Member of the Fire Protection Association of Australia

240-244 Beecroft Road, Epping NSW 2121.

Sunday, 5 November 2017

Prepared and certified by:	**Matthew Willis** BPAD – Level 3 Certified Practitioner Certification No: BPD-PA 09337		5/11/2017
Can this proposal comply with AS3959-2009 (inc PBP addendum 3)?		**Yes**	
What is the recommended AS 3959-2009 level of compliance?		**BAL-12.5**	
Is referral to the RFS required?		**Yes, integrated development.**	
Can this development comply with the requirements of PBP?		**Yes**	
Concept plans supplied by Molino Stewart Pty Ltd.		**Attached**	

Bushfire Planning Services
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Bushfire Risk Assessment

Sunday, 5 November 2017

Contact
Steven Molino
Molino Stewart Pty Ltd
Suite 3, level I,
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Parramatta NSW 2124
9354 0300

Subject Property
Lot 22, DP 1180959
240-244 Beecroft Road
Epping NSW 2121

1. Contents

2. Executive summary.

Bushfire Planning Services has been requested by Mr Steven Molino of Molino Stewart Pty Ltd to supply a bushfire compliance report on Lot 22, DP 1180959, number 240-244 Beecroft Road, Epping, NSW 2121.

The purpose of this report is to evaluate a concept design for the redevelopment of a parcel of land adjacent to the Epping/Hornsby rail corridor with a view to the proposal's likelihood of compliance with the relevant bushfire requirements needed to gain a section 100B Bushfire Safety Authority from the Rural Fire Service (RFS).

Stage 1 work comprises the subdivision to create two separate lots for the proposed residential development and Epping Service Facility.

The concept proposal for a residential flat building development comprising of:

- *Building envelopes for residential flat buildings with a maximum height of 48m.*
- *An indicative yield of around 450 dwellings.*
- *Residential gross floor area (GFA) of around 40,000m².*
- *Non-Residential use/s in the lower level/s of the building.*
- *Around 270 car parking spaces.*
- *Two proposed basement parking entrances.*

Although the subject lot is now within the Parramatta Local Government Area (LGA) it was previously within the Hornsby LGA before the recent Council boundary changes. It should be noted that the site is still under Hornsby Planning Controls.

The Hornsby Bushfire Prone Land Map, which currently covers the subject lot, is dated 2013 and is due for renewal in 2018.

The area of vegetation that is the hazard to this proposal is mapped as a category one hazard with a 100m buffer area surrounding the hazard. The hazardous vegetation is unlikely to be remapped as a category one hazard due to a change in the bushfire prone land mapping guidelines several years ago. It is expected that the hazard will become a category two hazard with a 30m buffer surrounding the identified vegetation.

As the area proposed for the new work is at a distance exceeding 30m from a category 2 hazard resulting in the proposed lot no longer being mapped as bushfire prone land there should be no bushfire requirements for the subject lot in the future.

The entire proposal can easily comply with the setback requirements of table A2.4 of Planning for Bushfire Protection and in addition all proposed buildings can achieve the setback required in table 2.4.2 of AS3959 to achieve a BAL-12.5 construction level.

All other aspects of this proposal can comply with the acceptable solutions for subdivision as outlined in Planning for Bushfire Protection.

Based on the assumptions and measurements contained within this assessment the development is considered to be able to meet the requirements of clause 44 of the Rural Fi res Regulation 2008 and the RFS requirements as outlined in Planning for Bushfire Protection.

Should this proposal be presented to the RFS it is reasonable to expect that the RFS would issue a section 100B bushfire safety authority for the development.

3. General.

As this proposal is for the subdivision of an existing allotment and the creation of a multi-unit residential development the proposal is considered to be "integrated development" and is required under section 91 of the Environmental Planning and Assessment Act to obtain a section 100 B Bushfire Safety Authority from the Rural Fire Service.

For the Rural Fire Service to issue the 100 B Bushfire Safety Authority it must be satisfied that the proposal can meet the requirements of clause 44 of the Rural Fires Regulation.

This assessment is based around the requirements of clause 44 and indicates if and how the proposal meets these requirements.

The following text in italics is a copy of clause 44 of the Rural Fires Regulation 2008;

44 Application for bush fire safety authority

For the purposes of section 100B (4) of the Act, an application for a bush fire safety authority must be made in writing and must include the following:

(a) a description (including the address) of the property on which the development the subject of the application is proposed to be carried out,

(b) a classification of the vegetation on and surrounding the property (out to a distance of 140 metres from the boundaries of the property) in accordance with the system for classification of vegetation contained in Planning for Bush Fire Protection,

(c) an assessment of the slope of the land on and surrounding the property (out to a distance of 100 metres from the boundaries of the property),

(d) identification of any significant environmental features on the property,

(e) the details of any threatened species, population or ecological community identified under the Threatened Species Conservation Act 1995 that is known to the applicant to exist on the property,

(f) the details and location of any Aboriginal object (within the meaning of the National Parks and Wildlife Act 1974) or Aboriginal place (within the meaning of that Act) that is known to the applicant to be situated on the property,

(g) a bush fire assessment for the proposed development (including the methodology used in the assessment) that addresses the following matters:

(i) the extent to which the development is to provide for setbacks, including asset protection zones,

(ii) the siting and adequacy of water supplies for fire fighting,

(iii) the capacity of public roads in the vicinity to handle increased volumes of traffic in the event of a bush fire emergency,

(iv) whether or not public roads in the vicinity that link with the fire trail network have two-way access,

(v) the adequacy of arrangements for access to and egress from the development site for the purposes of an emergency response,

(vi) the adequacy of bush fire maintenance plans and fire emergency procedures for the development site,

(vii) the construction standards to be used for building elements in the development,

(viii) the adequacy of sprinkler systems and other fire protection measures to be incorporated into the development,

(h) an assessment of the extent to which the proposed development conforms with or deviates from the standards, specific objectives and performance criteria set out in Chapter 4 (Performance Based Controls) of Planning for Bush Fire Protection.

