



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

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**UPDATED
BUSHFIRE HAZARD ASSESSMENT AND
MITIGATION PLAN**

**PROPOSED MIXED INDUSTRY BUSINESS AREA
IN
Sub-Precinct 5A
Yarrabilba**

**FOR

Lendlease**

**DATED

16th January 2023**

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

Approval no: DEV2022/1306
Date: 3 February 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	16/05/22	Draft BMP	Brett Bain	
2	29/06/2022	Finalised BMP	Brett Bain	
3	16/01/2023	Amended Site Layout	Brett Bain	

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1. Background

This plan is for the proposed Mixed Industry Business Area (MIBA) in Sub-Precinct 5A of Yarrabilba, as shown in Appendix 1 of this report.

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

- 1.1.** Precinct 2A & Part of Precinct 5 - Plan of Subdivision, drawn by RPS, Plan Ref. 124141-48, Revision I, Dated 12/1/23, is attached as Appendix 1.

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.
- 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 5A is located at the northern end of Precinct 5 MIBA and consists of industrial/commercial 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.

The power line easement area (to the north and northeast), is to be managed by regular slashing in accordance with the approved Concept BMP, providing a ‘Not Bushfire Prone Area’ rating. To the west is Tamborine Waterford Road, with managed properties opposite, providing a ‘Not Bushfire Prone Area’ hazard rating.

The bushland exposure for the area is along the southern boundary of the sub-precinct. Along the southern boundary is to be a vegetated corridor which would be assigned a Vegetation Hazard Class (VHC) 16.1 with associated fuel loads of up to 16t/Ha, over a slope of up to 4 degrees with 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. Much of the southern boundary will have a high retaining wall interfacing with the vegetated corridor.

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, proposed Lots 17-19, 22-27, 35-39 & 43-49 would be assigned a 'Medium' hazard rating, while the remaining lots in Sub-Precinct 5A, 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 to the south and north. It is considered unlikely that access/egress would be compromised by bushfire.

3.2. Driveways

Being industrial/commercial allotments, the driveways would be short and direct.

3.3. Trails

A fire trail is to be installed to the south/southeast of Lots 19, 37, 48 & 49 providing vehicle access between the lots and bushland that don't have road separation. Due to the presence of the retaining wall it is recommended that the fire trail is located at the base of the wall so as to allow access to the open space corridor for fire suppression and hazard reduction activities. Connection is to be provided to Tamborine Waterford Road, to the main north-south road through the precinct and to the trail network in the power line easement.

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 2 on fire trails is included in this report as a guide on establishing and maintaining fire access trails.

4. Appropriate Building Location

The proposed allotments are located on relatively level ground with a short slope down to the vegetation corridor in the south, away from steep slopes and ridgelines, in an already disturbed area.

The State Planning Policy 7/17 support document - Bushfire Resilient Communities Technical Reference Guide 10/19, requires a separation distance between buildings and unmanaged bushland that limits the radiant heat flux impact on the building to less than 29kW/m² when assessed under the methodology specified in the Bushfire Resilient Communities Technical Reference Guide 10/19. The minimum distance equates to 16 metres separation between buildings and bushland in this location.

Future buildings on Lots 19, 37, 48 & 49 are to have a minimum 10 metre setback from the south and southeast bushland boundaries, which combined with the 6 metre wide fire trail provides a minimum separation of 16 metres from unmanaged bushland. The 10 metre setback may include driveways or carparking.

Vulnerable Uses, Community Infrastructure for Essential Services and Hazardous Material Sites (as defined in Table 7 of the State Planning Policy – state interest guidance material – Natural hazards, risk and resilience – Bushfire 12/19), see Table 4.1 below, are preferably not located in a bushfire prone area (within 100 metres of bush). If an overriding community need for the use to be in a bushfire location can be proven and it cannot go anywhere else, then these uses must have a separation distance that achieves a 10kW/m² radiant heat flux or less, which equates to a minimum distance of 38 metres for those uses in this location.

Table 4.1: Vulnerable Use, Community Infrastructure & Hazardous Materials

Group	Uses
Vulnerable uses	<i>childcare centre, community care centre, detention facility, educational establishment, hospital, nature-based tourism, relocatable home park, rooming accommodation, residential care facility, resort complex, retirement facility, tourist park</i>
Community infrastructure for essential services	<i>educational establishment, emergency services, hospital</i>
Hazardous materials in the context of bushfire hazard	Hazardous chemicals that are present at the levels or in the quantities that would constitute the use being a hazardous chemical facility Hazardous materials that are present in the quantities identified in the Work Health and Safety Regulation, schedule 15

Table 7 – Vulnerable uses, community infrastructure for essential services and materials that are hazardous in the context of bushfire hazard

5. Appropriate Clearing and Landscaping

The proposed 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 vegetation corridor to the south should 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.

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*).

As Sub-precinct 5A is an industrial/commercial area, future buildings will not be Class 1, 2, 3 or associated 10A structures and therefore the bushfire requirements of the NCC, including AS3959-2018, are not applicable.

