

Bushfire Hazard Assessment Report

Planning proposal:
**Commercial and retail
hub incl. childcare.**

At:
**185 – 195 Fifteenth Avenue,
West Hoxton**

Reference Number: 141141

Prepared For:
Western Sydney Parklands Trust

29th July 2015

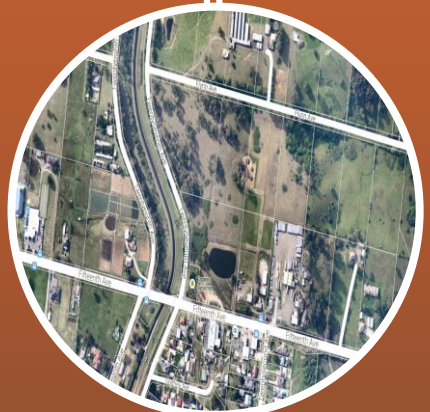


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Contents

	<u>Page No.</u>
List of Abbreviations	2
1.0 Introduction	3
2.0 Purpose of Report	3
3.0 Scope of Report	3
4.0 Referenced Documents and Persons	3
5.0 Summary Table and Notes	4 - 5
6.0 Aerial view of the subject allotment	5
7.0 Bushfire Hazard Assessment	6 - 14
8.0 Conclusion	15 - 16
9.0 Annexure	17
- List of referenced documents and attachments	
- Attachments	

List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2009 as amended.
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Liverpool Council
DA	Development Application
EP&A Act	<i>Environmental Planning and Assessment Act - 1979</i>
ESD	Ecologically Sustainable Development
FRNSW	Fire & Rescue NSW
IPA	Inner Protection Area
LPMA	Land and Property Management Authority
NCC	National construction Code
NP	National Park
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP	<i>Planning for Bush Fire Protection - 2006</i>
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply
WSP	Western Sydney Parklands

1.0 Introduction

The development proposal is a State Significant Development (SSD) which relates to a staged commercial development within six (6) existing allotments located at 185-195 Fifteenth Avenue, West Hoxton.

The subject proposal will involve the creation of six (6) new commercial allotments, a seventh allotment for a storm water detention basin and rain garden, and a new internal road. The newly created commercial allotments will contain a Service Station, Retail Square, Retail Outlets Supermarket, Large Format Retail, Child Care and associated infrastructure including an internal road and car parking.

The investigation area includes additional lots to the north of the subject site and has street frontage to Fifteenth Avenue to the south, Flynn Avenue to the north and Twenty Seventh Avenue to the west and abuts Western Sydney Parklands Trust to the east.

It is understood that the residual part of the investigation area (north of the subject site) will be retained in its current form (grazed pastures). Where grazing activities cease it is proposed that the existing pastureland will be subject to regular and ongoing slashing to ensure grasslands are managed at a bushfire safe level.

The subject site is not identified as being bushfire prone on Liverpool Council's Bushfire Prone Land Map. Irrespective a merits based assessment has been undertaken with respect to existing and potential future bushfire hazards and the suitability of the site for the development and, where applicable, the subsequent application of the relevant bushfire protection measures in accordance with *Planning for Bush Fire Protection 2006*.

In this regard consideration has been given to the *Western Sydney Parklands Plan of Management* (December 2010), specifically gazetted conservation areas and bushland corridors.

2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide an independent assessment of the proposed development and satisfy the Secretary's Environmental Assessment Requirements (SEARs) received for the application. The recommendations contained within this report may assist in forming the basis of any specific construction conditions and/or bushfire protection measures the Authority Having Jurisdiction may elect to place within any consent conditions issued for the subject State Significant Development.

3.0 Scope of this Report

The scope of this report is limited to providing a bushfire assessment and recommendations for the subject property. Where reference has been made to the surrounding lands, this report does not purport to directly assess those lands; rather it may discuss bushfire impact and/or progression through those lands and possible bushfire impact to the subject property.

4.0 Referenced Documents and Persons

Comments provided are based on the requirements of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), the *Rural Fires Act 1997*, the *Rural Fires Regulations 2013*, the RFS document known as '*Planning for Bush Fire Protection – 2006*' for the purposes of bushfire hazard determination and *Australian Standard 3959 – 2009* titled 'Construction of buildings in bushfire-prone areas' as amended for building/structural provisions.

A company representative has made a site inspection of the subject property and the surrounding area. Plans by LFA (Pacific) Pty Ltd Illustrative Lot Pattern and Illustrative Site Plan 2014 4330 Dated 14 May 2015 have been relied upon and consideration has also been given to the *Western Sydney Parklands Plan of Management* (December 2010).

5.0 Summary Tables & Notes

The following table sets out the projects compliance with *Planning for Bush Fire Protection – 2006*.

	North	East / Northeast	South	West
Vegetation Structure	Maintained curtilages	Managed rural allotments *	Fifteenth Avenue and maintained curtilages	Maintained curtilages
Slope	N/A	10 - 15 degrees downslope	N/A	N/A
Significant Environmental Features	Grazed pastures / managed grassland Stage 2 retained for future development / Flynn Avenue	Part of Western Sydney Parkland Trust / Possible future bushland corridor	Fifteenth Avenue / Residential and Retail development	Twenty Seventh Avenue / Sydney Water Reserve / Supply Canal.
Threatened Species	APZ Existing	APZ Existing	APZ Existing	APZ Existing
Aboriginal Relics	APZ Existing	APZ Existing	APZ Existing	APZ Existing

* Note: The subject site is zoned SEPP Western Sydney Parklands and is located within Precinct 15 of the WSP Trust land. While the exact nature of the future land uses to the east and northeast of this site within WSP is unknown it is noted that in this locality is land designated for a “bushland corridor”. Given the presence of Shale Plains Woodland in this locality we have considered the possibility of future unmanaged grassy woodland and the effect that this may have if it emerges around this development. It should be noted that WSPT have consulted with DP&E in relation to the gazetted Conservation Area / Bushland Corridor within 185 Fifteenth Avenue and have successfully negotiated that this area should be removed as a Conservation Area due to the presence of a Bus Depot and no significant vegetation (map yet to formally be changed, but in principle support provided).

