



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

ABN 97 782 336 595 | Phone: 07 5546 7933 | PO Box 40, Ormeau, Qld, 4208 | E-mail: admin@bpsfire.com.au

BUSHFIRE HAZARD ASSESSMENT AND MITIGATION PLAN

PROPOSED RESIDENTIAL DEVELOPMENT IN Precinct 6 ROL1 Yarrabilba

FOR

Lendlease

**PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL**

Approval no: DEV2023/1433

Date: 22 December 2023



DATED

24th August 2023

AMENDED IN RED

By: Gabrielle Shepherd

Date: 21 December 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	22/08/23	Draft BMP	Brett Bain	
2	23/08/23	Finalised BMP	Brett Bain	
3	24/08/23	Amended References and updated Appendix 1	Brett Bain	

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1. Background

This plan is for the proposed residential development in Precinct 6 ROL 1 of Yarrabilba, as shown in Appendix 1 of this report.

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

- 1.1. Precinct 06 – Application 1 Reconfiguration of a Lot Plan, drawn by Lendlease, Drawing No. YAR-PO6-ROL1-ROL-230824, Sheet 1 of 4, Dated 24/8/23, is attached as Appendix 1.
- 1.2. Bushfire Hazard Assessment and Management Plan, drawn by Lendlease, Drawing No. YAR-PO6-ROL1-BFA-230821, Dated 21/8/23, 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

Precinct 6 ROL 1 is located in the north of Precinct 6, between two vegetation corridors, 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 south is Sub-Precinct 6B which will also provide a ‘Not Bushfire Prone Area’ hazard rating.

The ‘linear park managed’ areas shown in Appendix 2 are to be managed as outlined in Section 5 of this report and will provide a ‘Not bushfire prone area’ hazard rating.

To the north are areas of bushland and basins. Whilst the vegetation is a linear corridor the width and configuration are sufficient to warrant a bushfire hazard rating from proposed Lot 2001 north, as shown in Appendix 2. The bushland would be assigned a Vegetation Hazard Class (VHC) of 16.1 with associated fuel loads of up to 16t/Ha, over slopes of up to 2 degrees and a Forest Fire Danger Index (FFDI) of 54, providing for a potential fire line intensity of up to 8,486kW/m equating to a ‘Medium’ hazard rating.

With management over the stormwater basin adjacent to Stage 11(as outlined in Section 5 of this report), the remaining ‘linear park unmanaged’ area in the eastern corridor (from Lot 2001 south to Lot 476) forms a narrow linear corridor and is considered to have a low hazard rating due to its limited size and configuration.

To the south of the basin, the corridor (adjoining Sub-Precinct 6B) widens out again and would be assessable. The bushland would be assigned a VHC 16.1 with associated fuel loads of up to 16t/Ha, over slopes of up to 2 degrees and an FFDI of 54, providing for a potential fire line intensity of up to 8,486kW/m equating to a 'Medium' hazard rating.

To the northwest and west is a corridor of vegetation adjoining Precinct 6 which would be assigned a VHC 16.1 with associated fuel loads of up to 16t/Ha, over slopes of up to 2 degrees and an FFDI of 54, providing for a potential fire line intensity of up to 8486kW/m equating to a 'Medium' hazard rating.

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 63-86, 107-129, 133-139, 162-172, 189-192, 200-206, 229-233, 237-251, 255-261, 289-295, 317-330, 400-405, 409, 410, 471-479, 490-500, 528, 529, 535, 536 & 563-567, as shown in Appendix 2, would be assigned a 'Medium' hazard rating, while the remainder of the allotments in Precinct 6 ROL 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 the main access/egress coming in from the north. There are also future connections to the Sub-Precinct in the south, which will further connect into other precincts.

With the exception of proposed Lots 229-233, there is a perimeter roadway providing separation to the bushland corridors. Lots 229-233 have a managed buffer and trail providing separation.

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

The proposed walking/bikeway path behind Lots 229-233 & 2001 is to be designed so as to double as a fire trail with connections to the roadway at each end.

Fire trails would be low impact preferably with a mowed or slashed surface which would minimise disturbance or erosion, have a maximum grade of 25% and maximum cross slope of 5%. Fire trails are to have a minimum cleared width of 6 metres and minimum formed width of 4 metres. Where fire trails deviate away from lot boundaries the area between the trail and lot boundary must be managed with low fuel levels so as not to compromise the buffer function that fire trails provide in addition to vehicle access. Appendix 5 on fire trails is included in this report as a guide on establishing and maintaining fire access trails.

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.

The future dwelling on proposed Lot 120 is to have a minimum 2.5 metre building setback from the northeast lot boundary.

Future dwellings are to have a minimum 10 metres separation from the section of low hazard rated 'linear park unmanaged' area in the eastern corridor (Lot 2001 south to Lot 476) and basin. As indicated in Appendix 2 this has been provided.

The SPP7/17 bushfire support documents released December 2019, require separation distances between buildings and hazardous bushland that achieve a radiant heat flux rating of 29kW/m² or less when assessed in accordance with the methodology outlined in the Bushfire Resilient Communities Technical Reference Guide 10/19. This would require a minimum 15 metres of separation from the 'Medium' rated bushland areas, which has been provided as indicated in Appendix 2.

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>.

The managed linear park in the eastern corridor contains a walking/bike path which delineates the border between the managed and unmanaged corridor. The area between the pathway and the road/lot boundaries is to be managed as an inner Asset Protection Zone (APZ), as outlined in Appendix 3.

The managed linear park in the western corridor is to be managed as an outer Asset Protection Zone (APZ), as outlined in Appendix 3, which will assist in the control of edge effects.

The stormwater quality basin adjoining Stages 9 & 11 is to be managed so as not to result in an area of future bushfire hazard. This can be achieved by:

- Retention of mature tall canopy trees
- Selective retention of juvenile tall canopy tree species
- Removal of limbs less than 2 metres high on trees over 4 metre tall
- Removal of weed growth.
- Mowing/brush cutting of grass, keeping grass under 300mm high, but allowing for reed/rush type vegetation in the basin to allow for the function of the detention area.
- Minimise mid-storey vegetation (except the juvenile trees in dot point 2) to prevent ladder fuel structure.
- Occasional dis-continuous small clumps of evergreen ground covers would be permissible, such as *Lomandra Hystrix*, which should be trimmed back prior to the start of fire season (fire season generally starts in July/August).
- Removal of fallen timber.
- Restricting leaf litter build-up to 5t/Ha (approx. 10mm deep), allowing for a total of 8t/ha overall fuel load.
- All plantings should be 'fire wise' as outlined in the 'Landscaping for Bushfire' document referred to above.
- Steepness of batter slopes must allow for management (<1:4).

Lot 2001 is to be a managed active park.

Non-endemic grass and weed growth is to be controlled in the 'Linear Park Unmanaged' corridors. 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 those dwellings.

As proposed Lots 63-86, 107-129, 133-139, 162-172, 189-192, 200-206, 229-233, 237-251, 255-261, 289-295, 317-330, 400-405, 409, 410, 471-479, 490-500, 528, 529, 535, 536 & 563-567 have a ‘Medium’ hazard rating, the Logan Planning Scheme 2015, Table 5.7.1, requires the National Construction Code (NCC) and where relevant the Australian Standard for Construction of Buildings in Bushfire-Prone Areas (AS3959) to be addressed.

P2.7.5 of the NCC requires:- A Class 1 building or a Class 10a building or deck associated with a Class 1 building that is constructed in a designated bushfire prone area must, to the degree necessary, be designed and constructed to reduce the risk of ignition from a bushfire, appropriate to the –

- (a) Potential for ignition caused by burning embers, radiant heat or flame generated by a bushfire; and
- (b) Intensity of the bushfire attack on the building.

Section 3.10.5.0 (Qld variation) of the NCC is the deemed-to-satisfy provision and states:-

- (a) Subject to (b), Performance Requirement P.2.7.5 is satisfied for—*
 - (i) a Class 1 building; or*
 - (ii) a Class 10a building or deck associated with a Class 1 building, located in a designated bushfire prone area if it is constructed in accordance with—*
 - (iii) AS 3959; or*
 - (iv) NASH Standard – Steel Framed Construction in Bushfire Areas.*
- (b) The requirements of (a) do not apply when, in accordance with AS 3959, the classified vegetation is Group F rainforest (excluding wet sclerophyll forest types), mangrove communities and grasslands under 300 mm high.*

Where a Performance Solution is proposed, the relevant Performance Requirements must be determined in accordance with Sections A2.2(3) and A2.4(3) of the NCC as applicable.

Section V2.7.2 of the NCC is a means to verify the appropriate risk of ignition from a bushfire in order to meet the requirement of P2.7.5. For further guidance refer to the Buildings in Bushfire Prone Area Verification Method Handbook available from the Australian Building Code Board.

The level of construction for dwellings, if any, should be assigned prior to plan sealing stage when the actual risk would be more readily assessable for individual allotments, allowing for potential alterations during development to terrain and vegetation types.

It is noted that with the implementation of the recommendations of this report, future dwellings are not expected to exceed a BAL-19 bushfire construction rating under AS3959-2018. These levels of construction are reliant on the recommendations of this report being implemented and maintained.

Any mains gas supply is to be installed in accordance with AS2596, the requirements of relevant authorities and metal piping is to be exclusively used.

Electricity supplies within the property are to be protected and not vulnerable to falling tree or bushfire threatening the viability of transmission poles.

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.

