



**Bushland Protection
Systems**
Specialising in
**BUSHFIRE HAZARD
PLANNING & MITIGATION**

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BUSHFIRE HAZARD ASSESSMENT AND MITIGATION PLAN

PROPOSED RESIDENTIAL DEVELOPMENT
IN
Sub-Precinct 4F
Yarrabilba
(Precinct 4, Application 5)

FOR

Lendlease

DATED

30th September 2022

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2022/1341

Date: 5 June 2023



A Bushfire Mitigation Plan is designed to identify and minimise the potential bushfire risk to a given property and to help property owner/occupiers to minimise bushfire risk to themselves, their property and their neighbours, although it cannot completely eliminate that risk. Ultimately it is a community responsibility to protect the environmental values, life and property in their area.

Bushland Protection Systems
Document Control:

Version	Date	Details	Prepared	Checked
1	20/07/22	Draft BMP	Brett Bain	
2	30/09/2022	Finalised BMP-amended precinct	Brett Bain	

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1. Background

This plan is for the proposed residential development in Sub-Precinct 4F of Yarrabilba (Precinct 4, Application5), as shown in Appendix 1 of this report.

This plan is based on the following material supplied by Lendlease.

- 1.1. Reconfiguration of a Lot Plan, drawn by RPS, Drawing No. YAR-PO4-ROL5-ROL-220907, Dated 7/9/22, is attached as Appendix 1.
- 1.2. Bushfire Hazard Assessment and Management Plan, drawn by RPS, Drawing No. YAR-PO4-ROL5-BFH-220908, Dated 8/9/22, is attached as Appendix 2.

This plan is produced in accordance with:

- Bushfire hazard assessment in accordance with the Logan Planning Scheme 2015, Section 8.2.3 – Bushfire Hazard Overlay Code and Sc6.2.6 – Planning Scheme Policy 6, based on State Planning Policy 7/17, support document – Bushfire Resilient Communities 2019, under the Planning Act 2016.
- The Context Bushfire Hazard Assessment and Mitigation Plan for Precinct 4 of Yarrabilba produced by Bushland Protections Systems, dated 14/7/17.
- This report also takes into consideration the ‘Pre-Development Bushfire Mitigation Concept’ Plan prepared by Bushland Protection Systems, dated 30/1/12, and the approved ‘Conceptual Bushfire Risk Assessment and Mitigation Plan’ (BMP), produced by Bushland Protection Systems, dated 18/7/2012.

2. Site Description and Bushfire Hazard Assessment

Sub-Precinct 4F is located in the south of Precinct 4 and consists of residential allotments, which will be cleared for development. The proposed lots will be managed and be assigned a Vegetation Hazard Class (VHC) 42.6, resulting in a ‘Not Bushfire Prone Area’ hazard rating.

To the north is Sub-precinct 4E. To the east and south are future precincts, which will have a minimum 100 metre slashed buffer until developed in accordance with the Concept and Context BMP’s. Proposed, future, retained vegetation corridors to the east are over 100 metres from the proposed allotments in Sub-Precinct 4F. Therefore, the north, east and south will also have a ‘Not Bushfire Prone Area’ hazard rating.

To the west of Sub-precinct 4F is a narrow corridor retained vegetation consistent with a Vegetation Hazard Class (VHC) of 16.1. On the opposite side of the corridor will be further residential development, providing a ‘Not Bushfire Prone Area’ hazard rating. The vegetation forms a narrow linear corridor with residential each side, and therefore would have limited capacity for a large bushfire. The corridor would be downgraded to a Low hazard rating, under the corridor and patch filtering (Bushfire Resilient Communities Technical Reference Guide 10/19), due to its limited size and configuration.

There is no other bushland exposure within 100 metres of the Sub-precinct 4F.

Table 2.1: Potential Bushfire Hazard Rating

POTENTIAL HAZARD CLASS	POTENTIAL FIRELINE INTENSITY
Not Bushfire Prone Area (Low)	<4,000 kw/m
Medium	4,000 to 20,000 kw/m
High	20,000 to 40,000 kw/m
Very High	>40,000 kw/m

The Bushfire Hazard Mapping also incorporates a 100 metre Potential Impact Buffer meaning that any land within 100 metres of a Potential Bushfire Hazard is also assigned the same rating as that bushland and triggers the Bushfire Code if Medium, High or Very High. Whilst having the same distance for all three levels of hazard is not considered a fit for purpose application, it is unfortunately what is legislated at this current time. Therefore, the proposed allotments in Sub-Precinct 4F, as shown in Appendix 1, would be assigned a Low/No hazard rating.

