

Bush Fire Constraints And Opportunities Report

Proposed:
**Residential Flat Building
Development**

At:
**166 Epping Road,
Lane Cove West NSW**

Reference Number: 190134

Prepared For:
Epic Doncaster Pty Ltd

16th August 2018



Prepared By:
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List of Abbreviations

APZ	Asset Protection Zone
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Lane Cove Council
CDC	Complying Development
DA	Development Application
EP&A Act	Environmental Planning and Assessment Act 1979
ESD	Ecologically Sustainable Development
FRNSW	Fire & Rescue NSW
IPA	Inner Protection Area
NCC	National Construction Code
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SWS	Static Water Supply

1.0 Introduction

The subject site is an existing allotment, zoned IN2 Light Industrial, and is known as 166 Epping Road, Lane Cove West NSW. The site is bounded by Epping Road and a private access road to the east and abuts neighbouring private allotments to the north and south and a vacant vegetated allotment followed by Lane Cove River to the west.

The subject site is located within Lane Cove Council's local government area.

In this instance the subject site is depicted on Lane Cove Council's Bushfire Prone Land Map as containing designated Category 1 Vegetation and its associated 100 metre buffer zone. The application of *Planning for Bush Fire Protection* 2006 and Australian Standard 3959 – 2009 is therefore triggered for any future development.

It is understood that the proposal relates to a rezoning application to allow for a future residential flat building development. The future subdivision of the residential flat building will be assessed under s100B of the *Rural Fires Act* 1997. Even if the future residential flat building application does not include the subdivision of the units the matter will still be assessed as if it were a residential subdivision as it relates to an increased density on a singly parcel of land.

Building Code and Bushfire Hazard Solutions P/L has been commissioned by Epic Doncaster Pty Ltd to provide a detailed bushfire constraints and opportunities report for the future residential flat building development on the subject site.

2.0 Purpose

The purpose of this report is to outline the required Bushfire Protection Measures (BPMs) that would be applicable for future residential flat building development at 166 Epping Road, Lane Cove West.

The application of Planning for Bush Fire Protection 2006 will require satisfactory demonstration of the following BPMs:

- Asset Protection Zones
- Building Construction & Design
- Landscaping
- Emergency Management Arrangements
- Water Supply & Utilities
- Access Arrangements

This assessment will systematically address the minimum requirements (to maximise development yield) and our subsequent recommendation for the proposed development to satisfy the above BPMs.

We have not considered any Special Fire Protection Purpose development (e.g. childcare), which attract larger Asset Protection Zones.

This document is for design purposes only and not suitable for submission as supportive documentation for any planning proposal or Development Applications.

3.0 Location

The subject site is known as 166 Epping Road, Lane Cove West and comprises of an existing allotment zoned IN2 Light Industrial, being Lot 13 DP 807958.

The subject site is located within Lane Cove Council's local government area.

The site is bounded by Epping Road and a private access road to the east and abuts neighbouring private allotments to the north and south and a vacant vegetated allotment followed by Lane Cove River to the west.

There is a recent residential flat building development located to the east, beyond the private access road, within 150 Epping Road, Lane Cove West.



Image 01: Aerial view of the subject area, subject site highlight in red

4.0 Vegetation

As part of this bushfire assessment process consideration has been given to all existing vegetation within neighbouring allotments and any retained or proposed vegetated areas within the subject site.

For the purpose of this assessment we have assumed that all grounds within the subject site will be either developed or maintained and therefore do not warrant consideration as a bushfire hazard. If future environmental studies identify any area within the site is required to be protected / rehabilitated for environmental conservation we must review our assessment and update advice accordingly.

The vegetation identified onsite as posing the bushfire threat to the subject site was found to be located to the north, east, south and west within neighbouring allotments. The vegetation posing a hazard was found to consist of trees 10-30 metres in height having a canopy foliage cover of 30-70% and an understorey of low trees, shrubs and grasses.

The vegetation to the west was found to transition from Sydney Coastal Dry Sclerophyll Forests to Coastal Floodplain Wetlands and Mangrove Swamps adjacent Lane Cove River.

For the purpose of assessment under Planning for Bush Fire Protection we have determined the vegetation east and south to be Forest. This assessment is consistent with the Sydney Metro vegetation mapping (Sydney Metro Area v3 2016).

The vegetation posing a hazard to the north within the development of the subject site will be less than a hectare in size (approx. 0.4ha). In accordance with A2.3 of PBP the vegetation posing a hazard to the north was determined to be Remnant and a Rainforest structure used to determine the minimum required Asset Protection Zones. There may be opportunity to have this vegetation declassified as a bushfire hazard due to its size and isolation however this will be at the discretion of the NSW Rural Fire Service. At this stage of the development it is prudent to consider this vegetation a hazard and apply the relevant setbacks.