It is recommended that residents with a Medium bushfire hazard rating prepare a 'Bushfire Survival Plan', a template for which is available from the Rural Fire Service Queensland website at www.qfes.qld.gov.au/bushfires. The 'Bushfire Survival Plan' document provides information on Bushfire Danger Ratings, Community Warning Information, how to prepare your property, what to do in the event of a bushfire and what to expect. The Bushfire Survival Plan should be updated annually. Further information is also available through the Prepare•Act•Survive brochure also available on the Rural Fire Service website. For further information contact your local Fire Brigade for assistance or phone 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 proposed walking/bikeway path behind Lots 229-233 & 2001 is to be designed so as to double as a fire trail with connections to the roadway at Lots 229 & 2001.
- Fire trails can be low impact preferably with a mowed or slashed surface which would minimise disturbance or erosion, have a maximum grade of 25% and maximum cross slope of 5%. Fire trails are to have a minimum cleared width of 6 metres and minimum formed width of 4 metres. Where fire trails deviate away from lot boundaries the area between the trail and lot boundary must be managed with low fuel levels so as not to compromise the buffer function that fire trails provide in addition to vehicle access.
- The future dwelling on proposed Lot 120 is to have a minimum 2.5 metre building setback from the northeast lot boundary.
- Future dwellings are to have a minimum 10 metres separation from the section of low hazard rated 'linear park unmanaged' area in the eastern corridor (Lot 2001 south to Lot 476) and basin.
- Future dwellings are to have a minimum 15 metre separation from 'Medium' rated bushland areas.
- 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.
- The managed linear park in the eastern corridor contains a walking/bike path which delineates the border between the managed and unmanaged corridor. The area between the pathway and the road/lot boundaries is to be managed as an inner Asset Protection Zone (APZ), as outlined in Appendix 3.
- The managed linear park in the western corridor is to be managed as an outer Asset Protection Zone (APZ), as outlined in Appendix 3, which will assist in the control of edge effects.
- The stormwater quality basin adjoining Stages 9 & 11 is to be managed as outlined in Section 5 of this report.
- Lot 2001 is to be a managed active park.
- Non-endemic grass and weed growth is to be controlled in the 'Linear Park Unmanaged' corridors. 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.

- Edge effects should be managed.
- 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.
- Dwellings with a 'Medium' hazard rating are to be constructed in accordance with AS3959-2018 as outlined in Section 6 of this report. The level of construction for dwellings, if any, should be assigned prior to plan sealing stage when the actual risk would be more readily assessable for individual allotments, allowing for potential alterations during development to terrain and vegetation types.
- Any mains gas supply is to be installed in accordance with AS2596, the requirements of relevant authorities and metal piping is to be exclusively used.
- Electricity supplies within the property are to be protected and not vulnerable to falling tree or bushfire threatening the viability of transmission poles.
- 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.
- It is recommended that residents with a Medium bushfire hazard rating prepare a 'Bushfire Survival Plan', a template for which is available from the Rural Fire Service Queensland website at www.qfes.qld.gov.au/bushfires.

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 2028, 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”

Queensland Fire and Emergency Services, October 2019, Bushfire Resilient Communities, “Technical Reference Guide for the State Planning Policy State Interest: Natural Hazards, Risk and Resilience – Bushfire”

Queensland Fire and Emergency Services, March 2019, “Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots”

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)

Standards Australia, Barry Eadie Et al., 2009, HB330-2009, “Living in bushfire-prone areas – A guide to reducing the threat and impact of bushfire attack and an explanation of the basis of AS3959”

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



- PRECINCT SIX- APPLICATION ONE BOUNDARY
- STAGE BOUNDARY
- OPEN SPACE - LINEAR AND STORMWATER QUALITY
- OPEN SPACE - NEIGHBOURHOOD RECREATION PARK
- OPEN SPACE - LOCAL RECREATION PARK
- LOCAL STAGE ROAD
- PATHWAY CONNECTION
- VILLAGE ROAD
- MAJOR ROAD

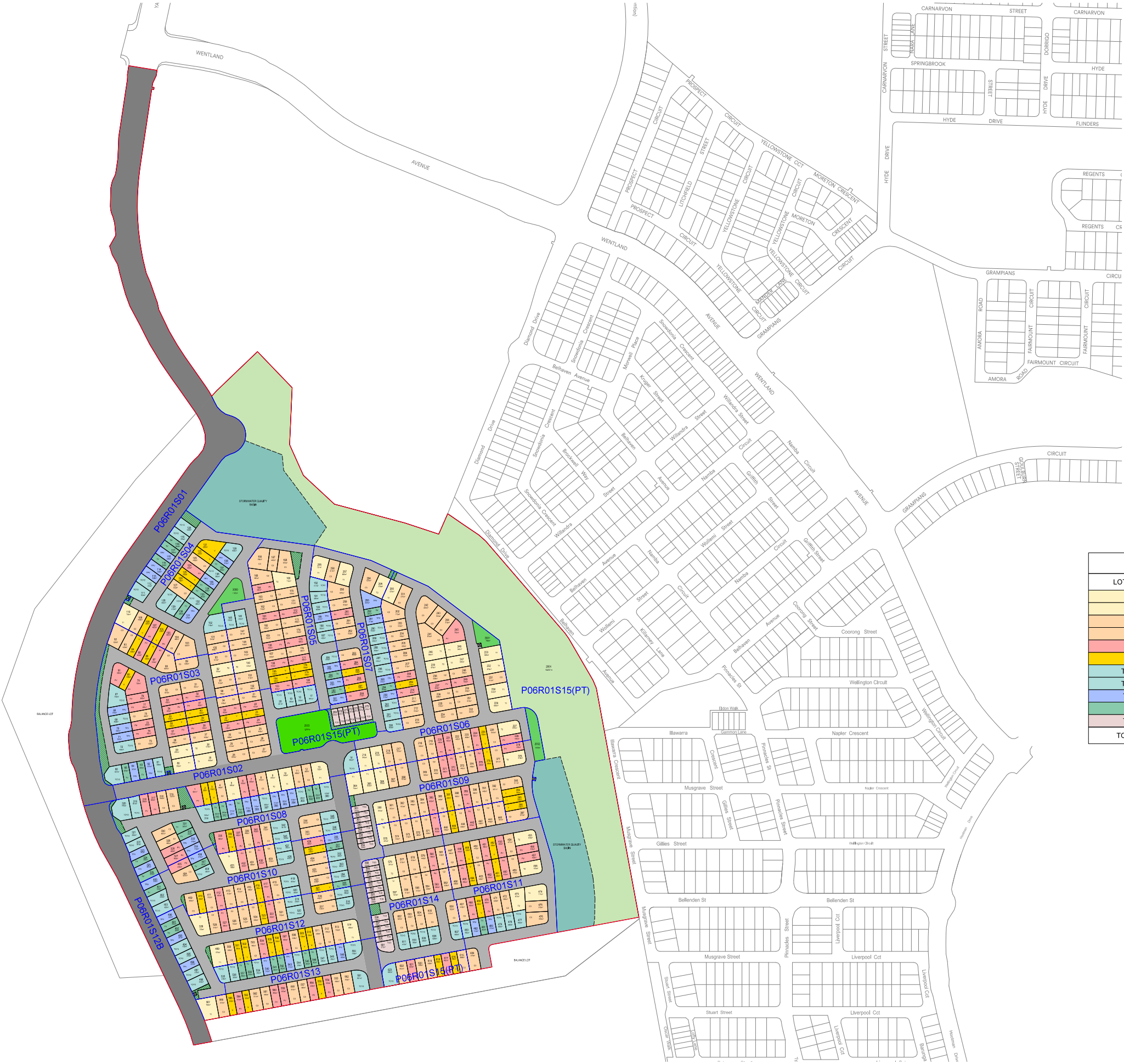
LAND USE	AREA (ha)
Residential	24.025 ha
Open Space - Local	0.306 ha
Open Space - Neighbourhood	0.526 ha
Open Space - Linear	10.600 ha
Road - Major Road	5.305 ha
Road - Village Road	1.472 ha
Road - Local Road	9.737 ha
TOTAL	51.970 ha

MINIMUM RESIDENTIAL DENSITY - 36.07 ha
559dw
15.50 dw/ha
MAXIMUM RESIDENTIAL DENSITY - 36.07 ha
559 dw
15.50 dw/ha

LOT YIELD BY LOT TYPE							
LOT TYPE	No.	No. %	AREA	AREA %	MINIMUM	MAXIMUM	AVERAGE
T1	22	3.94%	14894.27m²	6.20%	576.00m²	794.75m²	677.01m²
T2	22	3.94%	13272.88m²	5.52%	576.00m²	723.19m²	603.31m²
C2	96	17.17%	44723.09m²	18.62%	448.00m²	873.97m²	465.87m²
C3	88	15.74%	47254.61m²	19.67%	512.00m²	804.56m²	536.98m²
PV	90	16.10%	37202.85m²	15.49%	400.00m²	753.45m²	413.36m²
V	53	9.48%	18126.99m²	7.55%	336.00m²	654.99m²	342.02m²
TCY2	45	8.05%	17756.10m²	7.39%	350.00m²	745.03m²	394.58m²
TCY3	39	6.98%	18038.58m²	7.51%	350.00m²	718.36m²	462.53m²
TPV	40	7.16%	13380.57m²	5.57%	312.50m²	556.97m²	334.51m²
TV	35	6.26%	9648.67m²	4.02%	262.50m²	387.41m²	275.68m²
TCD	29	5.19%	5949.77m²	2.48%	187.50m²	373.27m²	205.16m²
TOTALS	559	100%	240248.37m²	100%	187.50m²	873.97m²	429.78m²

