

BUSHFIRE PROTECTION ASSESSMENT

FOR THE PROPOSED TORRENS TITLE
RESIDENTIAL SUBDIVISION

OF THE

PITT TOWN INVESTIGATION AREA

FOR THE

JOHNSON PROPERTY GROUP.



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EXECUTIVE SUMMARY

Australian Bushfire Protection Planners Pty Limited, at the request of the *Johnson Property Group*, has undertaken the bushfire consultancy to update the bushfire protection measures to the proposed residential subdivision of at Pitt Town, and specifically for Lot 14 in DP 865977 & Lot 132 in DP 1025876, (Bona Vista), Bootles Lane and Johnston Street, Pitt Town.

The Department of Planning [DOP] has approved an application, under Part 3A of the *Environmental Planning & Assessment Act 1979*, for the residential subdivision of the land. However, as part of the *Environmental Assessment* required as part of the Part 3A process, DOP has requested that a review of the bushfire protection measures be undertaken for the proposed residential subdivision.

The proposal is a Project Approval for the development under the provisions of Section 75P (c) of the *Environmental Planning & Assessment Act 1979*.

The land over which the subdivision proposal is being undertaken is land that formed part of the Bona Vista estate and is located to the north of Bootles Lane, west and south of Johnston Street.

The “Summary Flora Assessment” prepared by Anne Clements & Associates Pty Limited states:

“The vegetation on Lot 14 DP 865977 and Lot 132 DP 1025876 “Bona Vista” property, Pitt Town includes an area in the south-east corner that falls outside the Pitt Town Local Environmental Study area. The LES Study Area was “located on relatively flat lands that have been extensively cleared for agriculture and associated infrastructure and residential dwellings” (Connell Wagner 2001).

From the historical aerial photographs and previous and current flora surveys, the Site supports mainly cleared paddocks with remnant vegetation of varied intactness in the south-east and east, and some remnant trees in the north-east along Johnston Street.

The remnant vegetation on the Site which appears to meet the criteria for Shale Gravel Transition Forest, an endangered ecological community under the NSW Threatened Species Conservation Act 1995, was identified”.

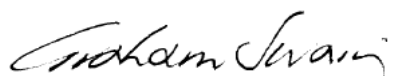
A review of the Hawkesbury Bushfire Prone Land Map confirms the vegetation within the south-eastern and north-eastern portions of the site as Category 1 Bushfire Prone Vegetation. Following construction of the residential lots on the site, the Shale Gravel Transition Forest retained in the south-eastern corner will contain an area greater than one hectare in area and will therefore remain classified as Category 1 Bushfire Prone Vegetation under the provisions of Section 146 of the *Environmental Planning & Assessment Act 1979*.

Therefore, the lots within 100 metres of this vegetation are deemed to be within a bushfire prone area.

The precincts to the north of Hall Street, namely Blighton, Cleary and Thornton are greater than 100 metres from the bushfire prone vegetation within Bona Vista and are therefore not within a bushfire prone area and are not examined in this report. Furthermore, whilst the land within the Fernadell precinct is impacted by the bushfire prone vegetation in Bona Vista, future residential development of the Fernadell precinct will be separated by a 34 metre width road reserve, exceeding the minimum setback required by *Planning for Bushfire Protection 2006*. Therefore, this precinct is also excluded from examination within this report.

The Director General's Environmental Assessment Requirements includes, under subheading "Hazard Management and Mitigation", the advice that the Environmental Assessment must address the requirements of *Planning for Bushfire Protection 2006 (RFS)*.

This report undertakes an assessment to determine the deemed-to-satisfy requirements of *Planning for Bushfire Protection 2006* and provides recommendations on the provision of Asset Protection Zones to the buildings; emergency access/egress; fire-fighting access and water supplies; construction standards of the buildings and the management of the Asset Protection Zones and residual vegetation so as to address the aim and objectives of *Planning for Bushfire Protection 2006* and therefore Item 7 of the Director General's Requirements [DGRs].



Graham Swain,
Director,
Australian Bushfire Protection Planners Pty Limited.

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SECTION 1

INTRODUCTION

1.1 Development Proposal.

This Bushfire Protection Assessment has been prepared, at the request of *Johnson Property Group*, to review the bushfire protection measures required to be implemented to Stages 2 – 5 in the subdivision of land within Lot 14 in DP 865977 & Lot 132 in DP 1025876, Bona Vista, Pitt Town, being the land bounded by Bootles Lane to the south and Johnston Street to the east and north.

Stage 1 of the subdivision contains twenty nine lots [29] and is located in the south-western corner of the site with access from Bootles Lane. This stage has been approved and is presently under construction. In addition to Stage 1 and the subdivision of the remaining land onto staged residential development with a total of two hundred & seventeen [217], the development proposal upgrades the construction of the northern section and the northern portion of the east part of Johnston Street and provides an internal road network that links to Bootles Lane in the south and Johnston Street to the east and west.

This road network will provide, when the estate is completed, a perimeter road between the bushfire hazard and the adjoining lots and a through road network that provides for alternate routes to the estate roads.

The lot containing the Shale Gravel Transition Forest will be transferred to Council ownership as a Public Reserve.