The vegetation posing a hazard to the west was found to provide a less than 50 metre fire run toward the subject site. In accordance with A2.3 of PBP the vegetation posing a hazard to the west was determined to be Remnant, and a Rainforest structure used to determine the minimum required Asset Protection Zones.



Image 02: Aerial view of the subject area with Sydney Metro vegetation layer (state classes)

5.0 Topography

The slope that would most significantly affect bushfire behaviour must be assessed for at least 100 metres from within the bushfire hazards. The effective slopes were determined onsite using an inclinometer and digitally using 1 metre LiDar contour mapping of the subject area.

In accordance with A2.3 the slope along the length of the Remnant hazards (north and west) was used to determine the minimum required Asset Protection Zones and subsequent Bushfire Attack Levels.

It is noted that there is a transect to the south which records gradients of up to 9.5 degrees down to the Lane Cove River. A fire burning along this transect has a limited fire development period and in our opinion does not represent the greatest threat to this aspect. We have subsequently determined the effective slope to this aspect as 0 – 5 degrees down. This slope assessment could be challenged by the RFS however we are confident in our assessment.

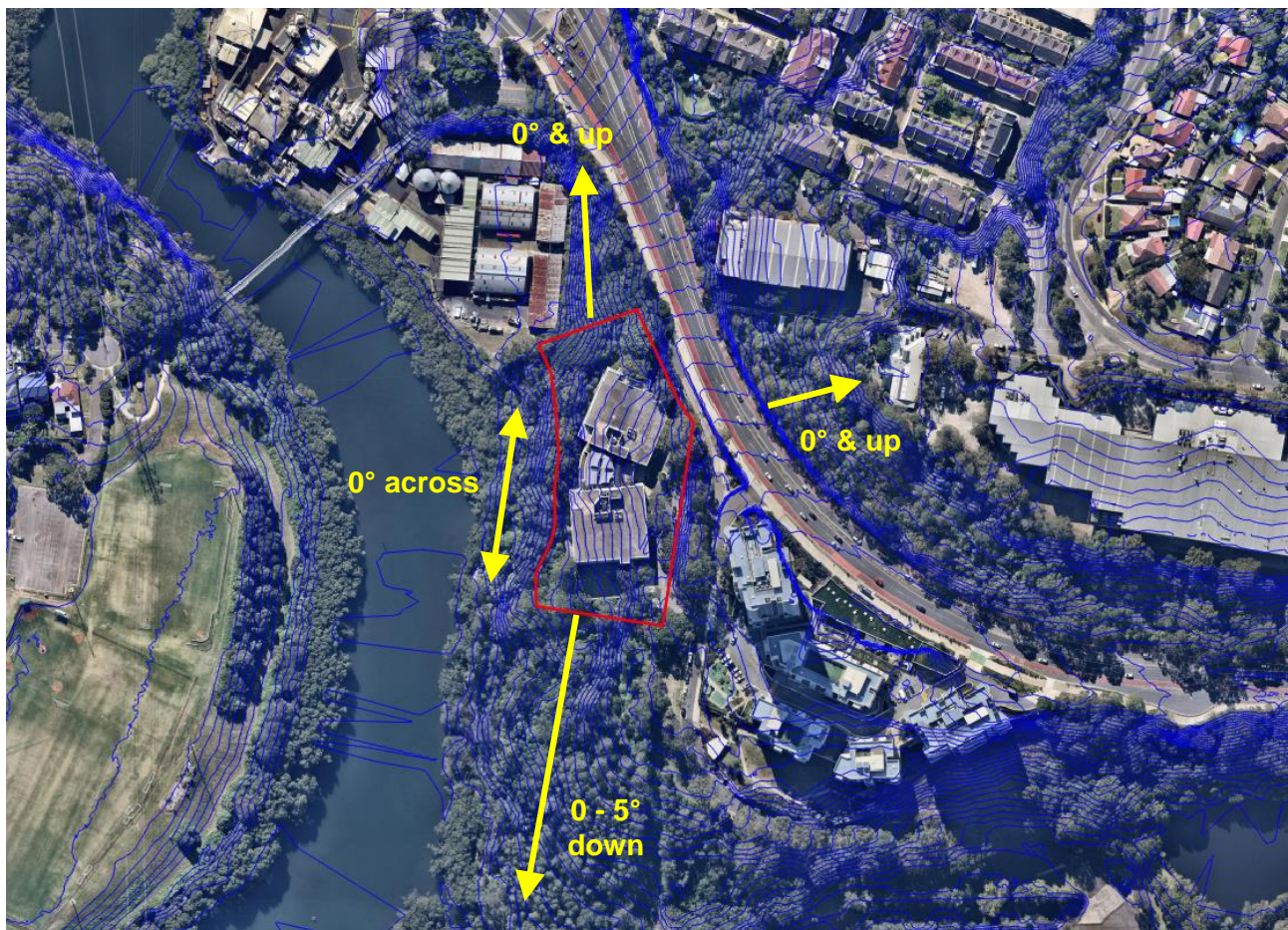


Image 03: 1 metre LiDar contours of the subject area

6.0 Asset Protection Zones

Constraints:

Asset Protection Zones for new residential development are currently determined from Table A2.4 of PBP 2006 or bushfire design modelling achieving a radiant heat impact of no more than 29kW/m² at the closest point of the building footprint.

