Bushfire Management Plan
2038 Wanneroo Road, Neerabup
Service Station Development

Revision: BMP 1.0

3 February 2020

XB19060

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Report Information

Report Detail	
Prepared for	Hodge Collard Preston Architects
Lot size	4,011 m^2 (approximately)
Development Application reference	
Prepared by	Moira Darmody* – Bldg Fire Safety and Risk Eng
Project Location	2038 Wanneroo Road, Neerabup
Project Number	XB19060
Report Type	Bushfire Management Plan
Report Revision	BMP 1.0
Date	3 February 2020

* on behalf of Xero Fire & Risk

Document Issue Register

Revision	Revision Date	Comment	Checked		Authorised	
			Name	Signature	Name	Signature
BMP 1.0	3 February 2020	DA Issue	Moira Darmody Grad Dip (Bldg Fire Safety & Risk Eng)		Rene Hutter BSc, CPEng, NER, MIEAust, BPAD38247	

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Contents

1 Introduction

Xero Fire & Risk has been commissioned by Hodge Collard Preston Architects to prepare a Bushfire Management Plan (BMP) for the subject site, located at 2038 Wanneroo Road, Neerabup, within the City of Wanneroo.

The purpose of this BMP is to:

- Set out the short, medium and long term risk management strategies for the life of the development;
- Ensure that the necessary bushfire protection methods are incorporated into the new development;
- Identify the stakeholders responsible for implementing the bushfire protection methods.

This BMP includes the following information to achieve the stated purpose:

- A Bushfire Attack Level Assessment;
- Bushfire protection methods required to achieve compliance with the bushfire protection criteria elements; and
- Identifying ongoing maintenance requirements and responsibilities.

1.1 Site Description

The development comprises of the construction of a single storey Class 6 service station development on the existing lot located at 2038 Wanneroo Road, Neerabup. The Lot is approximately 4,011 m^2 in total area as shown in Figure 1.

The service station development is deemed to be a high-risk land use in accordance with SPP 3.7 and Policy Measure 6.6.1 which states that high-risk land uses in areas between BAL-12.5 and BAL-29 require a BMP. The development of this BMP satisfies Policy Measure 6.6.1.

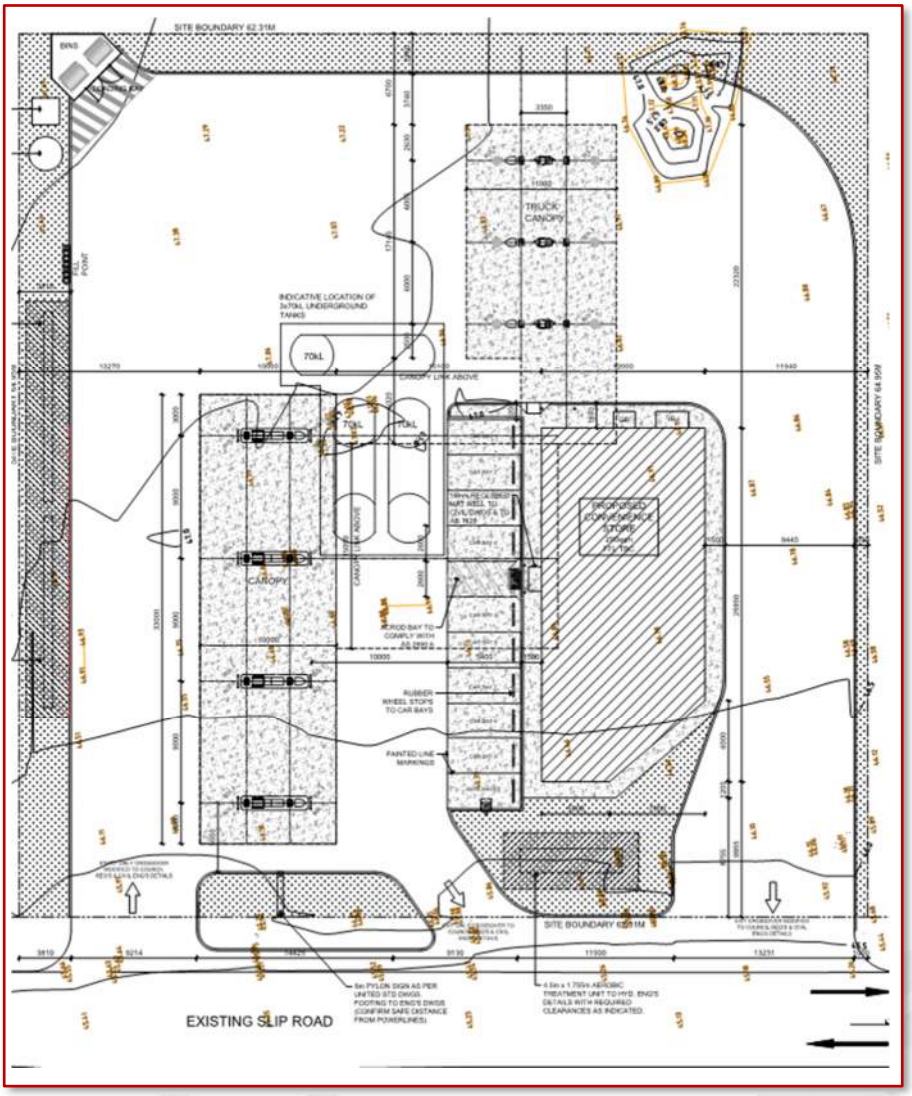

Figure 1: Site plan

The site is currently identified as a bushfire prone area, which was designated by the Department of Fire and Emergency Services (DFES) Office of Bushfire Risk Management as shown in Figure 2.