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 06 - APPLICATION ONE
RECONFIGURATION OF A LOT

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North



- PRECINCT SIX - APPLICATION ONE BOUNDARY
- STAGE BOUNDARY
- LOW BUSHFIRE HAZARD RATING
- MEDIUM BUSHFIRE HAZARD RATING
- MANAGED BUFFER - LATER APPLICATIONS
- POTENTIAL BUSHFIRE IMPACT ZONE
- LINEAR PARK MANAGED
- LINEAR PARK UNMANAGED
- MINIMUM BUILDING SETBACKS

PREPARED BY LENDLEASE ON BEHALF OF
BUSHLAND PROTECTION SYSTEMS

SUPERCEDED

PRECINCT 06 - APPLICATION ONE BUSHFIRE HAZARD ASSESSMENT AND MANAGEMENT PLAN

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0 60 120 180 240 300m

Scale 1:5,000 at A3

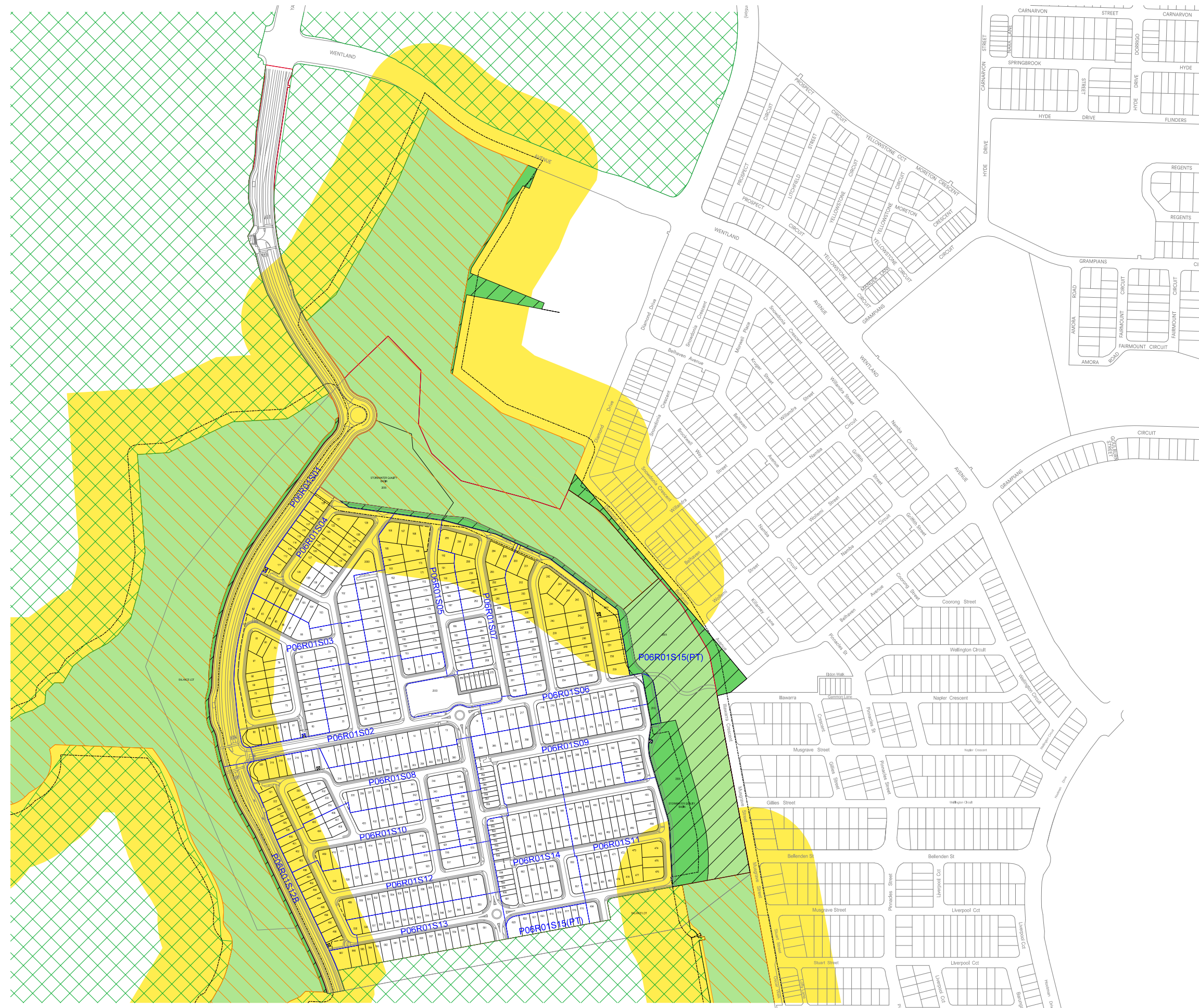


lendlease

- PRECINCT SIX - APPLICATION ONE BOUNDARY
- STAGE BOUNDARY
- LOW BUSHFIRE HAZARD RATING
- MEDIUM BUSHFIRE HAZARD RATING
- MANAGED BUFFER - LATER APPLICATIONS
- POTENTIAL BUSHFIRE IMPACT ZONE
- LINEAR PARK MANAGED
- LINEAR PARK UNMANAGED
- MINIMUM BUILDING SETBACKS

PREPARED BY LENDLEASE ON BEHALF OF
BUSHLAND PROTECTION SYSTEMS

PLAN INSERTED BY EDQ 21/12/2023



PRECINCT 06 - APPLICATION ONE BUSHFIRE HAZARD ASSESSMENT AND MANAGEMENT PLAN

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0 60 120 180 240 300m

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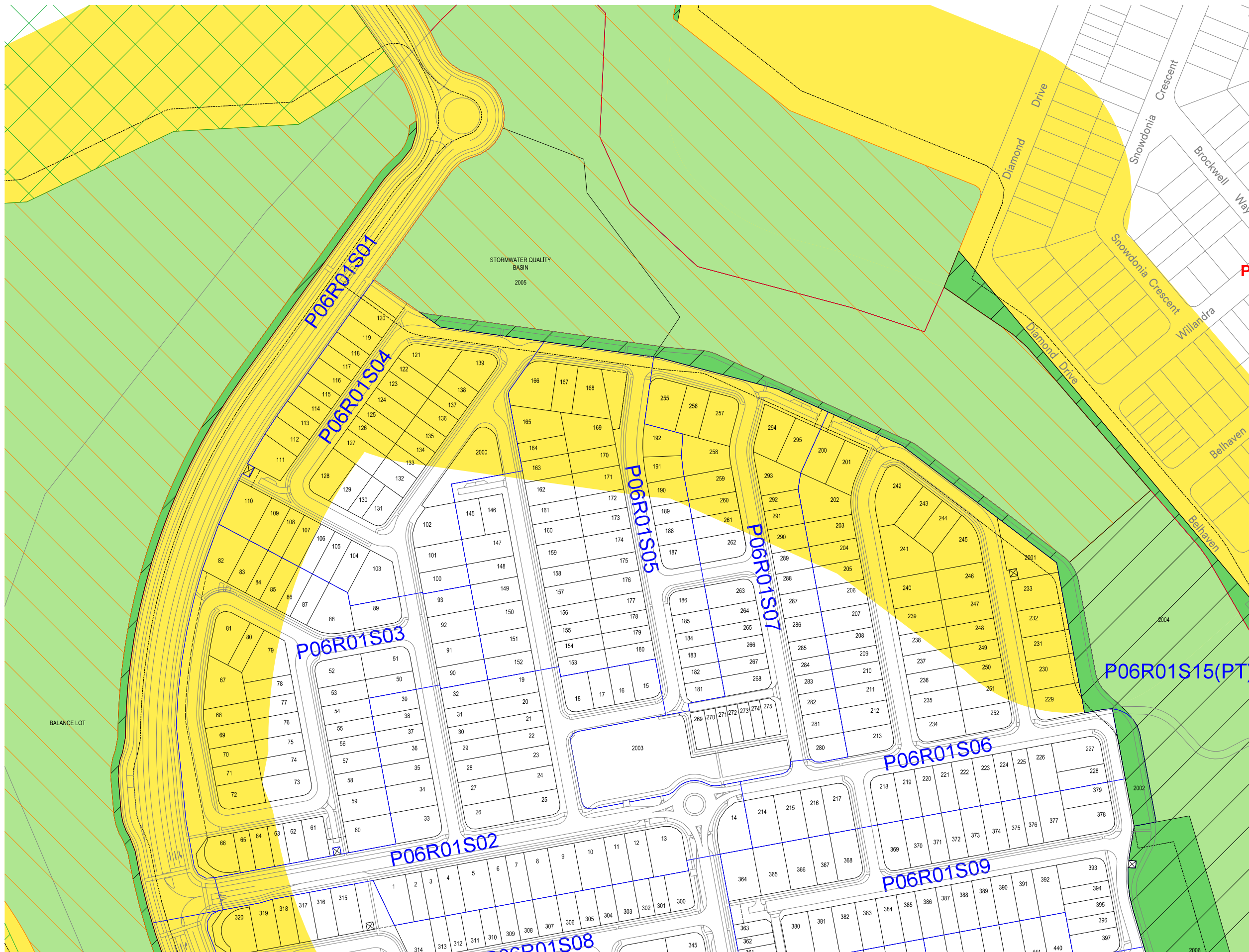
North