Planning for Bush Fire Protection (PBP) is currently under review with public consultation on the draft document now closed and advice received from the NSW Rural Fire Service being that the new document will take effect in May 2019.

As this application is at the early planning phase we have also given this draft document due consideration to ensure the future Development Application can conform to the relevant specifications and requirements of this new document.

In this instance the resultant minimum required Asset Protection Zones are larger under the future document.

The attached 'Constraints Overlay PBP 2006' depicts the minimum required Asset Protections Zones for residential development under 'Planning for Bush Fire Protection' 2006, the relevant document applicable today. These being:

Aspect	Min APZ	Comment
North	10 metres	Could be reduced to 8 metres using bushfire design modelling. Subject to RFS approval.
East	20 metres	Achieved completely external to the subject site.
South	25 metres	
West	10 metres	

The attached 'Constraints Overlay Draft PBP 2017' depicts the minimum required Asset Protections Zones for residential development under the published draft 'Planning for Bush Fire Protection' 2017. These being:

Aspect	Min APZ	Comment
North	11 metres	
East	23 metres	Achieved completely external to the subject site.
South	29 metres	
West	11 metres	

The reported Asset Protection Zones have been determined from Table A2.4 of PBP 2006 and Table A1.11.17 of draft PBP 2017.

It should be noted that under the future document the minimum required Asset Protection Zones also result in a BAL 29 rating under Australian Standard 3959 'Construction of building in bushfire-prone areas' 2009, where the APZs under the current document will result in BAL 40.

Opportunities – Maximising the APZ:

It is recommended that where proposed perimeter roads be located within the Asset Protection Zones adjacent the hazard interfaces. The provision of perimeter roads will maximise the APZ and also satisfied the NSW Rural Fire Service's preferred position for access arrangements.

Non-habitable structures are also permitted within the APZs, these include car parking, play equipment, active open space, swimming pools, tennis courts and the like.

Opportunities – Bushfire design modelling:

We have undertaken bushfire design modelling for the northern aspect and concluded that this Asset Protection Zone could be reduced from 10 metres to 8 metres under Planning for Bush Fire Protection 2006. The approach relies on the NSW Rural Fire Service agreeing to allow for the use of a reduced fire front / vegetation (which is present) in conjunction with the reduced fuel loads associated with the Remnant classification.

We would suggest that if this approach is investigated a Pre-DA meeting be conducted with the RFS to ascertain their view. This could be done while the planning proposal is being assessed, prior to the DA being lodged.

Reductions in the southern and western APZs were not achievable.

The timing of the DA will be a factor as no reduction in any of the APZ is viable under the published draft PBP 2017.

Opportunities - External Asset Protection Zone

Should the adjacent allotments to the north and / or south be cleared and a formal management agreement (easement) established the respective APZs would be reduced. This would shift the aforementioned minimum required APZs, to the depth of the clearing / agreement, resulting in a larger development area within the subject site.

It is recommended that you liaise with an environmental expert and Council to gauge the feasibility of clearing vegetation within the neighbouring allotments to the north and south.

The Rural Fire Service will require as a minimum a letter of intent from the owner of the neighbouring allotment to grant the easement.

Short Fire Run Modelling:

We have undertaken specialist short fire run modelling to determine whether a further reduction in the APZs described above are achievable.

There are various limitations to the eligibility of the use of Short Fire Run modelling, including the fire run cannot exceed 150 metres and must not have connectivity with any other parcels of land containing vegetation capable of supporting a fully developed fire that would directly impact the asset from the same direction as the proposed SFR. The southern aspect does not satisfy these limitations and therefore is not eligible for the use of Short Fire Run modelling.

The results of this modelling for the northern and western aspects concluded that a further reduction in the APZs is not achievable.

Special Fire Protection Purpose development:

Asset Protection Zones for new Special Fire Protection Purpose development (e.g. child care centres) are currently determined from Table A2.6 of PBP 2006 or bushfire design modelling achieving a radiant heat impact of no more than 10kW/m² at the closest point of the available building footprint.

Special fire protection purpose means the purpose of the following:

- (a) a school,
- (b) a child care centre,
- (c) a hospital (including a hospital for the mentally ill or mentally disordered),
- (d) a hotel, motel or other tourist accommodation,
- (e) a building wholly or principally used as a home or other establishment for mentally incapacitated persons,
- (f) seniors housing within the meaning of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004*,
- (g) a group home within the meaning of *State Environmental Planning Policy No 9—Group Homes*,
- (h) a retirement village,
- (i) any other purpose prescribed by the regulations.

We understand that the proposal will not include any SFPP development and therefore we have not addressed this type of development in this assessment.

