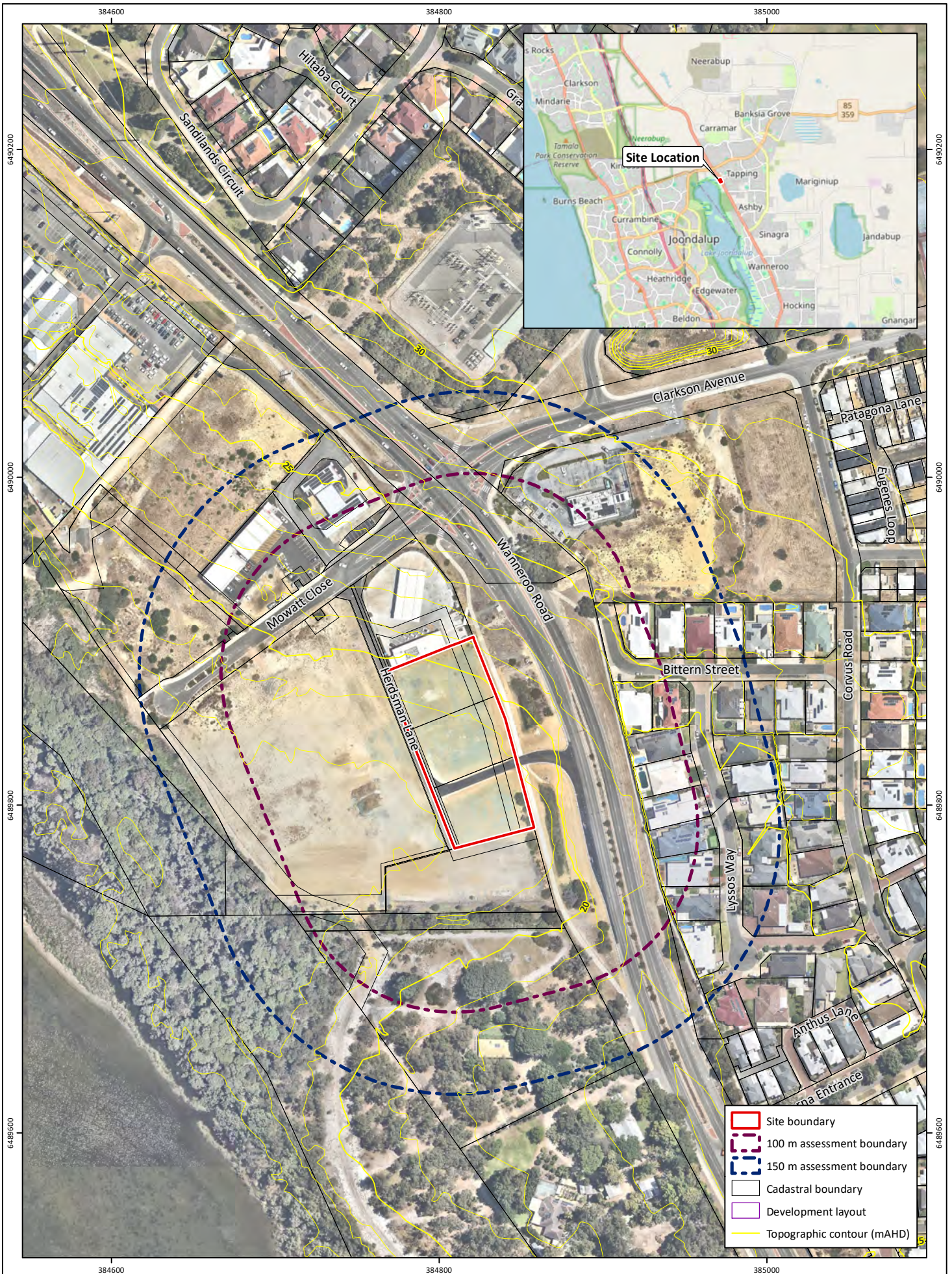
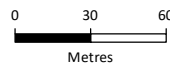


Figure 1: Site Location and Topographic Contours

Project: Bushfire Management Plan
 Lot 202, Lot 203 and Lot 204, Wanneroo Road, Wanneroo
Client: Bella Build & Design WA Pty Ltd

Plan Number: EP24-008(01)--F02
Drawn: GAR
Date: 08/02/2024
Checked: DVB
Approved: KK
Date: 23/02/2024



Scale: 1:3,000@A4
 GDA2020 MGA Zone 50





Figure 2: AS 3959 Vegetation Classifications and Effective Slope

Project: Bushfire Management Plan
 Lot 202, Lot 203 and Lot 204, Wanneroo Road, Wanneroo

Client: Bella Build & Design WA Pty Ltd

Plan Number: EP24-008(01)--F03
Drawn: GAR
Date: 08/02/2024
Checked: DVB
Approved: KK
Date: 23/02/2024

0 25 50
 Metres
 Scale: 1:2,500@A4
 GDA2020 MGA Zone 50



While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used.
 © Landgate (2024). Nearmap Imagery date: 02/12/2023

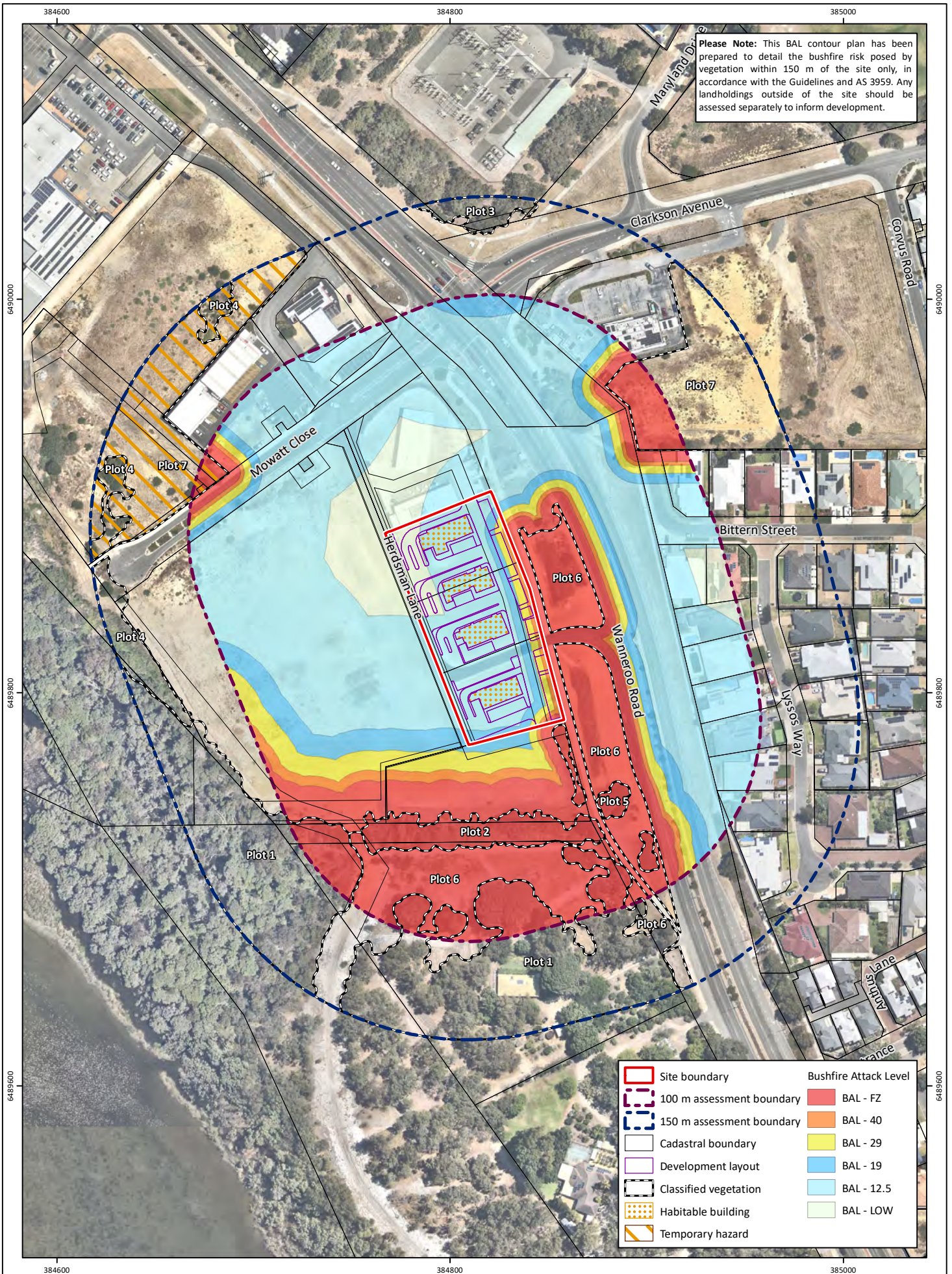


Figure 3: Bushfire Attack Level Contour Plan

Project: Bushfire Management Plan
 Lot 202, Lot 203 and Lot 204, Wanneroo Road, Wanneroo
Client: Bella Build & Design WA Pty Ltd