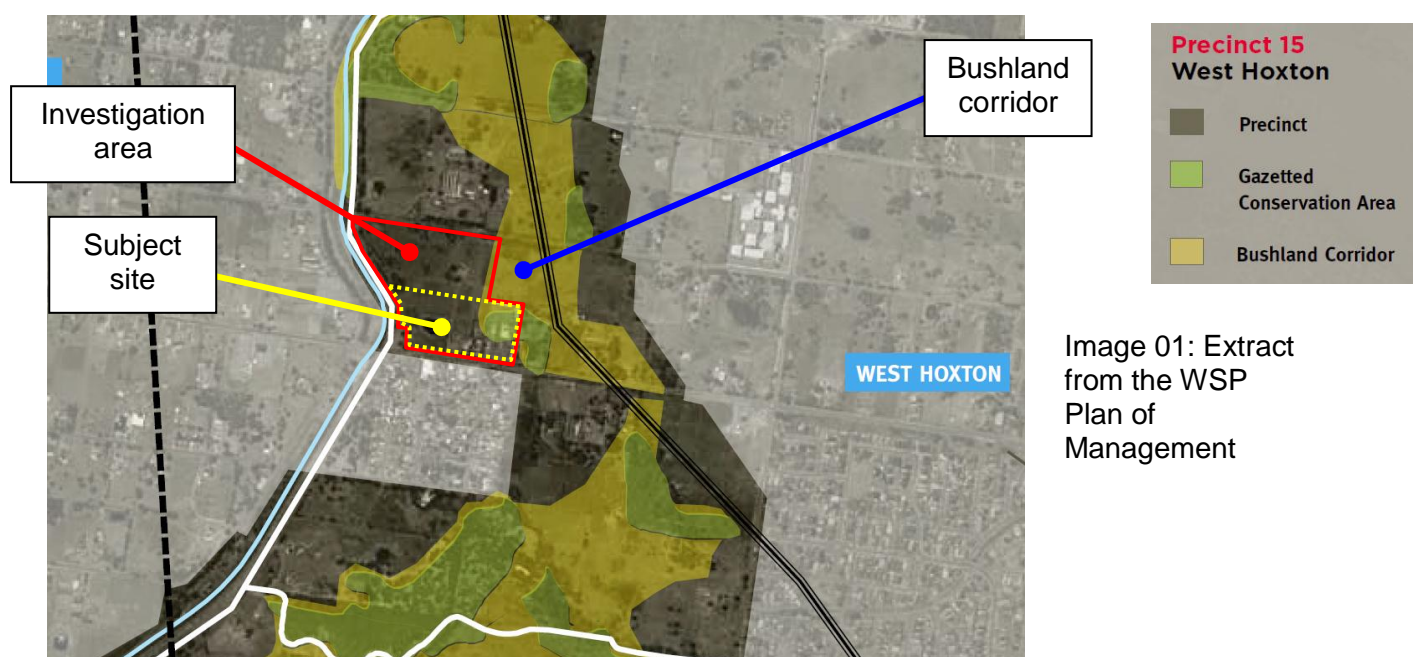


Image 01: Extract from the WSP Plan of Management

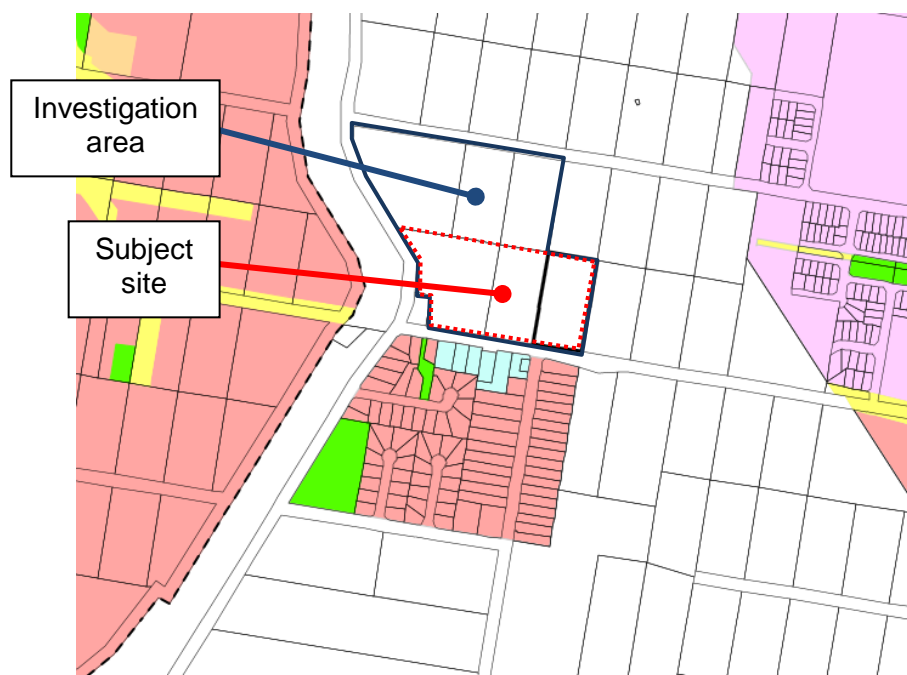


Image 02: Extract from Liverpool Councils online Mapping Database.