If any SFPP development was to be proposed a separate detailed assessment would be required, however it is unlikely that the site will be able to accommodate the minimum required APZs for SFPP development.

7.0 Access

Planning for Bush Fire Protection addresses design considerations for internal roads for properties determined to be bushfire prone.

There is opportunity to satisfy the access requirements by way either demonstrating compliance with the Acceptable Solutions or Performance Criteria (alternate solution). It is strongly encouraged that in the first instance compliance with the Acceptable Solutions is targeted.

Any future internal roads must satisfy the requirements for 'Public Roads' as detailed in section 4.1.3(1) of **PBP 2006**, in particular:

- Public roads are two-wheel drive, all weather roads.
- 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. Non perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (medium Rigid Vehicle).
- The perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas.
- Traffic management devices are constructed to facilitate access by emergency services vehicles.
- Public roads have a cross fall not exceeding 3 degrees.
- All roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer

radius turning circle, and are clearly sign posted as a dead end and direct traffic away from the hazard.

- Curves of roads (other than perimeter roads) are a minimum inner radius of six metres and minimal in number, to allow for rapid access and egress.
- The minimum distance between inner and outer curves is six metres.
- 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.
- There is a minimum vertical clearance to a height of four metres above the road at all times.
- The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting 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.
- Public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression.
- 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.
- 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.
- 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.
- 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.
- Public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road.

Image 04: 'Table 4.1 – Road widths for Category 1 Tanker' from PBP 2006

Curve radius (inside edge) (metres)	Swept Path (metres width)	Single lane (metres width)	Two way (metres width)
<40	3.5	4.5	8.0
40-69	3.0	3.9	7.5
70-100	2.7	3.6	6.9
>100	2.5	3.5	6.5

The following requirements are the Acceptable Solutions under the published **draft PBP 2017**:

All Roads

- property access roads are two-wheel drive, all-weather roads, and
- perimeter roads are provided for residential subdivisions of three or more allotments, and
- subdivisions of three or more allotments have more than one access in and out of the development, and
- traffic management devices are constructed to not prohibit access by emergency services vehicles
- the capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/causeways are to clearly indicate load rating, and
- property access to private dwellings have passing bays every 200m that are 20m long by 3m wide, making a minimum trafficable width of 7m at the passing bay
- hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression, and
- hydrants are provided in accordance with AS 2419.1:2005 there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available

Perimeter Roads

- perimeter roads are two-way sealed roads, and
- 8m carriageway width kerb to kerb, and
- parking is provided outside of the carriageway width, and
- hydrants are located clear of parking areas, and
- there are through roads, and these are linked to the internal road system at an interval of no greater than 500m, and
- curves of roads have a minimum inner radius of 6m, and
- the maximum grade road is 15° and average grade is 10°, and
- the road crossfall does not exceed 3°, and
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided

Non-Perimeter Roads

- minimum 5.5m carriageway width kerb to kerb, and
- parking is provided outside of the carriageway width, and
- hydrants are located clear of parking areas, and
- there are through roads, and these are linked to the internal road system at an interval of no greater than 500m, and
- curves of roads have a minimum inner radius of 6m, and
- the maximum grade road is 15° and average grade is 10°, and
- the road crossfall does not exceed 3°, and
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided

Attached to this report are additional design principles for emergency service vehicle access contained within Appendix 3 of the published **draft PBP 2017**.

Perimeter roads are the preferred design option and should be provided wherever possible. If a perimeter road is not achievable there may be an opportunity to provide a fire trail or other access arrangement.

The NSW Rural Fire Service encourages the application of new zoning that limits or excludes incompatible development in bushfire affected areas where the development is likely to be difficult to evacuate during a bush fire. We have undertaken a desktop analysis of the existing public road infrastructure in this locality in consideration of the bushfire threat to the subject property.

We are of the opinion that with an appropriate internal design, in combination with the bushfire protection measures discussed herein the subject site is suitable for residential development.

8.0 Services

Water Supply:

Any future residential development must comply with the water supply requirements detailed in Planning for Bush Fire Protection. These requirements can be achieved in two ways, being:

- reticulated water is to be provided to the development, where available.
- a static water supply is provided where no reticulated water is available.

Given the scale of the proposal it would be considered likely that any future development will be serviced by a hydrant system. In this regard the following are the relevant Acceptable Solutions applicable for reticulated water supplies:

- Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.
- 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.
- Hydrants are not located within any road carriageway
- All above ground water and gas service pipes external to the building are metal, including and up to any taps.
- The provisions of parking on public roads are met.

Planning for Bush Fire Protection also addresses the installation of services (i.e. electricity and gas) within bushfire prone areas. The following are the requirements for the relevant services.

Electricity:

- where practicable, electrical transmission lines are underground, and
- where overhead, electrical transmission lines are proposed as follows:
 - lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas, and
 - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines

Gas:

- reticulated is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used, and
- polymer-sheathed flexible gas supply lines to gas meters adjacent to buildings are not used, and
- above-ground gas service pipes are metal, including and up to any outlets.