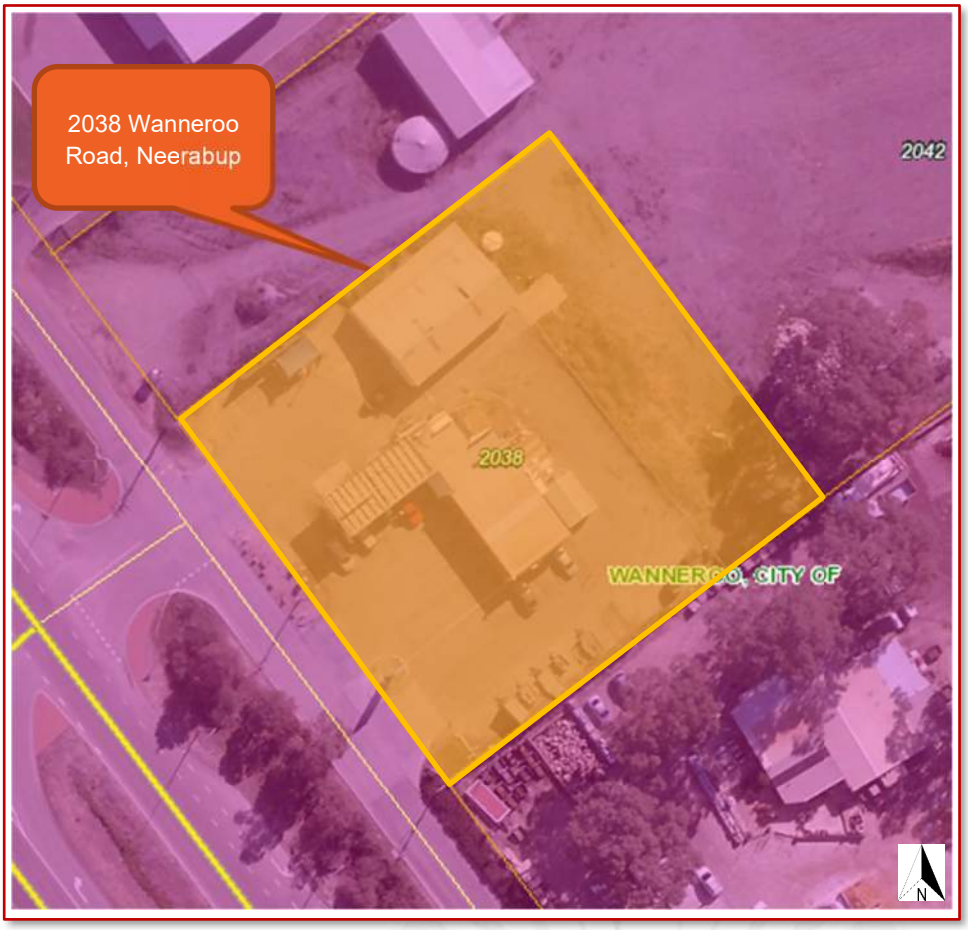

Figure 2: Bushfire prone map of the site

The identification of bushfire prone areas within any portion of the site requires further assessment of the bushfire hazard implications on the proposed development to be undertaken in accordance with accordance with SPP3.7 and the Guidelines.

A site assessment was undertaken by a Xero Fire Bushfire Assessor on 14 October 2019.

The site is bounded by (see Figure 3):

- Existing commercial sites to the north, east and south-east;
- Wanneroo Road directly to the west;
- Remnant vegetation further west.

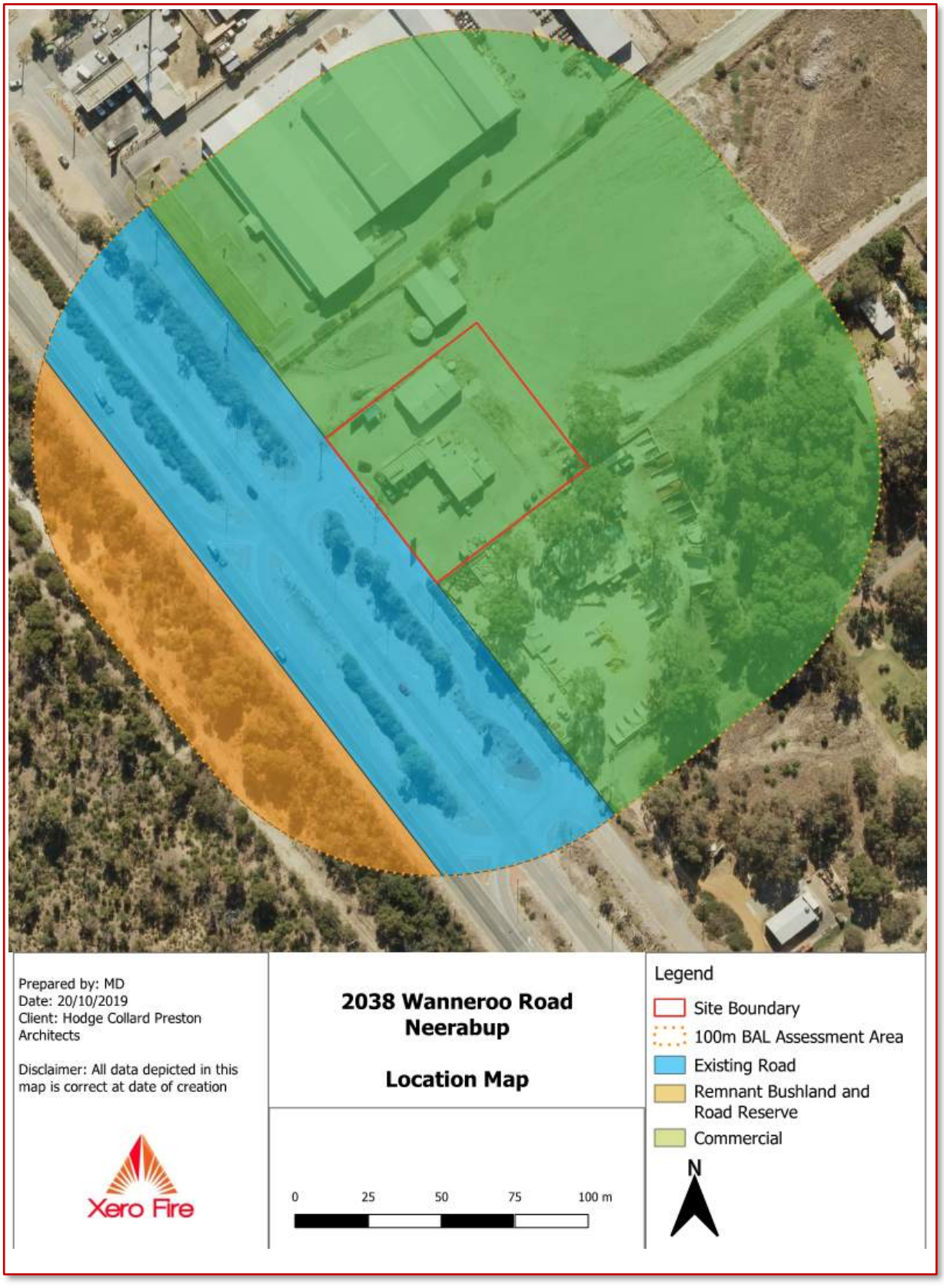

Figure 3: Location plan

1.1.1 Habitable and Non-habitable Structures

The Western Australian Planning Commission Planning Bulletin 111/2016 provides the following definition for a habitable building:

A 'Habitable building' is any fully or partially enclosed structure, with at least one wall and a roof made of solid material, and used by people to:

- *live (house, apartment or hostel);*
- *work (office, factory or hospital);*
- *study (school, university or library); or*
- *socialise or entertain (gym, theatre, restaurant or community facility.*

The development comprises of the construction of a habitable Class 6 service station building and a non-habitable associated canopy structure covering the fuel bowsers on the subject site. Relevant plans showing the proposed development are contained in Appendix A.

The Guidelines state that the BAL assessment forms the basis for establishing the requirements for construction to improve the protection of building elements from attack by bushfire. Therefore, the construction requirements of AS 3959 would only apply to the Class 6 service station building.

1.2 Bushfire Construction Requirements for High-Risk Land Use and Class 6 Buildings

The client has confirmed that the service station building and the canopy structures shall be constructed to comply with the requirements of AS 3959 for BAL-12.5 and BLA-29 respectively.

A summary of the construction requirements for BAL-12.5 and BAL-29 is contained in Appendix B.

1.3 Relevant Legislation

1.3.1 State Planning Policy 3.7

State Planning Policy 3.7 (SPP 3.7) states that any development application located in a bushfire prone area must demonstrate compliance with policy measures 6.3, 6.4 or 6.5. This BMP is considered to meet policy measure 6.5 for development applications.

As defined in SPP 3.7, the development is considered to be a high-risk land use and therefore this BMP also demonstrates compliance with policy measure 6.6.

1.3.2 Guidelines for Planning in Bushfire Prone Areas

It is a requirement of SPP 3.7 that the BMP is prepared in accordance with The Guidelines for Planning in Bushfire Prone Areas. The Guidelines assist in determining appropriate land use planning in relation to bushfire prone areas; specify requirements to be met at each stage of development; and, when applied, ensure that the necessary bushfire protection measures are incorporated into the development.