Zoning (LEP)

WSP - SEPP Western Sydney
Parklands

(100.0%)

6.0 Aerial view of the subject allotment

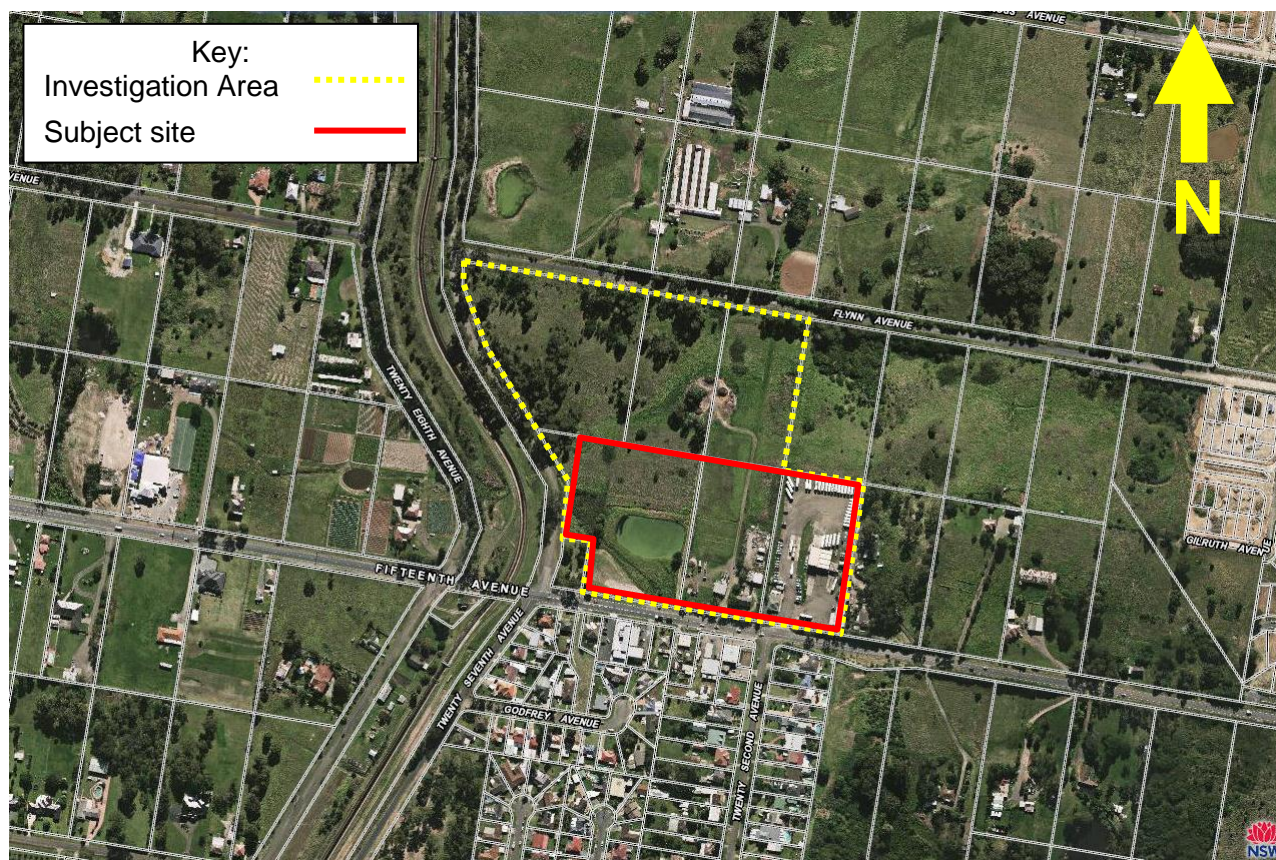


Image 03: Extract from Dept Land SIXMaps database

7.0 Bushfire Hazard Assessment

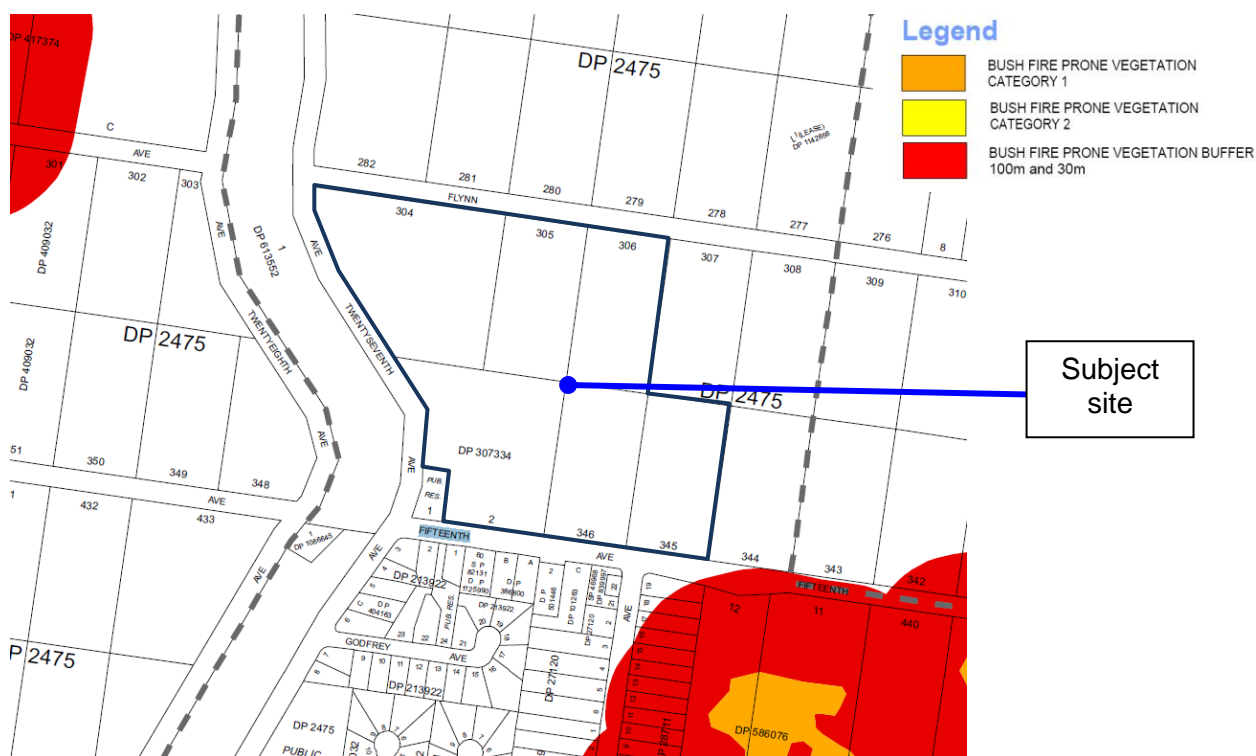
7.01 Preface

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and or the Rural Fire Service. All property development within affected areas is subject to the conditions detailed in the document '*Planning for Bush Fire Protection 2006*' (PBP). Set back distances for the purpose of creating Asset Protection Zones (APZ's) must be applied and any buildings must then conform to corresponding regulations detailed in *Australian Standard 3959 'Construction of buildings in bushfire prone areas' 2009*.

Planning for Bush Fire Protection 2006, (PBP) formally adopted on the 1st March 2007 provides for the protection of property and life (including fire-fighters and emergency service personnel) from bushfire impact. The thrust of the document is to ensure that developers of new properties or subdivisions include the constraints associated with the construction of buildings in bushfire prone areas within their proposed development sites. PBP is applicable to proposed development inside a determined Category 1 or 2 areas and also inside a buffer zone radius of 100m from a Category 1 bushfire area or 30m from a Category 2 bushfire area.

The document also acknowledges 'infill' developments associated with re-development of existing properties and allows some higher levels of building safety where the increased 'set backs' (APZ's) may not be achievable.