9.0 Construction

The provision of the minimum required Asset Protection Zones (no closer) will result in a Bushfire Attack Level as high as BAL 40 under Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009 if submitted under Planning for Bush Fire Protection 2006.

The minimum required Asset Protection Zones under the published draft PBP 2017 will result in a BAL 29 rating under Australian Standard 3959 'Construction of building in bushfire-prone areas' 2009.

Further downgrades in the required construction level can be applied where the setbacks to the bushfire hazards are increased. Once building footprints have been chosen we will be in a position to provide further information on the relevant construction requirements if necessary.

10.0 Development Risks

Bushfire Protection Measures can have a significant impact on development costs, viability and timing. Understanding the relevant specifications and requirements of Planning for Bush Fire Protection at the due diligence phase is essential to ensure that the development can be delivered on time, within budget and with the desired yield.

Development Yield:

As detailed in section 6.0 of this report we have identified the minimum required Asset Protection Zones under PBP 2006 and the published draft PBP 2017. No part of the building envelope is permitted within this zone.

There are no height restrictions from a bushfire planning perspective once the minimum required APZ is achieved.

We have also provided opportunities to minimise the impact of these requirements and maximise the development yield.

Timing of development:

It is of our opinion that should the proposed development comply with the detail contained herein then we will be in a position to put forward a favourable report for a rezoning application and Development Application. Furthermore by satisfying Acceptable Solutions contained herein the risk of extended delays caused by requests for additional information during the assessment phase is minimised as the proposal will be able to demonstrate compliance with the prescriptive requirements of PBP.

Where the proposal seeks to demonstrate compliance with PBP via an alternative solution this can lead to extended assessment periods by the NSW Rural Fire Service to facilitate their verification process.

End Product:

The Bushfire Protection Measures applied to the proposal at the planning level are unlikely to result in a significant cost increase. The end product, being the residential apartment buildings, can have a significant cost differential which is primarily driven by the Bushfire Attack Level (BAL).

The general construction type of residential flat buildings satisfies most building elements for most of the BALs. The notable elements which can significant costs are the windows and doors, specifically BAL 40 will require proprietary tested systems, where BAL 29 can use untested systems comprising of toughened glass.

The BAL can also have an impact on external appearance of the building with BAL 40 generally not permitting the use of external timbers.

11.0 Conclusion

In this instance the subject site is depicted on Lane Cove Council's Bushfire Prone Land Map as containing designated Category 1 Vegetation and its associated 100 metre buffer zone. The application of *Planning for Bush Fire Protection* 2006 and Australian Standard 3959 – 2009 is therefore triggered for any future development.

Any future residential development must demonstrate compliance with the minimum required Asset Protection Zones from the existing vegetation within neighbouring allotments to the north, east south and west as described herein.

The size of the subject site is such that all relevant Bushfire Protection Measures can be accommodated.

Comments provided are based on advice received from the NSW Rural Fire Service and the requirements of the *Environmental Planning and Assessment Act* 1979, the *Rural Fires Act* 1997, the *Rural Fires Regulations* 2013, *Planning for Bush Fire Protection* 2006, *Planning for Bush Fire Protection* 2017 (draft) and Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009.

It is of our opinion that should the proposed development comply with the detail contained herein then we will be in a position to put forward a favourable report for a rezoning application and Development Application.

Should you have any further questions please do not hesitate in contacting myself.

Prepared by
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List of Referenced Documents

- a) Environmental Planning and Assessment Act 1979
- b) Rural Fires Act 1997
- c) State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
- d) “Planning for Bush Fire Protection” - NSW Rural Fire Services 2006
- e) “Planning for Bush Fire Protection” - NSW Rural Fire Services 2017 (draft)
- f) “Construction of buildings in bushfire-prone areas” - AS 3959 – 2009 (as amended)
- g) “Lane Cove Council’s Bushfire Prone Land Map”
- h) Acknowledgements to:

SixMaps © NSW Government
Nearmap.com
Geoscience Australia (ELVIS)
QGIS

Attachments

- Attachment 01:** Constraints Overlay PBP 2006
- Attachment 02:** Constraints Overlay Draft PBP 2017
- Attachment 03:** Additional design principles for emergency service vehicle access
Appendix 3 draft PBP 2017



Legend

— Boundary ■ PBP 2006 Minimum required Setback

BCBHS Ref: 190134

Drawn by: GB

Dated: 16/04/2018

Issue: 1 Scale: NTS

Client: Epic Doncaster PTY LTD

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SILVER MEMBER
Fire Protection Association Australia

Constraints Overlay PBP 2006



Legend

— Boundary ■ Draft PBP 2017 Minimum Required Setback

BCBHS Ref: 190134
 Drawn by: GB
 Dated: 16/04/2018
 Issue: 1 Scale: NTS
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Constraints Overlay Draft PBP 2017

