



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

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**UPDATED
BUSHFIRE HAZARD ASSESSMENT
AND MITIGATION PLAN**

FOR

**PROPOSED STAGES 14-45
RESIDENTIAL WEST PRECINCT
NORTH HARBOUR**

PREPARED BY

BUSHLAND PROTECTION SYSTEMS PTY LTD

COMMISSIONED BY

NORTHEAST BUSINESS PARK P/L

DATE: 15th June 2022.

1. Background

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

This plan is produced in accordance with the Moreton Bay Regional Council (MBRC) Planning Scheme, Section 9.4.1.6.3 General Residential Zone, Next Generation Neighbourhood Precinct and SC6.4 – *Bushfire Prone Areas*, based on the State Planning Policy 7/17, under the Queensland Sustainable Planning Act 2009.

This plan is in regard to the proposed residential subdivision over Stages 14-45, Residential West Precinct, North Harbour, as shown in Appendix 1. This plan is based on the following material supplied by Northeast Business Park P/L.

- 1.1. The Overall Proposal Plan for Stages 14-45, showing the proposed lots, roadway layout and BAL lines, drawn by Development Evolution, drawing no. NH-BFM-3/PF, dated 16/5/22, is included as Appendix 1 in this report.

2. Site Description and Assessment

Stages 14-45 consists of residential allotments that will be cleared and maintained into the future with a Low hazard rating. The allotments would be assigned a Vegetation Hazard Class (VHC) of 42.6 with an associated fuel loading of up to 2t/Ha over level land with an FFDI of 55, providing for a potential fire line intensity of up to 146kw/m equating to a 'Not Bushfire Prone Area' rating.

The bushland exposures for the site are external to the stages around the perimeter of the development.

The areas shaded light green on Appendix 1 are local parks that will predominantly consist of lawn and some landscaping, managed as outlined in Section 5 of this report. The Park areas would be assigned a VHC of 39.2 with an associated fuel loading of up to 8t/Ha over level land with an FFDI of 55, providing for a potential fire line intensity of up to 2,338kw/m equating to a 'Not Bushfire Prone Area' rating. The local park areas will assist in providing buffering to hazardous vegetation.

Appendix 2 of this report shows a green line representing the 'Edge of Assessable Vegetation' to also be known as the edge of hazardous vegetation. The area between the allotments/roads and the green line is proposed to be managed as outlined in Section 5 of this report, including detention basins/wetland areas that lay within. The management area will be assigned a VHC of 39.2 with an associated fuel loading of up to 8t/Ha over level land with an FFDI of 55, providing for a potential fire line intensity of up to 2,338kw/m equating to a 'Not Bushfire Prone Area' rating. Therefore the management area will be considered a part of the bushfire buffering to hazardous vegetation.

Around the outer perimeter of the development to the northwest, north, northeast and east, is a waterway with a vegetation corridor of predominantly melaleuca. Currently, some areas such as to the east of Stages 38 & 39 are wide and more heavily wooded, where as some areas such as northeast of Stages 36, 37 & 45 are very open and would barely be classed as open

woodland, being predominantly grassland. However it is expected that the waterway areas over time will be subject to rehabilitation and revegetation creating areas and corridors of melaleuca bushland such as the planned future rehabilitation to the west of Stages 14-16 & 21. With expected future development to the north and northeast, it may be possible that the revegetated waterways between the subject site and future development may meet the definition of corridors that would be non-assessable due to size and configuration however these areas do not yet meet those definitions. Therefore for the purpose of this assessment the current and future vegetation would be assigned a VHC 22.1 with an associated fuel loading of up to 28.4t/Ha over level land with an FFDI of 55, providing for a potential fire line intensity of up to 22,468kw/m equating to a High hazard rating.

To the southeast of Stage 41 the corridor of melaleuca vegetation continues from the northeast across parts of Lot 7 RP107811, Lot 60 SP249215 & Lot 4 RP171670, having the same 22,468kw/m High hazard rating. It is proposed that the development works will include clearing of any vegetation within the northern boundary of Lot 4 RP171670 and the existing drainage easement on that lot, providing a separation of 20 metres from unmanaged bushland to the southern boundary of Stage 41.