3. Roads, Driveways and Trails

3.1. Roads

The sub-precinct has substantial internal road network with future connections in all directions. There is a perimeter roadway and/or managed local park as separation to the Low rated vegetation corridor to the west. It is considered unlikely that access/egress would be compromised by bushfire.

3.2. Driveways

Being residential allotments, the driveways would be short and direct.

3.3. Trails

No fire trails are proposed.

4. Appropriate Building Location

The proposed residential allotments are located on relatively level ground to rolling hills, away from steep slopes and ridgelines, in an already disturbed area. There is no exposure to a bushfire hazard rating of Medium or higher.

Future dwellings are to have a minimum 10 metres of separation from the linear vegetation corridor which has been provided for through a combination of road separation and managed local park strips, as shown in Appendix 1, that provide a minimum 13.5 metre separation.

5. Appropriate Clearing and Landscaping

The residential allotments are to be maintained with low ground fuel levels at all times and may include domestic gardens, lawns with grass kept under 100mm in height and scattered trees with discontinuous canopy.

As a guide to landscaping and gardening in a bushfire prone area, the document 'Landscaping for Bushfire' produced by the CFA Victoria, is a useful guide on plant selection, garden design and ongoing maintenance. It can be found at <https://www.cfa.vic.gov.au/plan-prepare/landscaping>.

Lot 900 is to be a managed active park. As a minimum the first 10 metres around dwellings are to be managed as an inner Asset Protection Zone (APZ) with the balance managed as an outer APZ as outlined in Appendix 3, so as not to become a bushfire hazard.

The narrow corridor along the small waterway, in the west, is to be managed by control of non-endemic grass and weed growth. All slash pine is to be removed.

All previous or future cleared timber and foliage or accumulated rubbish should be removed from the site or mulched and not simply moved aside as this will result in a concentrated area of fuel loading which will increase the potential bushfire hazard from that direction.

Fibrous bark trees, such as melaleuca, swamp mahogany and stringy bark, have a tendency to increase ember attack during a bushfire, due to the fire running up the tree trunk and burning bark breaking off, creating large quantities of airborne burning embers. Ribbon bark tree species (trees that shed their bark in long strips) are also an issue, significantly increasing the potential for spot fires. For this reason, tree species with these bark types should not be used as revegetation/rehabilitation/regeneration plantings in urban interface areas. It is recommended that ground fuels be kept to a minimum around the base of existing trees of this type, to minimise the risk of bushfire running up the tree trunk.

In bushland areas, the areas around the fringes of the bushland and along fire trails have a tendency to have increased ground fuel loading, as a result of increased sunlight penetration producing better growing conditions for grass and weeds (known as 'Edge Effects'), which can have an adverse impact on the local ecosystem and safety issues for fire suppression personnel during unplanned fire events. These non-endemic grasses and weeds penetrate into the edges of the retained bushland, creating conditions for higher intensity fire which damages the edges of the bushland, opening up the canopy which then allows more sunlight in and promotes grass and weed intrusion further into the bushland. This cyclic process has the effect of decreasing the size of quality bushland and increasing grass and weed dominated areas. The most cost-effective way to control grass and weed growth is to create a good closed in canopy cover, which will shade out the undesirable species. The control of fuel loads along the edges by regular mowing, brush cutting or in some cases poisoning may be suitable. Areas with a build-up of volatile fuel levels along the open edges of bushland, where full sunlight is available, can be where the most damage is inflicted on the bushland during a bushfire.

For optimal bushfire safety and best practise, the allotments must be cleared during operational works and maintained by the developer with low ground fuel levels until sold. Once sold the purchaser must maintain the allotment at all times, before, during and after construction of the dwelling.

Where the development is to take place in stages, care should be exercised to ensure the developed stages are not threatened by bushfire from the undeveloped stages. When operational clearing approvals are applied for, the application needs to include cleared buffers of 100 metres into developable areas in adjoining stages and these areas must be managed until developed.

6. Building Construction

The bushfire provisions of the National Construction Code (NCC) are applied to Class 1, 2 & 3 buildings and associated Class 10a buildings, located in designated bushfire prone areas. “Designated bushfire prone area means land which has been designated under a power in legislation as being subject, or likely to be subject, to bushfires” (*NCC Schedule 3 Definitions*).