The subject site is not identified as being bushfire prone on Liverpool Council's Bushfire Prone Land Map. Irrespective a merits based assessment has been undertaken with respect to existing and potential future bushfire hazards and the suitability of the site for the development and where applicable the subsequent application of the relevant bushfire protection measures in accordance with *Planning for Bush Fire Protection 2006*.



7.02 Location

The subject site is known as 185-195 Fifteenth Avenue, West Hoxton and comprises of Lot 2 DP 307334 and Lots 345, 346 DP 2475 and is located within Liverpool Councils Local Government Area. The investigation area includes additional lots to the north of the subject site and include Lot 2 DP 307334 and Lots 345, 346, 304, 305 & 306 DP 2475. The investigation area has street frontage to Flynn Street to the north, Fifteenth Avenue to the south, Western Sydney Parklands Trust to the east and Twenty Seventh Avenue to the west. A small park (Kirpatrick Boyland Park) is located adjacent the southwest corner of the site.

Subject property



Photograph 01: View north from Fifteenth Avenue toward the subject property

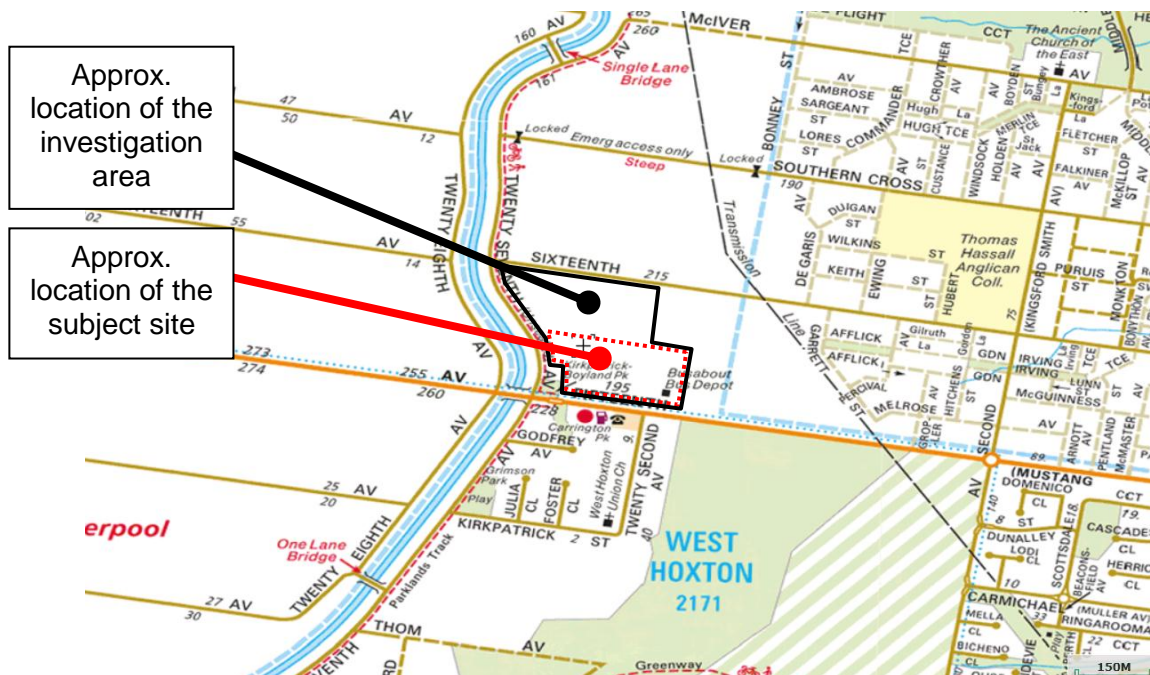


Image 05: Extract from street-directory.com.au

7.03 Vegetation

The subject site is in an area surrounded by mixed land uses and land sizes. To the south beyond Fifteenth Avenue is small lot residential development and commercial outlets which consist of built upon areas surrounded by mown lawns and defined garden beds.

North of Flynn Avenue, southeast beyond Fifteenth Avenue and east of the site are large lot rural / agricultural land predominately comprising of grazed pasture land. West of the site is managed land adjacent a water supply channel within Sydney Water land.