- PRECINCT SIX - APPLICATION ONE BOUNDARY
- STAGE BOUNDARY
- LOW BUSHFIRE HAZARD RATING
- MEDIUM BUSHFIRE HAZARD RATING
- MANAGED BUFFER - LATER APPLICATIONS
- POTENTIAL BUSHFIRE IMPACT ZONE
- LINEAR PARK MANAGED
- LINEAR PARK UNMANAGED
- MINIMUM BUILDING SETBACKS

PREPARED BY LENDLEASE ON BEHALF OF
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PLAN INSERTED BY EDQ 21/12/2023



PRECINCT 06 - APPLICATION ONE BUSHFIRE HAZARD ASSESSMENT AND MANAGEMENT PLAN

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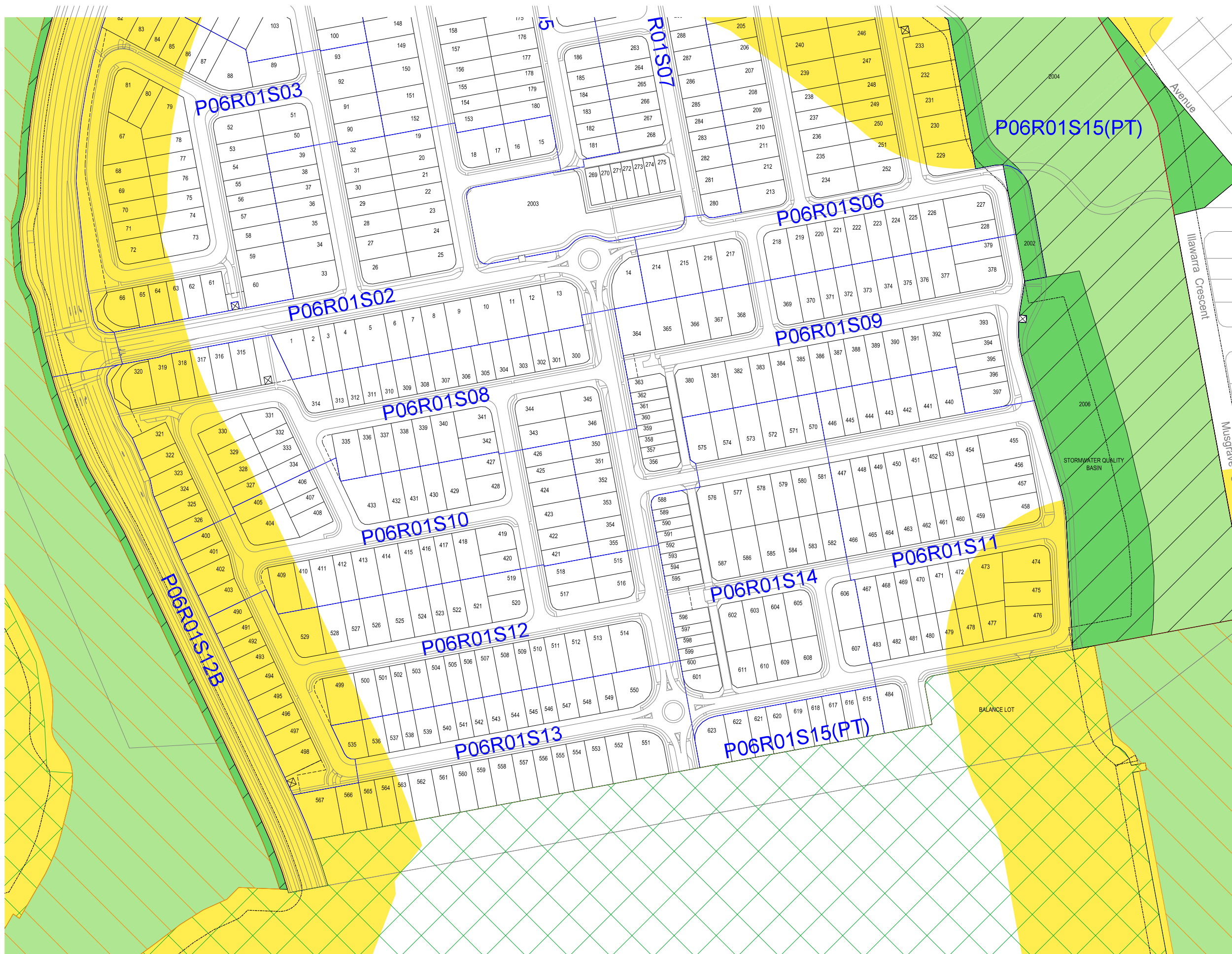
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Scale 1:2,500 at A3



- PRECINCT SIX - APPLICATION ONE BOUNDARY
- STAGE BOUNDARY
- LOW BUSHFIRE HAZARD RATING
- MEDIUM BUSHFIRE HAZARD RATING
- MANAGED BUFFER - LATER APPLICATIONS
- POTENTIAL BUSHFIRE IMPACT ZONE
- LINEAR PARK MANAGED
- LINEAR PARK UNMANAGED
- MINIMUM BUILDING SETBACKS

PREPARED BY LENDLEASE ON BEHALF OF
BUSHLAND PROTECTION SYSTEMS

PLAN INSERTED BY EDQ 21/12/2023



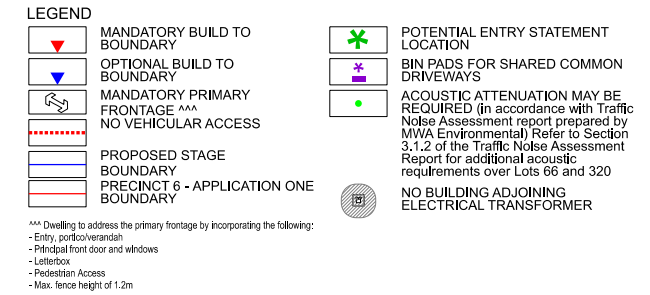
PRECINCT 06 - APPLICATION ONE BUSHFIRE HAZARD ASSESSMENT AND MANAGEMENT PLAN

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0 25 50 75 100 125m

Scale 1:2,500 at A3





LOT TYPE		GROUND FLOOR			FIRST FLOOR			CORNER LOTS - SECONDARY FRONTAGE
		FRONT - PRIMARY FRONTAGE	REAR AND SIDE (to wall)	BUILD TO BOUNDARY	FRONT	SIDE	REAR	
(T1, T2)	TRADITIONAL	3.0	0.9	N/A	3.0	2.0	0.9	1.5
(C2, C3)	COURTYARD	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(P1)	PREMIUM VILLA	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(V)	VILLA	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TCY2, TCY3)	TOWN COURTYARD	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TPV)	TOWN PREMIUM VILLA	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TV)	TOWN VILLA	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TCD)	TERRACE (DUAL FRONTAGE)	2.4	0.5*	0.0	2.4	0.0	0.5	1.0

LOT TYPE		Traditional Town Court	Courtyard Town Court	Premium Villa Town Premium Villa Town Cottage	Villa Town Villa Small Villa Smart	Terrace	Maximum Retaining Height
	EARTHWORKS						
Front Boundaries	Cut Average	1.5	1.4	1.25	1.0	0.5	1.8
Side Boundaries	Cut Average	1.0	0.7	Fill Maximum height of 1.0 m	0.5	0.5	1.0
Rear Boundary	Cut Average	1.5	0.7	0.6	0.5	0.5	1.0
		1.5	0.5	1.5	1.5	1.5	1.8
				Fill Maximum height of 1.0 m			

Diagram illustrating the relationship between Secondary and Primary setbacks. The diagram shows a building footprint on a lot. The front setback (Secondary Setback) is 6m. The lot width is 6m. The primary setback is the distance from the road to the building's side wall. The area between the primary and secondary setbacks is shaded and labeled "NO BUILDING ALLOWED IN THE SHADED AREA".

Date 20 DEC 2023

LEGEND

	MANDATORY BUILD TO BOUNDARY		POTENTIAL ENTRY STATEMENT
	OPTIONAL BUILD TO BOUNDARY		BIN PADS FOR SHARED COMMON DRIVEWAYS
	MANDATORY PRIMARY FRONTAGE - NO VEHICULAR ACCESS		ACOUSTIC ATTENUATION MAY BE REQUIRED (in accordance with Traffic Noise Assessment report prepared by MVA Environmental) Refer to Section 3.1.2 of the Traffic Noise Assessment Report for additional acoustic requirements over Lots 66 and 320
	PROPOSED STAGE BOUNDARY		NO BUILDING ADJOINING ELECTRICAL TRANSFORMER

*** Dwelling to address the primary frontage by incorporating the following:
 - Entry, porch/veranda
 - Hardened front door and windows
 - Letterbox
 - Pedestrian Access
 - Max. fence height of 1.2m

SETBACK TABLE

LOT TYPE	GROUND FLOOR		FIRST FLOOR		CORNER LOTS - SECONDARY FRONTAGE
	FRONT - PRIMARY FRONTAGE	REAR AND SIDE (to wall)	BUILD TO BOUNDARY	FRONT SIDE REAR	
(T1, T2) TRADITIONAL	3.0	0.9	N/A	3.0 2.8 0.8	1.5
(C2, C3) COURTYARD	3.0	0.9	0.0	3.0 1.0 0.9	1.5
(PV) PREMIUM VILLA	3.0	0.9	0.0	3.0 1.0 0.9	1.5
(V) VILLA	3.0	0.9	0.0	3.0 1.0 0.9	1.5
(TCY2, TCY3) TOWN COURTYARD	3.0	0.9	0.0	3.0 1.0 0.9	1.5
(TPV) TOWN PREMIUM VILLA	3.0	0.9	0.0	3.0 1.0 0.9	1.5
(TV) TOWN VILLA	3.0	0.9	0.0	3.0 1.0 0.9	1.5
(C1C3) TERRACE (DUAL FRONTAGE)	2.4	0.9	0.0	2.4 0.8 0.5	1.0