Lots 1 & 2 RP107811 to the south of Stages 33 & 41, have grassy eucalypt woodland over the majority of the allotments and would be assigned a VHC 9.1 with an associated fuel loading of up to 24.1t/Ha over level land with an FFDI of 55, providing for a potential fire line intensity of up to 21,220kw/m equating to a High hazard rating.

To the south and southwest of Stage 21 is eucalypt forest over the rear of Lots 13 & 14 RP87748 and adjoining lots to the west. The bushland would be assigned a VHC 9.1 with an associated fuel loading of up to 24.1t/Ha over level land with an FFDI of 55, providing for a potential fire line intensity of up to 21,220kw/m equating to a High hazard rating.

Whilst it may be likely that the bushland on Lots 1 & 2 RP107811 and Lots 13 & 14 RP87748 will be cleared as development progress in the area and result in a lower hazard, in the meantime the bushland does pose a hazard and is treated as such for the purpose of this report.

To the southeast of Stage 22, the bushland on Lot 3 RP87748 is proposed to be cleared and maintained for approximately 46 metres from the shared boundary as shown in Appendix 1. The remaining area of bushland is just over 2Ha in size and therefore will be assessable. The vegetation would be assigned a VHC 9.1 with an associated fuel loading of up to 24.1t/Ha over level land with an FFDI of 55, providing for a potential fire line intensity of up to 21,220kw/m equating to a High hazard rating. The other rural allotments adjoining the southern side of Stage 22 are open grassland with scattered trees and would be assigned a VHC of 39.2 with an associated fuel loading of up to 8t/Ha over level land with an FFDI of 55, providing for a potential fire line intensity of up to 2,338kw/m equating to a 'Not Bushfire Prone Area' rating.

Table 1

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 all or part of the following proposed lots would be assigned a High Hazard Rating:

- Stage 14: Lots 438-442 & 453
- Stage 15: Lots 470, 471, 1439-1449
- Stage 16: Lots 472-474, 501-503 & 850
- Stage 18: Lots 526-541, 560-562, 564 & 1563-1564
- Stage 19: Lots 565, 566, 569-574 & 1567
- Stage 20: Lots 603-605 & 628-633
- Stage 21: Lots 634, 635, 637-661, 8142 & 8143
- Stage 22: Lots 662, 663, 669-676, 888, 2201 & 2202
- Stage 29: Lot 263
- Stage 31: Lot 369
- Stage 32: Lots 374-378, 380 & 383-385
- Stage 33: Lots 408-412 & 434-443,
- Stage 34: Lots 698-700, 748-751 & 767
- Stage 36: Lots 768-776, 781-789 & 795-798
- Stage 37: Lots 799-801, 811-826 & 832-836
- Stage 38: Lots 262, 455, 463-484 & 3801-3803
- Stage 39: Lots 485-489, 492-501 & 515-525
- Stage 40A: Lots 528-541 & 562-567
- Stage 41: Lots 568 & 583-603
- Stage 43: Lots 652-660
- Stage 44: Lots 670-677, 683-704, 709 & 710
- Stage 45: Lots 711-719, 731-736, 746-750

The remainder of the allotments not listed above would have a Low hazard rating.

3. Roads, Driveways and Fire Trails

The main access to the overall estate is via Buckley Road with future connections provided for to the north, northeast and south. Buckley Road is through a Low hazard rated area and is unlikely to be denied during a bushfire event.

The extensive internal road layout provides a perimeter road (or road reserve) to bushland for the majority of the site, with the exception of Lots 670-672, 2201, 2202 (Stage 22), Lot 567 (Stage 40), Lots 602 & 603 (Stage 41) and 695-704 (Stage 44). The roadways, parks and management buffers combine to ensure a separation distance from unmanaged bushland of 20 metres or more. All road reserves are to be managed to their full widths.

The roadways are through roads with the exception of a cul-de-sac in Stage 35 and a turning area in Stages 18 & 34. These dead-end roads are within the site with well over 20 metres separation from unmanaged bushland and meet the turning requirements of Qld Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines.