It should be noted that Western Sydney Parklands Trust own the land immediately to the northeast and east of the subject site.

The subject site is zoned SEPP Western Sydney Parklands and is located within Precinct 15 of the WSP Trust land. While the exact nature of the future land uses to the east and northeast of this site (within WSP) is unknown it is noted that in this locality the land is designated for a “bushland corridor”. The presence of Shale Plains Woodland suggests the possibility of future unmanaged grassy woodland adjacent the eastern and northeast boundary of the Stage 1 precinct.

WSPT have consulted with DP&E in relation to the gazetted Conservation Area / Bushland Corridor within 185 Fifteenth Avenue and have successfully had this area removed as a Conservation Area due to the presence of a Bus Depot and no significant vegetation.

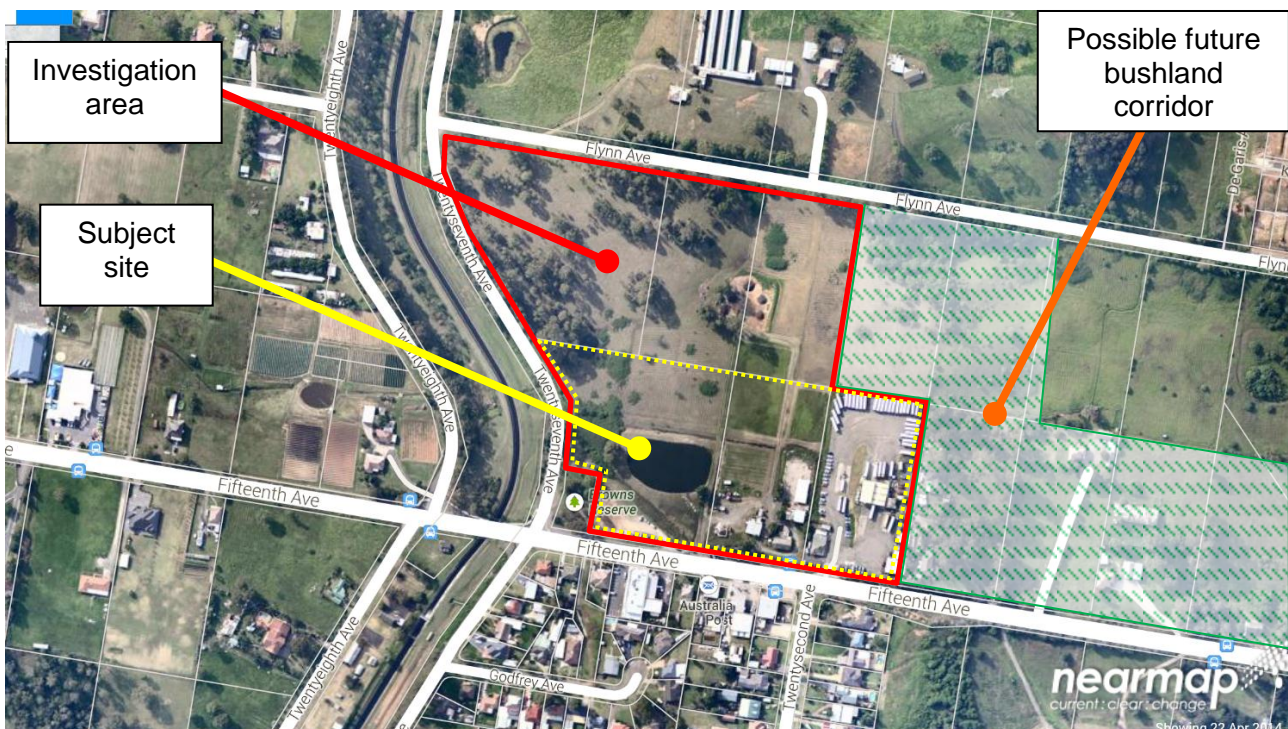


Image 06: Extract from nearmap.com (date of image 22 April 2014)

7.04 Slope and Topography

On the assumption that the land to the east and northeast of the subject site is grassy woodland the most significant bushfire impact from the east and northeast is expected to be a bushfire travelling upslope towards Stage 1 development. While it is noted that the predominate slope is less steep further east, over the last 100 metres adjacent the site the slope increases at varying levels due to undulations in the land. The slope that would **most significantly** influence bushfire impact was determined to be:

- 10 - 15 degrees up slope within the land reserved as a Bushland Corridor to the east

10 - 15 degrees
down slope



Photograph 03: View southwest from Flynn Avenue into the WSP Bushland Corridor area