The Logan Planning Scheme 2015, Table 5.7.1 – Building Work, Editor’s note, states “*Land identified in a bushfire hazard area on Bushfire hazard overlay map-OM-03.00 is a designated bushfire prone area for the Building Code of Australia and the Queensland Development Code.*” OM-03.00 only maps areas of Very High, High or Medium Potential Bushfire Hazard (PBH).

Under the Logan Planning Scheme 2015, Table 5.7.1 – Building Work, Editor’s note, a site with a low PBH rating does not require assessment under the National Construction Code in relation to bushfire or under the Australian Standard (AS3959) for *Construction of Buildings in Bushfire Prone Areas* and therefore **no specific level of construction would be required in relation to bushfire for the dwellings in Sub-Precinct 4F.**

This level of construction is reliant on the recommendations of this report being implemented and maintained.

7. Provision of Adequate Water Supplies

The area of the proposed development is to be serviced by reticulated water supplies with the inclusion of fire hydrants for firefighting purposes. These services are to comply with the relevant standards as required by the local authorities, including a minimum pressure and flow of 10 litres a second at 200kPa or that which is able to be supplied by the local reticulated network.

Fire Hydrants are to be installed in accordance with the *Fire Hydrant and Vehicle Access Guidelines for residential, commercial and industrial lots*, Queensland Fire and Emergency Services, 2015, unless otherwise specified by the relevant water authority.

8. Provision of Fire Fighting Infrastructure

Dwellings are to have external taps and hoses that are positioned so water supply is capable of reaching to all parts of the building. All water lines are to be covered by at least 300mm of soil or be of metal above ground. Residents should maintain good access around their homes for fire suppression activities by fire services.

9. Local Fire Brigades

The subject property is in the urban Fire & Rescue district and they would be responded on a 000 emergency call, with back-up from Logan Village and Tamborine Rural Fire Brigades. If further back-up is required, additional units would be engaged by the Beaudesert/Logan Rural Fire Brigade Groups.

10. Improved Community Awareness

Managing ground fuel in small pockets of bushland at the interface between urban development and bushland (Izone) is the easiest way of reducing bushfire hazard, particularly the removal of non-endemic grass and weeds.

It is recommended that a copy of this report be placed on display at any sales office, and a copy of the report be given to the purchasers of lots to provide them with the necessary information required for the building application process.

A copy of this plan should be retained by residents to assist them in minimising the risk of bushfire damage. It is recommended that regular liaison with the local fire brigade takes place as a way of being informed of danger periods.

Further useful information on Bushfire Preparedness and Local Rural Fire Brigades can be obtained through the Rural Fire Service Division of the Queensland Fire and Emergency Service at www.ruralfire.qld.gov.au or by phoning 1300 369 003.

The Bushland open space is a very sensitive ecosystem and could be altered drastically if not cared for properly. Residents can assist in maintaining this fragile ecosystem by preventing unwanted fires from encroaching into the parkland, ensure that dumping of rubbish does not degrade the area and that exotic plant species do not invade the bushland. Hot fires on a regular basis will degrade the bushlands biodiversity.

11. Summary of Recommendations

- The residential allotments are to be maintained with low ground fuel levels at all times and may include domestic gardens, lawns with grass kept under 100mm in height and scattered trees with discontinuous canopy.
- Lot 900 is to be a managed active park, As a minimum the first 10 metres around dwellings are to be managed as an inner Asset Protection Zone (APZ) with the balance managed as an outer APZ as outlined in Appendix 3, so as not to become a bushfire hazard.
- The narrow corridor along the small waterway, in the west, is to be managed by control of non-endemic grass and weed growth. All slash pine is to be removed.

- All previous or future cleared timber and foliage or accumulated rubbish should be removed from the site or mulched and not simply moved aside as this will result in a concentrated area of fuel loading which will increase the potential bushfire hazard from that direction.
- For optimal bushfire safety and best practise, the allotments must be cleared during operational works and maintained by the developer with low ground fuel levels until sold. Once sold the purchaser must maintain the allotment at all times, before, during and after construction of the dwelling.
- Where the development is to take place in stages, care should be exercised to ensure the developed stages are not threatened by bushfire from the undeveloped stages. When operational clearing approvals are applied for, the application needs to include cleared buffers of 100 metres into developable areas in adjoining stages and these areas must be managed until developed.
- The area of the proposed development is to be serviced by reticulated water supplies with the inclusion of fire hydrants for firefighting purposes. These services are to comply with the relevant standards as required by the local authorities, including a minimum pressure and flow of 10 litres a second at 200kPa or that which is able to be supplied by the local reticulated network.
- Fire Hydrants are to be installed in accordance with the *Fire Hydrant and Vehicle Access Guidelines for residential, commercial and industrial lots*, Queensland Fire and Emergency Services, 2015, unless otherwise specified by the relevant water authority.
- Dwellings are to have external taps and hoses that are positioned so water supply is capable of reaching to all parts of the building. All water lines are to be covered by at least 300mm of soil or be of metal above ground. Residents should maintain good access around their homes for fire suppression activities by fire services.
- It is recommended that a copy of this report be placed on display at any sales office, and a copy of the report be given to the purchasers of lots to provide them with the necessary information required for the building application process.
- A copy of this plan should be retained by residents to assist them in minimising the risk of bushfire damage. It is recommended that regular liaison with the local fire brigade takes place as a way of being informed of danger periods.