APPENDIX 3

ACCESS

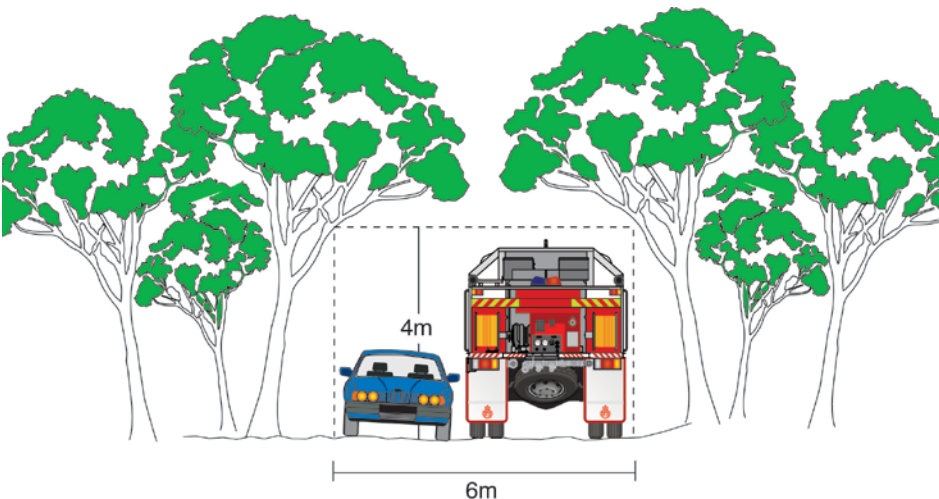
This appendix provides design principles for emergency service vehicle access.

A3.1 Vertical Clearance

An unobstructed clearance height of 4 metres should be maintained above all access ways including clearance from building construction, archways, gateways/doorways and overhanging structures (e.g. ducts, pipes, sprinklers, walkways, signs and beams). This also applies to vegetation overhanging roads and fire trails.

Figure A3.1

Vertical clearance



A3.2 Vehicle turning requirements

Fire crews must have rapid access and egress for vehicles, therefore curved carriageways should be constructed using the minimum swept path.

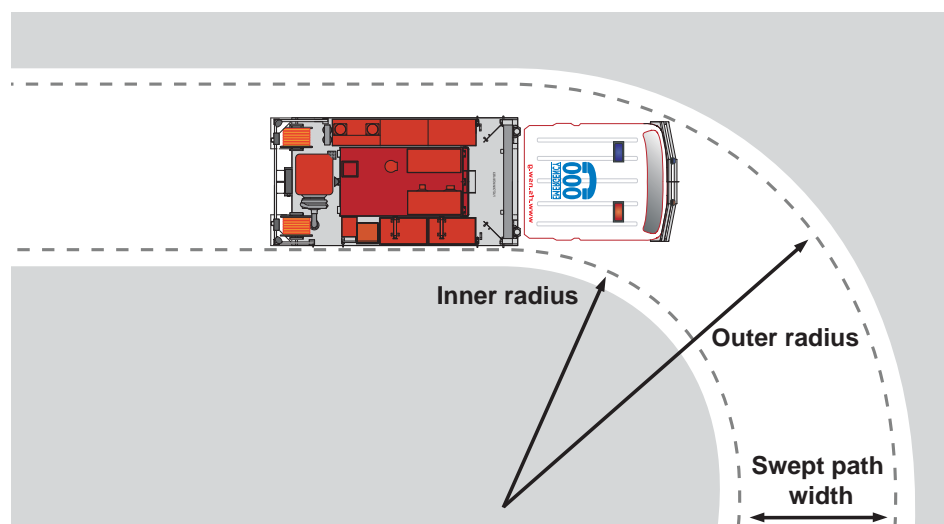
Table A3.2

Minimum curve radius for turning vehicles

Curve radius (inside edge in metres)	Swept path (metres width)
< 40	4.0
40 - 69	3.0
70 - 100	2.7
> 100	2.5

Figure A3.3

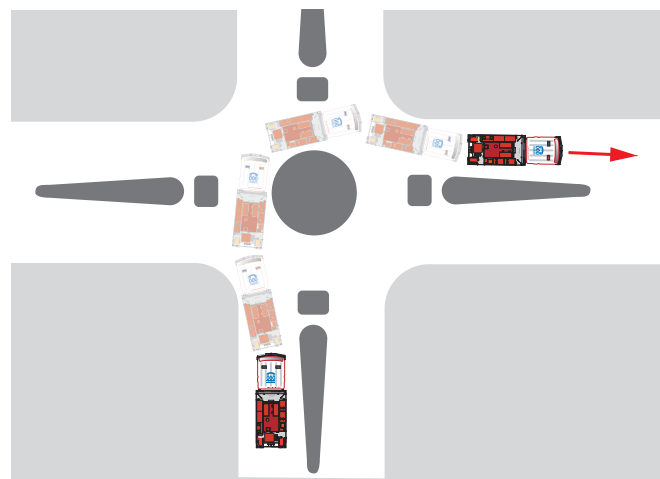
Swept path width for turning vehicles



The radius dimensions given are for wall to wall clearance where body overhangs travel a wider arc than the wheel tracks (vehicle swept path). The calculated swept path shall include an additional 500mm clearance either side of the vehicle.