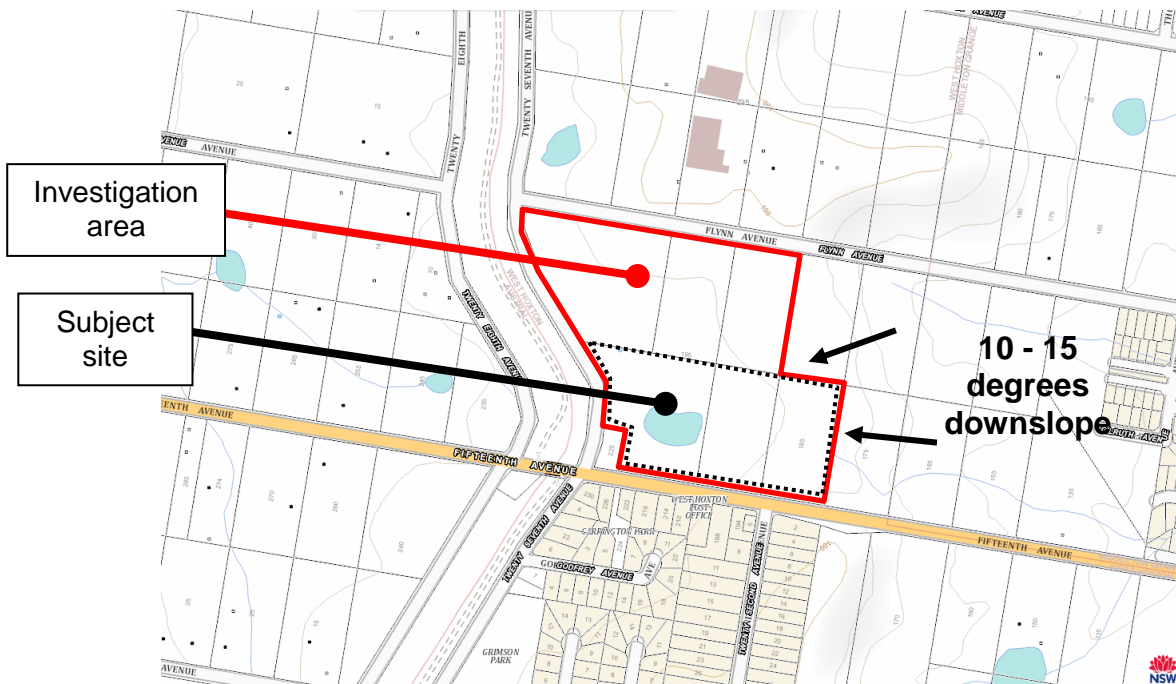


Image 07: Extract from the Land and Property Management Authority SixViewer

7.05 Asset Protection Zones

The proposed commercial development will involve the creation of six (6) new commercial allotments, a seventh allotment for a storm water detention basin and rain garden, and a new internal road. The newly created commercial allotments will contain a Service Station, Retail Square, Retail Outlets Supermarket, Large Format Retail, Child Care and associated infrastructure including an internal road and car parking.

Service stations are listed in Planning for Bush Fire Protection 2006 as being a type of development that should be excluded from bushfire prone areas. The land in which the proposed service station will be located is not currently identified as being bushfire prone land. The proposed service station is also located >100 metres from the possible 'bushland corridor' to the east and northeast and would therefore not be 'bushfire prone'.

The proposed Child Care is considered Special Fire Protection Purpose development under section 100b of the Rural Fires Act 1997 and Planning for Bush Fire Protection 2006. Asset Protection Zones for Special Fire Protection Purpose (SFPP) development are determined from Table A2.6 of PBP or bushfire design modelling achieving a radiant heat impact of no more than 10kW/m² at the closest point of the available building footprint.

The minimum required Asset Protection Zones (APZ) for the child care was determined from Table A2.6 of *Planning for Bush Fire Protection* 2006 to be 70 metres to the east and northeast. The APZ is required to consist entirely of an Inner Protection Area (IPA).

The available Asset Protection Zones from the proposed child care centre was measured from plans provided to be > 200 metres to the east and > 170 metre to the northeast boundaries.

Neither the childcare centre nor the land where the service station bowsters and infrastructure is proposed would be bushfire prone land regardless of future development or planting within the Western Sydney Parkland's bushland corridor.

In relation to the proposed Retail Square, Retail Outlets Supermarket and Large Format Retail the National Construction Code does not provide for any bush fire specific performance requirements for Class 5 to 8 structures and as such Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009 does not apply as a set of 'deemed to satisfy' provisions.

The general fire safety construction provisions are taken as acceptable solutions, but the aim and objectives of Planning for Bush Fire Protection 2006 (PBP) apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management.

In circumstances where the aim and objectives of PBP are not met, then the construction requirements for bush fire protection will need to be considered on a case-by-case basis.

In this instance we recommended that the proposed Retail Square, Retail Outlets Supermarket and Large Format Retail provide a minimum Asset Protection Zone (APZ) of 25 metres to the east and northeast (bushland corridor). The provision of the 25 metre APZ will locate the building footprints outside the designated 'Flame Zone'.

The APZs should consist of grounds that can be managed for the life of the development. Usually this relies on providing the APZs entirely within the subject site however in this instance as the subject site is owned by WSPT (and will continue to be) and the neighbouring allotments to the northeast and east are also owned by the WSPT the APZ can be located within both the subject site and the adjacent WSPT lands. Where APZs are provided within the adjacent WSPT lands they must be subject to a Plan of Management to ensure their ongoing management.

It is noted that all buildings on the site are subject to future Development Applications through the local Council or Department of Planning & Environment (subject to Capital Investment Value) and therefore the specific particulars and Bushfire Protection Measures (including APZs) of the buildings will be addressed at that time.

7.06 Fire Fighting Water Supply

Any future development would involve extension of the water main system into the site to supply potable water for domestic and commercial needs.

The Performance requirement within Planning for Bush Fire Protection requires that “water supplies are easily accessible and located at regular intervals”. The acceptable solution is the “fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2005”. The dimensions for fire hydrant under AS2419 is that a tanker must be able to park within 20 metres of a hydrant and reach the most disadvantaged point of a building with two hose lengths (60 metres) and a 10 metre water jet. The last 10 metres must be measure in a straight line.

Future hydraulic plans should address this requirement when designing hydrant layouts.