The objectives of The Guidelines are met by demonstrating compliance with the 4 bushfire protection criteria:

1. Location.
2. Siting and design of development.
3. Vehicular access.
4. Water.

1.3.3 Objectives

The objective of this BMP is to demonstrate compliance with the following:

- SPP3.7 policy measures 6.2(a) & (b), 6.5 and 6.6; and
- Bushfire protection criteria elements as per The Guidelines.

1.4 Existing Bushfire Management Plans

It is understood that no previous bushfire management plans have been prepared for the subject site.

1.5 Bushfire Consultant Accreditation and Qualifications

SPP 3.7 and the Guidelines for Planning in Bushfire Prone Areas only recommends that bushfire services are prepared by an accredited Practitioner in designated bushfire prone areas. The Fire Protection Association Australia (FPAA) is the only training and accrediting body for Practitioners to be recognised by the State Government.

Xero Fire is a family owned independent fire engineering and bushfire consultancy led by Rene Hutter. Rene has over 18 years' experience in the fire industry, and in addition to being BPAD Level 1 accredited he is a Chartered Professional Engineer and Executive Member of the National Committee for the Society of Fire Safety Australia.

Rene has also completed BPAD Level 2 training and is in the process of seeking Level 2 BPAD accreditation. On receipt of Level 2 accreditation, Rene shall be pursuing Level 3 BPAD accreditation based on his bushfire and engineering qualifications, combined with his wealth and breadth of industry experience.

Accreditation is not mandatory, and nor is there a legislative requirement in Western Australia for a proponent to engage an accredited consultant to undertake bushfire management work. Proponents and decision makers can be satisfied that Xero Fire and Rene Hutter is suitably qualified and experienced to provide bushfire services of the highest standard.

1.6 Disclaimer and Limitations

This report is prepared solely for the subject site only.

The prescribed mitigation strategies contained in this BMP are considered to meet the minimum standards only at the time of writing, based on Xero Fire experience as well as standards prescribed by relevant authorities. It is expressly stated that Xero Fire do not guarantee that if such standards are complied with, or if a property owner exercises prudence, that a building or property will not be damaged or that lives will not be lost in a bush fire.

Bushfire is an extremely unpredictable force of nature. Changing climatic factors (predictable or otherwise) either before, or at the time of a fire can have a significantly affect in a bushfire prone area, therefore it is not possible to completely safeguard against a bushfire attack.

The growth, planting or removal of vegetation; poor maintenance of any fire prevention/mitigation measures; addition of structures not included in this report; or other activity can and will change the bushfire threat to all properties detailed in the BMP. Furthermore, the achievement of the level of implementation of fire precautions will depend on the actions of the landowner or occupiers of the land, over which Xero Fire has no control. Should changes be made to the subject site a new BMP is required.

Xero Fire accepts no liability whatsoever for the following:

- Claim, damage, loss or injury to property, or persons caused by fire;
- Further growth, planting or removal of vegetation on the subject site;
- Poor maintenance of any fire protection measures;
- Additional structures not included in this assessment;
- Any other activity that may change the bushfire threat level.

The client/owner of the subject site acknowledges that they have been made aware of this exclusion and that such exclusion of liability is reasonable in all the circumstances.

Xero Fire accepts no liability, or responsibility whatsoever for or in respect of any use or reliance upon this report and its supporting material by any third party.

This report is valid for a period of three years only from the date of its issue. All BAL ratings identified in this report are indicative and are required to be verified at the time of construction of individual buildings to ensure appropriate setbacks identified in the subject site/building have been achieved.

2 Environmental Considerations

2.1 Native Vegetation Modification or Clearing

The existing lot comprises of an existing service station building and fuel bowsers which shall be demolished to make way for the new service station building and covered petrol bowsers. The site is clear of all vegetation.

No specific environmental considerations were found to be applicable to the development area or the immediately surrounding areas, including wetlands, foreshores, Bush Forever sites, remnant vegetation, threatened species, ecological communities, nature reserves or coastal reserves.

2.2 Revegetation or Landscaping

The development will comprise of a Class 6 service station building, covered petrol bowsers and carparking. Any landscaping to be undertaken shall consist of reticulated lawns, managed gardens, mulched garden beds and the like, which is considered to be consistent with low threat vegetation in accordance with AS 3959 Clause 2.2.3.2(f).

3 Bushfire Assessment Results

3.1 Assessment Inputs

3.1.1 Bushfire Attack Level Assessment

A Bushfire Attack Level (BAL) assessment has been undertaken for the proposed development. A Method 1 BAL assessment was undertaken as detailed in AS 3959. A Method 1 procedure incorporates the following parameters:

- FDI 80 rating for Western Australia;
- Classified vegetation within 150 metres of the proposed development;
- Effective slope; and
- Separation distance between the classified vegetation and the proposed development.

3.1.2 Bushfire fuels

The location and extent of AS 3959 classifiable vegetation including Clause 2.2.3.2 exclusions, within 150 m of the subject site are shown in Figure 4 and associated photographic evidence is contained in Section 3.2.

The bushfire fuel loads measured within the 150 m assessment area are identified as consistent with AS 3959 Table B2 for the purposes of undertaking radiant heat flux modelling. All classifiable vegetation has been assessed in its mature state unless otherwise identified.

3.1.3 Effective slope

Effective slope under each vegetation plot was assessed in accordance with the methodology detailed within AS 3959. Slope data was measured on site and cross referenced with Landgate elevation data.

Slope throughout the vegetated plots outside of the site boundary were found to be downslope relative to the subject site. The effective slope is therefore assessed as downslope.