Figure A3.4

Swept path on a roundabout



Left is an example of a 'swept path' as applied to a roundabout. The distance between inner and outer turning arcs allows for expected vehicle body swing of front and rear overhanging sections (the swept path).

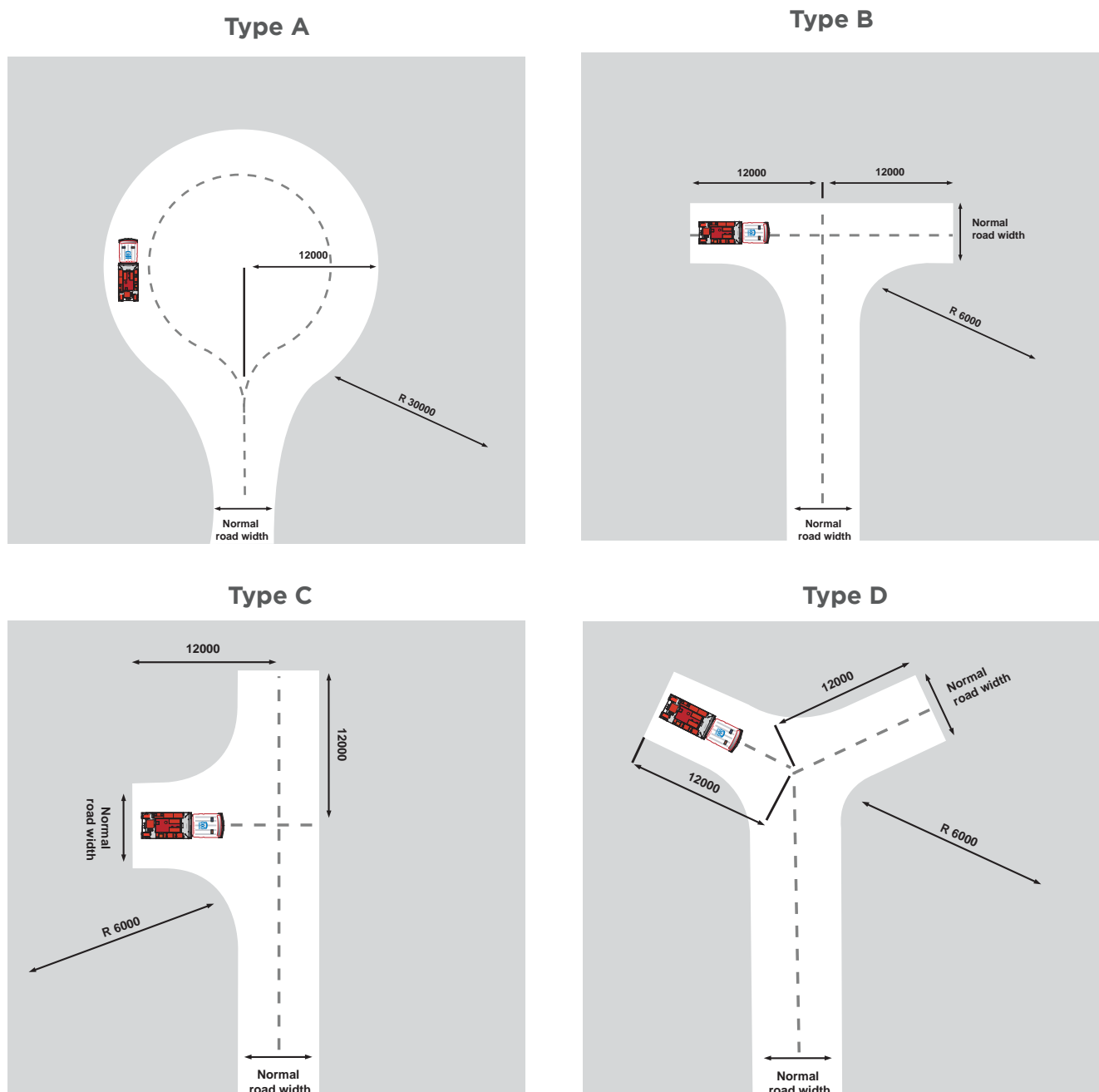
A3.3 Vehicle turning head requirements

Where a turning head is proposed the NSW RFS requires that dead ends having a length greater than 20 metres should be provided with a turning head area which avoids multipoint turns.

The minimum turning radius should be no less than the respective outer radius given in table A3.2. Where multipoint turning is proposed the RFS will consider the following types:

Figure A3.5

Multipoint turning options



A3.4 Passing bays

The construction of passing bays, where required, shall be 20m in length, provide a minimum trafficable width at the passing point of 6m.