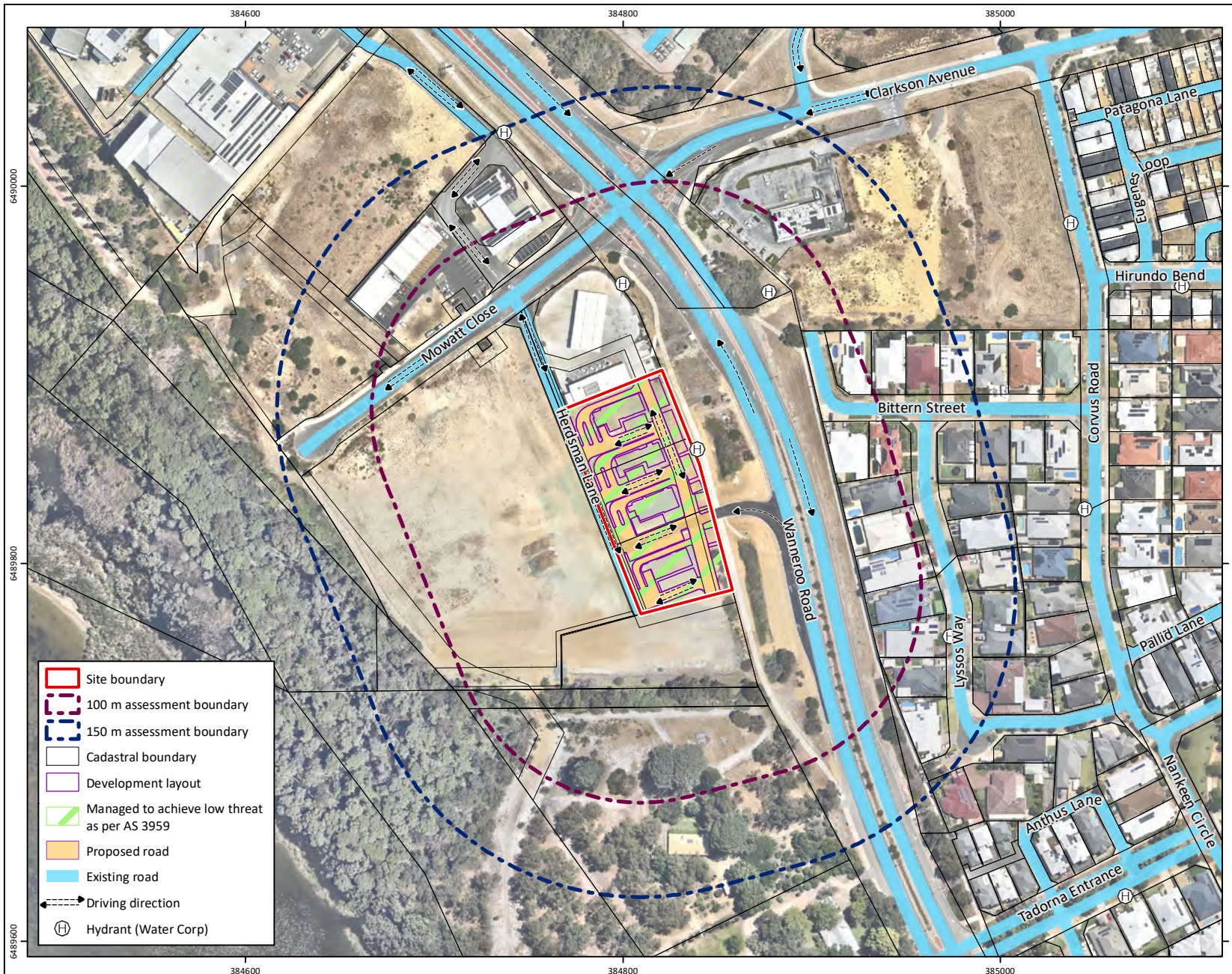
Plan Number: EP24-008(01)--F04
Drawn: GAR
Date: 08/02/2024
Checked: DVB
Approved: KK
Date: 23/02/2024



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 Metres
 Scale: 1:2,500@A4
 GDA2020 MGA Zone 50



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Habitable buildings

All habitable buildings to be located in an area that achieves BAL-29 or less (as determined in accordance with AS 3959).

Vegetation management

The entire site including landscaping areas are to be designed and managed to achieve low threat in accordance with Section 2.2.3.2 of AS 3959 and the principles of Schedule 1 in Appendix Four of the Guidelines. This will be maintained by the proponent and/or the owner/occupier in perpetuity.

Vehicle access

Ensure that vehicle access within the site is designed and installed in accordance with the requirements of Appendix Four in the Guidelines unless agreed otherwise with City of Wanneroo. This includes connections to Wanneroo Road and Herdsman Lane.

Water supply

The development will be serviced by a network of reticulated water hydrants.

Figure 4: Spatial Representation of Bushfire Management Strategies

Project: Bushfire Management Plan
 Lot 202, Lot 203 and Lot 204, Wanneroo Road, Wanneroo
Client: Bella Build & Design WA Pty Ltd

Plan Number:
 EP24-008(01)-F05
Drawn: GAR
Date: 08/02/2024
Checked: DVB
Approved: KK
Date: 23/02/2024



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 Metres
 Scale: 1:3,000@A4
 GDA2020 MGA Zone 50



Appendix A

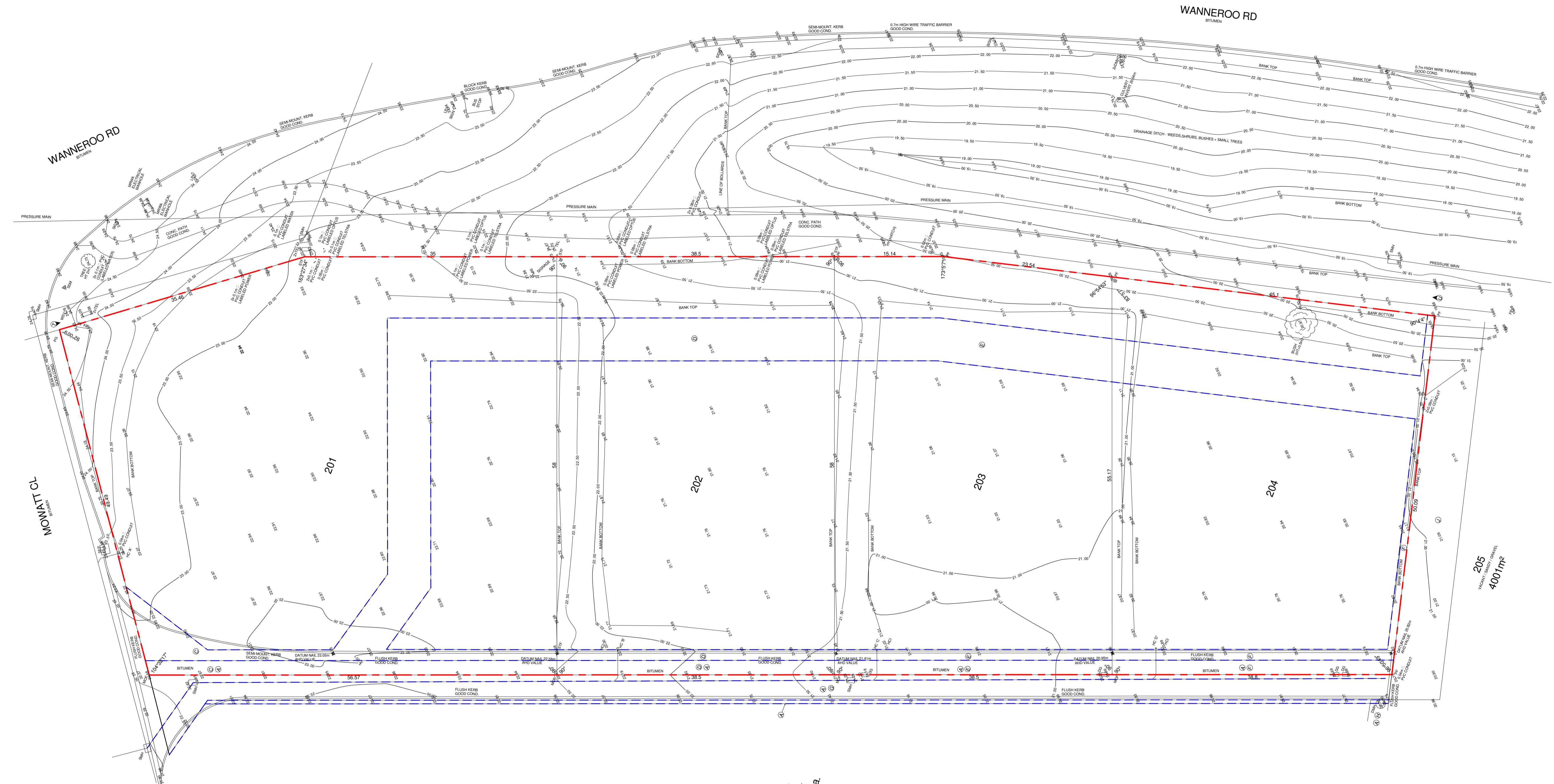
Proposed Site Plan





188.21_DRAWING LIST				
DRAWING No.	REV	ISSUED	DRAWING NAME	
DA00	E	13.12.2023	COVER PAGE & DRAWING LIST	
DA01	E	13.12.2023	EXISTING SITE SURVEY	
DA02	E	13.12.2023	PROPOSED OVERALL SITE PLAN	
DA03	E	13.12.2023	PROPOSED FLOOR PLAN & ELEVATIONS - TENANCY 1	
DA04	E	13.12.2023	PROPOSED FLOOR PLAN & ELEVATIONS - TENANCY 2	
DA05	E	13.12.2023	PROPOSED FLOOR PLAN & ELEVATIONS - TENANCY 3	
DA07	E	13.12.2023	PROPOSED TENANCY 4 ELEVATIONS	
TOTAL DRAWINGS: 7				

E	ISSUED FOR DA	JR	NP	13.12.2023
revision/ issue	description	drawn by	check by	date
project	MIXED COMMERCIAL DEVELOPMENT	drawn	JR	description
location	LOT 201 - 203 WANNEROO ROAD, WANNEROO	checked	NP	COVER PAGE & DRAWING LIST
scale		date	13.12.2023	
Hodge Collard Preston ARCHITECTS		Third Floor, 38 Richardson Street, West Perth, WA 6005 PO Box 743, West Perth, WA 6872 Ph: (08) 9322 5144 Fax: (08) 9322 5140 Email: admin@hccparoh.com		project no 188.21 dwg no DA00 rev E



SERVICE LEGEND

POWER

- CONSUMER POLE □ CP
- POWER POLE □ PP
- LIGHT POLE □ LP
- STAY POLE □ SP
- S. WIRE ANCHOR □ SWA
- UNI PILLAR □ UP
- EXPOSED CABLES □ EC

GAS

- PRIE LAD CONN. □ GPC
- METER □ GM

SEWERAGE

- MANHOLE □ SMH
- INSPECT. SHAFT □ IS
- INSPECT. OPENING □ IO
- HOUSE CONNECTION □ HC
- HOUSE CONN. □ HCC
- INDICATOR □ IC
- INSPECT. SHAFT CONNECTION □ ISC

TELE.