The residential allotments will have short direct driveway access, over level land. A vehicular fire trail is to be provided within the local park area behind Lots 695-704 (Stage 44) with connections to Roads at each end.

Vehicular fire trails are to have a minimum 6 metre cleared width and 4 metre formed width and would be low impact preferably with a mowed or slashed grass surface which would minimise disturbance or erosion, Appendix 3 on fire trails is included in this report as a guide on establishing and maintaining fire access trails.

A 6 metre wide, cleared pedestrian fire trail is to be provided along the eastern side of Lot 603 (Stage 41).

A gate, wide enough for vehicle access, is to be provided at the end of the roadway between Lots 2201 & 2202 (Stage 22), allowing Fire Service 4WD access to the rear of Lot 3 RP87748.

4. Appropriate Building Site Location

The proposed allotments are over level land, away from steep slopes and ridge tops and with no aspect.

AO56(c) of Council's constraint code requires a minimum separation from bushland of 20 metres or the distance required to achieve a Bushfire Attack Level BAL whichever is the greater. The code doesn't state which BAL, however it is assumed that this refers to a BAL-29 which is the level State Government and most Councils are treating as a tolerable risk level.

On Appendix 1, the Blue '20m Building Setback' line demonstrates the minimum 20 metre setback required under AO56(c) which also exceeds the separation distances required for a BAL-29 rating under AS3959-2018 as outlined in Section 6 of this report.

Lots 639-643 & 649-652 (Stage 21) are to have a minimum 4 metre building setback from the front lot boundary. This setback combined with the roadway will maintain the minimum 20 metre separation required.

The future dwelling location on Lots 602 & 603 (Stage 41) is to ensure a minimum 20 metre setback from the unmanaged bushland to the southeast on Lot 60 SP249215 & Lot 4 RP171670.

Future dwellings on proposed Lots 408 (Stage 33), 528-533 (Stage 40) are to have a minimum building setback from the southern lot boundary so as when combined with the road reserve width total a minimum separation of 20 metres from the unmanaged bushland to the south.

The future dwelling on proposed Lot 567 (Stage 40) is to have a minimum 20 metre setback from the southern boundary and residents are to ensure that clear pedestrian access for fire suppression personnel is provided at all times along the full length of the southern lot boundary, within the lot.

With the separations outlined above and the proposed road network and buffers, it is considered that sufficient separation from bushland has been provided with a minimum 20 metre provided. All buildings have been located to ensure a BAL-29 construction rating or less is achieved when assessed under AS3959-2018, and therefore considered to be at a tolerable risk level.

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 tall canopy trees with discontinuous canopy.

All road reserves are to be managed to their full widths with low ground fuel levels at all times (grass kept under 300mm).

The managed buffer areas between the allotments/roads and the 'Edge of assessable vegetation', shown as a green line on Appendix 1, including the Local parks and basin/wetland areas contained within, are to be managed as follows:

- The first 10 metres from allotments (that's not roadway) is to be managed as an Inner Buffer Zone where grass is regularly mown (kept below a height of 100mm), fallen timber is removed, mature tall canopy trees with discontinuous canopy cover may be retained and no mid-storey vegetation.
- The remainder of the buffer area is to be managed as an Outer Buffer Zone where grass is kept below a height of 300mm, fallen timber is removed, tall canopy tree species are retained and minimal mid-storey species allowing for the retention of scattered juvenile tall canopy tree species, providing for future canopy infill and replacement.
- Basin/wetland areas may contain reed/rush type vegetation in the basins as required for their functionality. Non-endemic grass and weed growth must be controlled.
- The buffer areas are to be established and have tree densities that allow for easy mowing/slashing of the buffer areas.
- The use of fibrous and loose bark trees, such as melaleuca, swamp Mahogany and stringy bark, are to be avoided within the managed buffer areas and local parks. Trees with ribbon/candle bark should also be avoided.
- Trees over 4 metres high are to have branches below 2 metres removed and loose bark should be removed prior to fire season which generally begins in August.
- Ground fuel loads (leaf litter) should not exceed 3t/ha, with a maximum limit 8t/ha overall fuel loading for the buffer areas so as not to provide a significant fire hazard.