Any wording that appears in blue italics are quotes from Planning for Bushfire Protection 2006 (PBP).

Some of the distance measurements used in this report have been taken from aerial photographs and as such are approximate only. If doubt exists the distances should be verified by survey.

4. Significant factors that may influence further development

The proposal is bushfire prone due to the current block's proximity to a piece of vegetation that is mapped in the council's bushfire prone land map as a category one bushfire hazard, this was in accordance with the bushfire prone land mapping guidelines that were used at the time of the map's production.

In accordance with the bushfire prone land mapping guidelines a category one hazard is surrounded by a 100m buffer area and any lots that wholly or partially fall within that buffer are considered as bushfire prone.

The proposal as presented includes the subdivision of the current parent lot into two smaller allotments with the concept proposal situated on the southern allotment, the lot furthest away from the mapped hazard at a distance of approximately 80m.

The current bushfire prone land map is dated 2013 and in accordance with the RFS document "Guide for bushfire prone land mapping version 5B November 2015", is due for revision into 2018.

Since the current mapping was undertaken the bushfire prone land mapping guidelines have changed which should result in a reclassification of the current hazard from a category one hazard to a category two hazard.

The significant difference between the current and the future mapping is that instead of a 100m buffer surrounding the hazard it will only require a 30m buffer.

Given that the proposed lot is at a distance of approximately 80m from the currently mapped hazard, the reduction in the buffer size from 100m to 30m will mean that the proposed lot will no longer be bushfire prone land and therefore should not require a section 100B bushfire safety authority from the RFS for its development.

Should this occur specific bushfire construction measures are unlikely to be imposed on this concept proposal unless specifically requested by the consenting body.

5. Block description

Clause 44 requirement. "a description (including the address) of the property on which the development the subject of the application is proposed to be carried out"

As this is assessment has been undertaken on the concept design stage the lot and DP number of the subject lot is unknown however the parent lot is, Lot 22, DP 1180959.

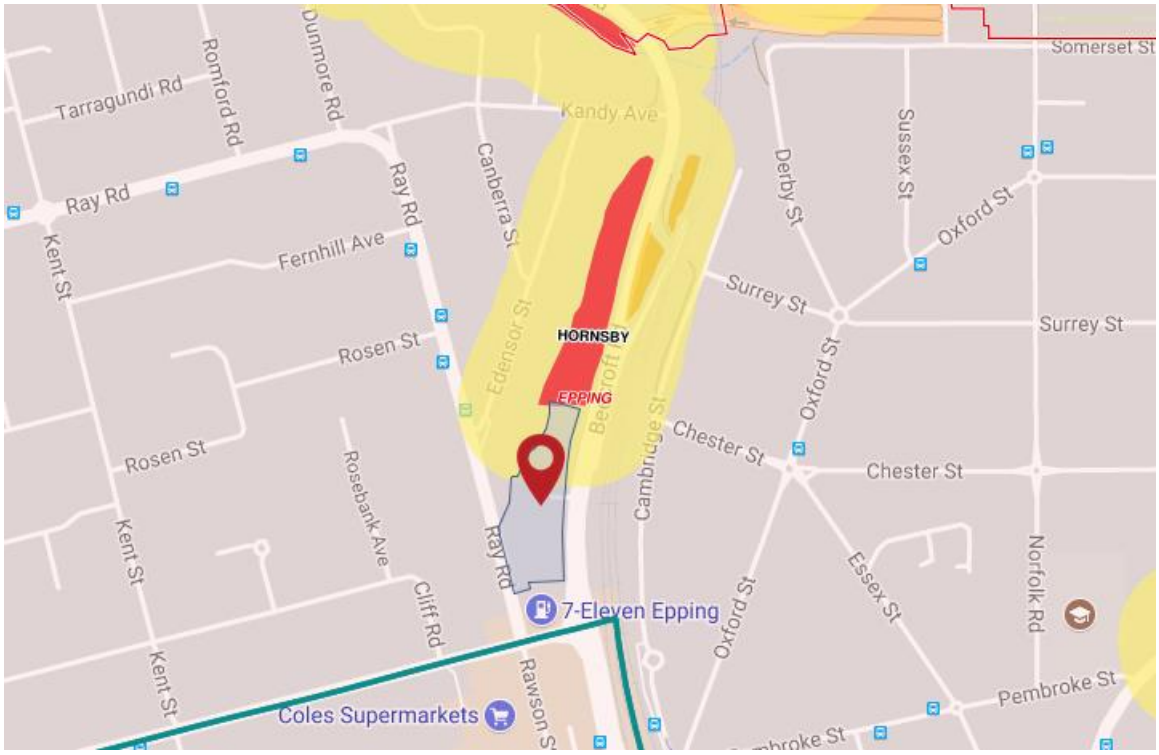
The parent lot is on the Western side of the Beecroft Road which in turn is on the Western side of the northern rail line.

The lot is bounded by Beecroft Road to the east with Ray Road and existing apartments to the west. There is a Service Station to the south and future rail infrastructure is planned to be constructed adjacent to the northern boundary, between the subject lot and the identified hazard.

MAP 1. THE ABOVE MAP SHOWS THE PROPOSED LOT HIGHLIGHTED IN GREEN.

PHOTO 1 (ABOVE) SHOWS A GENERAL OVERVIEW OF THE SURROUNDING AREA.

MAP 2. A CLOSER VIEW OF THE AREA.