- PIT □ TEL
- PRIE LAD CONN. □ TPL

DRAINAGE

- MANHOLE □ DMH
- DAILY PIT □ DHP
- LOT PIT □ LPP
- HOUSE CONN. □ DHC
- SIDE ENTRY PPT □ SEP

COMBINATION

- ENTRY PPT □ EPP

WATER

- STOP VALVE □ WSV
- HYDRANT □ WHP
- FLUSH POINT □ WFP
- WATER TAP □ WTP
- WATER METER □ WM
- PRIE LAD CONN. □ WPL

SURVEY

- DATUM NAIL □ DN
- PEG FOUND □ PF
- MARK ON FEATURE □ MOF
- PEG OCHS □ PO
- STAKE FOUND □ STF

LOT RECORDS

LOT	STATUS	DATE
201	AVAILABLE	13/12/2023
202	AVAILABLE	13/12/2023
203	AVAILABLE	13/12/2023
204	AVAILABLE	13/12/2023

LOT #	AREA	C/T
201	3532m²	4016 / 402
202	2233m²	4016 / 403
203	2200m²	4016 / 404
204	2200m²	4016 / 405

NOTE: SERVICE EASEMENT (SEWERAGE) (A)

NOTE: EASEMENT (PUBLIC ACCESS) SEE DP 417273

NOTE: SERVICE EASEMENT (DRAINAGE) (H)

NOTE: ACCESS RESTRICTION BETWEEN POINTS (D) (E)

LINKS SURVEYING

P: (08) 9554 8511
E: info@linkssurveying.com.au
W: www.linkssurveying.com.au

TITLE: FEATURE SURVEY
CLIENT: N/A
BUILDER: LEYTON PROPERTY

LOT: 201 WANNEROO RD
SUBURB: WANNEROO
AUTHORITY: CITY OF WANNEROO
UBD REF: 146 K 5
GPS: S 31.72033° E 115.78390°

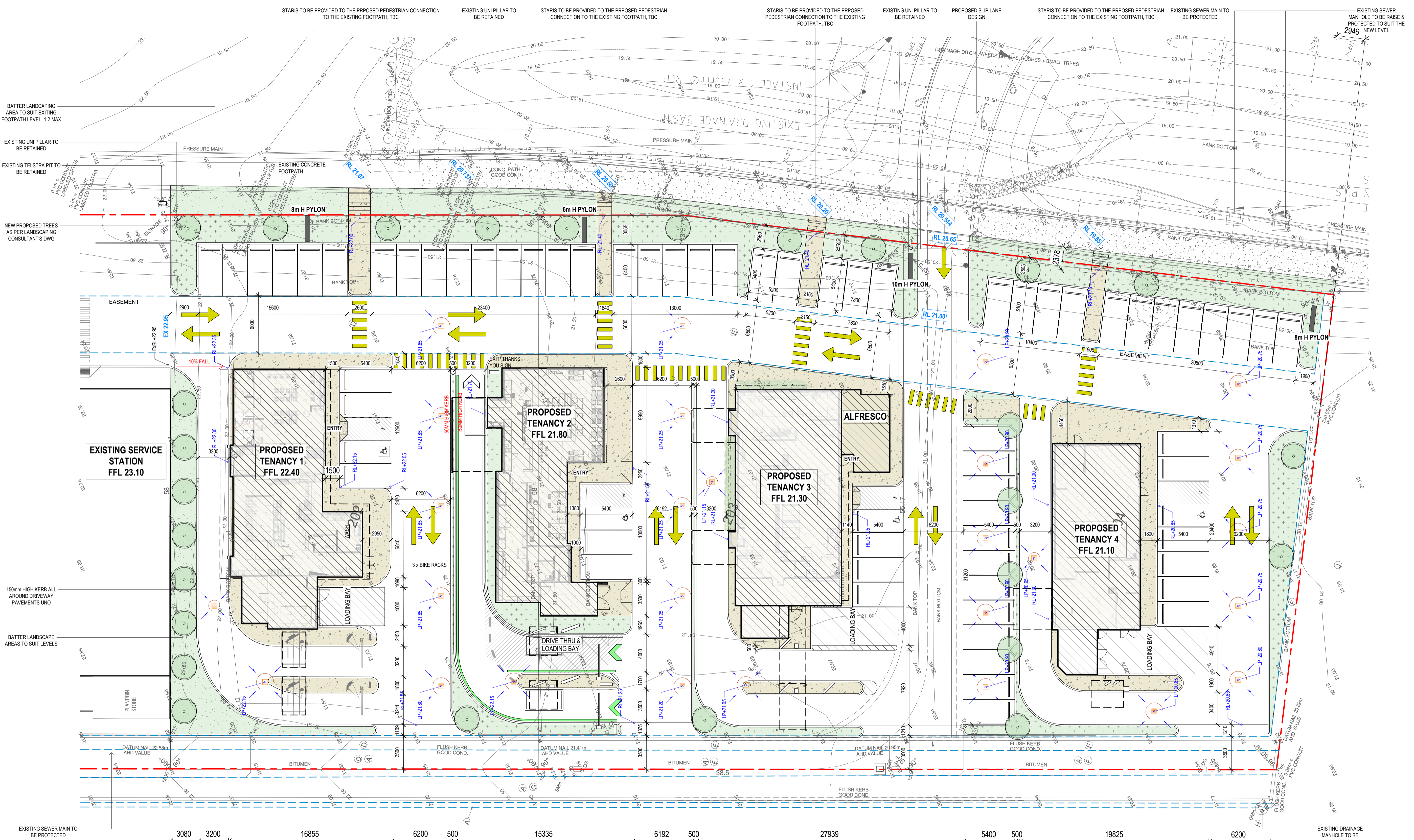
DATE: 01/04/22
SCALE @ A0: 1:200
DWG NO: 44540-01-200
REV: 1 of 1

GROUND COVER
SANDY / GRASS / WEED
ROCK / BUSHES / SMALL TREES

revision/ issue	ISSUED FOR DA	JR	NP	13.12.2023
description		drawn by	check by	date
project	MIXED COMMERCIAL DEVELOPMENT	drawn by	JR	description
location	LOT 201 - 203 WANNEROO ROAD, WANNEROO	checked	NP	EXISTING SITE SURVEY
scale	1:300	date	13.12.2023	project no
		dwg no	188.21	DA01
		rev		E

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Email: admin@hpcparch.com



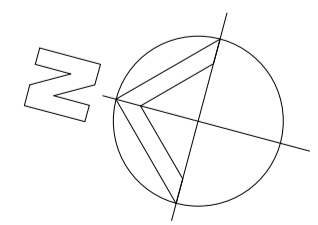
1 PROPOSED SITE PLAN
1:200

- GENERAL NOTES:**
- DO NOT SCALE FROM DRAWINGS.
 - ALL BOUNDARIES, LEVELS AND DIMENSIONS TO BE CONFIRMED ON SITE.
 - ALL DRAWINGS TO BE READ IN CONJUNCTION WITH ALL CONSULTANTS DRAWINGS.
 - REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO COMMENCING ANY WORKS.
 - KERB RAMPS AND TISSES TO BE IN ACCORDANCE WITH AS 1428.
 - NIL STEP AT ENTRY DOORS TO PROVIDE CONTINUOUS PATH OF TRAVEL IN ACCORDANCE WITH AS 1428.
 - MAX 1 IN 40 CAMBER AND CROSSFALLS TO ALL RAMPS AND WALKWAYS IN ACCORDANCE WITH AS 1428.
 - ALL MATERIALS & FIXTURES TO BE COMPLIANT WITH NCC & S.
 - GLAZING ASSEMBLIES TO BE ASSEMBLED AND INSTALLED AS SHOWN.
 - WET AREAS TO BE WATERPROOFED IN ACCORDANCE WITH BCA PART F1 AND AS3740.