The buffer areas proposed within Lot 3 RP87748 & Lot 4 RP171670 are to be managed the same as above.

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 http://www.cfa.vic.gov.au/fm_files/attachments/plan_and_prepare/landscaping/landscaping_f_or_bushfire.pdf.

Fire trails are to be maintained with low ground fuel to minimise the potential for localised bushfire hindering access or egress. Low branches along the sides of fire trails should be 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 4.8 metres to ensure access by medium and heavy fire vehicles. Appendix 4 on fire trails is provided as a guide to fire trail implementation and maintenance.

Ongoing vegetation management is the responsibility of the land owner on which the vegetation is located.

All previous or future cleared timber and foliage or accumulated rubbish would need to be removed from the site or mulched and not simply moved aside as this would result in a concentrated area of fuel loading which would increase the PBH from that direction.

For optimal bushfire safety and best practise, the required vegetation management is to be established prior to plan sealing 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.

Ongoing management of vegetation over properties is not an optional issue, it is an obligation accepted by choosing to reside on such a property. Care must be exercised by owners to prevent the build-up of unacceptable fuel levels on their properties which may pose a bushfire risk to themselves or neighbours.

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.

6. Appropriate Building Construction

The bushfire provisions of the Building Code of Australia (BCA) are applied to Class 1, 2 & 3 buildings in designated bushfire prone areas. Bushfire Prone Areas are designated by the local government through their planning scheme.

The Moreton Bay Regional Council Planning Scheme Table 1.6.1 identifies Very high potential bushfire intensity, High potential bushfire intensity, Medium potential bushfire intensity and Potential impact buffer on the Bushfire hazard areas overlay map as the 'designated bushfire hazard area' for the purposes of section 12 of the Building Regulation 2006, except on land in the Centre zone, General residential zone, Industry zone or Township zone.

The hazard rated allotments outlined in Section 2 of this report, require the Building Code of Australia (BCA) and where relevant the Australian Standard for Construction of Buildings in Bushfire-Prone Areas (AS3959) to be addressed.

P2.3.4 of the BCA 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 3.7.4.0 (Qld variation) of the BCA states:-

- (a) *Subject to (b), Performance Requirement P.2.3.4 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.*

These levels of construction are reliant on the proposed vegetation management and recommendations of this report being implemented and maintained.

For the bushland exposure to the south on Lots 1 & 2 RP107811, Lot 3 RP87748, Lots 13 & 14 RP87748 & rear of Lot 1 RP81375; In accordance with AS3959-2018 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is woodland and slope is 0-5 degrees. The distance between the building and unmanaged bushland will determine the standard of construction required. A minimum 20 metre setback will already be established in accordance with the recommendations of this report.

- If the distance between the unmanaged bushland and the building is between 20 - 23 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-19. A BAL-19 level requires Sections 3 and 6 of AS3959-2018 to be applied.
- If the distance between the unmanaged bushland and the building is between 23 - 100 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-12.5. A BAL-12.5 level requires Sections 3 and 5 of AS3959-2018 to be applied.
- If the distance between the unmanaged bushland and the building is greater than 100 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-LOW. A BAL-LOW level requires no specific construction standards under AS3959-2018 in relation to bushfire.

For the other bushland exposures to the site; In accordance with AS3959-2018 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’, the vegetation class is forest and slope is 0-5 degrees. The distance between the building and unmanaged bushland will determine the standard of construction required. A minimum 20 metre setback will already be established in accordance with the recommendations of this report.

- If the distance between the unmanaged bushland and the building is between 20 - 24 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-29. A BAL-29 level requires Sections 3 and 7 of AS3959-2018 to be applied.
- If the distance between the unmanaged bushland and the building is between 24 - 34 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-19. A BAL-19 level requires Sections 3 and 6 of AS3959-2018 to be applied.
- If the distance between the unmanaged bushland and the building is between 34 - 100 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-12.5. A BAL-12.5 level requires Sections 3 and 5 of AS3959-2018 to be applied.