MAP 3 IS AN EXTRACT FROM THE COUNCILS BUSHFIRE PRONE LAND MAP.

6. Vegetation

Clause 44 requirement *"a classification of the vegetation on and surrounding the property (out to a distance of 140 metres from the boundaries of the property) in accordance with the system for classification of vegetation contained in Planning for Bush Fire Protection"*

The study area for the vegetation is 140m surrounding the development site. The vegetation assessment has been undertaken using the methodology of "Ocean Shores to Desert Dunes, Native Vegetation of New South Wales and the ACT" by David Keith.

The vegetation within the study area for this proposal comprises of urban landscaping within a mixture of commercial and medium density residential allotments. There is major road and rail infrastructure to the east of the proposal which severely limits vegetation in that direction.

The vegetation to the North is mapped as Sydney Turpentine Ironbark Forest which is an endangered ecological community. The vegetation has a state class of Northern Hinterland Wet Sclerophyll Forest and state form of Wet Sclerophyll Forest.

The vegetation structure is considered as Forest with the predominant species E.pilularis/S.glomulifera+/-A.costata/E.resinifera.

There is a narrow band of "Weeds and Exotics" along the small drainage canal to the North West of the subject lot. This area is fragmented/discontinuous and not considered to be a bushfire risk.

For the purpose of compliance with Planning for Bushfire Protection the hazardous vegetation is considered as Forest.

PHOTO 2 . VEGETATION IDENTIFICATION AS PER SYDNEYMETOAREA_V 3_2016_E_4489 VEGETATION MAPPING.

7. Slope

Clause 44 requirement *"an assessment of the slope of the land on and surrounding the property (out to a distance of 100 metres from the boundaries of the property)",*

The slope analysis for this proposal was undertaken using contours derived from 1m LIDAR DEM. This elevation data has been processed to achieve

'Category 1' DEM products as described by the ICSM Guidelines for Digital Elevation Data which specifies accuracies not exceeding 30cm with 2 sigma or 95% confidence.

For the purpose of the slope analysis for this proposal 1 slope run beneath the hazard to the North has been evaluated. The run is shown on the following topographical map and the run details are shown in table 1.

TABLE 1. THE FOLLOWING TABLE SHOWS THE PARTICULARS OF THE SLOPE RUN USED IN THIS ASSESSMENT.

Slope run	Starting height (m)	Finish height (m)	Length of run (m)	Height difference (m)	Slope (deg)
1	*79*	*75*	*100*	*4*	*2*

8. Significant features

Clause 44 requirement "identification of any significant environmental features on the property"

I have not been informed of any significant environmental features that would be affected by this proposal. There is currently a Heritage and Archaeology assessment being undertaken by GML Heritage.

9. Threatened Species

Clause 44 requirement "the details of any threatened species, population or ecological community identified under the Threatened Species Conservation Act 1995 that is known to the applicant to exist on the property,"

The hazard is mapped as Sydney Turpentine Ironbark Forest which is a critically endangered ecological community. This community will not be affected by this proposal as no vegetation clearing is recommended.

10. Aboriginal Heritage

Clause 44 requirement "the details and location of any Aboriginal object (within the meaning of the National Parks and Wildlife Act 1974) or Aboriginal place (within the meaning of that Act) that is known to the applicant to be situated on the property,"

I have not been informed of any places of cultural significance that would be affected by this proposal.

11. Bushfire Assessment Methodology

Clause 44 requirement"a bush fire assessment for the proposed development (including the methodology used in the assessment) that addresses the following matters:

The methodology used in the assessment of bushfire threat to the subject property is outlined in;

- *Planning for Bushfire Protection 2006 as published by the New South Wales Rural Fire Service, and*
- *Australian Standard 3959-2009, Construction of buildings in Bushfire Prone Areas.*

12. Setbacks

(i)	Clause 44 requirement "the extent to which the development is to provide for setbacks, including Asset Protection Zones,"

The available setbacks between the proposal and the hazard have been taken from the northern boundary of the subject lot to the southern extremity of the vegetation. It should be noted that the measurement to

the hazard also includes a small area of vegetation that is not currently mapped as a hazard.

As the boundary of the subject lot has been used and not the actual building line of the proposal, the setbacks available are larger than those used in the calculations of this assessment.

This has been done to provide a conservative assessment.