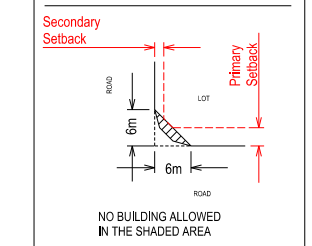
NOTE:
 ALL GARAGES MUST BE SETBACK 5.0m TO THE FRONT WALL AND A FURTHER 240mm TO THE GARAGE DOOR. SETBACKS ARE AS PER TABLE UNLESS OTHERWISE DIMENSIONED. ALL SETBACKS ARE TO WALL (EXCLUDES TCD ALLOTMENTS).
 WHERE THE LOWER FACE OF A REAR BOUNDARY RETAINING WALL EXCEEDS 2M IN HEIGHT THE MINIMUM SETBACK IS 2.8M TO THE GROUND AND SECOND FLOOR OF THE DWELLING.
 * INCLUDES GARAGES

RETAINING WALL HEIGHT TABLE

LOT TYPE	Traditional	Courtyard Town Cottage	Premium Villa Town Cottage	Villa Town Villa Small Villa Smart	Terrace	Maximum Retaining Height
EARTHWORKS	1.5	1.4	1.25	1.0	0.5	1.8
Front Boundary	1.5	1.4	1.25	1.0	0.5	1.8
Side Boundary	1.0	0.9	0.8	0.5	0.5	1.0
Rear Boundary	1.5	1.4	1.25	1.0	0.5	1.8

NOTE: RETAINING WALLS WITH A HEIGHT OF 1.0M OR MORE REQUIRE RPEQ CERTIFICATION

SPECIAL SITING REQUIREMENTS FOR CORNER ALLOTMENTS



THESE CRITERIA MUST BE READ IN CONJUNCTION WITH RESIDENTIAL PLAN OF DEVELOPMENT SHEET 5 OF 5 [DGN No P06-ROL1-POD231220] - DESIGN CRITERIA FOR RESIDENTIAL DEVELOPMENT

PRECINCT 06 - APPLICATION ONE PLAN OF DEVELOPMENT

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LEGEND

	MANDATORY BUILD TO BOUNDARY		POTENTIAL ENTRY STATEMENT LOCATION
	OPTIONAL BUILD TO BOUNDARY		BN PADS FOR SHARED COMMON DRIVEWAYS
	MANDATORY PRIMARY FRONTAGE ***		ACOUSTIC ATTENUATION MAY BE REQUIRED (in accordance with Traffic Noise Assessment report prepared by MVA Environmental) Refer to Section 3.1.2 of the Traffic Noise Assessment Report for additional acoustic requirements over Lots 66 and 320
	NO VEHICULAR ACCESS		NO BUILDING ADJOINING ELECTRICAL TRANSFORMER
	PROPOSED STAGE BOUNDARY		
	PRECINCT 6 - APPLICATION ONE BOUNDARY		

*** Dwelling to address the primary frontage by incorporating the following:
 - Entry, portico/verandah
 - Principal front door and windows
 - Letterbox
 - Potentially Access
 - Max. fence height of 1.2m

SETBACK TABLE

LOT TYPE	GROUND FLOOR			FIRST FLOOR			CORNER LOTS - SECONDARY FRONTAGE
	FRONT - PRIMARY FRONTAGE	REAR AND SIDE (to wall)	BUILD TO BOUNDARY	FRONT	SIDE	REAR	
(T1, T2) TRADITIONAL	3.0	0.9	N/A	3.0	2.0	0.9	1.5
(C2, C3) COURTYARD	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(PV) PREMIUM VILLA	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TV) VILLA	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TCY2, TCY3) TOWN COURTYARD	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TPV) TOWN PREMIUM VILLA	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TV) TOWN VILLA	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TCD) TERRACE (DUAL FRONTAGE)	2.4	0.5*	0.0	2.4	0.5	0.9	1.0

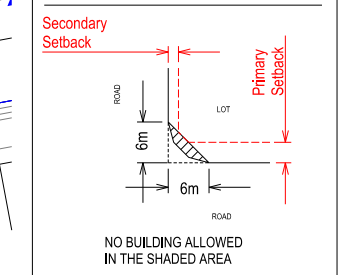
NOTE:
 ALL GARAGES MUST BE SETBACK 5.0m TO THE FRONT WALL AND A FURTHER 240mm TO THE GARAGE DOOR. SETBACKS ARE AS PER TABLE UNLESS OTHERWISE DIMENSIONED. ALL SETBACKS ARE TO WALL (EXCLUDES TCD ALLOTMENTS). WHERE THE LOWER FACE OF A REAR BOUNDARY RETAINING WALL EXCEEDS 2m IN HEIGHT THE MINIMUM SETBACK IS 2.5m TO THE GROUND AND SECOND FLOOR OF THE DWELLING.
 * INCLUDES GARAGES

RETAINING WALL HEIGHT TABLE

LOT TYPE	Traditional	Courtyard Town	Premium Villa Town Cottage	Villa Town Villa Smart	Terrace	Maximum Retaining Height
Front Boundary	1.5	1.4	1.25	1.0	0.5	1.8
Side Boundary	1.0	0.7	0.6	0.5	0.5	1.8
Rear Boundary	1.5	0.7	0.6	0.5	0.5	1.8
Earthworks	1.5	1.5	1.5	1.5	1.5	1.8

NOTE: RETAINING WALLS WITH A HEIGHT OF 1.0M OR MORE REQUIRE REPO CERTIFICATION

SPECIAL SITING REQUIREMENTS FOR CORNER ALLOTMENTS



THESE CRITERIA MUST BE READ IN CONJUNCTION WITH RESIDENTIAL PLAN OF DEVELOPMENT SHEET 5 OF 5 [DGN No P06-ROL1-POD231220] - DESIGN CRITERIA FOR RESIDENTIAL DEVELOPMENT

PRECINCT 06 - APPLICATION ONE PLAN OF DEVELOPMENT

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LEGEND		POTENTIAL ENTRY STATEMENT LOCATION	
	MANDATORY BUILD TO BOUNDARY		POTENTIAL ENTRY STATEMENT LOCATION
	OPTIONAL BUILD TO BOUNDARY		BIN PADS FOR SHARED COMMON DRIVEWAYS
	MANDATORY PRIMARY FRONTAGE ***		ACOUSTIC ATTENUATION MAY BE REQUIRED (in accordance with Traffic Noise Assessment report prepared by MVA Environmental) Refer to Section 3.1.2 of the Traffic Noise Assessment Report for additional acoustic requirements over Lots 66 and 320
	PROPOSED STAGE BOUNDARY		NO BUILDING ADJOINING ELECTRICAL TRANSFORMER
	PRECINCT 6 - APPLICATION ONE BOUNDARY		

*** Dwelling to address the primary frontage by incorporating the following:
- Empty, perforated verandah
- Principal front door and windows
- Letterbox
- Pedestrian Access
- Max. fence height of 1.2m

SETBACK TABLE

LOT TYPE	GROUND FLOOR			FIRST FLOOR			CORNER LOTS - SECONDARY FRONTAGE
	FRONT - PRIMARY FRONTAGE	REAR AND SIDE (to wall)	BUILD TO BOUNDARY	FRONT	SIDE	REAR	
(T1, T2) TRADITIONAL	3.0	0.9	N/A	3.0	2.0	0.9	1.5
(C2, C3) COURTYARD	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(PV) PREMIUM VILLA	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(V) VILLA	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TCY2, TCY3) TOWN COURTYARD	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TPV) TOWN PREMIUM VILLA	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TV) TOWN VILLA	3.0	0.9	0.0	3.0	1.0	0.9	1.5
(TCD) TERRACE (DUAL FRONTAGE)	2.4	0.5*	0.0	2.4	0.0	0.5	1.0

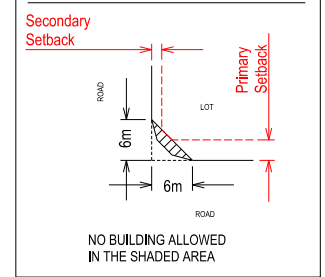
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ALL GARAGES MUST BE SETBACK 5.0m TO THE FRONT WALL AND A FURTHER 240mm TO THE GARAGE DOOR. SETBACKS ARE AS PER TABLE UNLESS OTHERWISE DIMENSIONED. ALL SETBACKS ARE TO WALL (EXCLUDES TCD ALLOTMENTS).
WHERE THE LOWER FACE OF A REAR BOUNDARY RETAINING WALL EXCEEDS 2M IN HEIGHT THE MINIMUM SETBACK IS 2.9M TO THE GROUND AND SECOND FLOOR OF THE DWELLING.
* INCLUDES GARAGES