PARKING SCHEDULE	
STANDARD PARKING BAY	70
DRIVE THRU CAR BAY	40
TOTAL	110

SITE LAYOUT LEGEND

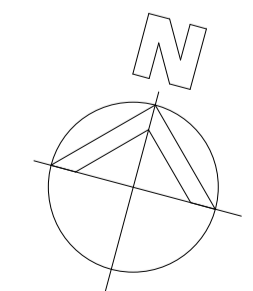
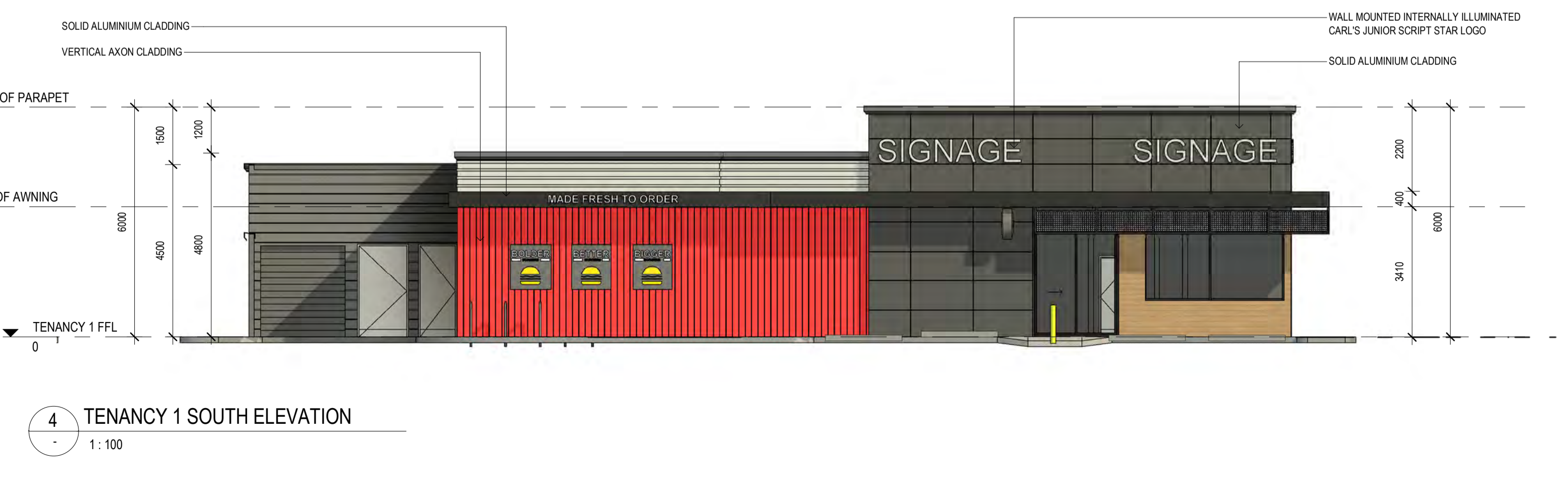
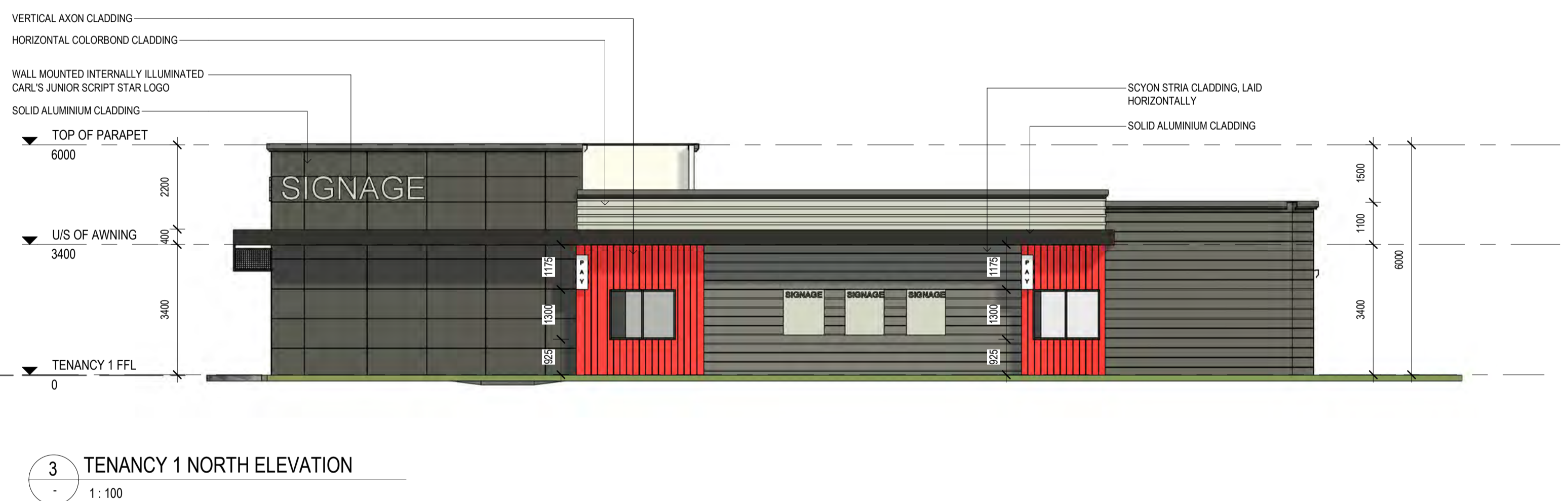
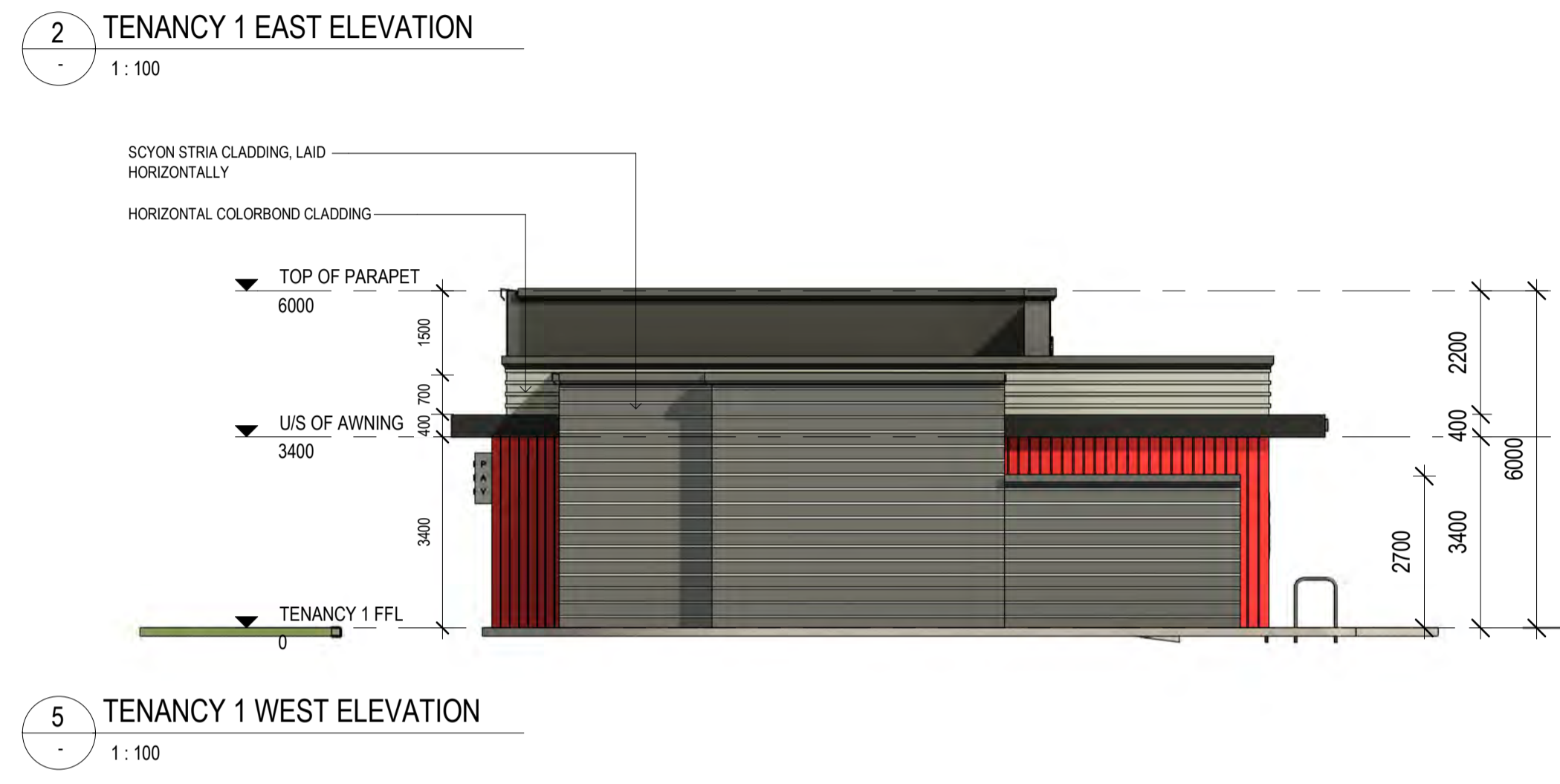
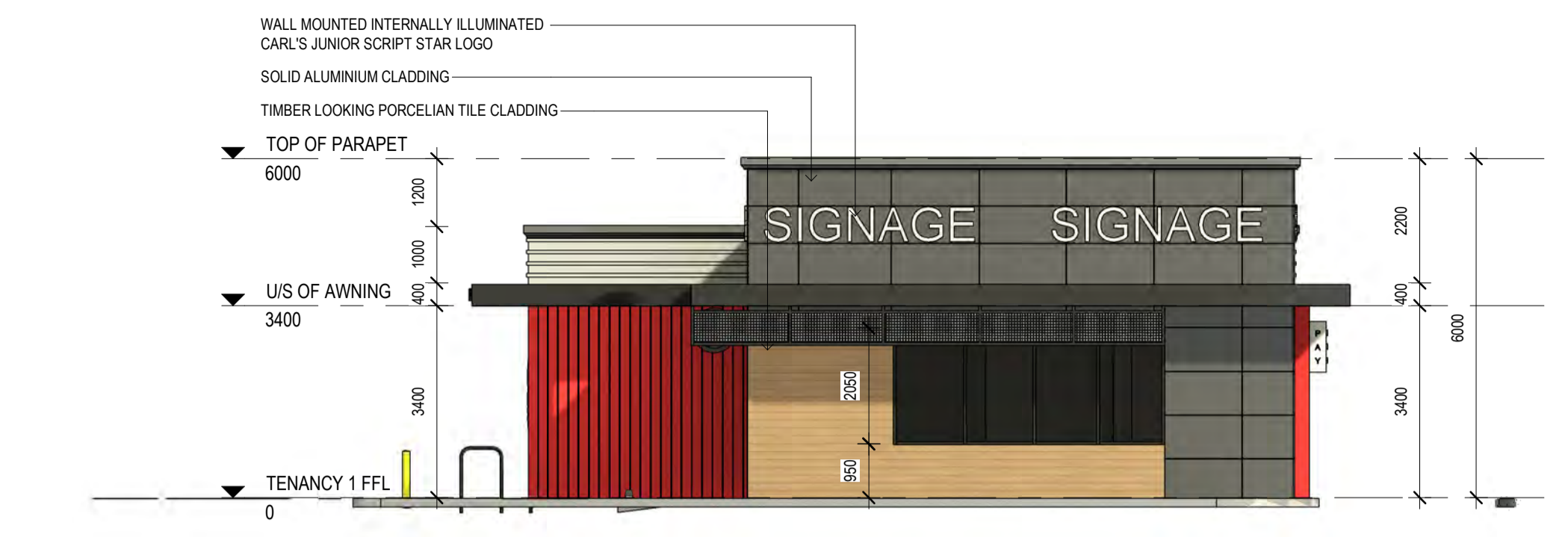
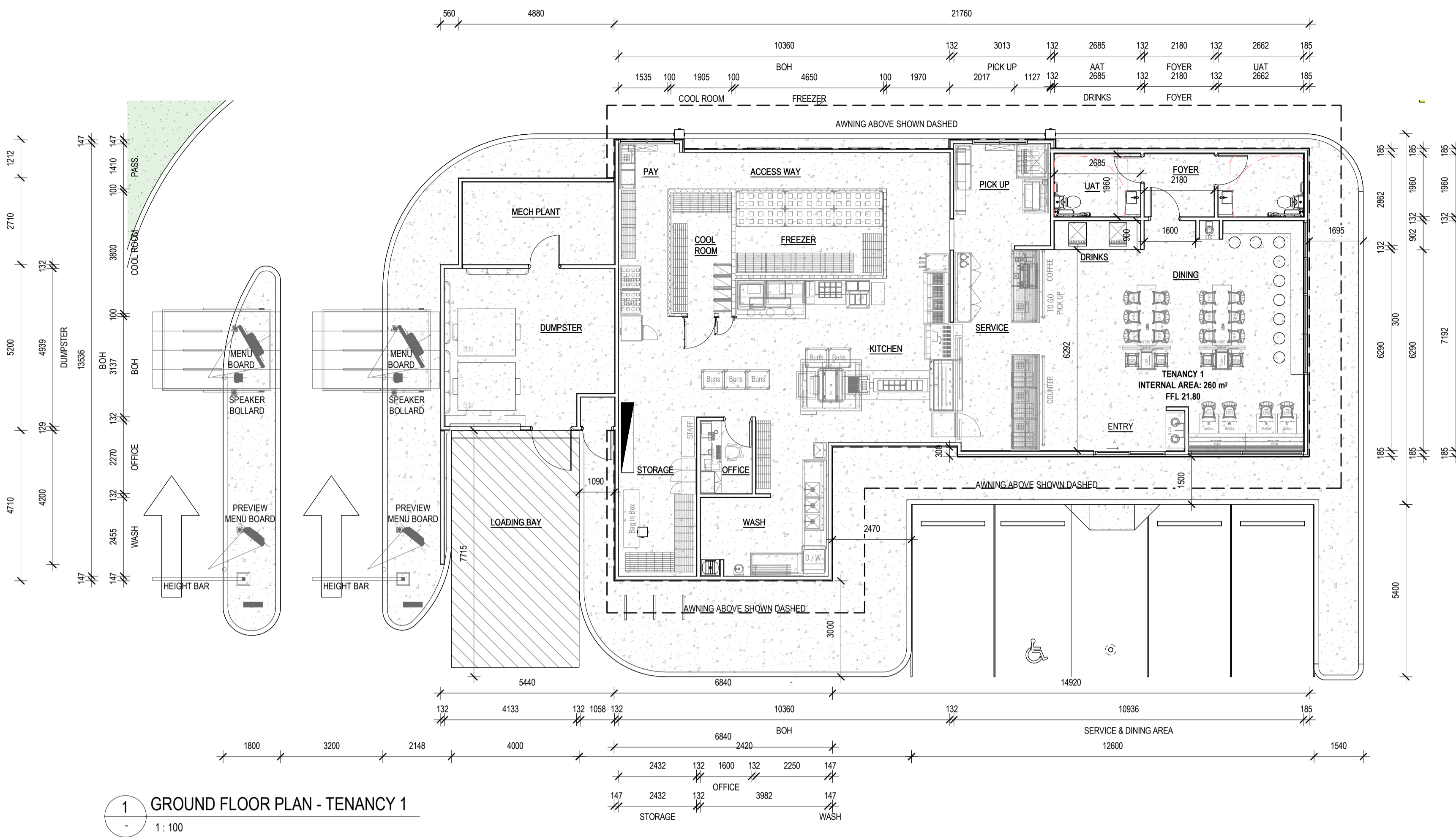
- LANDSCAPING, LANDSCAPING DESIGN AS PER LANDSCAPING CONSULTANT'S DWG
- CONC. PAVING, REFER CIVIL ENGINEER'S DRAWINGS FOR CUTS / THICKNESS
- TOP OF KERBING, REFER CIVIL ENGINEER'S DRAWINGS FOR CUTS / THICKNESS
- WHEEL STOP, AS PER AS 2880.1:2004
- EX 5.28 EXISTING SITE LEVELS
- RL 5.450 NEW SITE LEVELS TO CIVIL ENGINEER'S DRAWINGS
- BOUNDARY LINE
- EXTEND OF RETAINING WALL (SUBJECT TO RESIDENTIAL DESIGN)
- EXTEND OF EASEMENT
- STORMWATER PIT AS PER CIVIL ENG. DWG