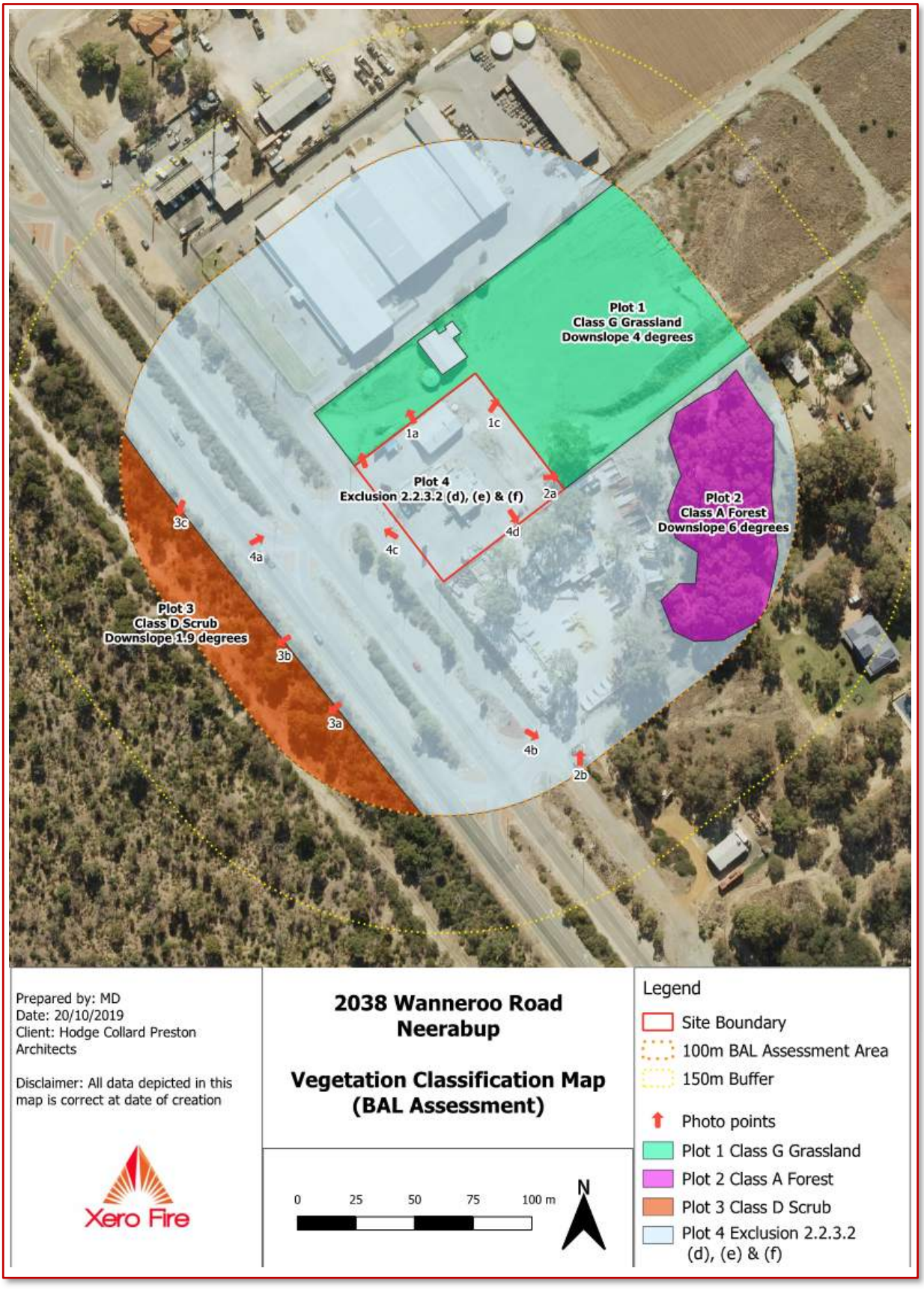

Figure 4: Vegetation Classification Map (BAL Assessment map)

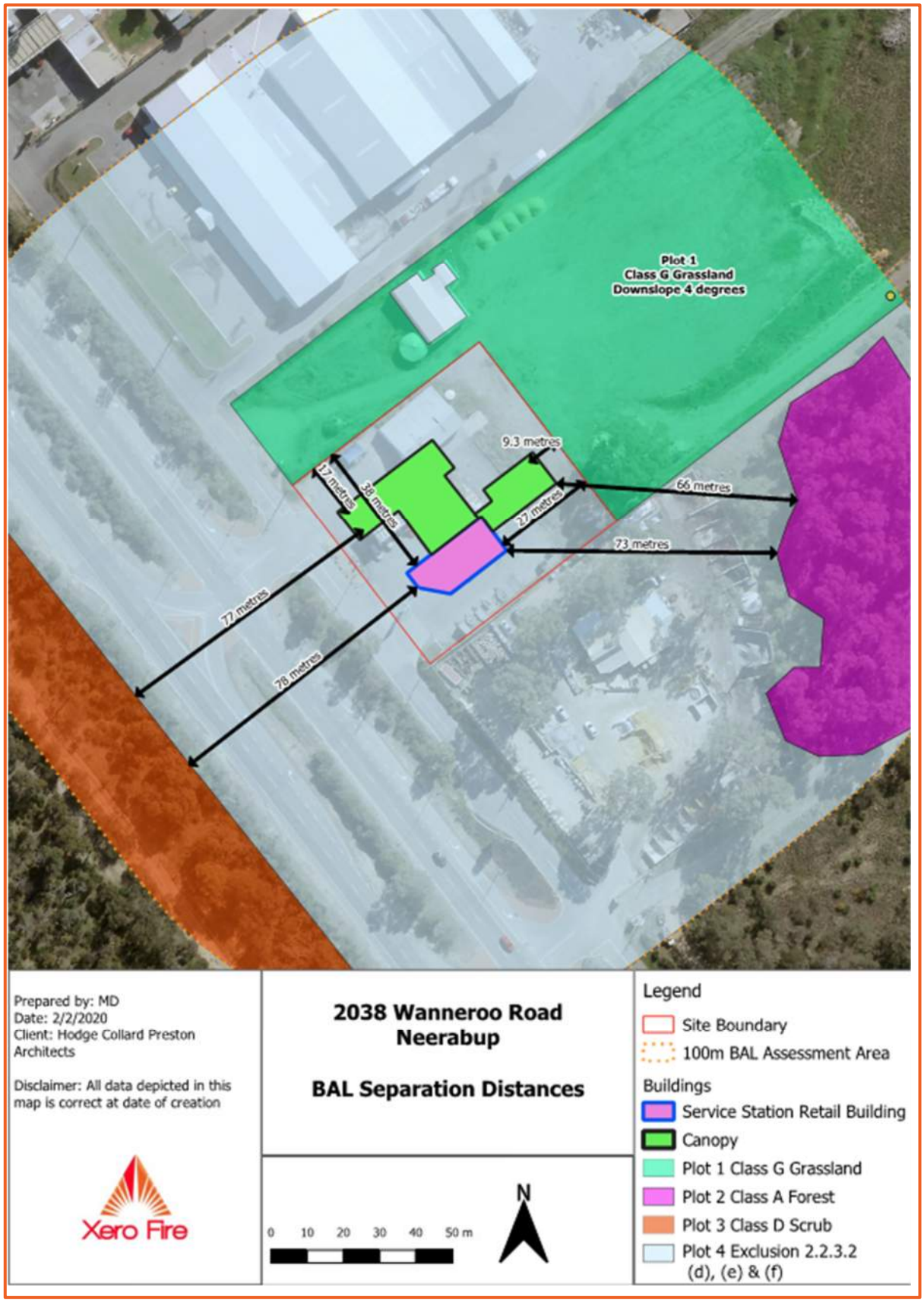

Figure 5: Subject site BAL assessment map – separation distances

3.2 Vegetation Classification

All vegetation within 150 m of the subject site was classified in accordance with Clause 2.2.3 of AS 3959. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.

Plot 1	
Existing classification	Class G Grassland
Post-development classification	Class G Grassland
Effective slope	Downslope 4 degrees

Description: Plot 1 comprises of unmanaged grassland on the adjacent lot. It is consistent with Class G Grassland classification.

Photo ID: 1a

Photo ID: 1b

Photo ID: 1c

Plot 2	
Existing classification	Class A Forest
Post-development classification	Class A Forest
Effective slope	Downslope 6 degrees

Description: Plot 2 comprises of the vegetation located on the commercial lot located to the south east of the subject site. Due to the limited access, this vegetation has been conservatively classified as Class A Forest.

Photo ID: 2a

Photo ID: 2b

Plot 3	
Existing classification	Class D Scrub
Post-development classification	Class D Scrub
Effective slope	Downslope 1.9 degrees

Description: Plot 3 comprises of the remnant bushland and road reserve located across the road to the south east of the subject site. This area contains tall shrubs up to 6 m in height comprising of parrotbush (banksia) and various melaleucla trees. This is consistent with Class D Scrub classification.