RETAINING WALL HEIGHT TABLE

LOT TYPE	Traditional	Courtyard Town Courtyard	Premium Villa Town Cottage	Villa Town Villa Small Villa Smart	Terrace	Maximum Retaining Height
EARTHWORKS						
Front Boundaries	Cut Average 1.5	1.4	1.25	1.0	0.5	1.0
Side Boundaries	Cut Average 1.0	0.7	0.6	0.5	0.5	1.0
Fill Average	1.5	0.7	0.6	0.5	0.5	1.0
Rear Boundary	Cut Average 1.5	1.5	1.5	1.5	1.5	1.0
Fill Average	1.5	1.5	1.5	1.5	1.5	1.0

NOTE: RETAINING WALLS WITH A HEIGHT OF 1.0M OR MORE REQUIRE RPEQ CERTIFICATION

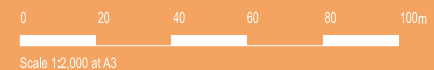
SPECIAL SITING REQUIREMENTS FOR CORNER ALLOTMENTS



THESE CRITERIA MUST BE READ IN CONJUNCTION WITH RESIDENTIAL PLAN OF DEVELOPMENT SHEET 5 OF 5 [DGN No P06-ROL1-POD231220] - DESIGN CRITERIA FOR RESIDENTIAL DEVELOPMENT

PRECINCT 06 - APPLICATION ONE PLAN OF DEVELOPMENT

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Scale 1:2,000 at A3



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Date 20 DEC 2023

- 1. General:**
- i. Easements over infrastructure have not been shown which may affect setbacks. Eaves must not protrude into easements.
 - ii. The maximum height of unattached buildings shall not exceed 8.5m above natural ground level. For attached buildings on lots greater than 450sqm a building height of 10.5m may be permitted as measured from the natural ground level.
 - iii. It is assumed that the pad level of each block will be the average of the four corners of the block.
 - iv. Buildings will be built to this pad level unless the consent of property owners on both sides of the block is obtained to vary the pad level.
 - v. Acoustic treatment may be required for some lots, refer to report prepared by MWA Environmental.
 - vi. Construction standards/setbacks may be affected by bushfire risk. Refer to the Sub-Precinct Specific Bushfire Hazard Assessment and Mitigation Plan for Precinct 6 Application 1 Yarrabilba, prepared by Bushfire Protection Systems Pty Ltd.

- 2. Setbacks:**
- i. Setbacks are as per the Setback Table included on the Plan of Development unless otherwise specified.
 - ii. All setbacks are measured to the wall. No projection will be closer to a side boundary than 450mm including gutter or fascia, with the exception of any eave returning to a build to boundary wall.
 - iii. Front verandah and covered areas to the front door are permitted to extend into the front setback on the condition that the roofed area is not enclosed. For front setbacks, this roofed area can extend to 1.0m from the front property line.
 - iv. The build to boundary line is nominated on this plan. The length of wall built to this boundary is not to exceed 15.0m (excluding the terrace product) unless specified otherwise in a Plan of Development. Parapets are considered to be a wall and are to comply with the Setback table included on the Plan of Development.
 - v. Buildings to be sited in accordance with the 'Special Siting Requirements for Corner Allotments'.
 - vi. Front setbacks on corner lots are determined by the frontage that the primary facade is addressing. The primary frontage is taken to be the frontage where the front door and letterbox is located.
 - vii. Allotments containing or adjoining the lower face of a rear retaining wall exceeding 2.0 metres in height are required to have a minimum rear setback of 2.5m to the rear property boundary from the ground and second floor of the dwelling.

- 3. Site Cover and Amenity:**
- i. Site cover for each lot is not to exceed the following:
 - a. 80% for dual attached lots;
 - b. 65% for build to the boundary lots;
 - c. 60% for lots that do not use a build to boundary;
 - ii. Total outdoor private open space accessible from the ground floor dwelling, either covered or uncovered, should be generally flat without any fall exceeding 70mm vertical or every 1.0 m horizontally. Private outdoor space excludes area for driveways and must include an area with a minimum dimension of 2.4m. The total outdoor space should equal at least 15% of the total site area.

- 4. Parking, Garages and Carports:**
- i. Each allotment must provide one covered car parking space.
 - ii. Carports must include a roof design, design features and materials which are consistent with the form and materials of the home.
 - iii. Carports must include either a garage door at the front or screening to the rear.
 - iv. Any column or wall provided to support a carport must be set back a minimum of 5.0m from the front boundary of the property.
 - v. For garages on front loaded lots less than 10m in width the following criteria must be met:
 - Single storey homes must have a single or tandem garage
 - Double storey homes can have a double garage provided the 2nd floor front wall or balcony is a minimum of 560mm forward of the garage wall.

- 5. Driveways:**
- i. The driveway must be laid at the grade of the adjacent verge area. No grade change to the verge for the construction of a driveway will be allowed.
 - ii. Where there is a footpath within the verge, the driveway prevails, i.e. the portion of the footpath where the driveway crosses is removed.
 - iii. Maximum driveway grades within lots must not exceed 1:5 or 1:4 with transitions at both ends of the driveway.
 - iv. Driveways must be offset at least 300mm from the side property boundary.
 - v. Driveways must be completed prior to occupation and be located as shown on the approved Functional Layout Roadworks Plan, unless otherwise agreed by DSDMIP.
 - vi. Driveways across the verge cannot exceed 3.0m for a single garage or 5.0m for a double garage.
 - vii. Driveways, unless varied by a provision above, shall accord with Logan City Council's standards (except for the driveway siting requirements in relation to intersections which is as per the approved POD). Prior to construction, approval from Logan City Council for Vehicular Access to Residential Premises is required.

- 6. Retaining Walls, Earthworks and Sloping Land (where occurring following construction by Lendlease):**
- i. Retaining wall heights must not exceed those nominated in the Retaining Wall Heights table included on the Residential Plan of Development.
 - ii. If these requirements are not able to be achieved, construction methods other than slab on ground construction are to be used.
 - iii. If elevated construction is to be used, under floor services must be located or screened to minimise their appearance to adjoining properties and public spaces.
 - iv. Retaining walls along street or park frontages cannot exceed 1.0 m in height. A planted strip of a minimum width of 500mm must exist between any terraced retaining walls.
 - v. Retaining walls to side boundaries between lots cannot exceed 1.8 metres high at the front wall of the house and must taper down to natural ground level forward of the house.
 - vi. Retaining walls over 900mm high require a 1 metre high fence above the wall and adequate landscape screening.
 - vii. Where the block allows for build to the boundary, the build to the boundary wall must be projected to 150mm below the likely pad level of the adjacent block. The pad level can be assumed to be the average of the four corners of the adjacent block using the As Built levels. The build down or the build to boundary wall must be in a material consistent with the wall above it.
 - viii. The front wall of the home must not be more than 50% below the midpoint level of the front boundary.

7. External Building Materials:
No raw, unfinished or untreated materials are permitted for external building works. This includes galvanised iron, zinc or aluminium coated steel, corrugated or unpainted fibre cement sheeting and bare, painted or uncoloured concrete block work or commons brickwork.

- 8. Front Facade Articulation:**
- i. Facades of the home fronting the street must include a highly visible entry and include a substantial verandah or include two materials or finishes to the entry.
 - ii. Homes must include articulation between the alignment of the front wall and the garage on the primary frontage. The minimum acceptable alignment variation is 560mm. Garages are permitted to be a maximum 1.0m forward of the front building wall where the roof of the entry is positioned forward of the roof of the garage.
 - iii. Double storey homes which incorporate a verandah or balcony to the first floor to at least 40% of the front elevatio width do not require articulation between the alignment of the front wall and the garage.

9. Homes with more than one Visible Facade (Corner Homes/Homes with frontage to park):
Homes on corners or with park frontage must provide feature windows and detailing to match the front elevation along the secondary frontage or extend the detailing of the priority street facade to the front four metres of the secondary frontage.

- 10. Fencing:**
- i. Any fencing on the primary street frontage is to be a maximum of 1.2 metres in height and decorative in style, except for regulation fencing required around pools.
 - ii. Fencing up to 1.5 m in height will be permitted on primary street frontages if it is:
 - a. an open style fence that is 50% transparent, or
 - b. is a courtyard wall constructed of face brickwork or masonry piers with coloured render or textured finish
 - iii. Fencing provided to a secondary street frontage can be up to 1.8 metres in height and must be decorative fencing.
 - iv. All side fencing must either return to the house a minimum of 1.0 metre behind the front building line or continue forward of the front building line as decorative fencing.
 - v. Decorative fencing is to be constructed of rendered and painted masonry piers or painted or stained posts, with infill panels of coloured metal tube, painted or stained timber palings or horizontal battens. Timber paling fences will only be accepted if they are painted and treated with decorative capping or trims and provided with pronounced posts.
 - vi. Secondary street frontage fencing must finish 4 metres behind the front wall of your home.
 - vii. Untreated or coloured metal sheeting or fibrous cement is not acceptable as a decorative fence.
 - viii. Fencing and retaining walls erected by Lendlease must not be altered, removed or modified in any way, without the prior written approval from Lendlease.

11. Landscaping:
At least 50% of your front yard is landscaped with grass and/or garden beds. 25% of the front yard must be planted garden beds with trees and/or shrubs capable of growing to 3 metres tall and at least 600mm high at the time of planting. Refer to the preferred Yarrabilba plant species list for guidance.

- 12. Outdoor Structure and Services**
- i. All outdoor structures visible from the street or public spaces including but not limited to, roof or wall mounted air-conditioning units, satellite dishes, antennas, sheds, water tanks and clotheslines must be suitably screened and located to minimise detrimental visual impact.
 - ii. Solar panels and collectors for hot water units are the exception to this standard when orientated to maximise their effectiveness.