Under the soon to be adopted NCC 2022 preview (expected to be adopted in September 2022), there are proposed new bushfire mitigation requirements for certain Class 9 buildings in or within 100 metres of bushfire prone areas. It is expected that this will apply for building applications lodged after NCC 2022 is adopted. These structures include difficult to evacuate facilities, such as early childhood centres, primary and secondary schools, residential care buildings, health-care buildings (as defined in the NCC 2022). If any buildings associated with these uses are proposed within 100 metres of the south/southeast bushland, additional requirements may be applicable and further advice should be sought at building application stage.

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

Buildings are to have external taps and hoses (or hose reels) 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. Occupants should maintain good access around their buildings 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 lot owners and occupants 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

- A fire trail is to be installed to the south/southeast of Lots 19, 37, 48 & 49 providing vehicle access between the lots and bushland that don't have road separation. Due to the presence of the retaining wall it is recommended that the fire trail is located at the base of the wall so as to allow access to the open space corridor for fire suppression and hazard reduction activities. Connection is to be provided to Tamborine Waterford Road, to the main north-south road through the precinct and to the trail network in the power line easement.
- 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.
- Future buildings on Lots 19, 37, 48 & 49 are to have a minimum 10 metre setback from the south and southeast bushland boundaries, which combined with the 6 metre wide fire trail provides a minimum separation of 16 metres from unmanaged bushland. The 10 metre setback may include driveways or carparking.
- Vulnerable Uses, Community Infrastructure for Essential Services and Hazardous Material Sites (as defined in Table 7 of the State Planning Policy – state interest guidance material – Natural hazards, risk and resilience – Bushfire 12/19), must have a minimum separation of 38 metres from unmanaged bushland.
- The proposed 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 vegetation corridor to the south should 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, should not be used as revegetation/rehabilitation/regeneration plantings in urban interface areas.
- 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.
- As Sub-precinct 5A is an industrial/commercial area, future buildings will not be Class 1, 2, 3 or associated 10A structures and therefore the bushfire requirements of the NCC, including AS3959-2018, are not applicable.
- 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.
- Buildings are to have external taps and hoses (or hose reels) 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. Occupants should maintain good access around their buildings 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 lot owners and occupants 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 occupants and fire services in attending to a bushfire threat.

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/working in a bushfire prone area must take the precautions necessary to protect themselves, their families and their homes/premises 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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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

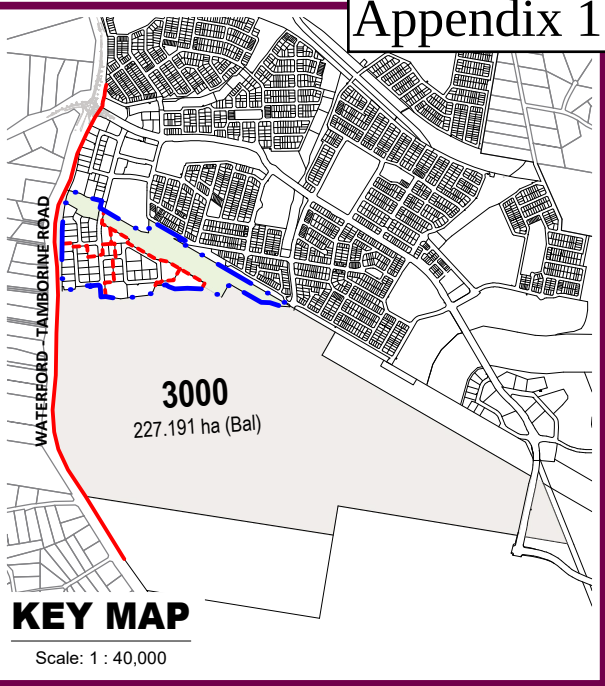
Australian Building Codes Board, National Construction Code (NCC) Volumes 1 & 2

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

Development Statistics						
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Overall
Mixed Industry and Business Allotments	15	19	15	—	—	49
Total Stage Area	6.241 ha	5.703 ha	7.553 ha	1.341 ha	10.487 ha	31.325 ha 100.0%
Saleable Area						
Mixed Industry and Business	3.235 ha	4.341 ha	6.081 ha	—	—	13.657 ha 43.60%
Total Area of Allotments	3.235 ha	4.341 ha	6.081 ha	—	—	13.657 ha 43.60%
Open Space						
Open Space Lots (Powerline Corridor)	1.740 ha	—	—	—	10.487 ha	12.227 ha 39.03%
Stormwater Treatment Area	—	—	—	1.341 ha	—	1.341 ha 4.28%
Total Open Space	1.740 ha	—	—	1.341 ha	10.487 ha	13.568 ha 43.31%
Roads						
Collector Road (24.6m Wide)	0.604 ha	0.543 ha	—	—	—	1.147 ha 3.66%
Local Access Road (20.6m Wide)	0.662 ha	0.819 ha	1.472 ha	—	—	2.953 ha 9.43%
Total Road Area	1.266 ha	1.362 ha	1.472 ha	—	—	4.100 ha 13.09%



Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

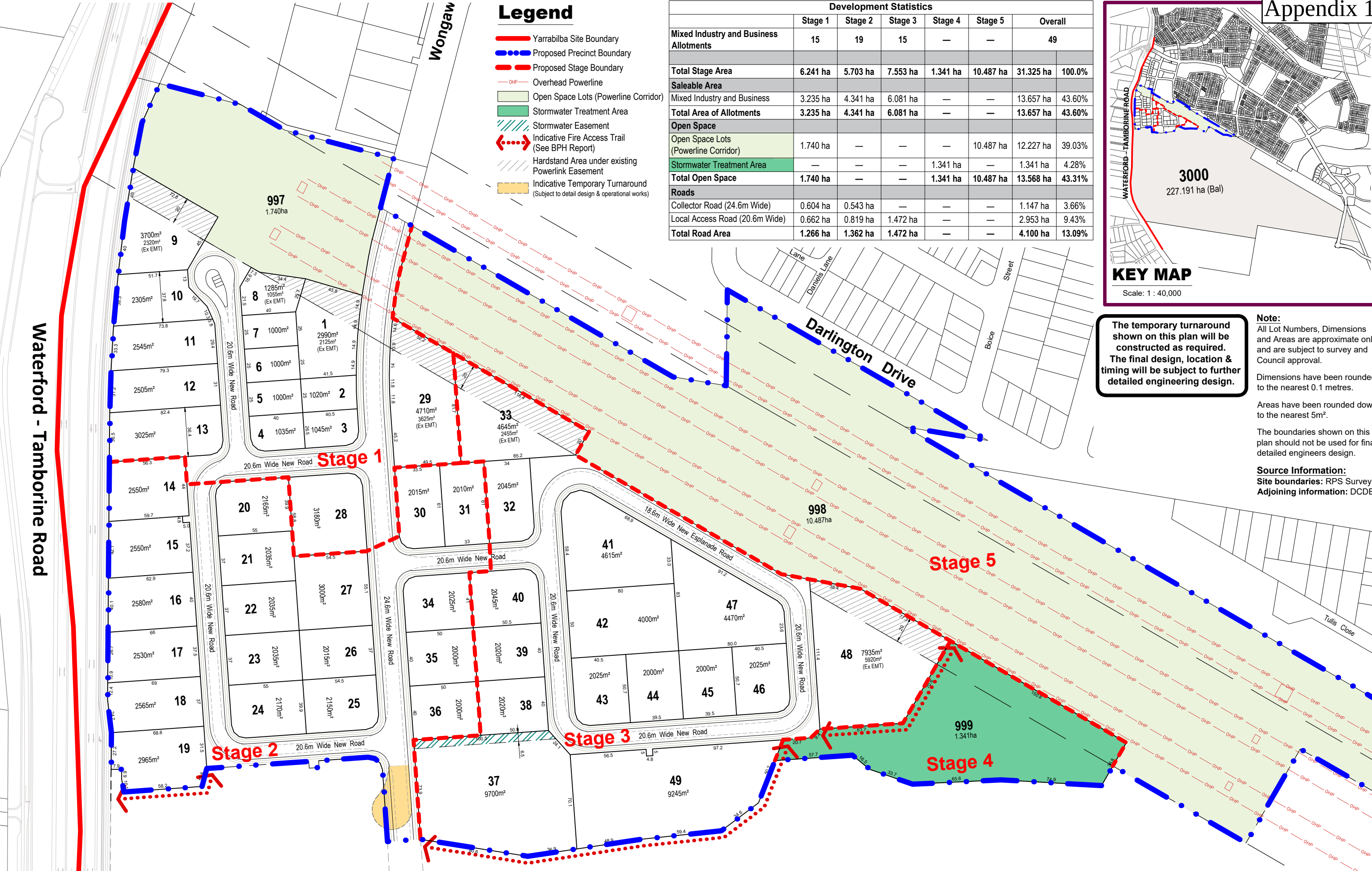
Areas have been rounded down to the nearest 5m².

The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:
Site boundaries: RPS Survey.
Adjoining information: DCDB.

Legend

- Yarrabilba Site Boundary
- Proposed Precinct Boundary
- Proposed Stage Boundary
- Overhead Powerline
- Open Space Lots (Powerline Corridor)
- Stormwater Treatment Area
- Stormwater Easement
- Indicative Fire Access Trail (See BPH Report)
- Hardstand Area under existing Powerlink Easement
- Indicative Temporary Turnaround (Subject to detail design & operational works)



PLAN REF: 124141 – 48

Rev No: I
DATE: 12 January 2023
CLIENT: LendLease
DRAWN BY: NF
CHECKED BY: WNW



YARRABILBA MIBA
Precinct 2A & Part of Precinct 5
Plan of Subdivision

0 20 40 60 80 100 120 140 1 : 2,500 @ A3

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Appendix 2: 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, whoa 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 trails 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.