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project description	checked	NP	
location	NP		
LOT 201 - 203 WANNEROO ROAD, WANNEROO	scale	date	13.12.2023
	As indicated	project no	188.21
		dwg no	DA02
		rev	E

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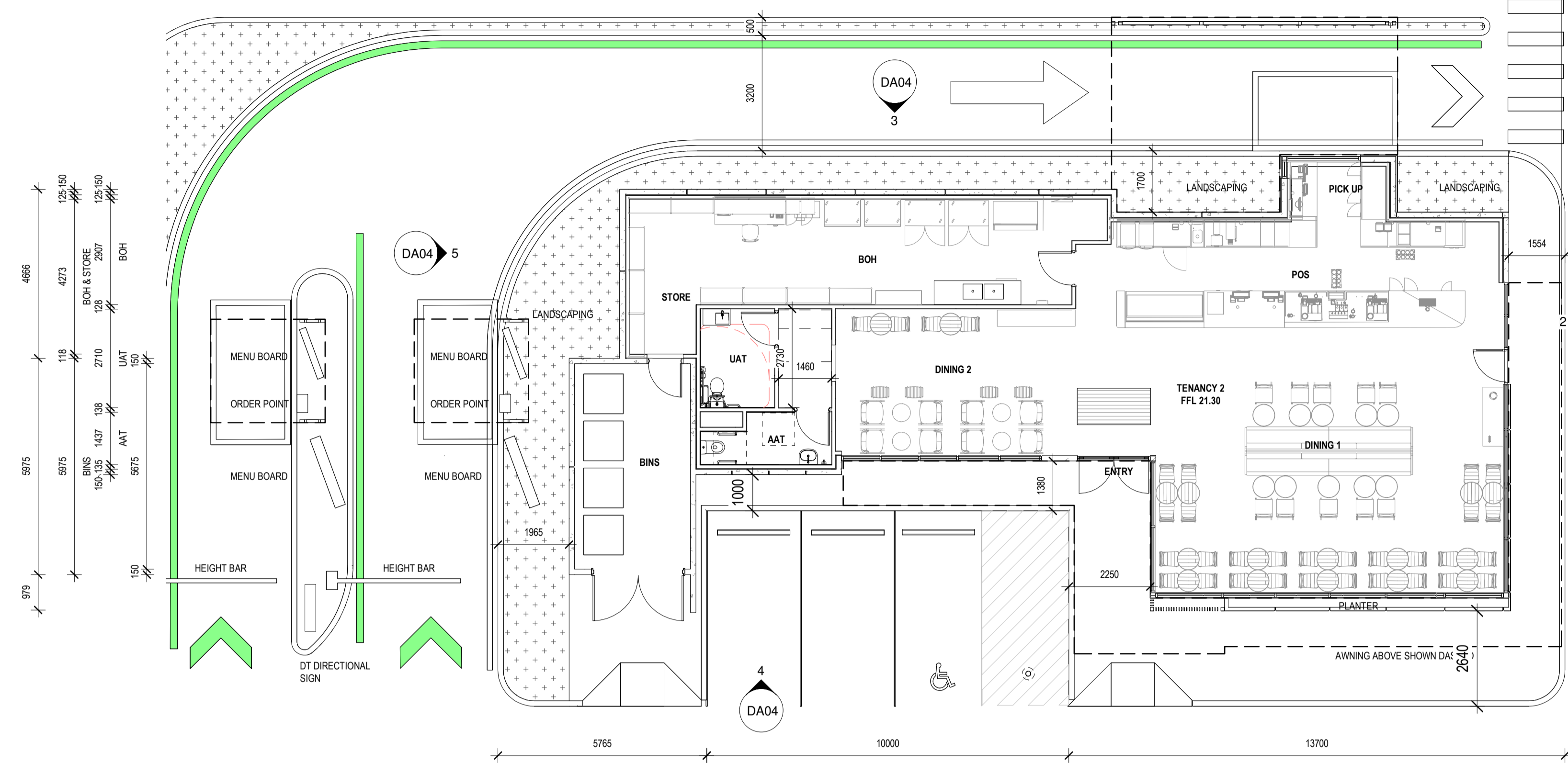
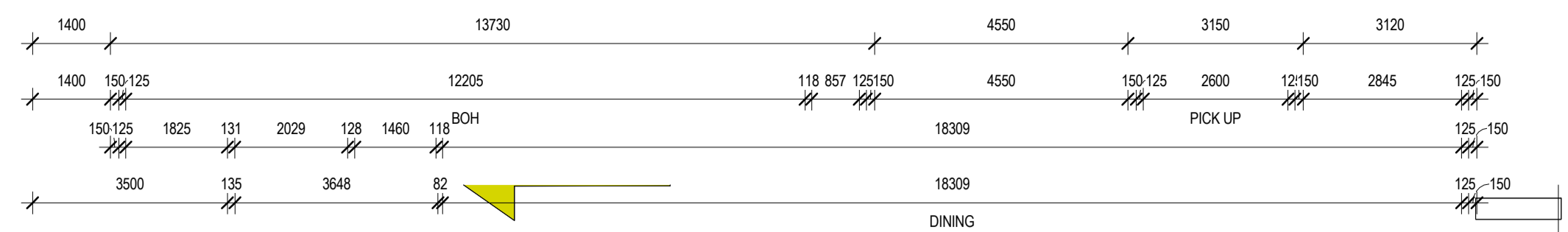
Third Floor, 38 Richardson Street,
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description		drawn by	check by	date
project	MIXED COMMERCIAL DEVELOPMENT	drawn by	description	PROPOSED FLOOR PLAN & ELEVATIONS - TENANCY 1
location	LOT 201 - 203 WANNEROO ROAD, WANNEROO	checked	NP	