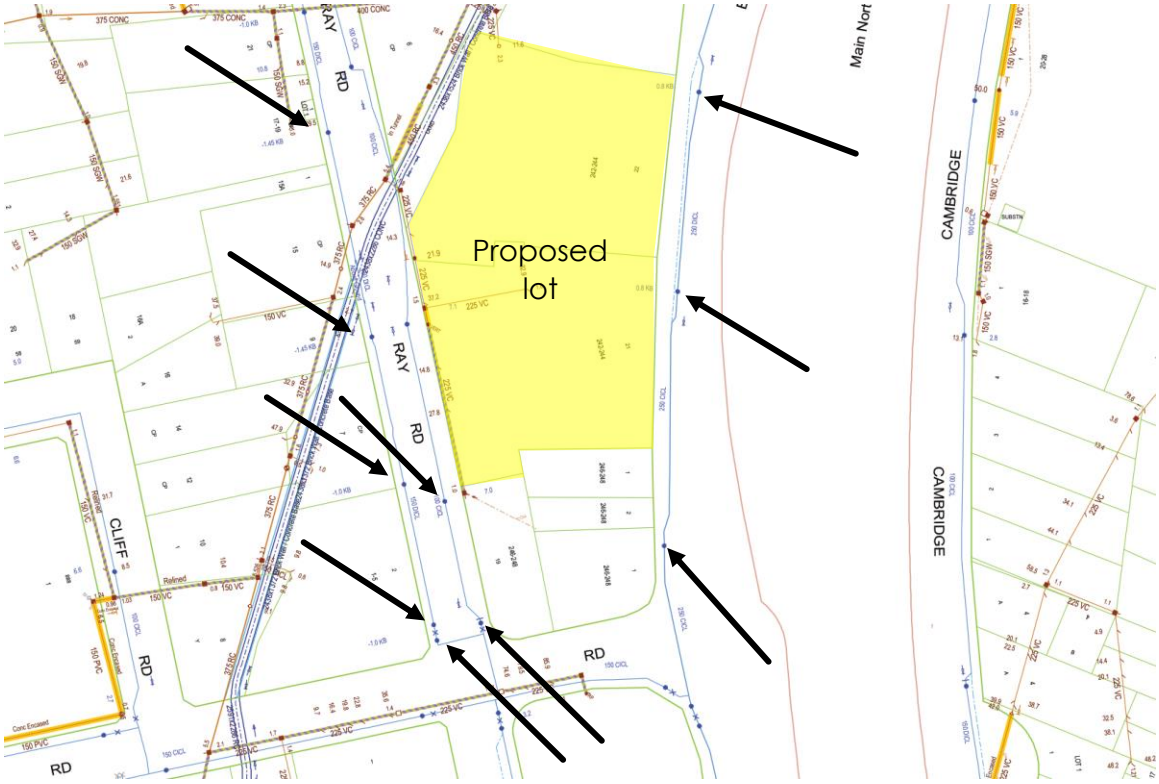
Setback run	***Available distance***
1	*64m*

13. Water

(ii)	Clause 44 requirement "the sighting and adequacy of water supplies for fire fighting,"

The following map is an extract from the Sydney Water hydrant map for the area. Hydrants are shown as blue dots on a blue line.

As can be seen there are multiple hydrants indicated around the subject lots.



14. Access

(iii)	Clause 44 requirement "the capacity of public roads in the vicinity to handle increased volumes of traffic in the event of a bush fire emergency,"

The subject lot has road frontage to Beecroft Road and Ray Road. Both roads are two-way roads that are considered to be capable of handling emergency service vehicles.

Currently access is only available from Ray Road however access from Beecroft Road is to be sought as part of the development approval.

15. Fire trails

(iv)	Clause 44 requirement "whether or not public roads in the vicinity that link with the fire trail network have two-way access,"

Fire trails are not planned or recommended as part of this development proposal. All roads in the vicinity have two-way access.

16. Property Access

(v)	Clause 44 requirement "the adequacy of arrangements for access to and egress from the development site for the purposes of an emergency response,"

In accordance with the requirements of Planning for Bushfire Protection there are no access requirements for this proposal.

17. Maintenance plans

(vi)	Clause 44 requirement "the adequacy of bush fire maintenance plans and fire emergency procedures for the development site"

No additional advice or information regarding bushfire maintenance plans & fire emergency procedures has been provided by the proponent.

Under the Rural Fires Act 1997 sect 52, the local council's bushfire management committees are required to prepare and submit management plans for the rural fire district or part of the state which it is constituted.

The plan covers the following,

- a plan of operations and
- a bushfire risk management plan.

The plan of operations must be reviewed within every 2 years and the bushfire risk plan must be reviewed within each 5 years.

Should a bushfire emergency impact upon this area, the implementation of the existing council's Sect. 52 Operations & Risk Plan should be adequate for bushfire suppression, hazard management and maintenance.

I have not been informed of any site-specific bushfire plans.

18. Building construction standards

(vii) Clause 44 requirement "the construction standards to be used for building elements in the development,"

Table 2.4.2 of AS 3959-2009 'Construction of Buildings in a Bushfire Prone Area' outlines the appropriate level of construction to be used once analysis has been undertaken in accordance with the methodology of that standard.

Given the variables of slope, vegetation classification and achievable setback distances from the classified vegetation have been considered the resultant BAL (Bushfire Attack Level) for this proposal has been determined as being less than or equal to BAL 29.

The appropriate construction standards for construction in bushfire prone areas are;

- AS 3959-2009 (amendment 3) Construction of Buildings in Bushfire Prone Areas.
- Building Code of Australia and the applicable referenced standards.
- The addendum to appendix 3 of Planning for Bushfire Protection.

19. Sprinkler systems

(viii) Clause 44 requirement "the adequacy of sprinkler systems and other fire protection measures to be incorporated into the development,"

Currently sprinklers are not considered as necessary in the design of the development.

20. Compliance with chapter 4 of PBP

Clause 44 requirement "assessment of the extent to which the proposed development conforms with or deviates from the standards, specific

objectives and performance criteria set out in Chapter 4 (Performance Based Controls) of Planning for Bush Fire Protection."

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
Radiant heat levels at any point on a proposed building will not exceed 29 kW/m^2	an APZ is provided in accordance with the relevant tables and figures in PBP	**Yes**	In accordance with table A2.4 of Planning for Bushfire Protection.
	the APZ is wholly within the boundaries of the development site	**No**	The APZ for this development is contained within the proposed lot and on the neighbouring developed or otherwise historically managed lands.
Applicants demonstrate that issues relating to slope are addressed: maintenance is practical, soil stability is not compromised and the potential for crown fires is negated	the APZ is not located on lands with a slope exceeding 18 degrees	**N/A**	
APZs are managed and maintained to prevent the spread of a fire towards the building	in accordance with the requirements of 'Standards for Asset Protection Zones (RFS 2005)	**Achievable**	APZ's used in this assessment are all on developed land or on land that does not contain a recognised bushfire hazard.
Fire fighters are provided with safe all-weather access to structures (thus allowing more efficient use of firefighting resources)	public roads are two-wheel drive, all weather roads	**Yes**	Existing roads provide this.
Public road widths and design that allow safe access for fire fighters while residents are evacuating an area	urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions	**N/A**	The subject development does not incorporate any new or redesigned public roadway.
	Non perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle)	**N/A**	
	the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas	**N/A**	