- If the distance between the unmanaged bushland and the building is greater than 100 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-LOW. A BAL-LOW level requires no specific construction standards under AS3959-2018 in relation to bushfire.

Section 3.5 of AS3959-2018 states “*The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack.*” Therefore a protected elevation of a proposed building can be constructed to the next lower Bushfire Attack Level, unless the level is already at BAL-12.5.

Appendix 4 of this report outlines the BAL rating for dwellings on the hazard rated allotments. Allotments not listed in Appendix 4 have a Low hazard rating and do not require assessment under the Building Code of Australia 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.

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 per second at 200kPa.

8. Provision of Fire Fighting Infrastructure

Buildings should have external taps and hoses that are positioned so water supply is capable of reaching to all around the building. All water lines are to be covered by at least 300mm of soil. Residents should maintain good access around the buildings for fire suppression activities by fire authorities.

9. Local Fire Brigades

The subject property is currently in the Urban Fire & Rescue district and they would be responded on a 000 emergency call.

10. Improved Community Awareness

Minimising ground fuel and regrowth is the easiest way of reducing bushfire hazard on rural lots. Owners can assist in the mitigation of these bushfires by the removal of ground fuels prior to the bushfire season.

It would be recommended that a copy of the fire management plan be placed on display at any sales office, and a copy of the plan including Appendix 2 on being prepared, be given to the purchasers of lots with a hazard rating.

A copy of the plan should be retained by residents and passed on to future residents including Appendix 2 on “being prepared” 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 would be recommended that residents with a hazard rated allotment prepare a ‘Bushfire Survival Plan’, which is available from the Queensland Rural Fire Service website at www.ruralfire.qld.gov.au. 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.

11. Summary of recommendations

- All road reserves are to be managed to their full widths.
- A vehicular fire trail is to be provided within the local park area behind Lots 695-704 (Stage 44) with connections to Roads at each end.
- Vehicular fire trails are to have a minimum 6 metre cleared width and 4 metre formed width and would be low impact preferably with a mowed or slashed grass surface which would minimise disturbance or erosion, Appendix 4 on fire trails is included in this report as a guide on establishing and maintaining fire access trails.
- A 6 metre wide, cleared pedestrian fire trail is to be provided along the eastern side of Lot 603 (Stage 41).
- A gate, wide enough for vehicle access, is to be provided at the end of the roadway between Lots 2201 & 2202 (Stage 22), allowing Fire Service 4WD access to the rear of Lot 3 RP87748.
- Lots 639-643 & 649-652 (Stage 21) are to have a minimum 4 metre building setback from the front lot boundary. This setback combined with the roadway will maintain the minimum 20 metre separation required.
- The future dwelling location on Lots 602 & 603 (Stage 41) is to ensure a minimum 20 metre setback from the unmanaged bushland to the southeast on Lot 60 SP249215 & Lot 4 RP171670.
- Future dwellings on proposed Lots 408 (Stage 33), 528-533 (Stage 40) are to have a minimum building setback from the southern lot boundary so as when combined with the road reserve width, total a minimum separation of 20 metres from the unmanaged bushland to the south.
- The future dwelling on proposed Lot 567 (Stage 40) is to have a minimum 20 metre setback from the southern boundary and residents are to ensure that clear pedestrian access for fire suppression personnel is provided at all times along the full length of the southern lot boundary, within the lot.