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				188.21
				dwg no DA03
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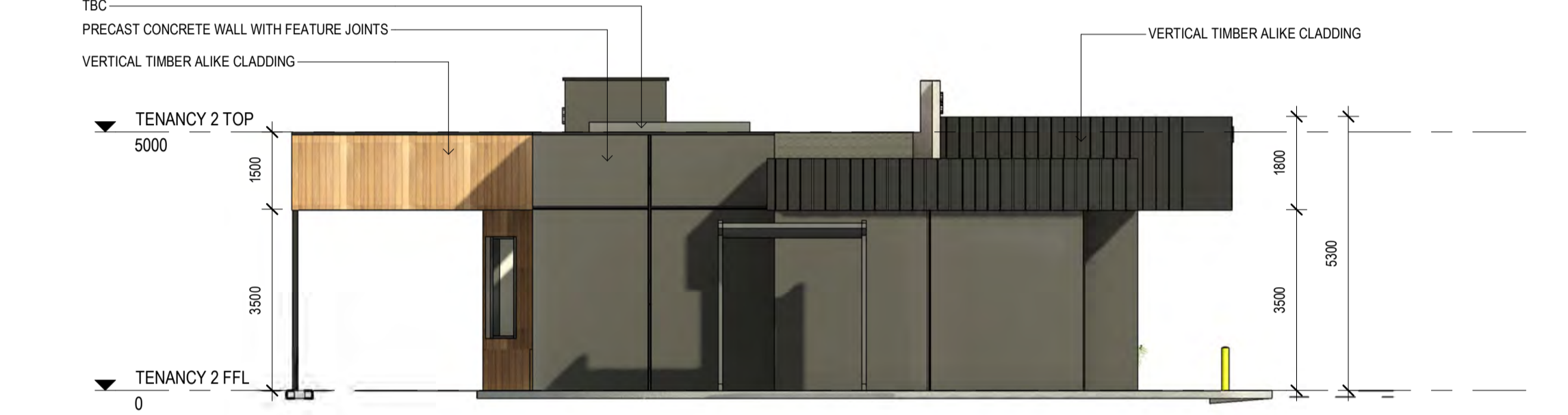
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Fax: (08) 9322 5140
Email: admin@hpcparh.com



1 GROUND FLOOR PLAN - TENANCY 2
1: 100



2 TENANCY 2 EAST ELEVATION
1: 100



5 TENANCY 2 WEST ELEVATION
1: 100



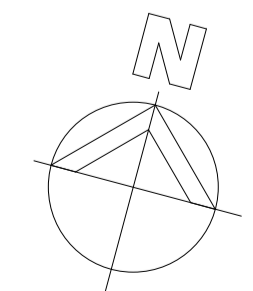
3 TENANCY 2 NORTH ELEVATION
1: 100



7 TENANCY 2 ARTIST'S IMPRESSION



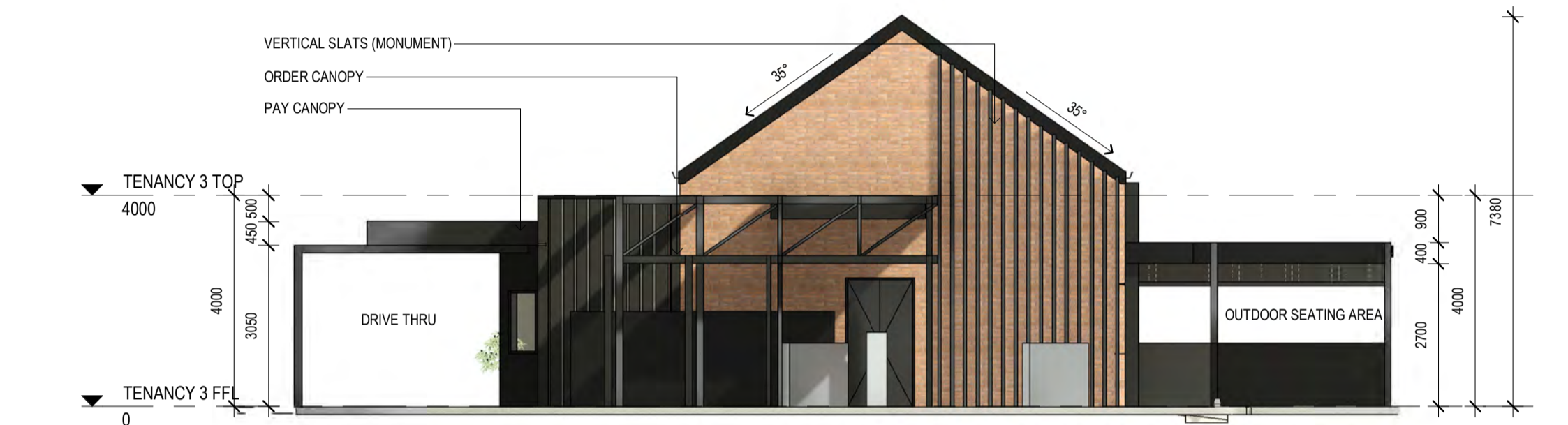
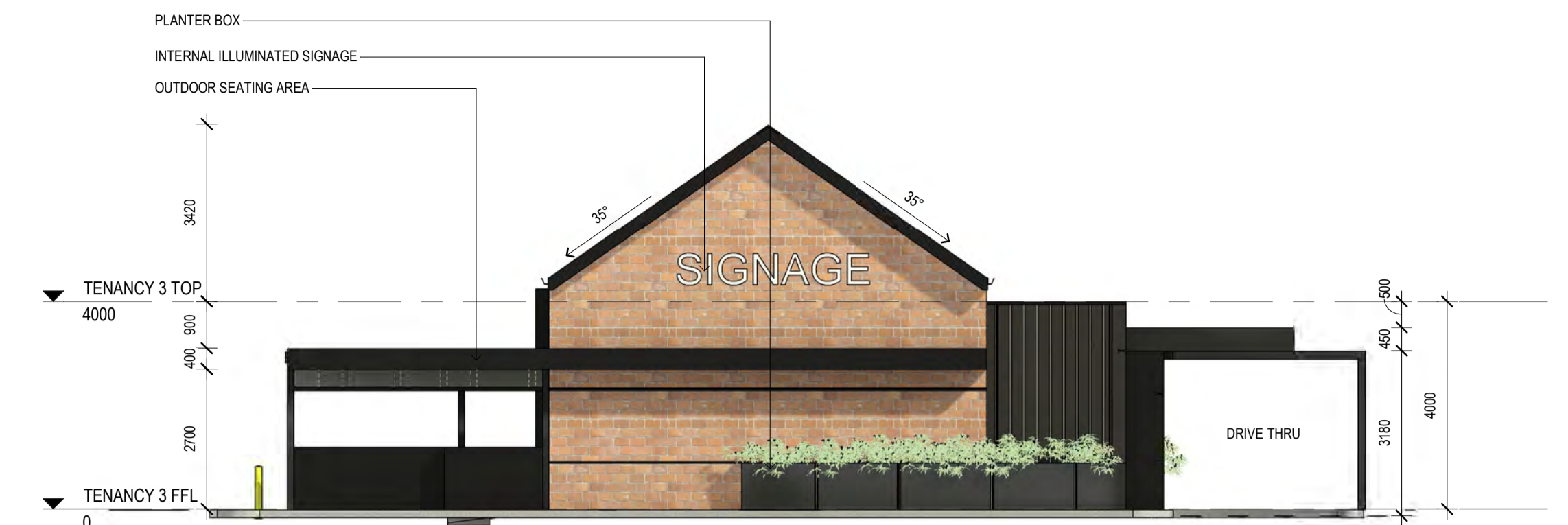
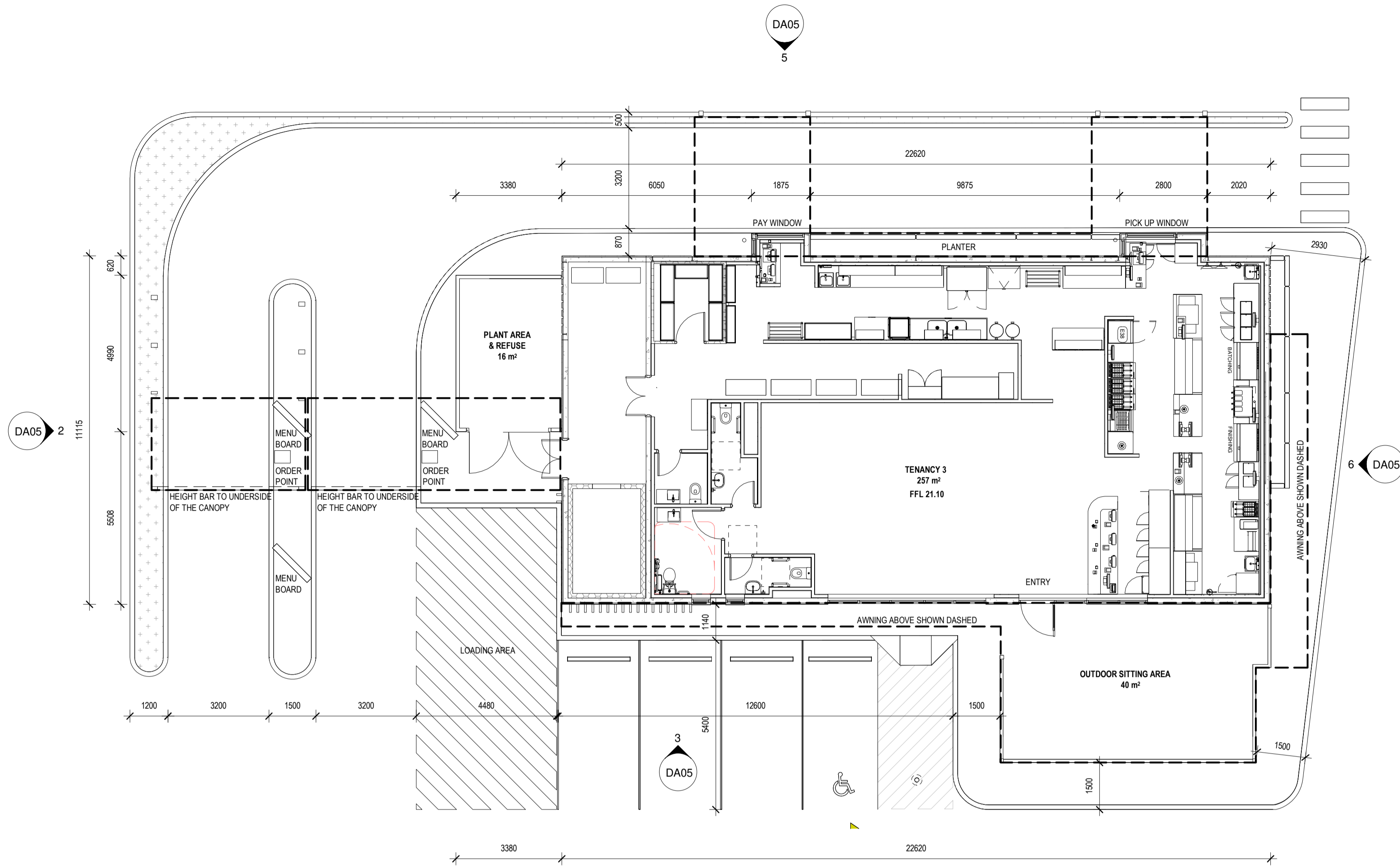
4 TENANCY 2 SOUTH ELEVATION
1: 100