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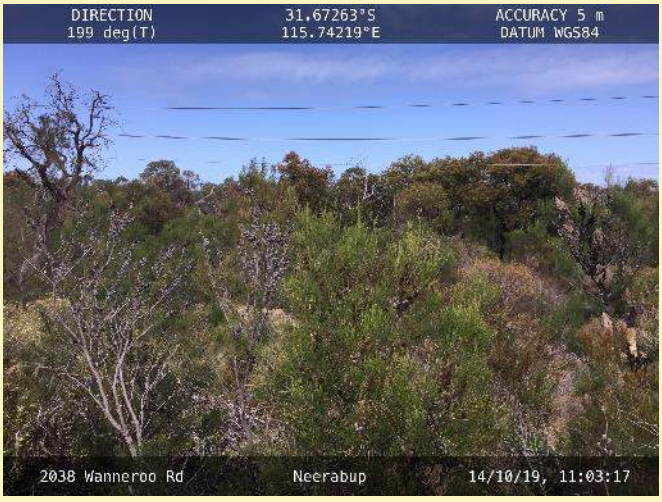

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Plot 4	
Existing classification	Exclusion 2.2.3.2 (d), (e) & (f)
Post-development classification	Exclusion 2.2.3.2 (d), (e) & (f)
Effective slope	n/a

Description: Plot 4 comprises of the subject site, existing roads and existing adjacent commercial buildings. This area also comprises of strips of road verge vegetation less than 20 m in width and not within 20 m of the site or other areas of classified vegetation. This area is consistent with exclusion 2.2.3.2 (d), (e) and (f).

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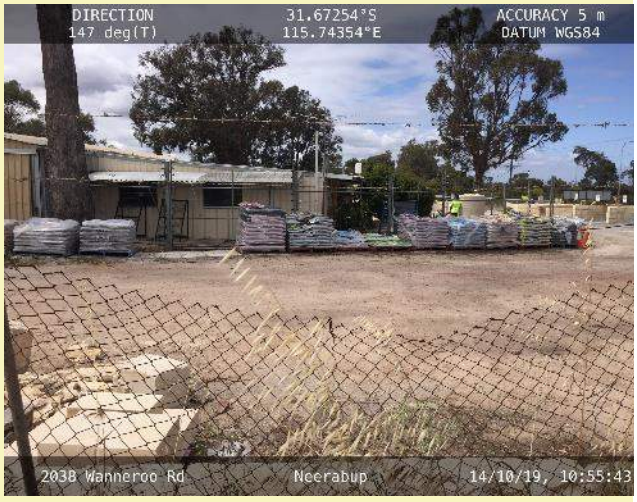

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3.3 Assessment Outputs

Potential bushfire impact analysis was undertaken in accordance with AS 3959 Method 1 to determine the worst-case radiant heat impacts to the subject site. A BAL contour map has been prepared to illustrate the potential heat impacts and associated BAL ratings for the subject site (see Figure 6).

3.3.1 BAL Assessment Outputs

Table 1 outlines the worst-case BAL rating for the Class 6 service station building and canopies based on separation distance to the vegetation plots.

Table 1: Determined BAL rating for the development

Subject Area	Vegetation Classification	Effective Slope	Separation distance (m)	Highest BAL
Service Station Retail Building	Class G Grassland	Downslope 4 degrees	29	**BAL-12.5**
	Class A Forest	Downslope 6 degrees	73	
	Class D Scrub	Downslope 1.9 degrees	78	
Canopy – measured to supporting columns	Class G Grassland	Downslope 4 degrees	9.3	**BAL-29**
	Class A Forest	Downslope 6 degrees	66	
	Class D Scrub	Downslope 1.9 degrees	77	

3.3.2 BAL Contour Map

The BAL contour map shown in the Following Figures is based on the results of the above BAL assessment and the vegetation classification and slope assessed at the site inspection