12. Conclusion

With the appropriate maintenance of fuel levels around the development, adequate water supply, good access provisions and minimising ground fuels, the risk of bushfire damage can be managed and improve the safety of residents and fire services in attending to a bushfire threat.

The proposed dwellings achieve a tolerable risk level in accordance with Bushfire Resilient Communities Technical Reference Guide 10/19.

This plan remains current for a period of 5 years, until 2027, at which time it should be subject to review to take account of changing land use and vegetation patterns. Any major bushfire event affecting the subject site should also trigger a review to determine effectiveness of protection measures and annual hazard reduction initiatives.

Ultimately, persons living in a bushfire prone area must take the precautions necessary to protect themselves, their families and their homes if Brigades are stretched and are unable to attend immediately.

If you require any further assistance, please do not hesitate to contact this office.



Brett Bain, MDIA, MRFAQ
Lead Bushfire Consultant.

13. Bibliography

Articles/Books/Reports/Guidelines/Standards

Australian Building Codes Board, March 2019, National Construction Code Handbook, “Bushfire Verification Method”

Leonard, J, Et al., 2014, “A new methodology for State-wide mapping of bushfire prone areas in Queensland”, CSIRO.

Leonard, J and Opie, K, 2017, “Estimating the potential bushfire hazard of vegetation patches and corridors”, CSIRO.

Queensland Department of State Development, Manufacturing, Infrastructure and Planning, December 2019, “Natural hazards, risk and resilience – Bushfire: State Planning Policy – state interest guidance material”

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Standards Australia, 2018, “Australian Standard 3959: Construction of buildings in bushfire-prone areas” (First Edition 1991; Second Edition 1999; Third Edition 2009; Fourth Edition 2018)

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The State of Queensland (Queensland Reconstruction Authority), CSIRO, July 2020, Bushfire Resilient Building Guidance for Queensland Homes

Vic Department of Sustainability and Environment, July 2010, “Overall fuel hazard assessment guide”, 4th Edition.

Legislation

Fire and Rescue Service Act 1990 (Qld)

<https://www.legislation.qld.gov.au/view/html/inforce/current/act-1990-010>

Building Act 1975 (Qld)

<https://www.legislation.qld.gov.au/view/html/inforce/current/act-1975-011>

Building Regulation 2006 (Qld)

<https://www.legislation.qld.gov.au/view/html/inforce/current/sl-2006-0227>

Planning Act 2016 (Qld)

<https://www.legislation.qld.gov.au/view/html/inforce/current/act-2016-025>

Vegetation Management Act 1999 (Qld)

<https://www.legislation.qld.gov.au/view/html/inforce/current/act-1999-090>

Work Health and Safety Regulation 2011 (Qld)

<https://www.legislation.qld.gov.au/view/html/inforce/current/sl-2011-0240>

Other Legislative Materials

Australian Building Codes Board, National Construction Code (NCC) Volumes 1 & 2

Department of Local Government and Planning, Department of Emergency Services, June 2003, State Planning Policy Guideline, “Mitigating the Adverse Impacts of Flood, Bushfire and Landslide” (SPP1/03)

Department of Infrastructure, Local Government and Planning, April 2016, State Planning Policy – State interest guideline “Natural hazards, risk and resilience” (SPP 7/17)

Council Planning Scheme

Appendix 1



- PRECINCT FOUR - APPLICATION FIVE BOUNDARY
- STAGE BOUNDARY
- OPEN SPACE
- LOCAL STAGE ROAD
- PATHWAY CONNECTION
- VILLAGE ROAD
- MAJOR ROAD

LAND USE	AREA (ha)
Residential	14.84 ha
Open Space	0.92 ha
Road - Major Road	1.60 ha
Road - Collector Road	2.69 ha
Road - Local Street	4.29 ha
TOTAL	24.33 ha