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revision/ issue	description	drawn by	check by	date
project	MIXED COMMERCIAL DEVELOPMENT	JR	JR	PROPOSED FLOOR PLAN & ELEVATIONS - TENANCY 2
location	LOT 201 - 203 WANNEROO ROAD, WANNEROO	checked	NP	
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				dwg no
				DA04
				rev
				E

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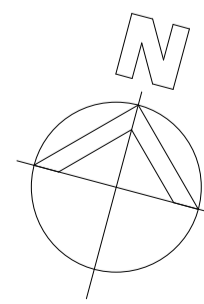
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Fax: (08) 9322 5140
Email: admin@hpcparoh.com



1 GROUND FLOOR PLAN - TENANCY 3
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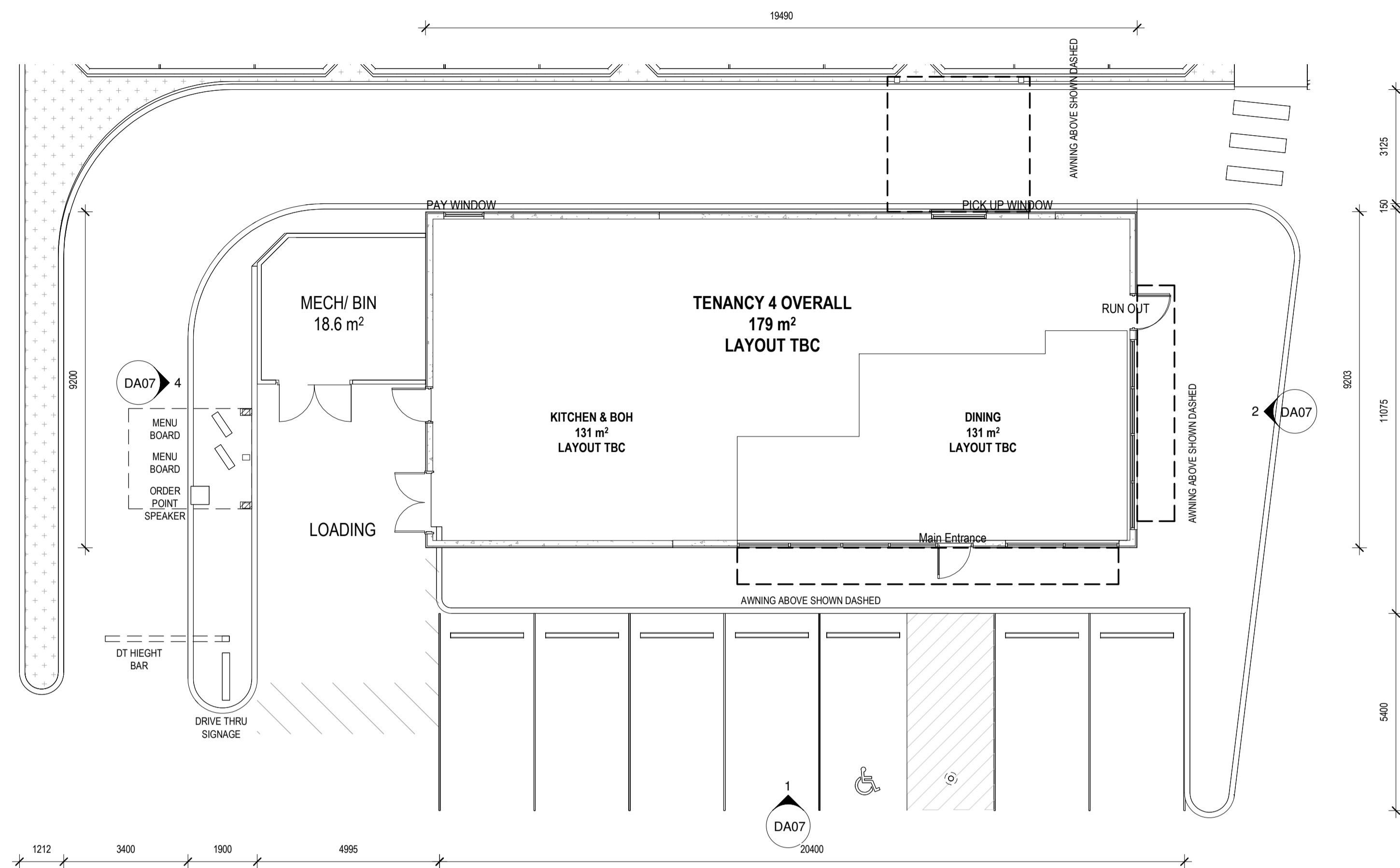


5 TENANCY 3 NORTH ELEVATION
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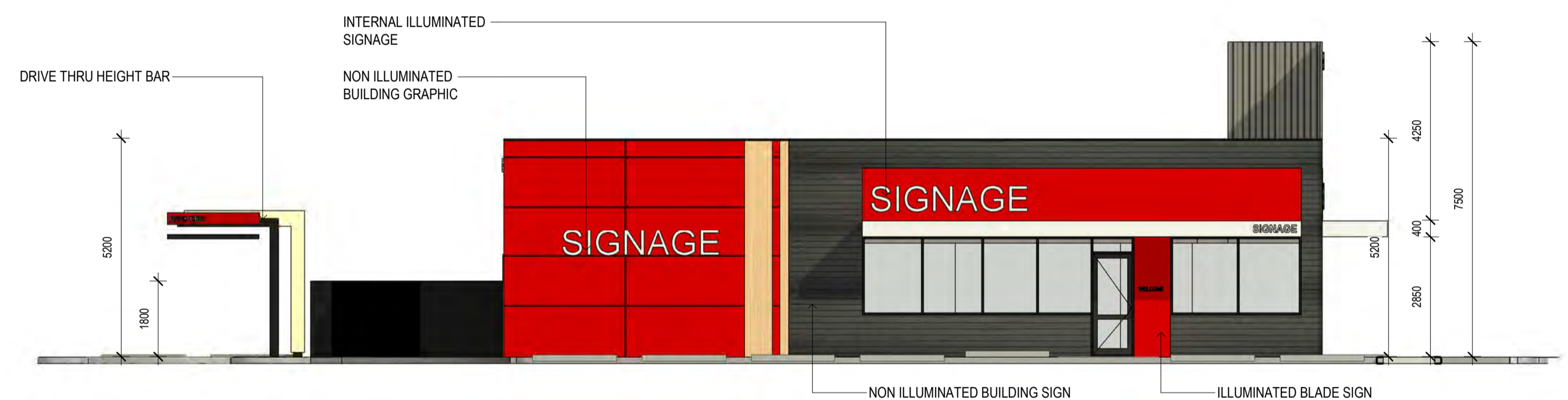