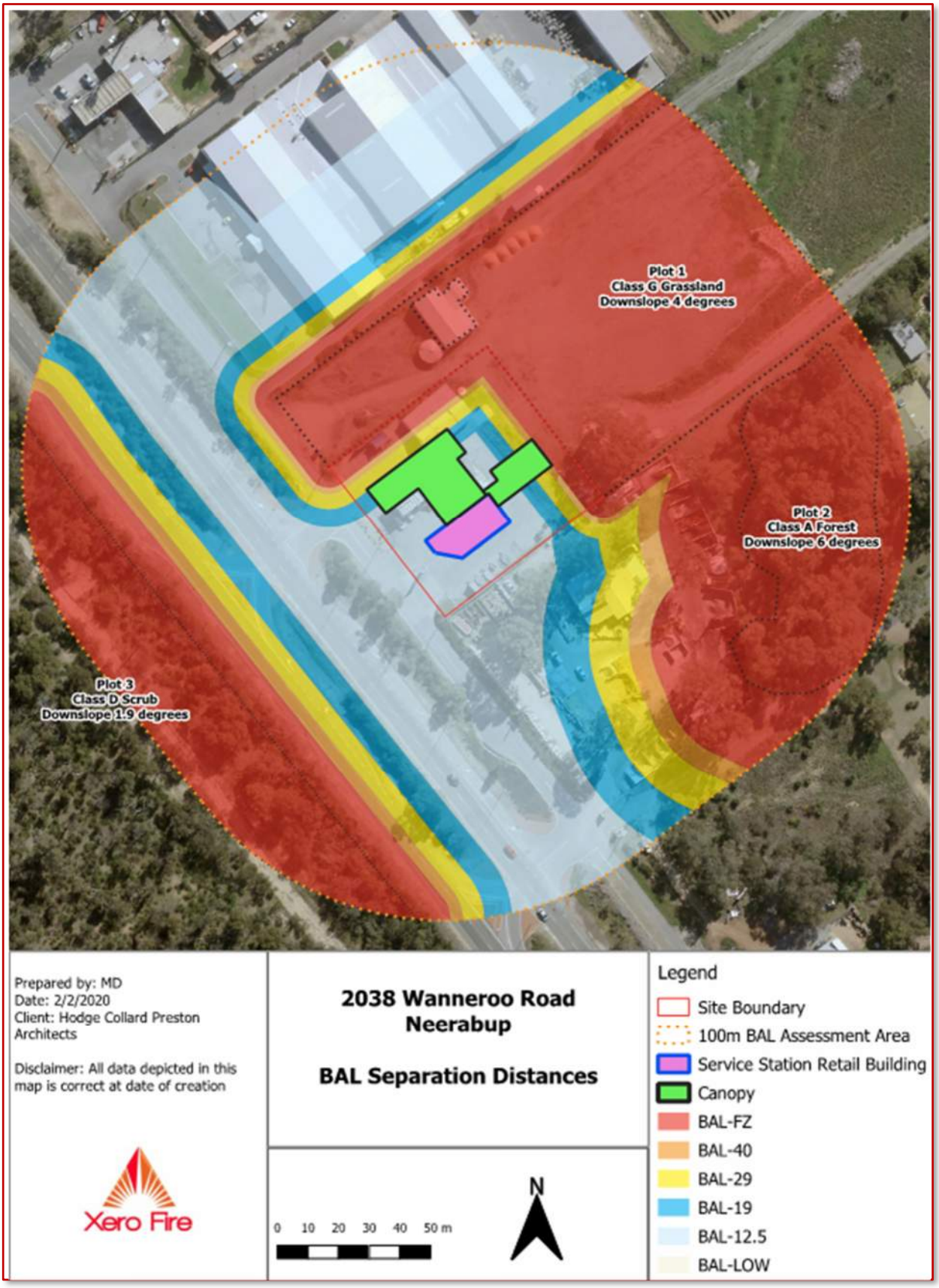


Figure 6: BAL Contour Map

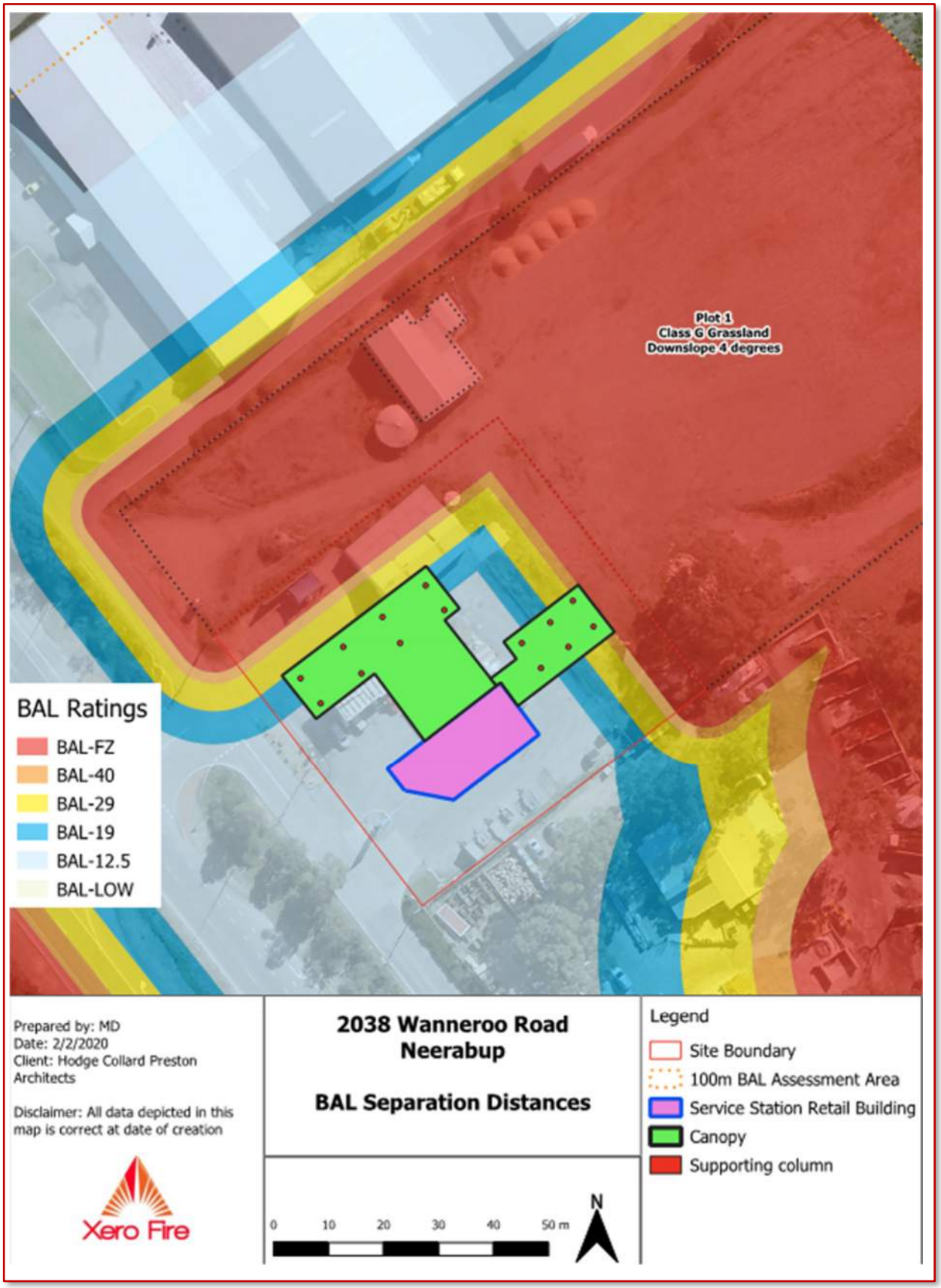


Figure 7: BAL Contour Map – Close Up

4 Identification of Bushfire Hazard Issues

4.1 Bushfire Context and Bushfire Hazard Issues

The bushfire risk to the site is present from Class G grassland to the north and east of the proposed development. The assessment undertaken has identified the following bushfire hazard issues:

- The entire site is subject to a risk rating above BAL-LOW. The bushfire selection criteria relevant to the development are addressed in Section 5 of this BMP.
- Section 5 of this BMP details the requirements for management of vegetated areas within the site to low threat, such as maintained gardens.
- The areas on the site which are subject to BAL-12.5 to BAL-29 are suitable for development.
- Areas on the site which are subject to BAL-40 and BAL-FZ are not suitable for development comprising of vulnerable land uses.
- The proposed development will be located wholly within the BAL-12.5 to BAL-29 areas on the site.

The site is located in an existing commercial area which incorporates suitable access provisions and all roads are existing.

Management of bushfire hazards within the site boundary will be achieved by maintaining any vegetated areas within the site as low-threat vegetation and non-vegetated areas in accordance with the Standards for Asset Protection Zones contained in Appendix C.

5 Assessment Against the Bushfire Protection Criteria

A performance-based system of control for bushfire hazard management has been adopted by Western Australia and is enforced through SPP 3.7 and The Guidelines.

The bushfire design criteria used to assess the development are as follows:

- Location.
- Siting and design of development.
- Vehicular access.
- Water.

The extent of compliance with the objectives of SPP 3.7 and bushfire protection criteria elements for the proposed residential development located at 2038 Wanneroo Road, Neerabup is discussed in the following sections and summarised in Table 2.

5.1 SPP 3.7 Objectives

Policy measure 5.1 – Avoid any increase in the threat of bushfire to people, property and infrastructure. The preservation of life and the management of bushfire impact are paramount.

This objective is satisfied by demonstrating that the service station building is exposed to a maximum BAL- 12.5 and the canopies are subject to BAL-29.

Policy measure 5.2 – Reduce vulnerability to bushfire through the identification and consideration of bushfire risks in decision-making at all stages of the planning and development process.

This objective is satisfied through the identification and assessment of the classified vegetation within 150m of the subject site as detailed in Section 3 of this BMP.

Policy measure 5.3 – Ensure that higher order strategic planning documents, strategic planning proposals, subdivision and development applications take into account bushfire protection requirements and include specified bushfire protection measures.

This objective is satisfied through compliance with all relevant sections of SPP 3.7 and the development of this BMP.

Policy measure 5.4 – Achieve an appropriate balance between bushfire risk management measures and, biodiversity conservation values, environmental protection and biodiversity management and landscape amenity, with consideration of the potential impacts of climate change.

This objective is satisfied through the assessment of risk and development of the bushfire management strategy detailed in the table below.

5.1.1 High-Risk Land Uses

Policy Measure 6.6 – Development applications for high-risk land uses in areas between BAL-12.5 to BAL-29 shall be accompanies by a Bushfire Management Plan and should include an evacuation plan and/or risk management plan for any flammable on-site hazards

This policy measure is satisfied by the development of this BMP.

A risk management plan for flammable on-site hazards shall be provided by the site operator.

5.2 Bushfire Protection Criteria Checklist

An acceptable solutions assessment against the bushfire protection criteria is provided in Table 2.