MINIMUM RESIDENTIAL DENSITY - 22.73 ha
331 dw
14.6 dw/ha
MAXIMUM RESIDENTIAL DENSITY - 22.73 ha
331 dw
14.6 dw/ha

LOT YIELD BY LOT TYPE

LOT TYPE	No.	No. %	AREA	AREA %	MINIMUM	MAXIMUM	AVERAGE
T1	15	4.53%	10631.73m ²	7.16%	640.00m ²	891.28m ²	708.78m ²
T2	13	3.93%	7907.44m ²	5.33%	576.00m ²	751.23m ²	608.26m ²
T3	5	1.51%	3145.53m ²	2.12%	576.00m ²	699.00m ²	629.11m ²
C2	56	16.92%	26009.53m ²	17.52%	448.00m ²	611.31m ²	464.46m ²
C3	51	15.41%	27736.59m ²	18.69%	508.16m ²	778.59m ²	543.85m ²
PV	58	17.52%	24340.38m ²	16.40%	396.97m ²	592.34m ²	419.66m ²
V	32	9.67%	11417.86m ²	7.69%	336.00m ²	519.49m ²	356.81m ²
TT3	4	1.21%	2971.66m ²	2.00%	691.64m ²	782.67m ²	742.91m ²
TCY2	23	6.95%	8860.50m ²	5.97%	350.00m ²	502.41m ²	385.24m ²
TCY3	22	6.65%	10144.87m ²	6.84%	400.00m ²	596.94m ²	461.13m ²
TPV	19	5.74%	6128.98m ²	4.13%	312.50m ²	413.04m ²	322.58m ²
TV	21	6.34%	6011.13m ²	4.05%	262.50m ²	386.25m ²	286.24m ²
TCD	12	3.63%	3113.11m ²	2.10%	202.50m ²	373.28m ²	259.43m ²
TOTALS	331	100%	148419.31m ²	100%	202.50m ²	891.28m ²	448.40m ²

NOTE:
MINIMUM DWELLINGS is based on the development of one dwelling on each single family and multi-family strata (MFS) lot.
MAXIMUM DWELLINGS is based on the development of one dwelling on each single family lot, and three dwellings on each multi family strata (MFS).

DENSITY calculations include the area of residential lots, local roads and credited park. The boundaries, roads and pathways shown hereon are subject to detailed engineering design, final survey and approval of subsequent development applications by the relevant authorities.