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
	roads are through roads. Dead end roads are not more than 200 metres in length from a through road, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end	**N/A**	
	traffic management devices are constructed to facilitate access by emergency services vehicles	**N/A**	
	there is a minimum vertical clearance to a height of four metres above the road at all times	**N/A**	
	curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress	**N/A**	
	the minimum distance between inner and outer curves is six metres	**N/A**	
	maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient.	**N/A**	
	Public roads have a cross fall not exceeding 3 degrees	**N/A**	
	the internal road surfaces and bridges have a capacity to carry fully-loaded fire fighting vehicles (15 tonnes)	**N/A**	
The capacity of public road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles	the capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicate load rating	**N/A**	
Roads that are clearly sign-posted (with easily distinguishable names) and buildings/properties that are clearly numbered	public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression	**N/A**	

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
	public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression	**N/A**	
There is clear access to reticulated water supply	public roads up to 6.5 metres wide provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression	**Yes**	There are several hydrants located in the surrounding area. The new proposal will be required to comply with the relevant Australian standards for firefighting water supplies.
	one way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression	**No**	
Parking does not obstruct the minimum paved width	parking bays are a minimum of 2.6 metres wide from kerb edge to road pavement. No services or hydrants are located within the parking bays	**N/A**	
	public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road	**N/A**	
Access to properties is provided in recognition of the risk to fire fighters and/ or evacuating occupants	at least one alternative property access road is provided for individual dwellings (or groups of dwellings) that are located more than 200 metres from a public through road	**N/A**	
The capacity of property access road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles	bridges clearly indicate load rating and pavements and bridges are capable of carrying a load of 15 tonnes	**N/A**	
All weather access is provided	roads do not traverse a wetland or other land potentially subject to periodic inundation (other than a flood or storm surge)	**N/A**	

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
Property road widths and design enable safe access for vehicles	Note: No specific access requirements apply in a urban area where a 70 metres unobstructed path can be demonstrated between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency fire fighting vehicles (i.e. a hydrant or water supply)	**Yes**	The speed limit on both Ray and Beecroft roads is below 70kmph and as such no specific access requirements apply.
	in forest, woodland and heath situations, rural property access roads have passing bays every 200 metres that are 20 metres long by two metres wide, making a minimum trafficable width of six metres at the passing bay	**N/A**	
	a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches	**N/A**	
	internal roads for rural properties provide a loop road around any dwelling or incorporate a turning circle with a minimum 12 metre outer radius	**N/A**	
	curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress	**N/A**	
	the minimum distance between inner and outer curves is six metres	**N/A**	
	the cross-fall is not more than 10 degrees	**N/A**	
	maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m), extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above	**N/A**	

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
	access to a development comprising more than three dwellings have formalised access by dedication of a road and not by right of way	**N/A**	
The width and design of the fire trails enables safe and ready access for fire fighting vehicles	a minimum carriageway width of four metres with an additional one metre wide strip on each side of the trail (clear of bushes and long grass) is provided	**N/A**	The subject development does not incorporate nor require any new or redesigned fire trail access.
	the trail is a maximum grade of 15 degrees if sealed and not more than 10 degrees if unsealed	**N/A**	
	a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches is provided	**N/A**	
	the cross-fall of the trail is not more than 10 degrees	**N/A**	
	the trail has the capacity for passing by: - reversing bays using the access to properties to reverse fire tankers, which are six metres wide and eight metres deep to any gates, with an inner minimum turning radius of six metres and outer minimum radius of 12 metres; and/or - a passing bay every 200 metres, 20 metres long by three metres wide, making a minimum trafficable width of seven metres at the passing bay	**N/A**	
Fire trails are trafficable under all weather conditions. Where the fire trail joins a public road, access shall be controlled to prevent use by non authorised persons	the fire trail is accessible to fire fighters and maintained in a serviceable condition by the owner of the land	**N/A**	The subject development does not incorporate nor require any new or redesigned fire trail access.
	appropriate drainage and erosion controls are provided	**N/A**	
	the fire trail system is connected to the property access road and/or to the through road system at frequent intervals of 200 metres or less	**N/A**	
	fire trails do not traverse a wetlands or other land potentially subject to periodic inundation	**N/A**	

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
	(other than a flood or storm surge)		
	gates for fire trails are provided and locked with a key/lock system authorised by the local RFS	**N/A**	
Fire trails designed to prevent weed infestation, soil erosion and other land degradation	fire trail design does not adversely impact on natural hydrological flows	**N/A**	The subject development does not incorporate nor require any new or redesigned fire trail access.
	fire trail design acts as an effective barrier to the spread of weeds and nutrients	**N/A**	
	fire trail construction does not expose acid-sulphate soils	**N/A**	
(Reticulated water supplies) **Water supplies are easily accessible and located at regular intervals**	reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads	**N/A**	The proposal will be required to comply with the requirements of A.S. 2419.
	fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles	**Achievable**	
	hydrants are not located within any road carriageway	**Achievable**	
	all above ground water and gas service pipes external to the building are metal, including and up to any taps	**Achievable**	
	the provisions of parking on public roads are met	**Achievable**	
(Non-reticulated water supply areas) **For rural-residential and rural developments (or settlements) in bush fire prone areas, a water supply reserve dedicated to fire fighting purposes is installed and maintained.** **The supply of water can be an amalgam of minimum**	the minimum dedicated water supply required for fire fighting purposes for each occupied building excluding drenching systems, is provided in accordance with [PBP] Table 4.2	**N/A**	.