Table 2: Compliance with bushfire protection criteria elements

Bushfire Protection Criteria	Intent Acceptable Solutions	Proposed Bushfire Management Strategy	Compliance Achieved
Element 1: Location	Intent: To ensure that development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.		
	A1.1. Development Location	This BMP demonstrates that the site and the proposed development which includes habitable and non-habitable parts will be located in an area of low risk on the site. The BAL assessment demonstrates that the maximum BAL that the development will be subject to is BAL-29. The service station retail building will be subject to BAL-12.5 and the canopy will be subject to BAL-29.	Yes
Element 2: Siting and design of development	Intent: To ensure that the siting and design of the development minimises the level of bushfire impact.		
	A2.1. Asset Protection Zone (APZ)	All vegetated areas within the site shall comprise of managed and landscaped garden beds and will be maintained as low threat areas in accordance with the Standards for an APZ (see Appendix C).	Yes

Bushfire Protection Criteria	Intent Acceptable Solutions	Proposed Bushfire Management Strategy	Compliance Achieved
Element 3: Vehicular Access	Intent: To ensure that the vehicular access serving a development is available and safe during a bushfire event.		
	A3.1. Two access routes.	The site is provided with existing access routes which connect to a public road network, provide safe access and egress to two different destinations and are available at all times under all weather conditions. The existing road network is shown in Figure 8.	Yes
	A3.2. Public road	All public roads which provide access and egress to the site are existing.	Yes
	A3.3. Cul-de-sac (including a dead-end-road)	Does not apply to this development	n/a
	A3.4. Battle-axe	Does not apply to this development	n/a
	A3.5. Private driveway longer than 50m	Does not apply to this development	n/a
	A3.6. Emergency access way	Does not apply to this development	n/a
	A3.7. Fire service access routes (perimeter roads)	Does not apply to this development	n/a
	A3.8. Firebreak width	The development encompasses the entire site and therefore a fire break will not be required.	Yes
Element 4: Water	Intent: To ensure that water is available to the development to enable people, property and infrastructure to be defended from bushfire.		
	A4.1. Reticulated areas	Does not apply to this development	Yes
	A4.2. Non-reticulated areas	Does not apply to this development	n/a

Bushfire Protection Criteria	Intent Acceptable Solutions	Proposed Bushfire Management Strategy	Compliance Achieved
	A4.3. Individual lots within non-reticulated areas	The development will be provided with a dedicated fire fighting water tank in accordance with A4.3 and as shown in Figure 8. The water supply shall comprise of a dedicated static water supply with an effective capacity of 10,000 litres.	n/a

5.3 Summary of Bushfire Management Strategies

The bushfire management strategies for the development are shown in Figure 8.