PRECINCT FOUR - APPLICATION FIVE RECONFIGURATION OF A LOT

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0 25 50 75 100 125m

Scale 1:2,500 at A3

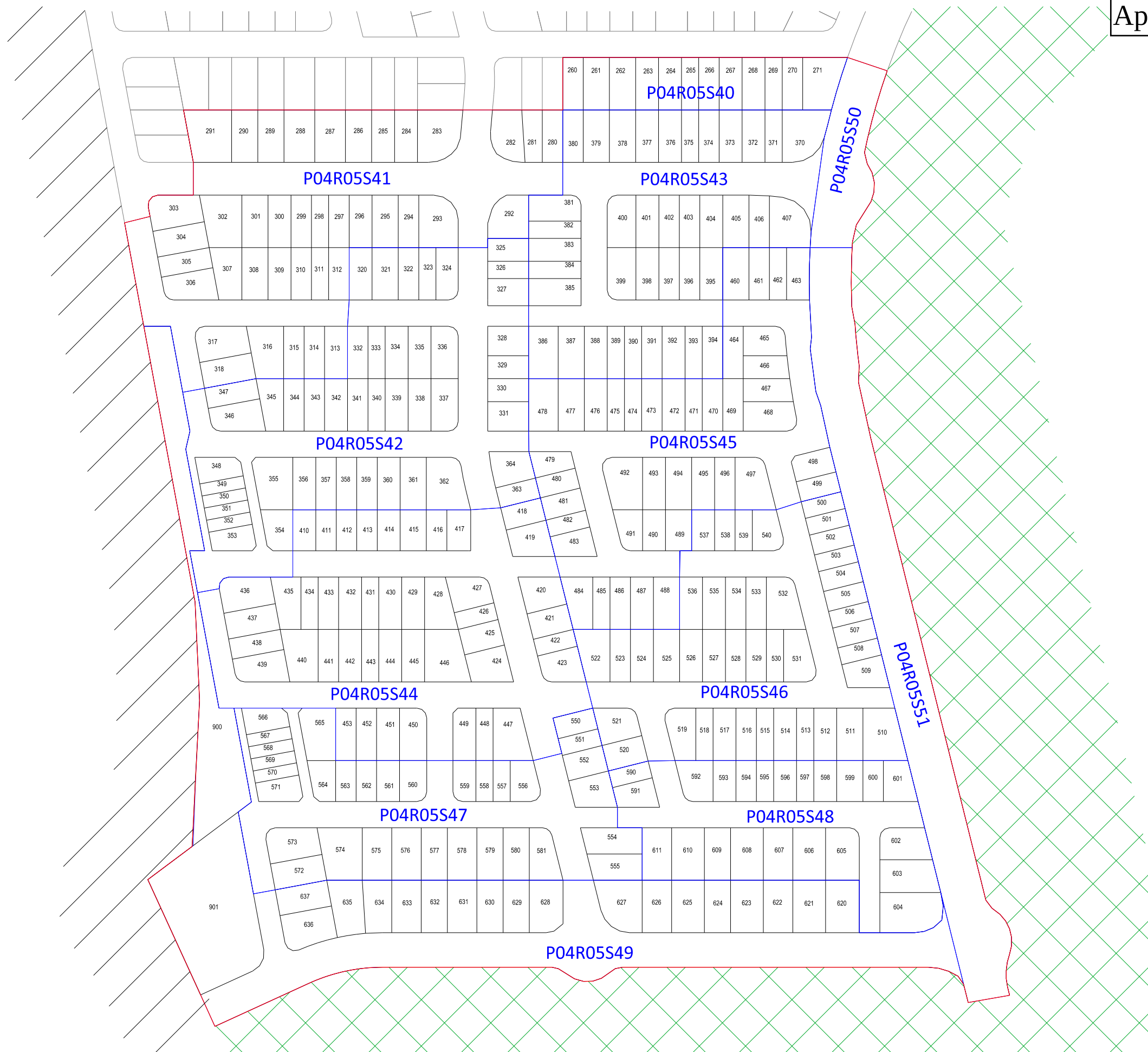


Lendlease

Date 07 SEPT 2022

-  PRECINCT FOUR - APPLICATION FOUR BOUNDARY
-  STAGE BOUNDARY
-  LOW POTENTIAL INTENSITY
-  MANAGED BUFFER - LATER APPLICATIONS

PREPARED BY LENDLEASE ON BEHALF OF
BUSHLAND PROTECTION SYSTEMS



PRECINCT FOUR - APPLICATION FIVE BUSHFIRE HAZARD ASSESSMENT AND MANAGEMENT PLAN

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0 25 50 75 100 125m
Scale 1:2,500 at A3

North

lendlease

Appendix 3: Asset Protection Zones

This Appendix on Asset Protection Zones (APZs) is included in this report as a guide on how to implement and maintain Asset Protection Zones.

What is an APZ

Generally, buildings or infrastructure located in a bushfire prone area are required to have a minimum separation between the buildings/infrastructure and the unmanaged hazardous bushland (hazardous bushland being bushland assigned a Medium, High or Very High bushfire hazard rating). This separation is known as an Asset Protection Zone (APZ) and is also sometimes referred to as a Radiation Zone or bushfire buffer.

The Asset Protection Zone can include roadways, fire trails, car parking, driveways, active park and managed areas (i.e. lawns and correctly designed landscaping). For example, on rural allotments the APZ would most often be provided by managed areas with a Low hazard rating (lawns and gardens), whilst in an area of small residential allotments adjacent to large areas of bushland the APZ may consist of a roadway or fire trail possibly supplemented by managed areas within the allotments.

An APZ provides an area for bushfire impact mitigation and a defensible space for active fire suppression. An APZ;

- Allows the radiant heat from a bushfire in adjacent bushland to at least partially dissipate before impacting on buildings or infrastructure, thereby mitigating the bushfires impact on the asset,
- Reduces the chance of direct flame contact on buildings,
- Usually includes vehicle access or firefighter pedestrian access,
- Provides an area of defensible space around the asset, allowing firefighters room to work safely and defend structures during direct, indirect and defensive suppression strategies,
- Provides a work area and break for hazard reduction burning activities to be conducted, if desirable.

Dimensions of APZs

Often the APZ will be split into two zones, an 'inner APZ' and 'outer APZ', particularly where the APZ is a managed vegetation area. As a general rule of thumb, the first ten metres around the building would be an inner APZ while the remainder of the required separation would be an outer APZ, however the exact dimensions are those stipulated in the bushfire mitigation plan, not the generalised examples stated in this appendix, as it may vary depending on individual site conditions. The dimensions may vary depending on site factors, for example with a building on a slope, the APZ may be less on the upslope side of the building than on the downslope side. A change in vegetation type or size of vegetation area that the building is exposed to may also vary the dimensions of the APZ. An extended outer APZ is also sometimes used to extend the outer APZ in consideration of slope. The extended outer APZ is usually managed the same as the outer APZ.