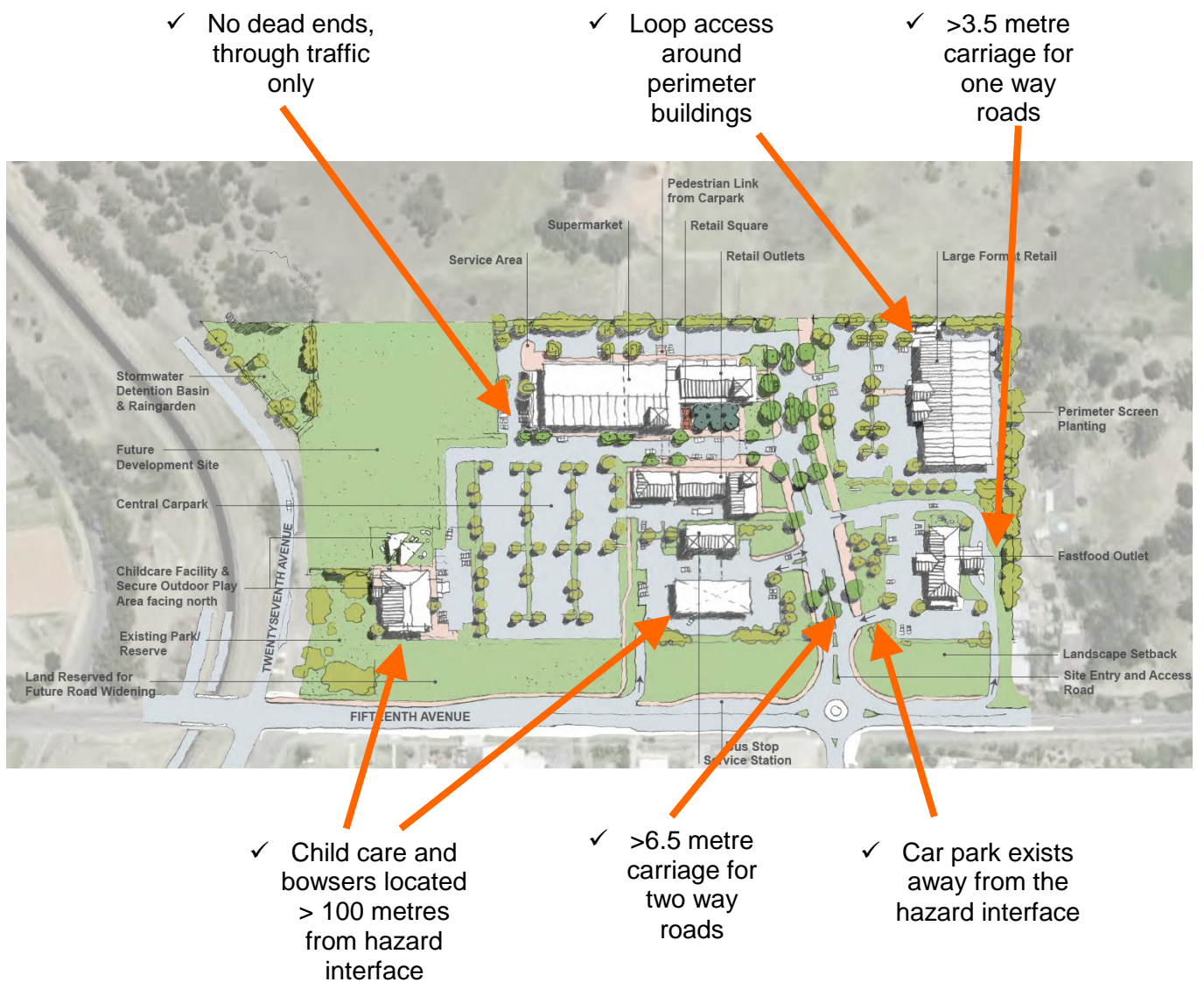
7.07 Property Access – Fire Services & Evacuation

The proposed development is accessed directly from Fifteenth Avenue to the south. PBP 2006 states that a perimeter road is the preferred option for residential and rural residential development and for commercial development the intent of measures “*to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area*” has to be addressed.

The concept layout shows perimeter access around buildings adjacent the hazard interface and car parks with exits away from the hazard interface and these principles should be retained within any future design.

Access widths should be sufficient to enable safe operational access for a fire appliance and therefore s4.1.3 (1) should apply, particularly the following:

- Non perimeter two way public roads have a minimum carriageway of 6.5 metres
- One way only public access roads are no less than 3.5 metres wide
- Traffic management devices are constructed to facilitate access by emergency services vehicles.
- Roads have a cross fall not exceeding 3 degrees.
- 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.
- Services are located outside carriageways and parking bays to ensure accessibility to reticulated water for fire suppression.



7.08 Australian Standard AS 3959 – 2009 ‘Construction of buildings in bushfire –prone areas’

Australian Standard 3959 – 2009 ‘Construction of buildings in bushfire-prone areas’ provides for six (6) levels of building construction these being BAL - Low, BAL - 12.5, BAL - 19, BAL - 29, BAL - 40 and BAL - FZ. The Australian Standard 3959 specifies construction standards for buildings within various Bushfire Attack Levels as determined by the *Planning for Bush Fire Protection – 2006* document. The NSW Rural Fire Service will not accept deemed to satisfy provisions for BAL Flame Zone and therefore have a NSW variation to the listed standard provisions of BAL FZ under AS3959 - 2009.

Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction under AS3959-2009
Low		No special construction requirements
12.5	≤12.5	BAL - 12.5
19	12.6 to 19.0	BAL - 19
29	19.1 to 29.0	BAL - 29
40	29.1 to 40.0	BAL - 40
Flame Zone	>40.0	BAL FZ No deemed to satisfy provisions

The objectives of *Planning for Bush Fire Protection – 2006* are for the protection of life including fire fighters. Provided these objectives can be met the construction of buildings is feasible and both the Rural Fire Service and Council should be in a position to consider future development applications.

The proposed design should include a minimum 25 metre APZ from the building footprints to the eastern and northeastern hazards. This APZ is sufficient to ensure that the highest Bushfire Attack Level to the closest future building will not exceed BAL 40.

The APZs should consist of grounds that can be managed for the life of the development. Usually this relies on providing the APZs entirely within the subject site however in this instance as the subject site is owned by WSPT (and will continue to be) and the neighbouring allotments to the northeast and east are also owned by the WSPT the APZ can be located within both the subject site and the adjacent WSPT lands. Where APZs are provided within the adjacent WSPT lands they must be subject to a Plan of Management to ensure their ongoing management.