- 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 tall canopy trees with discontinuous canopy.
- All road reserves are to be managed to their full widths with low ground fuel levels at all times (grass kept under 300mm).
- The managed buffer areas between the allotments/roads and the 'Edge of assessable vegetation', shown as a green line on Appendix 1, including the Local parks and basin/wetland areas contained within, are to be managed as outlined in Section 5 of this report. The buffer areas proposed within Lot 3 RP87748 & Lot 4 RP171670 are also to be managed the same.
- Fire trails are to be maintained with low ground fuel to minimise the potential for localised bushfire hindering access or egress. Low branches along the sides of fire trails should be 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 4.8 metres to ensure access by medium and heavy fire vehicles.
- Ongoing vegetation management is the responsibility of the land owner on which the vegetation is located.
- All previous or future cleared timber and foliage or accumulated rubbish would need to be removed from the site or mulched and not simply moved aside as this would result in a concentrated area of fuel loading which would increase the PBH from that direction.
- For optimal bushfire safety and best practise, the required vegetation management is to be established prior to plan sealing 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.
- 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 per second at 200kPa.
- Dwellings are to be constructed in accordance with AS3959-2018 as outlined in Section 6 and Appendix 4 of this report.
- Buildings should have external taps and hoses that are positioned so water supply is capable of reaching to all around the building. All water lines are to be covered by at least 300mm of soil. Residents should maintain good access around the buildings for fire suppression activities by fire authorities.
- It would be recommended that a copy of the fire management plan be placed on display at any sales office, and a copy of the plan including Appendix 2 on being prepared, be given to the purchasers of lots with a hazard rating.

- A copy of the plan should be retained by residents and passed on to future residents including Appendix 2 on “being prepared” 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 would be recommended that residents with a hazard rated allotment prepare a ‘Bushfire Survival Plan’, which is available from the Queensland Rural Fire Service website at www.ruralfire.qld.gov.au.

12. Conclusion

With the appropriate maintenance of fuel levels around the development, maintenance of trails, 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.

With the separations outlined above and the proposed road network and buffers, it is considered that sufficient separation from bushland has been provided with a minimum 20 metre provided. All buildings have been located to ensure a BAL-29 construction rating or less is achieved when assessed under AS3959-2018, and therefore considered to be at a tolerable risk level.

This plan should remain current for a period of 5 years, until 2027, at which time it should be subject to review to take account of changing land use and vegetation patterns. Any major bush fire event affecting the subject site should also trigger a review in order 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.