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
quantities for each lot in the subdivision (community titled subdivisions), or held individually on each lot			
	a suitable connection for fire fighting purposes is made available and located within the IPA and away from the structure. A 65mm Storz outlet with a Gate or Ball valve is provided	**N/A**	
	Gate or Ball valve and pipes are adequate for water flow and are metal rather than plastic	**N/A**	
	underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank. A hardened ground surface for truck access is supplied within 4 metres of the access hole	**N/A**	
	above ground tanks are manufactured of concrete or metal and raised tanks have their stands protected. Plastic tanks are not used. Tanks on the hazard side of a building are provided with adequate shielding for the protection of fire fighters	**N/A**	
	all above ground water pipes external to the building are metal including and up to any taps. Pumps are shielded	**N/A**	
(Electricity Services) **Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings** **Regular inspection of lines is undertaken to ensure they are not fouled by branches.**	where practicable, electrical transmission lines are underground	**Achievable**	
	where overhead electrical transmission lines are proposed: - lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002)	**Achievable**	
(Gas Services) **Location of gas services will not lead to ignition of**	reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant	**Achievable**	

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
surrounding bushland or the fabric of buildings	authorities. Metal piping is to be used		
	all fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation	**Achievable**	
	if gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2 metres away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal	**Achievable**	
	polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used	**Achievable**	

Explanation of terms;

- ***'Achievable'.*** *With appropriate design, this aspect can achieve the acceptable solution.*
- ***'Assumed'.*** *It is considered reasonable to assume this requirement has been met.*
- ***'N/A'.*** *This item is not considered as relevant to this proposal.*
- ***'Yes'.*** *This item can/does comply with the acceptable solution.*

21. Conclusions

It is shown through this assessment that this proposal has all the necessary requirements to meet the conditions of clause 44 of the Rural Fires Regulations and that it is reasonable to expect that the Rural Fire Service will issue a section 100B Bushfire Safety Authority for this development.

The proposal has sufficient setback from the hazardous vegetation to achieve a BAL of less than or equal to BAL-29 and will therefore meet the BAL threshold that is required by the RFS.

Bushfires are affected by many external influences such as climactic conditions, vegetation type, moisture content of the fuel, slope of the land and human intervention to name a few and are difficult to predict.

This report does not intend to provide a guarantee that the subject property will survive if a bushfire should impact the surrounding area. The purpose of this report is to show the developments level of compliance or in some cases non-compliance with the New South Wales legislation regarding building in bushfire prone areas.

Where non-compliance is found measures will be suggested that should make the building less susceptible to the various attack mechanisms of a bushfire and comply with the performance requirements of the Building Code of Australia.

The opinions expressed in this report are based on the writers experience and interpretation of the relevant guidelines and standards. Notwithstanding the above, these guidelines and standards are open to interpretation. All care has been taken to ensure that the opinions expressed in this report are consistent with past successful outcomes.

If any further clarification is required for this report please do not hesitate to contact me using the details above.