The relevant setbacks for the various Bushfire Attack Levels for the hazard interface were determined from Table 2.4.2 of AS3959 2009.

The following table details the minimum required setback to achieve the corresponding Bushfire Attack Level under AS3959 - 2009.

	BAL FZ	BAL 40	BAL 29	BAL 19	BAL 12.5	BAL Low
Hazard interface	N/A	25 to 33 m	>33 to 45m	>45 to 60m	>60 to 100m	>100m

7.09 Utilities – Electricity and Gas

Planning for Bush Fire Protection also address services such as electricity and gas. The following are the relevant requirements for services:

Electricity:

- Where practicable, electrical transmission lines are underground.
- 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).

Gas:

- Reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant 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.
- 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.
- Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.

8.0 Conclusion

The property is not deemed bushfire prone under Liverpool Council's Bushfire Prone Land Map however any development must consider the suitability of the site for the proposed use. In this instance this has included bushfire due to the nearby land within the Western Sydney Parklands being mapped or planned as a possible future bushland corridor.

In this instance we have considered the possibility that the land to the east and northeast of the development may regenerate (assisted or naturally) into the Shale Plains Woodland that is already identified over part of that area. The propensity for any development to meet the requirements of *Planning for Bush Fire Protection* 2006 and of the construction requirements of *Australian Standard 3959 'Construction of buildings in bushfire-prone areas'* 2009 has been addressed within this report.

The newly created commercial allotments will contain a Service Station, Retail Square, Retail Outlets Supermarket, Large Format Retail, Child Care and associated infrastructure including an internal road and car parking.

Service stations are listed in *Planning for Bush Fire Protection* 2006 as being a type of development that should be excluded from bushfire prone areas. The land in which the proposed service station will be located is not currently identified as being bushfire prone land. The proposed service station is also located >100 metres from the possible 'bushland corridor' to the east and northeast and would therefore not be 'bushfire prone'.

The proposed Child Care is considered Special Fire Protection Purpose development under section 100b of the Rural Fires Act 1997 and *Planning for Bush Fire Protection* 2006. The minimum required Asset Protection Zones (APZ) for the child care was determined from Table A2.6 of *Planning for Bush Fire Protection* 2006 to be 70 metres to the east and northeast. The available Asset Protection Zones from the proposed child care centre was measured from plans provided to be > 200 metres to the east and > 170 metre to the northeast boundaries.

In relation to the proposed Retail Square, Retail Outlets Supermarket and Large Format Retail the National Construction Code does not provide for any bush fire specific performance requirements for Class 5 to 8 structures and as such *Australian Standard 3959 'Construction of buildings in bushfire-prone areas'* 2009 does not apply as a set of 'deemed to satisfy' provisions.

The general fire safety construction provisions are taken as acceptable solutions, but the aim and objectives of *Planning for Bush Fire Protection* 2006 (PBP) apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management. In circumstances where the aim and objectives of PBP are not met, then the construction requirements for bush fire protection will need to be considered on a case-by-case basis.

In this instance we recommended that the proposed Retail Square, Retail Outlets Supermarket and Large Format Retail provide a minimum Asset Protection Zone (APZ) of 25 metres to the east and northeast (bushland corridor). The provision of the 25 metre APZ will locate the building footprints outside the designated 'Flame Zone'.

The APZs should consist of grounds that can be managed for the life of the development. Usually this relies on providing the APZs entirely within the subject site however in this instance as the subject site is owned by WSPT (and will continue to be) and the neighbouring allotments to the northeast and east are also owned by the WSPT the APZ can be located within both the subject site and the adjacent WSPT lands. Where APZs are provided within the adjacent WSPT lands they must be subject to a Plan of Management to ensure their ongoing management.

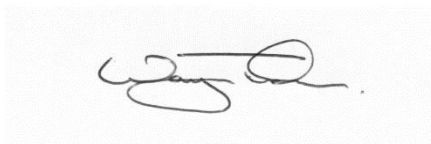
Recommendations on the access and service supply (water electricity and gas) have also been included within this report.

It is noted that all buildings on the site are subject to future Development Applications through the local Council or Department of Planning & Environment (subject to Capital Investment Value) and therefore the specific particulars and Bushfire Protection Measures (including APZs) of the buildings will be addressed at that time.

In accordance with the bushfire safety measures contained in this report, and consideration of the site specific bushfire risk assessment it is our opinion that when combined, they will provide a reasonable and satisfactory level of bushfire protection to the subject development.

We are therefore in support of the planning proposal. Should you have any enquiries regarding this project please contact me at our office.

Prepared by
Building Code & Bushfire Hazard Solutions




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Disclaimer:

Quote from *Planning for Bush Fire Protection* 2006, 'Any representation, statement opinion, or advice expressed or implied in this publication is made in good faith on the basis that the State of New South Wales, the NSW Rural Fire Service, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice referred to above..'

Similarly the interpretations and opinions provided by Building Code and Bushfire Hazard Solutions in regard to bushfire protection are also given in the same good faith.

9.0 Annexure 01

List of Referenced Documents

- a) *Environmental Planning and Assessment Act* - 1979
- b) *Rural Fires Act* 1997 as amended
- c) '*Planning for Bush Fire Protection*' - 2006 - NSW Rural Fire Services & Planning NSW
- d) 'Construction of buildings in bushfire prone areas' - AS 3959 – 2009 (as - amended) – Standards Australia
- e) 'Liverpool Council's Bushfire Prone Land Map'
- f) Acknowledgements to:
NSW Department of Lands – SixViewer
Street-directory.com.au
- g) Plans by LFA (Pacific) Pty Ltd Illustrative Lot Pattern and Illustrative Site Plan 2014 4330 Dated 14 May
- h) *Western Sydney Parklands Plan of Management* (December 2010).

Attachments

Attachment 01: N/A