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drawn by		JR	NP	
checked by		JR	NP	
drawn by		JR	NP	
checked by		JR	NP	
scale	1:100	date	13.12.2023	
project no	188.21	dwg no	DA05	
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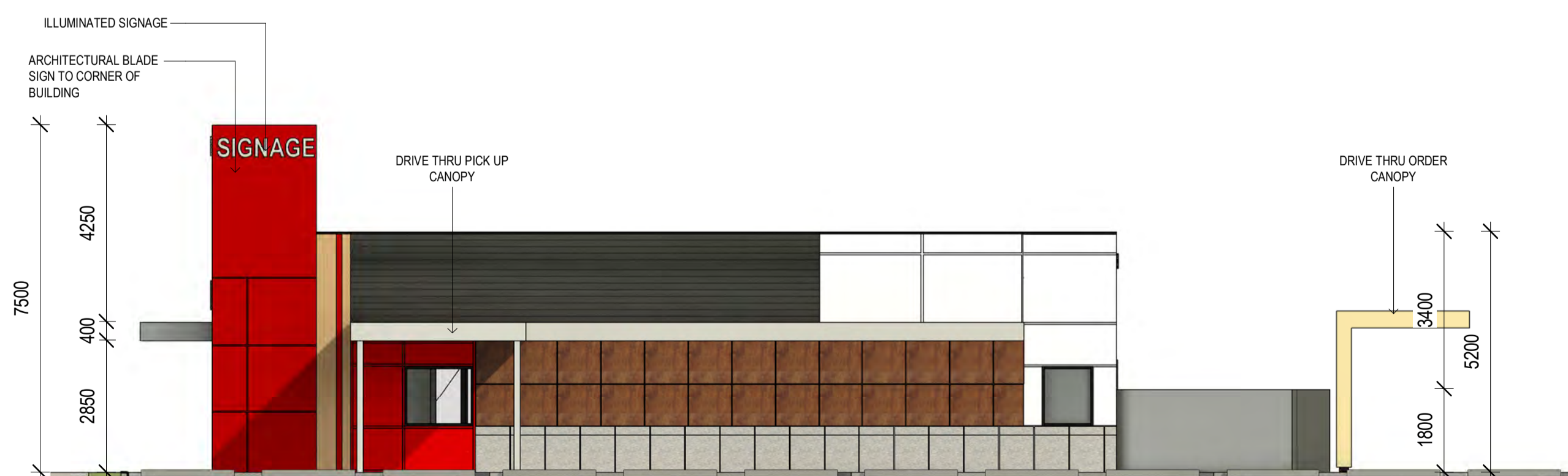
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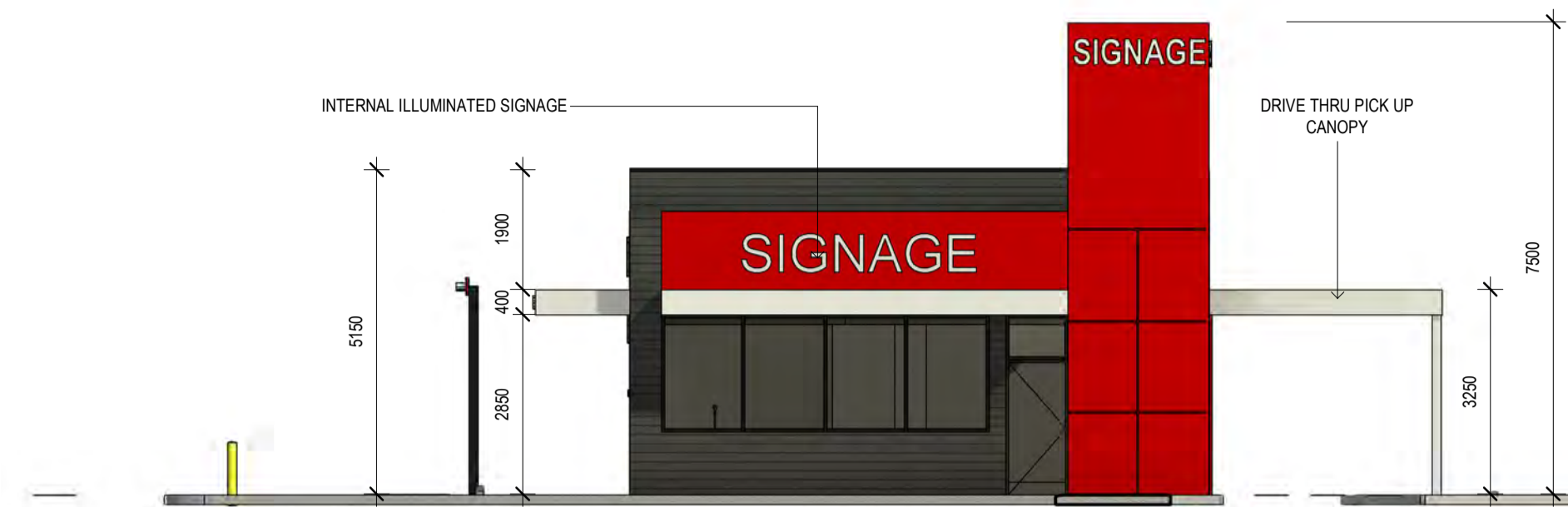
6 GROUND FLOOR PLAN - RED ROOSTER
1:100



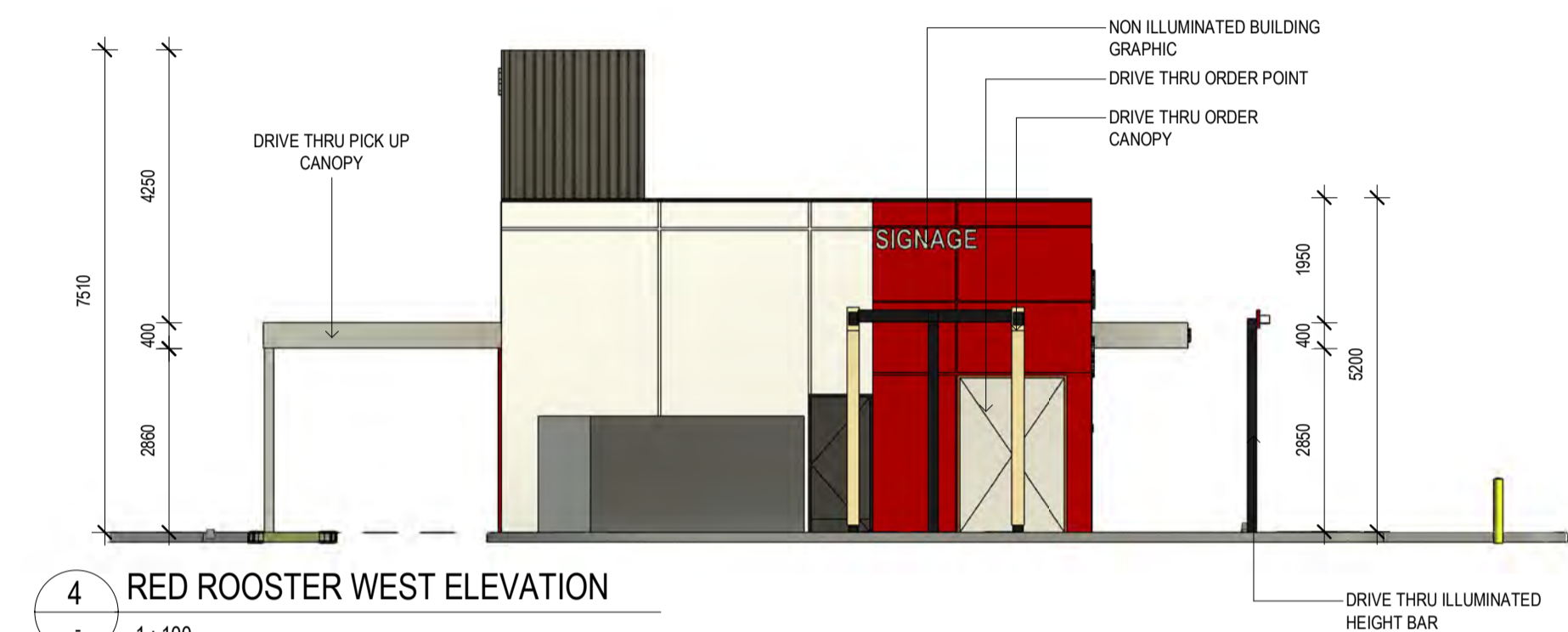
1 RED ROOSTER SOUTH ELEVATION
1:100



3 RED ROOSTER NORTH ELEVATION
1:100



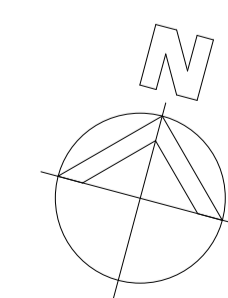
2 RED ROOSTER EAST ELEVATION
1:100



4 RED ROOSTER WEST ELEVATION
1:100



5 RED ROOSTER 3D VIEW 1



E ISSUED FOR DA		JR	NP	13.12.2023
revision/ issue	description	drawn by	check by	date
project description		MIXED COMMERCIAL DEVELOPMENT		
location		LOT 201 - 203 WANNEROO ROAD, WANNEROO		
checked	Author	checked	PROPOSED TENANCY 4 ELEVATIONS	
Checker		Checker		
scale	1:100	date	13.12.2023	
Hodge Collard Preston ARCHITECTS		project no	188.21	dwg no DA07
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