revisions

content

**OVERALL PROPOSAL
PLAN - STAGES 13 - 45**

project

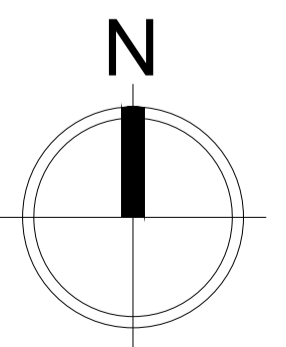
**NORTH HARBOUR
RES. WEST PRECINCT**

client

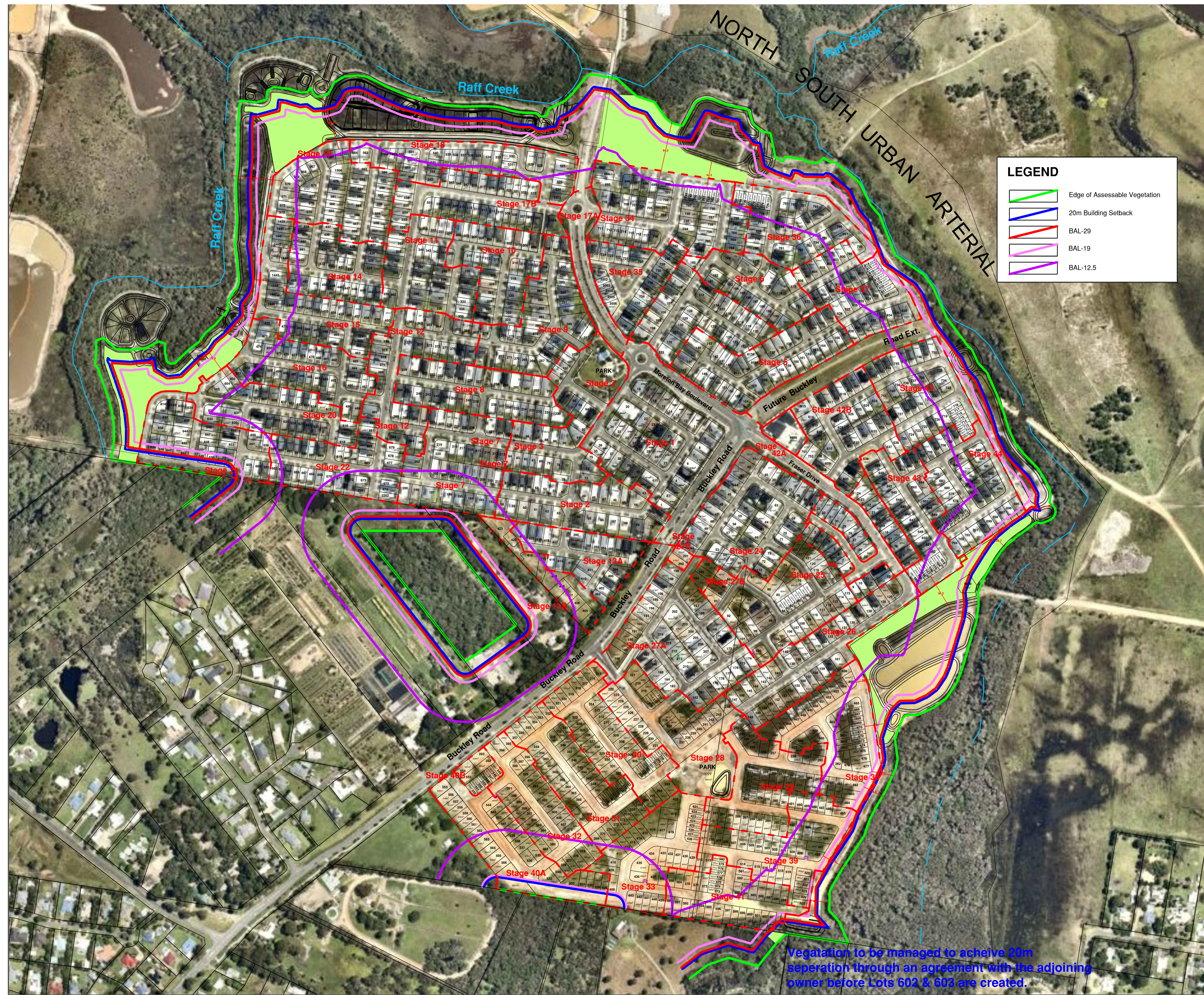
**NORTH EAST
BUSINESS PARK**

scale: 1:3000
@: A1






drawn by: MTM
checked by: MTM
date: 16/05/22
drawing no.



NH-BFM-3/PF



LEGEND

-  Edge of Assessable Vegetation
-  20m Building Setback
-  BAL-29
-  BAL-19
-  BAL-12.5

APPENDIX 2

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.ruralfire.qld.gov.au 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 tree tops ground fuels and elevated fuels must be present providing a 'ladder' of fuels from ground level to tree top. 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.ruralfire.qld.gov.au 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.ruralfire.qld.gov.au 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.ruralfire.qld.gov.au. 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 3

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 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.

APPENDIX 4

Individual BAL Assessment

The following Bushfire Attack Level (BAL) ratings are assessed in accordance with AS3959-2018 – Table 2.4.5 ‘*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)*’ as outlined in Section 6 of this report.

Allotments not listed in the table below have a Low hazard rating and do not require assessment under the NCC 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.

Lots	BAL Rating	Lots	BAL Rating
Stage 14 Lot 438	If dwelling within 6m of rear boundary BAL-12.5 If dwelling 6m or more from rear boundary BAL-Low.	Lot 439	If dwelling within 8m of rear boundary BAL-12.5 If dwelling 8m or more from rear boundary BAL-Low.
Lots 440-442 & 453	BAL-12.5		
Stage 15 Lots 1439-1449	BAL-12.5	Lots 470, 471	BAL-12.5
Stage 16 Lots 472-474	BAL-12.5	Lots 501-503	BAL-12.5
Lot 850	BAL-12.5		
Stage 18 Lot 564	If dwelling within 4m of front boundary BAL-12.5 If dwelling 4m or more from front boundary BAL-Low.	Lots 526-541, 560-562 & 1563-1564	BAL-12.5
Stage 19 Lot 574	If dwelling within 4m of rear boundary BAL-12.5 If dwelling 4m or more from rear boundary BAL-Low.	Lots 565, 566, 569-573 & 1567	BAL-12.5
Stage 20 Lots 603-605	BAL-12.5	Lots 628-633	BAL-12.5
Stage 21 Lots 639-641 & 649-652	If dwelling is between 4m-8m from front boundary BAL-29. If dwelling 8m or more from front boundary BAL-19.	Lots 634, 635, 637, 638, 643-648, 653-661, 8142 & 8143	BAL-12.5
Lot 642	BAL-19		
Stage 22 Lots 662, 663, 669-676, 888, 2201 & 2202	BAL-12.5		
Stage 29 Lots 263	BAL-12.5		