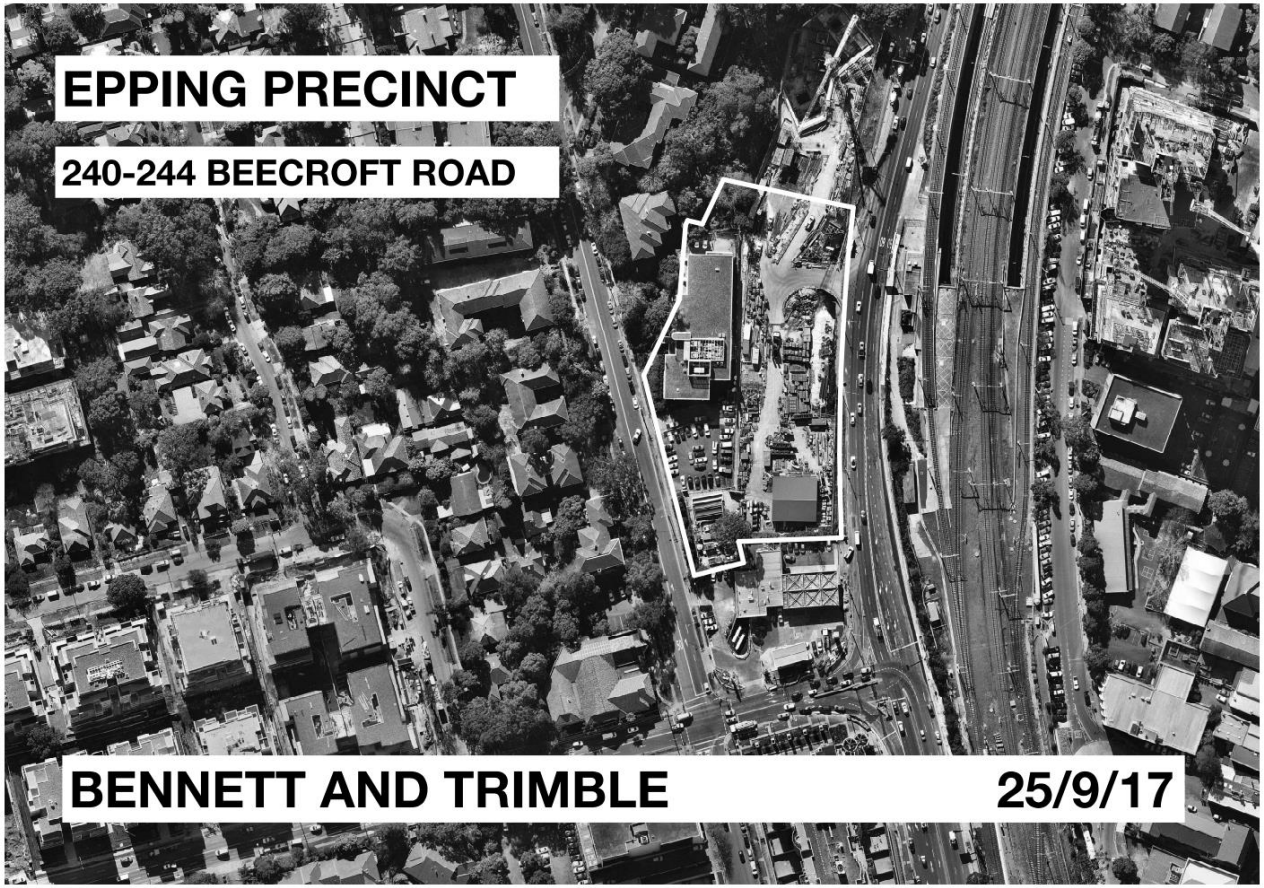
Yours Sincerely

Matthew Willis

Grad Dip Planning for Bushfire Prone Areas

Bushfire Planning Services Pty Limited.

22. Appendix 1 Plans



EXECUTIVE SUMMARY

The purpose of this design report is to develop a design concept for a parcel of government owned land immediately adjacent the "Epping Service Centre" facility for the North West Metro line.

Multiple site strategies and built form studies were investigated with two selected for additional testing. From these, the preferred option was further developed as the concept plan.

Preliminary planning for the buildings has been undertaken in order to test amenity through compliance with the Apartment Design Guide (ADG) focussing on solar access, natural cross ventilation, open space and building separation. Typical apartment plans have been developed to determine an achievable yield, and a schedule of areas.

Structure of Report:

A Site Analysis includes context analysis of the site, opportunities and constraints on the site, a summary of relevant planning controls, and urban design principles.

Concept Plans for site has been developed to test massing and urban form within planning controls, capacity and yield, ADG compliance for cross ventilation and daylight provisions, and typical floorplate efficiency.

They have been tested to demonstrate a development model that maximises the development yield within setback and building separation controls, the ADG, and the height limit, and that is commercially realistic in this market.

Concept Images have been prepared with indicative facade systems, materials, openings, landscaping and common open space.

Additional studies and preliminary concepts are included in the **Appendix.**

CONCEPT DESIGN

Three 15 storey towers are arranged on the site to optimise access to daylight, privacy, and building separation. The towers are oriented east/west to minimise exposure to rail and road noise and to open the primary facade to the north. Each tower comprises two rectangular forms that are angled in response to the geometry of the site and to increase solar penetration. This breaks down the scale of the towers, reducing the apparent width of each element and allows for increase opportunities for cross ventilation.

On Beecroft Road a 5 storey podium connects the two northernmost towers and on Ray Road a 5 storey podium connects the two southernmost towers.

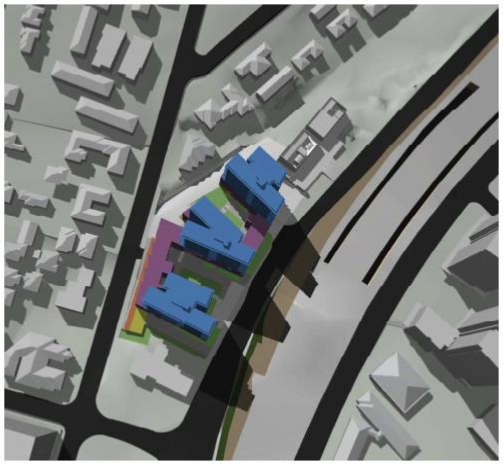
Non-residential uses are located at ground level on Ray Road. These uses could include a general store, childcare, gymnasium, cafe, small offices etc.

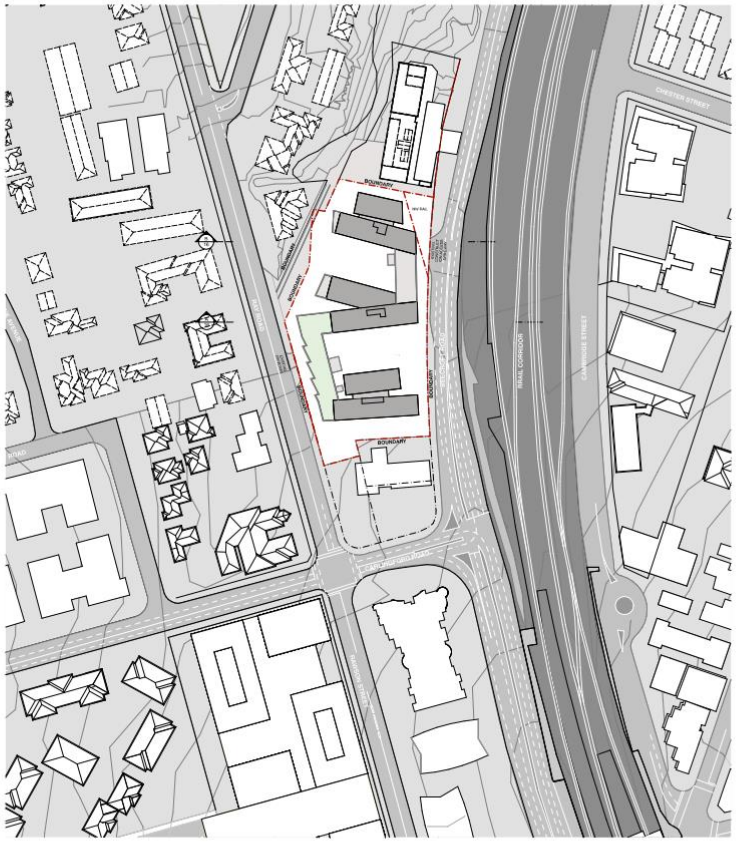
Communal open space is located in courtyards between the towers and on the rooftop of the southern podium.