- 13. Houses on Narrow Residential Lots (10m-12.49m in width)**
Houses on Lots 10m-12.49m in width must adhere to the following design criteria:
- i. The front facing building wall, which comprises the garage door must not exceed an external width of 5.7m.
 - ii. The garage door:
 - a. Width must not exceed 4.8m;
 - b. Must have a minimum 450mm eave above it;
 - c. Must be setback a minimum of 240mm behind the garage door wall and
 - d. Must have a sectional, tilt or a roller door.
 - iii. The front facade of the dwelling must be forward of the alignment of the garage wall and must include the following:
 - a. A front entrance door and windows and a side light is required where there is no habitable room facing the street.
 - b. A front verandah, portico or porch located over the front entrance, which extends a minimum of 1600mmmm forward of the entrance door.
 - c. The verandah, portico or porch is to include front piers with distinct materials and / or colours.

- 14. Residential Lots with Park Frontage**
- i. Fencing along park frontages must be:
 - a. 1.2m high solid; or
 - b. Up to 1.8m high if containing openings that make it more than 50% transparent.
 - ii. Dwellings are designed to include habitable rooms that face the park.

15. Secondary Dwellings

Minimum Lot Size	Secondary dwellings are not permitted on lots less than 400sqm in size.
Floor Area of Secondary Dwelling	Maximum 60sqm GFA
Design and Siting of buildings and structures	The dwelling / secondary dwelling must have the design effect of one (1) single dwelling from the road / street frontage or within public view.
Materials and Detailing	Materials, detailing, colours and roof forms and consistent with those of the primary house.
Outdoor Living Space	Minimum 9sqm with a minimum dimension of 3m and directly accessible from a main living area.
Driveway	The secondary dwelling must share the driveway of the primary dwelling.
Car Parking and Garaging	Minimum one space in addition to the primary dwelling requirement – with minimum dimensions of 5m x 3m.
Street Surveillance	On a single street frontage, the secondary dwelling entry must be hidden from view from the street, so as to give the effect that the home is one (1) single residential dwelling.
Letterboxes	Any secondary dwelling is not permitted its own letterbox and must be shared with the primary dwelling.
Titling	Any secondary dwelling is unable to be separately titled to the primary dwelling.
Separate Services	No separate infrastructure servicing to the secondary dwelling is permitted (i.e., water, gas, electricity).

16. Electronic Vehicle Readiness:
Each dwelling is to include a separate dedicated electrical circuit (conduit and wiring) into the garage or carport to enable the installation of Electric Vehicle Supply Equipment. Where not used for Electric Vehicle Supply Equipment, the circuit is to be fitted with a minimum 15amp GPO outlet.

- 17. Design Criteria for Multi Family Strata (MFS) Lots (Constitutes Multiple Residential Development)**
- i. MFS lots are identified on this Plan of Development and can be developed for the purpose of a House or Multiple Residential development (i.e., two or more dwellings on a single lot).
 - ii. The maximum number of dwellings per MFS lot is shown on this Plan of Development and must not be exceeded.
 - iii. Where an MFS lot is to be developed as Multiple Residential, the following design criteria apply:
 - a. The Multiple Residential development must address all street frontages and present with the appearance of a traditional house.
 - b. Each dwelling comprising the Multiple Residential development must include a laundry, food preparation area, sanitary facilities, bin storage and clothes drying areas.
 - c. Bin storage and clothes drying areas must not be visible from any street frontage.
 - d. The Multiple Residential development must be sited in accordance with this Plan of Development.
 - e. The Multiple Residential development must address all streets as primary frontages with a minimum of one (1) dwelling per frontage.
 - f. All buildings with a width of more than 10 metres that are visible from a road or a park, are to be articulated to reduce the mass of the building by one or more of the following
 - i. Windows are recessed into the facade;
 - ii. Balconies, porches or verandas are provided;
 - iii. Window hoods are provided; or
 - iv. Shadow lines are created on the building through minor changes in the facade (100mm minimum).
 - g. Lots that have a park frontage are to address the park through the inclusion of at least three of the following design elements:
 - i. A verandah, porch or portico;
 - ii. Awning and shade structures;
 - iii. Variation to roof and building lines;
 - iv. Inclusion of window openings; or
 - v. Use of varying building materials and treatments.
 - h. The extent of garages must not exceed 40% of the lot frontage on any street frontage, except where Houses on Narrow Residential Lots requirements are met.
 - i. Private open space must be provided at a minimum rate of 25sqm for each dwelling comprising the Multiple Residential development and must:
 - i. Incorporate a minimum of one single area of 16m² on the ground floor, or 12m² for elevated areas of outdoor living space;
 - ii. Primary outdoor spaces must be accessible from indoor living spaces and must have a minimum dimension of 4.0 metres for ground level living or 2.0 metres for elevated outdoor living spaces.
 - iii. Primary spaces must not have a slope of more than 10%; and
 - iv. Private outdoor living spaces must be clearly delineated for each dwelling.
 - j. Site cover for MFS lots shall not exceed 50%.

- 18. Criteria for Variations to an approved plan assessed via compliance assessment**
Applications for compliance assessment to vary the layout must be in accordance with the criteria outlined below. Changes that are not in accordance with these criteria will require lodgement of a change application, pursuant to Section 99 of the Economic Development Act 2012.
- i. Minor variation to the boundaries of parks subject to achieving the following:
 - a. The size of the park does not vary by +/- 5%;
 - b. The boundary of a park does not vary by more than 10m in any direction; and
 - c. No change to the location and classification of the proposed park are made; and
 - d. Minimum park size and embellishments under Community Greenspace IMP and EDQ Park Planning and Design Guideline 12 and met; and if it is required to accommodate a pad mount transformer- with a maximum area of 5m x 5m.
 - ii. Minor variations to the road network subject to achieving the following:
 - a. The classification of the road is not varied;
 - b. The location of a road is moved by not more than 10m in any direction;
 - c. Any change to a road location does not result in a new intersection within 50m of another intersection; and
 - d. The change of the road does not result in a block length of more than 200m; and
 - e. Retains grid or modified grid responsive to site characteristics; and
 - f. Does not result in an additional cul de sac; and
 - g. Demonstrate the variation accords with provisions within Guidelines 5, 6 and 13.
 - iii. Variation to lots subject to achieving the following:
 - a. The total number of lots is within +/- 5% of the number of lots already approved; and
 - b. The footprint of the lots is within the existing residential lot footprint (with the exception being where a road is moved in accordance with the provisions in Item b(i) above; and
 - c. It can be demonstrated where a lot increase is proposed that adequate on-street parking exists for visitors to the lots; and
 - d. Where a paramount transformer is required- max 5m x 5m.
 - iv. Variation to the approved POD where:
 - a. To amend setbacks as a result of a lot change; or
 - b. To change the location of a built to boundary wall or driveway.
 - c. It is noted a compliance assessment process cannot be used once any lot in the stage subject to the change has been sold.
 - v. Variations to staging or creation of sub-stages:
 - a. Permitted when not resulting in a park being created in a stand-alone stage or where a park is in the final stage with less than 10 residential lots associated with it.

Where a variation is proposed, the applicant must submit to EDQ for compliance assessment:

- i. A statement demonstrating compliance with the criteria above and relevant section of PDA Guidelines and Practice Notes.
- ii. Where minor variations are required due to detailed engineering design a statement outlining the
- iii. Reason for the variation and how the variation responds to Guidelines 13-Engineering Standards.
- iv. Updated ROL and POD plans as applicable.
- v. Updated Functional Layout Plans (if applicable)



PRECINCT 06 - APPLICATION ONE - PLAN OF DEVELOPMENT - DESIGN CRITERIA

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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.

Appendix 4: Being Prepared

Knowing how to prepare your property for bush fire, both pre-fire and during a fire, can assist in protecting people and property. It can also alleviate a lot of the stress and panic and the feeling of helplessness that is commonly felt by the inexperienced and by the ill-prepared.

It is generally accepted that South East Queensland does not experience the same degree of extreme fire conditions as the southern states of New South Wales, Victoria and South Australia. Having said this it is also accepted that this State's bushland experiences a relatively regular fire regime. From time to time conditions may occur that will institute a serious and potentially destructive fire. These conditions can be recognised and precautions taken. It must be remembered that during extreme fire conditions the fire services may be stretched to the limit and may not be able to respond immediately to your particular emergency. Fire trucks and fire fighters are a limited resource, so it is important that they are deployed in an appropriate manner to best manage the fire. The Queensland Fire and Rescue Service do not guarantee a fire truck will be available to defend every structure during a large bushfire. So, it would be desirable to be as prepared and self-reliant as possible to protect yourself, your family and your assets. It is not difficult if appropriate preparation is undertaken, and the following information is provided to be of some assistance.

1. Conditions that may lead to a Serious Fire:

- 1.1. Higher than average air temperatures for prolonged periods.
- 1.2. Large and very dry fuel loads.
- 1.3. Prolonged dry spell with little or no rain resulting in low soil moisture content.
- 1.4. Very low relative humidity, ie. there is very little moisture in the air.
- 1.5. Strong and gusty winds, usually from the north through to the west contribute to increased fire hazard. The longer these winds continue the drier the conditions become, and the higher the risk of serious fire.

Observation of local weather conditions past and present will give the best indication of the potential intensity of a fire at any given time or place.