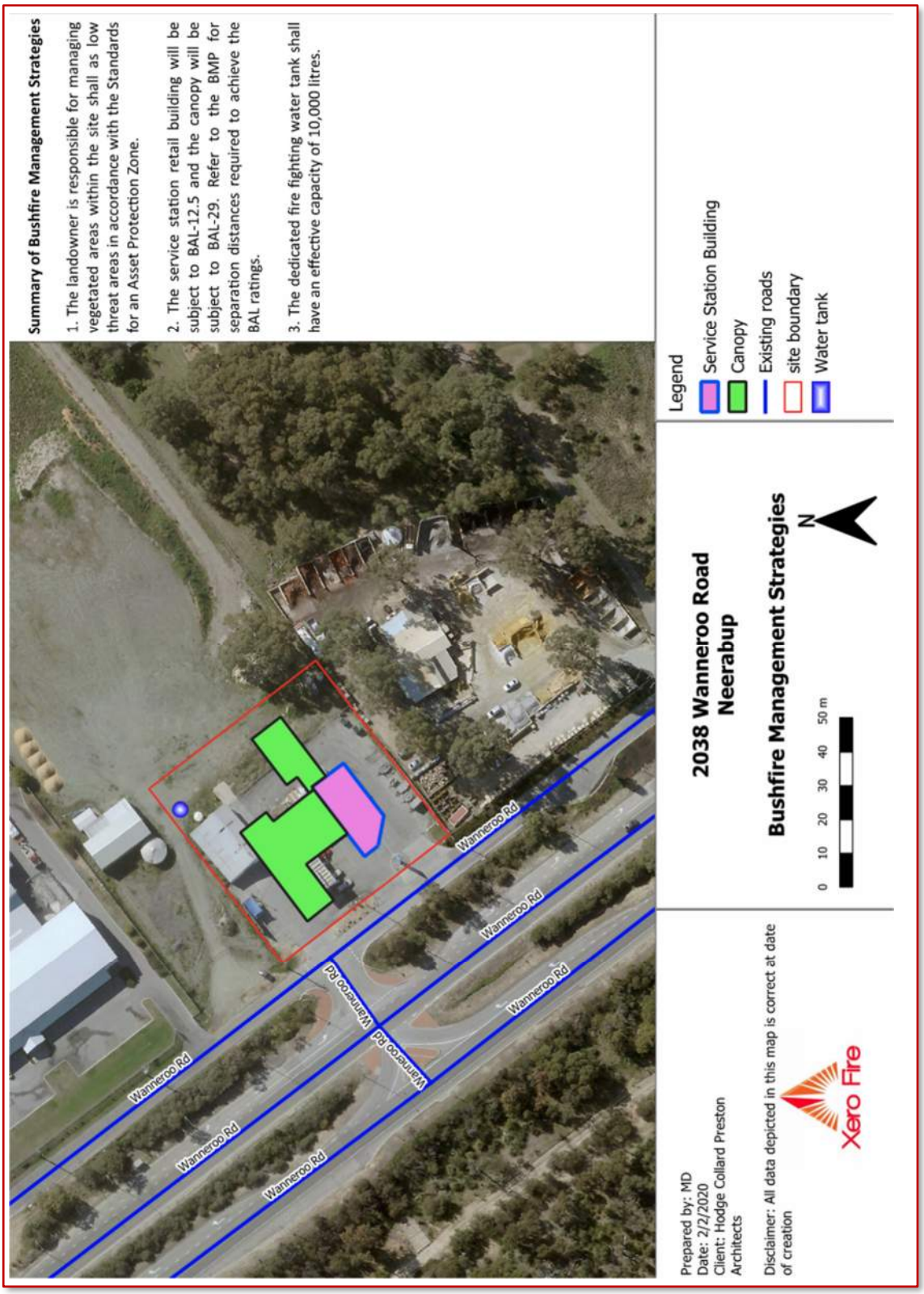


Figure 8: Bushfire management strategies

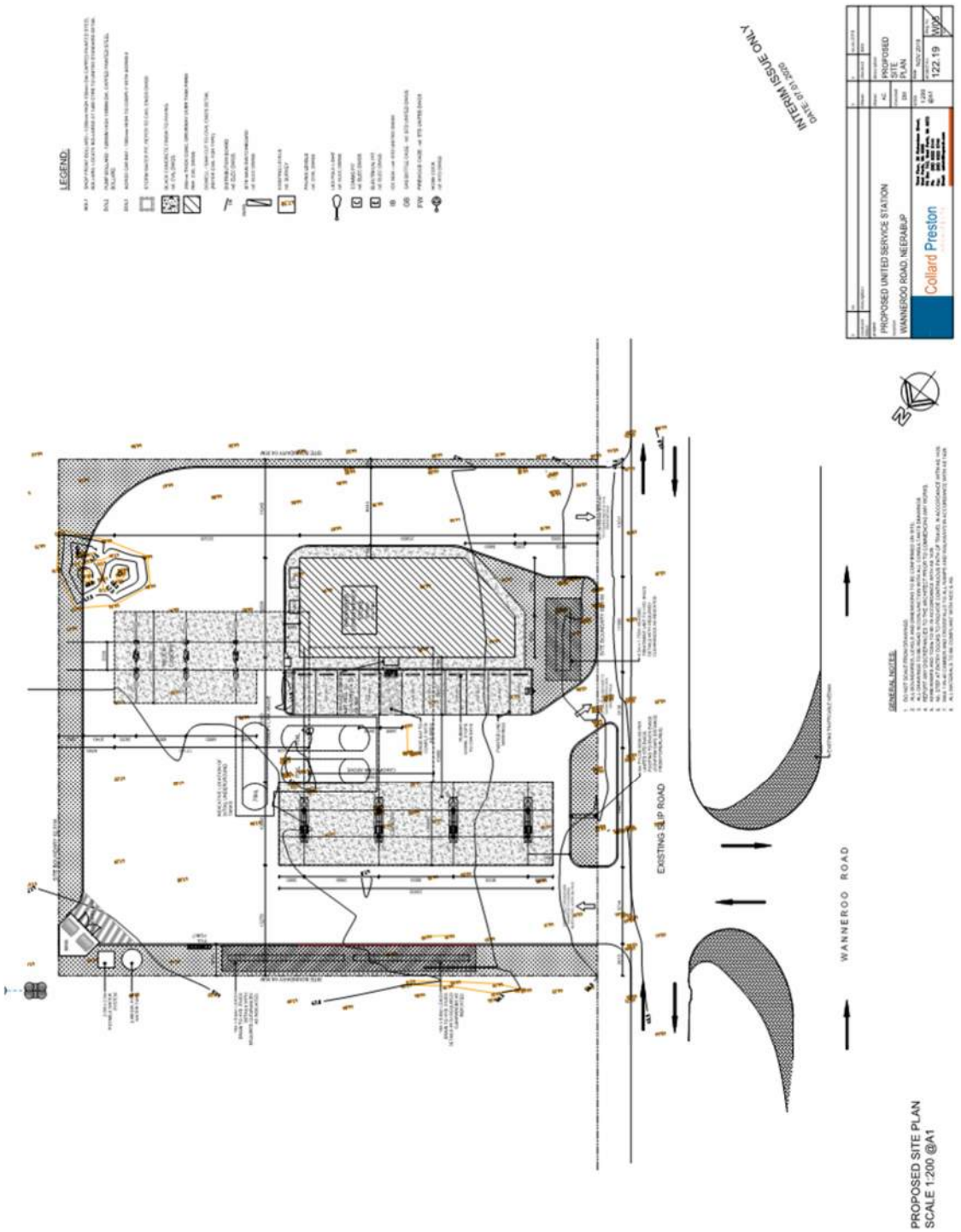
6 Implementation and Management Responsibilities

The following tables set out the responsibilities of the landowner and building occupier with regards to the initial implementation and ongoing maintenance of the required bushfire management strategies.

Table 3: Implementation and management responsibilities

DEVELOPER – PRIOR TO ISSUE OF TITLES	
No.	Implementation Action
1	Notification is to be placed on the certificate of title to ensure prospective landowners/owners/purchasers are aware that the site is subject to a BMP and associated bushfire management strategies.
LANDOWNER / DEVELOPER / OCCUPIER – PRIOR TO OCCUPANCY	
No.	Management Action
1	Landscaping within the subject site shall comprise of managed gardens and low threat vegetation only in accordance with clause 2.2.3.2(f) of AS 3959 and the Guidelines for Planning in Bushfire Prone Areas.
2	The development shall be provided with a dedicated water tank for firefighting purposes with an effective capacity of 10,000L.
LANDOWNER/OCCUPIER – ONGOING	
No.	Management Action
1	Landscaping within the subject site shall comprise of managed gardens and low threat vegetation only in accordance with clause 2.2.3.2(f) of AS 3959 and the Guidelines for Planning in Bushfire Prone Areas.
2	The landowner is responsible for managing the site on a regular and ongoing basis in accordance with low threat vegetation and the standards for an APZ.
3	The landowner shall ensure that the 10,000L effective capacity of the dedicated firefighting water tank is maintained at all times.

Appendix A Development Plans



Appendix B Summary of BAL-12.5 and BAL-29 Construction Requirements

Table 4: BAL 12.5 Construction Requirements

Construction element	BAL-12.5 requirement for service station retail building
Subfloor Supports	No special construction requirements
Floors	No special construction requirements
External Walls	External walls – Parts less than 400mm above ground or decks etc to be of non-combustible material, 6mm fibre cement clad or bushfire resistant/naturally fire resistant timber
External Windows	Protected by bushfire shutter; or Completely screened with steel, bronze or aluminium mesh; or 4mm Grade A safety glass or glass blocks within 400mm of ground, deck, carport roof or awning, and openable portion metal screened with frame of metal or metal reinforced PVC-U or bushfire resisting timber
External Doors	Protected by bushfire shutter; or Completely screened with steel, bronze or aluminium mesh; or Glazed with 4mm Grade A safety glass, non-combustible or 35mm solid timber for 400mm above threshold, metal or bushfire resistant timber framed for 400 mm above ground, decking, etc, tight-fitting with weather strips at base.
Roofs	Non-combustible covering. Roof/wall junction sealed. Openings fitted with non-combustible ember guards. Roof to be fully sarked.
Verandas, Decks etc.	Enclosed sub-floor space – no special requirement for materials except within 400mm of ground. Veranda posts must be either timber fixed on a galvanised shoe or stirrup 75mm above the adjacent finished surface or where less than 400mm from the surface of the deck be non-combustible or bushfire resistant timber or a timber species listed in AS3959 Appendix E.

Table 5: BAL 29 Construction Requirements

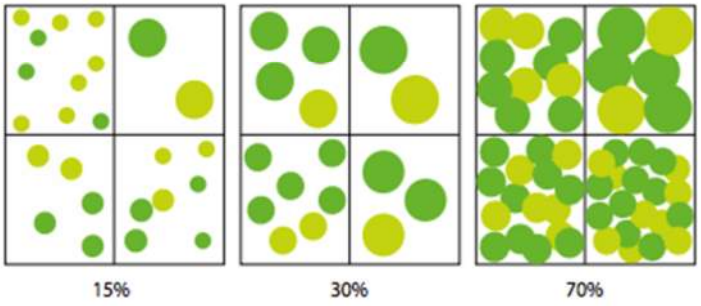
	BAL-29 for canopy
Floors	Concrete slab on ground, enclosure by external wall, metal mesh as above or flooring less than 400mm above ground level to be non-combustible, naturally fire resistant timber or protected on the underside with sarking or mineral wool insulation
Roofs	Non-combustible covering. Roof/wall junction sealed. Openings fitted with non-combustible ember guards. Roof to be fully sarked

Appendix C Low Threat Vegetation / Asset Protection Zone (APZ) Standards

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

- **Fences:** within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.
- **Objects:** within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.
- **Fine Fuel load:** combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare.
- **Trees (> 5 metres in height):** trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy.

Figure 18: Tree canopy cover – ranging from 15 to 70 per cent at maturity



- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m^2 in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.
- **Grass:** should be managed to maintain a height of 100 millimetres or less.