A through site link connects Beecroft Road and Ray Road between the two southern towers and under the Ray Road podium.

There are two proposed carpark entry points; one on Beecroft Road and one on Ray Road. Waste collection and loading would be from the Ray Road entry.

The architectural treatment of the buildings would further break down the scale of the building as series of elements at an appropriate urban scale.





URBAN DESIGN EPPING I NORTH WEST URBAN TRANSFORMATION 25/9/17 DRAFT

BENNETT AND TRIMBLE 11/49

CONCEPT DESIGN

INDICATIVE GROUND FLOOR PLAN 1:1000

INDICATIVE LEVEL 1 FLOOR PLAN 1:1000

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CONCEPT DESIGN

INDICATIVE TYPICAL PODIUM LEVEL FLOOR PLAN 1:1000

INDICATIVE TYPICAL TOWER FLOOR PLAN 1:1000

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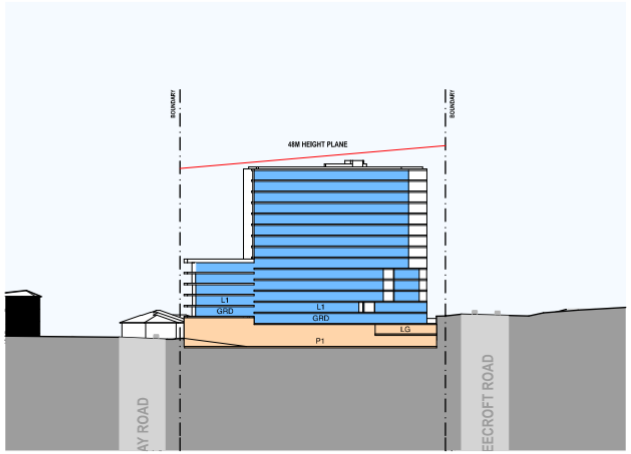
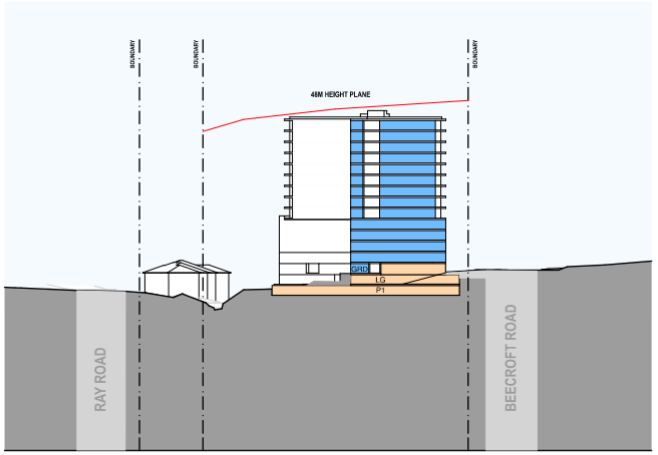
CONCEPT DESIGN



EAST-WEST SECTION A-A 1:1000
RAY ROAD ENTRY



EAST-WEST SECTION B-B 1:1000
BEECROFT ROAD ENTRY

CONCEPT DESIGN

LEP MAXIMUM BUILDING HEIGHT DIAGRAM

ADG OPEN SPACE DIAGRAM

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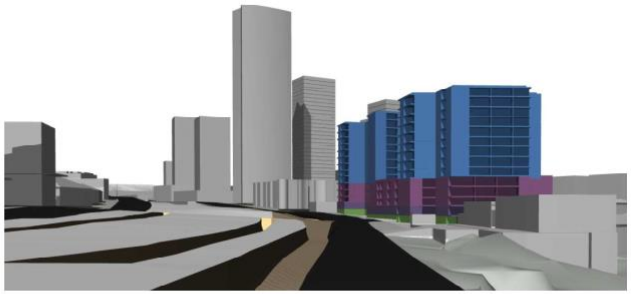
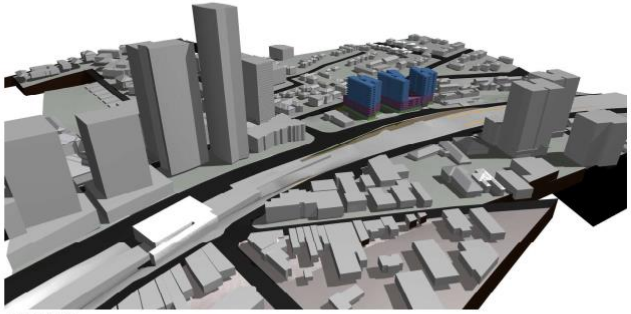
CONCEPT DESIGN

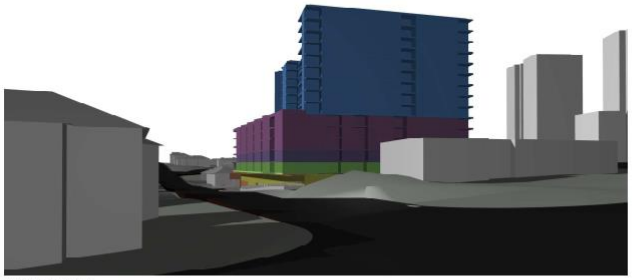


BEECROFT ROAD VIEW

AERIAL VIEW



AERIAL VIEW



RAY ROAD VIEW

URBAN DESIGN EPPING I NORTH WEST URBAN TRANSFORMATION 25/9/17 DRAFT

BENNETT AND TRIMBLE 18/49

23. References

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Clause 44