Notification of potential bushfire conditions are available from the Queensland Rural Fire Service and Local Brigades, in the form of Fire Danger Ratings often seen on roadside signs, Advice Messages, Watch and Act Messages and Emergency Warnings. More information on these information sources, where to find them and what they mean, is available on the Rural Fire Service Website www.qfes.qld.gov.au/bushfires or through the local Fire Brigade.

2. Basic Fire Behaviour.

Having some idea of what a fire is likely to do in your local area, will help you make the right decisions and give you the confidence to deal with an approaching fire if necessary. Following are some basic fire behaviours.

- 2.1. Fire will travel faster and hotter uphill. The steeper the slope the faster the rate of spread, in some cases allowing little time to react. The speed of a fire will double for every 10 degrees of upslope.
- 2.2. Fire will usually travel relatively slower down hill even with reasonably high fuel loads, which will give more time to prepare. The speed of a fire will halve for every 10 degrees of down slope.
- 2.3. A fire will generally travel faster and at higher intensities with a wind behind it. The stronger the wind, the faster the rate of spread. Likewise, a fire will slow considerably when burning against the wind in some cases it may even go out.
- 2.4. The fire will usually burn at a higher intensity and spread faster during the hottest times of the day and tend to slow down considerably as the evening approaches and air temperatures drop.
- 2.5. The greater the supply of dry ground fuel available to the fire, ie. grass, dry leaf litter, hanging bark and twigs, the greater the intensity of the fire. If the ground fuel is minimised the intensity of the fire reduces considerably and so does the personal risk and the potential for damage.
- 2.6. If ground fuels are kept relatively low the chances of a fire progressing into the treetops (crown fire) would be considerably reduced within the Queensland coastal bushlands. For a fire to progress into the treetops ground fuels and elevated fuels must be present providing a 'ladder' of fuels from ground level to treetop. Control of these fuels is the best way of minimising fire intensity and therefore limiting the destructiveness of a bushfire.

Talk to neighbours that have been present during previous bushfires or consult the local Fire Brigade to develop an understanding of usual fire behaviour for your specific location.

3. Preparing for the bushfire season.

Most cases of damage to property are caused by radiated heat, direct flame contact or most commonly by burning debris or sparks landing in, on, or around buildings and starting small spot fires which if not attended to may destroy the property long after a fire front has passed. There are many steps that should be taken prior to the onset of a fire season to help protect your property.

- 3.1. Keep ground fuel cleared from around buildings such as long dry grass, branches, dead leaves, bark and thick undergrowth.
- 3.2. Remove elevated fuels, such as hanging bark and fallen debris hung up on lower branches.
- 3.3. Ensure fire breaks/trails/buffers are checked and maintained, even a well-watered lawn can be an effective firebreak.
- 3.4. Flammable material around buildings should be kept well clear, such as firewood piles, rubbish, fuels, hazardous materials, plant pots, boxes, paper, patio and garden furniture.
- 3.5. Ensure flammable materials are not stored in open areas under the building.

- 3.6. Make sure that rainwater gutters are kept clear of leaf litter build-up. Consider a method of blocking off down pipes so gutters can be filled with water during a fire to extinguish sparks landing in gutters. There are commercially made products available or you can create your own.
- 3.7. Make sure that the roofing is well secured, as winds created during a fire may lift roofing and allow the entry of burning-embers into the roof space. Also clear any leaf litter or debris build-up from roof areas.
- 3.8. All windows and vents should be screened with fine wire mesh and all roof areas closed in to prevent entry by sparks.
- 3.9. Ensure gas tanks have their emergency relief valves facing away from the building (this includes barbeque bottles).
- 3.10. Make sure of reserve water supplies. Power frequently fails during a fire. If petrol or diesel pumps are available, make sure they and associated hoses and fittings are in good working order.
- 3.11. Ensure your bushfire survival kit is up to date and complete.

The Queensland Fire and Rescue Service provide detailed lists for preparation prior to fire season and what to do during a bushfire event. This information can be found at www.qfes.qld.gov.au/bushfires or obtained from your local fire brigade.

4. Green Fire Breaks

Added protection from bushfire can be achieved by establishing green fire breaks which include green lawns, trees arranged to create a shield to catch sparks or fire brands or the expanding of tropical rainforest species. Excess rainwater or tertiary treated waste water could be stored and used for this purpose during dry periods to maintain the green fire breaks. Trees and shrubs not subject to drought stress will cope better during bushfires. The higher the moisture content in the plant the slower it burns. Therefore, by keeping the surrounding area green and low in dry ground fuel, the intensity of an approaching fire will be reduced, and the risk of spot fires minimised.

5. Personal Protection

- 5.1. If you plan to evacuate, make sure you do so early, long before the fire front arrives. Evacuating at the very last moment results in the majority of deaths at bushfires. People remaining to fight the fire need to be physically and mentally fit to do so.
- 5.2. Those staying to protect the property should make sure they protect themselves from radiant heat, flying embers, smoke and most importantly heat stress. Protection measures should include the following:
 - Long trousers and long sleeve shirt made of wool, denim or cotton (no synthetics)
 - Woollen socks and sturdy work boots for foot protection
 - Goggles for eye protection
 - A good pair of work gloves to protect hands from burns
 - A smoke mask or a damp cloth (non-synthetic), to cover your nose and mouth to protect you from inhaling smoke and embers.

- Have plenty of drinking water available to protect against dehydration (not refrigerated as this can cause cramping).

5.3. During the fire

When a fire is approaching and given that you have already carried out your pre-fire precautions, established adequate buffers, implemented mitigation measures and established the degree of risk to your property, protection from the actual fire should be relatively straight forward.

5.3.1. Dress in the appropriate clothing and be sure to drink water regularly.

5.3.2. Fill up bathtubs, sinks, buckets, laundry tubs etc. in case of blackouts.

5.3.3. Close doors and windows.

5.3.4. Close gaps under doors and windows with wet towels.

5.3.5. Block up down pipes, wet down roof, walls and gardens, paying particular attention to the side the fire is approaching from.

5.3.6. Have a battery-powered radio on hand to listen for information about the fire's progress from local radio stations.

5.3.7. Patrol your property while the fire is approaching and take shelter inside as the fire front passes. Then continue patrolling the property for many hours after it has passed, to ensure that any spot fires or smouldering debris do not get a chance to develop into a major fire, paying particular attention to the roof cavity of your buildings. Smouldering embers have been known to start fires hours or even days after the initial passing of the bushfire front.

The Queensland Fire and Rescue Service provide detailed lists for preparation prior to the arrival of a bushfire and what to do during a bushfire event. This information can be found at www.qfes.qld.gov.au/bushfires or obtained from your local fire brigade.

6. Further Information?

The local fire brigade is a good source of local district knowledge, they also have pamphlets and literature produced by the Queensland Fire and Rescue Service available. Most brigades will also be happy to advise local residents.

The information provided above is only a basic guide. Further and more details information is available from the Queensland Fire and Rescue Service. It would be recommended that residents in bushfire prone areas prepare a 'Bushfire Survival Plan', which is available from the Queensland Rural Fire Service website at www.qfes.qld.gov.au/bushfires. The 'Bushfire Survival Plan' document provides information on Bushfire Danger Ratings, Community Warning Information, how to prepare your property, what to do in the event of a bushfire and what to expect. The Bushfire Survival Plan should be updated annually. Further information is also available through the Prepare•Act•Survive brochure also available on the Rural Fire Service website. For further information contact your local Fire Brigade for assistance or phone 1300 369 003.

Appendix 5: Fire Trails

Recommendations for Fire Trails

Fire trails can be a very effective tool in the management of bushland, for weed control, hazard reduction requirements, prescribed burns and fire suppression activities. A good well maintained trail network can effectively enhance and maintain desired ecosystems, while providing added safety for the protection of life and property. The following is some ways in which fire trails can be constructed and maintained to improve their viability.

1. Fire trails should preferably be constructed to a cleared width of 6 metres and a formed width of 4 metres, and be able to be negotiated by light and medium 4 wheel drive fire appliances.
2. They should preferably have a maximum gradient of 25%, a maximum cross slope of 5%, avoid large cut and fill and avoid sharp corners.
3. Fire trails up to 25% can be of compacted earth surface designed with water shedding devices, such as pipes under trail, woa boys or change of gradients, to prevent washouts or gouging of slopes. It would also be advantageous in some cases if grass coverage can be established, which with periodic slashing or mowing will assist in preventing washouts.
4. Fire trails should have access at each end and multiple access/egress points where possible.
5. Fire tails are to have passing and turn around areas at maximum intervals of 400 metres.
6. Periodic management of ground fuel levels along the edges of fire trails should be implemented to at least one metre each side to improve accessibility during a fire event.
7. Trees alongside fire trails should have low branches removed to a height of 2 metres to assist in preventing fire from climbing into treetops. Branches overhanging fire trails should be removed to a minimum height of 4 metres to ensure access by fire vehicles.
8. Fire trails should be inspected each year prior to fire season, to ensure their condition and carry out remedial work if required.
9. Dead or dying trees that are close to fire trails and may pose a risk to fire services should be removed.
10. Fire trails should not be seen as fire breaks. They are an aid in the management of fuel levels and fire suppression activities.
11. Fire trails should be identifiable to land managers and fire services by signage and map records. Where a fire trail network exists, intersections should also be identifiable.



Bushland Protection Systems

Specialising in

BUSHFIRE HAZARD

PLANNING & MITIGATION

ABN 97 782 336 595 | Phone: 07 5546 7933 | PO Box 40, Ormeau, Qld, 4208 | E-mail: admin@bpsfire.com.au

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.