Slopes in APZs

Generally, APZs require ongoing vegetation management and therefore need to be located where management can be physically possible. APZs on public land should not include slopes with a grade greater than 1:4, on private land APZs should avoid slopes greater than 1:3. For example, where a roadway (including road verge) provides the required separation, the road verge cannot consist of a batter greater than 1:4. Where a retaining wall is located within an APZ, access to all levels need to be provided permitting management of the entire APZ.

Vegetation in APZs

It should be noted that APZs do not necessarily call for complete clearing of all vegetation, as tall canopy tree retention, for example, is a common feature within outer APZs. The management of fuel levels within these zones is designed to reduce the intensity of bushfires before the bushfire impacts on assets such as buildings and property. The correct and continued maintenance of fuel levels within a buildings APZ may result (depending on factors such as terrain, fuel types and climatic conditions) in reduced flame height, a slowing of the rate of spread of the fire and a reduced risk of direct or radiant heat attack on buildings and other property assets.

The following is a guide for vegetation within APZs, however where there is an inconsistency between the main body of the Bushfire Mitigation Plan (BMP) and this Appendix, the requirements of the BMP applies.

The inner APZ:

- Trees have less than 15% canopy cover at maturity and canopy is discontinuous.
- Trees do not touch or overhang buildings.
- Near surface fuels (shrubs, ground covers) are not to be planted underneath tree canopies, are less than 300mm in height and have less than 10% plant cover.
- Lawns/grass is kept to less than 100mm height.
- No accumulated Leaf litter or fallen timber.

An example of 15% canopy – If the tree species being used have a maximum 5 metre diameter canopy at maturity then there could be up to one tree per 166m².

The outer APZ:

- Trees have less than 30% canopy cover at maturity.
- Trees do not touch or overhang buildings.
- Near surface fuels (shrubs, ground covers) are not to be planted underneath tree canopies, are less than 300mm in height and have less than 20% plant cover. Gaps between fuel patches are greater than the size of the patches.
- Lawns/grass are kept to less than 300mm height.
- No fallen timber.
- Leaf litter is not allowed to accumulate to more than 5t/Ha (10mm deep).

An example of 30% canopy – If the tree species being used have a maximum 5 metre diameter canopy at maturity then there could be up to one tree per 83m².

General for both zones;

- No mulch, woodchip, bark or leaf litter build-up against structures or flammable fencing.
- Shrubs and ground covers should not be species that accumulate a lot of dead fuel underneath.
- Creepers used as ground cover must not be climbers.
- Creepers should be low broadleaf succulents, such as *Myoporum ellipticum*.
- Tree selection is not to include fibrous bark trees or ribbon bark trees.
- Tree species have a well-defined trunk with upper canopy, not short bushy trees with foliage from ground to canopy, providing ladder fuels. Trees have branches lower than two metres removed, providing separation between canopy and ground fuels.
- Weed growth is removed.

The above criteria for an outer APZ, would approximately allow up to 8t/Ha overall fuel load in the outer zone.

Plant/Canopy cover is defined as the amount of ground blocked out by that fuel layer if viewed while looking straight down from above. Each plant is considered opaque – any ground within the perimeter of the plant cannot be seen.

Pebbles, gravel or scoria may be useful substitutes for garden mulch. Pathways and gravel areas in addition to lawn can assist in separation of plantings resulting in less continuity of fuels.

How to select the correct plant species for APZs

In selecting the correct plant species to use for landscaping in a bushfire prone area, consideration needs to be given to plant moisture content, branching patterns, texture, foliage density, leaf type, bark type, retention of dead material, and presence of oils, waxes and resins.

As a guide to landscaping and gardening in a bushfire prone area, the document ‘Landscaping for Bushfire’ produced by the CFA Victoria, is a useful guide on plant selection, garden design and ongoing maintenance. It can be found at <https://www.cfa.vic.gov.au/plan-prepare/landscaping>. Section 5 of the document provides a good description of the above characteristics and which are good or bad, and Section 7 of the document provides a plant selection key, which is a step by step guide on how to select plants based on those characteristics and should be used when choosing what plants to have in APZs.