Figure A3.6

Parking bays can provide advantages when designed correctly. Poor design can and does severely impede access.



A3.5 Parking

Parking can create a pinch point within the road reserve. The location of parking should be carefully considered to ensure fire appliance access is unimpeded. Hydrants should be located clear of any parking areas to ensure that access is available at all times.

Figure A3.7

Hydrants shall not be located within parking bays.

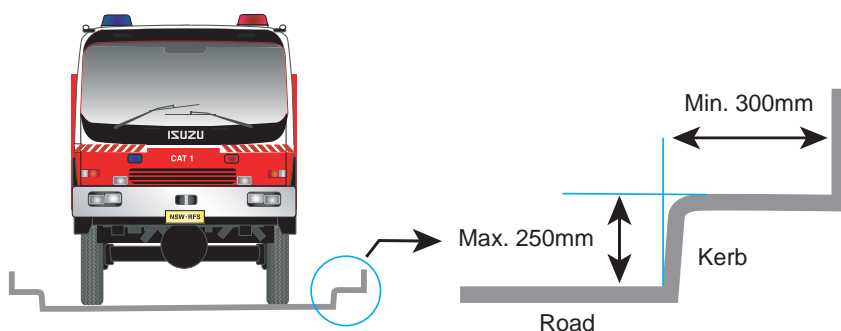


A3.6 Kerb dimensions

All kerbs constructed around access lanes should be no higher than 250mm and free of vertical obstructions at least 300mm back from the kerb face to allow clearance for front and rear body overhang.

Figure A3.8

Carriageway kerb clearance dimensions



Services

Hydrant services should be located outside the carriageway and parking bays to permit traffic flow and access. Shipping of standpipes within the carriageway will stop traffic flow. Hydrant services should be located on the side of the road away from the bush fire threat where possible.

Local Area Traffic Management (LATM)

The objective of LATM is to attain an acceptable level of speed, volume and composition of traffic within a local area and reduce the number of road accidents. This is achieved by modifying the street environment through the installation of various traffic control devices.

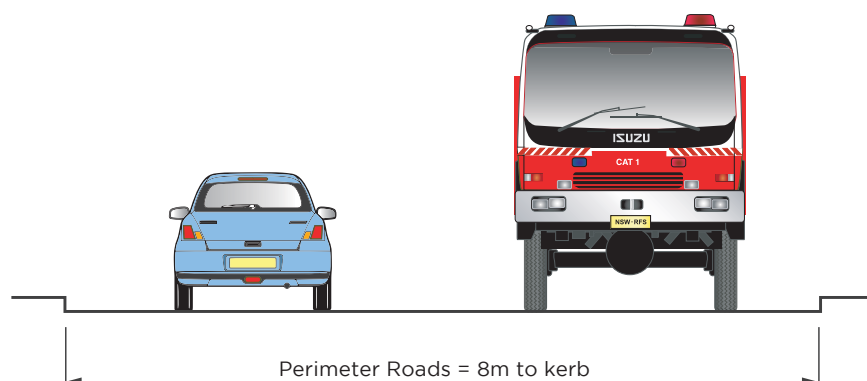
Traffic Engineers and Planners should consider the application of LATM devices when planning for local traffic control and their likely impact on emergency services. LATM devices by their nature are designed to restrict and or impede the movement of traffic, especially large vehicles, which is in conflict with the intent for access required by the RFS and may significantly increase response times for emergency services.

Where LATM devices are provided they are to be designed so that they do not impede fire vehicle access.

A3.7 Road Types

A3.5.1 Perimeter Roads

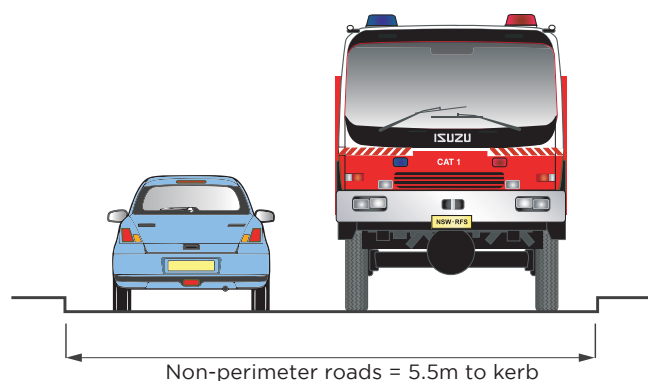
8 metres wide - inside kerb to inside kerb - parking and location of hydrant services are to be located outside carriage way.



Category 1
Heavy Bush Fire Tanker

A3.5.2 Non-perimeter Roads

5.5 metres wide - parking is provided outside of the carriageway width, and hydrants are located clear of parking areas .



1.2.3 Property access

4m wide all weather road. Can be sealed or unsealed