Lots	BAL Rating	Lots	BAL Rating
Stage 31 Lot 369	BAL-12.5		
Stage 32 Lots 374-378, 380 & 383-385	BAL-12.5		
Stage 33 Lot 434	If dwelling within 6m of southwest corner BAL-12.5 If dwelling 6m or more from southwest corner BAL-Low.	Lot 408	If dwelling within 4.5m from front boundary BAL-19. If dwelling 4.5m or more from front boundary BAL-12.5.
Lots 409-412 & 435-443	BAL-12.5		
Stage 34 Lot 698 & 748-751	If dwelling within 3m of front boundary BAL-12.5 If dwelling 3m or more from front boundary BAL-Low.	Lots 699	If dwelling within 5.5m of front boundary BAL-12.5 If dwelling 5.5m or more from front boundary BAL-Low.
Lot 700 & 767	BAL-12.5		
Stage 36 Lots 768-776	BAL-12.5	Lots 781-789 & 795-798	BAL-12.5
Stage 37 Lots 799-801, 811-826 & 833-836	BAL-12.5	Lot 832	If dwelling within 6m of northwest corner BAL-12.5 If dwelling 6m or more from northwest corner BAL-Low.
Stage 38 Lot 262, 455 & 463-484	BAL-12.5	Lots 3801-3803	BAL-12.5
Stage 39 Lot 489	If dwelling within 4m of southeast corner BAL-12.5 If dwelling 4m or more from southeast corner BAL-Low.	Lots 485-488, 492-501 & 515-525	BAL-12.5
Stage 40A Lot 541	If dwelling within 8m of southern corner BAL-12.5 If dwelling 8m or more from southern corner BAL-Low.	Lots 528-533	If dwelling within 4.5m from southern boundary BAL-19. If dwelling 4.5m or more from southern boundary BAL-12.5.

Lots	BAL Rating	Lots	BAL Rating
Stage 40A Lots 534-540 & 562-566	BAL-12.5	Lot 567	If dwelling between 20m-23m from southern boundary BAL-19. If dwelling 23m or more from southern boundary BAL-12.5.
Stage 41 Lot 568	If dwelling within 8m of southwest corner BAL-12.5 If dwelling 8m or more from southwest corner BAL-Low.	Lot 583	If dwelling within 4m of southeast corner BAL-12.5 If dwelling 4m or more from southeast corner BAL-Low.
Lot 602	If dwelling within 10m of southeast corner BAL-19 If dwelling 10m or more from southeast corner BAL-12.5.	Lot 603	If dwelling within 4m of southeast boundary BAL-29. If dwelling 4m or more from southeast boundary BAL-12.5.
Lots 584-601	BAL-12.5		
Stage 43 Lots 652-659	BAL-12.5	Lot 660	If dwelling within 6m of southeast corner BAL-12.5 If dwelling 6m or more from southeast corner BAL-Low.
Stage 44 Lots 671-677, 683-704, 709 & 710	BAL-12.5	Lot 670	If dwelling within 4m of southeast corner BAL-12.5 If dwelling 4m or more from southeast corner BAL-Low.
Stage 45 Lot 711-719, 731-736, 746-750	BAL-12.5		

These levels of construction are reliant on the proposed vegetation management and recommendations of this report being implemented and maintained.



Bushland Protection Systems

Specialising in

BUSHFIRE HAZARD

PLANNING & MITIGATION

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

COMPANY PROFILE

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

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

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

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

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