There are a number of different terms used to identify suitable plants, some of the more common ones include Fire Resistant, Fire Retardant and Firewise. Not all of these are correct and such plant lists are often confused by some as to their purpose.

‘Fire Resistant Plants’ is a term that describes plant species that survive being burnt and will regrow after a bushfire. They are resistant to being killed by a bushfire, but not to being burnt. Therefore, they may be highly flammable and inappropriate for bushfire risk areas. You can often find lists of ‘Fire Resistant Plants’ being used for the wrong purpose due to people not understanding this, so beware, it does not necessarily mean low flammability.

‘Fire Retardant Plants’ can be confused by some as being plants that will not burn. All plants will burn under the right conditions, so don’t be misled. Plants with low flammability are good, but can still burn, which is why positioning, planting density and ongoing management is also just as important.

‘Firewise Plants’ is the term used in the ‘Landscaping for Bushfire’ document to describe suitable lower flammability plants.

Other Features within APZs

Non-flammable features such as tennis courts, in-ground swimming pools, dams, driveways, paved or concreted areas, uncovered patios and non-combustible water tanks may be located within the APZs. (Note: a timber deck around a pool, is not non-flammable and if connected to the building is part of the building.)

Retaining walls and fencing within APZs should preferably be non-flammable.

Piles of timber, firewood and other flammable material should not be stored within the APZ unless shielded from bushfire.

Management of APZs

Management requirements in the APZ include:

- Tree branches below two metres being removed.
- Selective removal of tree saplings.
- Fallen Timber, bark and twigs being removed.
- Leaf Litter being controlled to the appropriate level, which can be achieved by raking or using a blower/vac.
- Removing of weed growth regularly, especially woody weed.
- Regular mowing, slashing or grazing.
- Trimming back of shrubs and ground covers
- Regular watering to keep lawns and vegetation lush and green at all times, particularly during drought, when fires are more likely to happen.
- If poisoning is used, ensure dead material has time to collapse and begin to rot prior to the onset of fire season and not provide standing dead material as fuel for a potential bushfire.

Ongoing management of vegetation in the APZ is just as critical as getting the right type of plants and correct landscape design.

Building construction ratings (or BALs) are calculated with consideration of the amount of separation between the building and hazardous bushland. Not properly maintaining the APZ separation may mean the designated construction of the dwelling is not sufficient and could compromise building survivability in the event of bushfire. This could also lead to issues with insurance claims in the event of building damage or loss.



Bushland Protection Systems

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BUSHFIRE HAZARD

PLANNING & MITIGATION

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Fire is a part of nature. Its effects can be catastrophic and fire can never be totally eliminated, however there are steps that can be taken to reduce the chances of uncontrolled fires occurring and the risk to life, property and the environment, in the event of uncontrolled fires. This is what we concentrate on, how the threats from bushfire can be minimised. There are many methods to do so, however deciding which method/s is best to use can be a complex decision to make. There are so many factors to consider such as ecological values, biodiversity, fire history, availability of resources, cost effectiveness and public awareness just to name a few. No guarantees can ever be given when dealing with Mother Nature, with ever increasing complexities it has now become a specialist field to be able to create plans to try and minimise the risk from bushfire. Ultimately it is a community responsibility to protect the environmental values, life and property in their area

COMPANY PROFILE

Bushland Protection Systems Pty Ltd (BPS) is a leading Bushfire Management Consultancy firm in Queensland, with many clients, ranging from private landowners to multi-national companies and Government bodies.

BPS consultants began operating as Bushfire Management Consultants with the introduction of the Gold Coast Bushfire Management Strategy in 1998 and spread their operations across the state with the implementation in 2003 of the State Planning Policy for mitigating the adverse impacts of flood, bushfire and landslide.

During that time over 3500 projects have been successfully completed, including large residential estates such as Coomera Waters, Spring Mountain, Pacific Pines, Coomera Springs, Observatory, Highland Reserve, Delfin Woodlands & Yarrabilba as well as commercial or Government project sites such as Paradise Country, Wacol Police Academy, Numinbah Correctional Facility, Silkwood Steiner School, Canon Hill Community Links Project & Griffith University.

With a strong background in bush fire fighting and involvement with numerous industry bodies, Bushland Protection Systems continues to deliver realistic and cost effective advice and solutions to provide higher levels of safety for the community, improve wildfire suppression and mitigation options for emergency services and land managers, while maintaining and improving environmental values for the future.

Our Consultants are registered with the Rural Fire Association of Queensland (RFAQ) as Level 2 Accredited Bushfire Practitioners.