1.2 Aim of this Assessment.

The aim of this assessment is to address the Director Generals Environmental Assessment Requirements, which necessitates the review of the bushfire protection measures to the estate, undertaken in accordance with the requirements of *Planning for Bushfire Protection 2006 (RFS)*.

This report examines the requirements of *Planning for Bushfire Protection 2006* and provides advice on the bushfire protection measures deemed necessary to address the potential bushfire threat to the development.

1.3 Statutory Requirements.

This report has been prepared having regard to the following legislative and planning requirements:

1.3.1 Legislation.

(a) *Environmental Planning and Assessment Act - 1979 (EPA Act)*

Planning and development within NSW is regulated by the *Environmental Planning & Assessment Act, 1979* (EPA Act). Part 3A [Major Projects] of the Act commenced on the 1st August 2005 and consolidated the assessment and approval regime for all major projects previously addressed under Part 4 [Development Assessment] or Part 5 [Environmental Assessment] of the Act.

(b) *Rural Fires Act 1997*

The objectives of the *Rural Fires Act* are to provide:

- The prevention, mitigation and suppression of fires;
- Coordination of bushfire fighting and prevention
- Protection of people and property from fires; and
- Protection of the environment.

In relation to the management of bushfire fuels on public and private lands within NSW, the following section of the Act applies:

- Sections 63(1) and 63(2) require public authorities and owners / occupiers of land to take all practicable steps to prevent the occurrence of bushfires on, and to minimize the danger of the spread of bushfires.

(c) *Rural Fires Regulation 2002.*

The *Rural Fires Regulation 2002*, August 2002, repeals the *Rural Fires Regulation 1997* and restates with some modifications the provisions of the old Regulation and contains new provisions relating to bushfire prone land and bushfire hazard reduction.

(d) *Threatened Species Conservation Act 1995 (TSC Act).*

The TSC Act aims to protect and encourage the recovery of threatened species, populations and communities as listed under the Act.

The TSC Act is integrated with the EP&A Act and requires consideration of whether a development or an activity (such as the implementation of hazard reduction and asset protection) is likely to significantly affect threatened species, populations and ecological communities or their habitat.

(e) *Native Vegetation Act 2003 (NV Act).*

The *Native Vegetation Act* states indigenous vegetation within 20 metres of the bed or bank of a river or lake, or on slopes over 18 degrees, requires clearing consent under the *NV Act*, unless during an emergency fire event as authorized under the *Rural Fires Act 1997*.

1.3.2 Planning Policies.

(a) *Planning for Bushfire Protection – 2006.* [Rural Fire Service]

This document provides guidance on the planning and development control processes in relation to bushfire protection measures for rural residential and residential subdivision, “Special Fire Protection” and Class 5 – 8 and 10 buildings in bushfire prone areas.

The document provides deemed-to-satisfy specifications on the provision of Asset Protection Zones to residential and “Special Fire Protection” developments; defensible space requirements to other developments and access/water supply provisions for developments in bushfire prone areas. Provision for the assessment of construction standards to buildings and management /maintenance of the Asset Protection Zones/defensible space to buildings is also provided in the document.

1.3 Documentation reviewed in this Assessment.

The following documents were reviewed in the preparation of this report:

- Subdivision Plans prepared by Brown Consulting (NSW) Pty Ltd;
- Hawkesbury Shire Council Local Environment Plan for the site;
- Summary of Flora Assessment prepared by Anne Clements & Associates Pty Limited – Environmental & Botanical Consultants;
- Aerial Photograph of the development site and surrounding lands;
- Hawkesbury Shire Council Bushfire Prone Land Map;
- Bushfire Planning Assessment for “Bona Vista”, Pitt Town prepared by HWR Pty Limited, dated 23 May 2006;
- *Planning for Bushfire Protection 2006* prepared by the NSW Rural Fire Service;
- Australian Standard AS3959 *Construction of Buildings in Bushfire Prone Areas*;
- *Rural Fires Regulation 2002.*

1.4 Site Inspection.

Graham Swain of *Australian Bushfire Protection Planners Pty Limited* inspected the site and surrounding areas on the 13th November 2007 to assess the topography, slopes and vegetation classification within and adjoining the development property and to validate the future subdivision’s compliance with the requisite deemed-to-satisfy Asset Protection Zones and access provisions. Adjoining properties were also inspected to determine the surrounding land use / vegetation communities land management.

SECTION 2

PROPERTY DESCRIPTION

2.1 Location.

The property known as Lot 14 in DP 865977 & Lot 132 in DP 1025876 is located in the Hawkesbury Shire Local Government Area (LGA) and occupies an area of land to the north of Bootles Lane and the south and east of Johnston Street, in the suburb of Pitt Town.

Bona Vista Homestead, on Lot 131 in DP 1025876 and residential development adjoin the western boundary of the property.

2.2 Existing Land Use.

The land within the development property is vacant grazing land with the proposed residential lots occupying the Residential Zoned land on the development site. Open Space land forms a curtilage to the Bona Vista Homestead and proposed Public Reserve land, containing the Shale Gravel Transition Forest vegetation occupies the south-eastern corner of the development site.



Figure 1 – Zoning Map of the Bona Vista Development Site.

2.3 Surrounding Land Use.

(a) **North**

The land adjoining the northern boundary of the development site, to the north of Johnston Street, contains existing rural properties.

(b) **East**

The land adjoining the eastern boundary of the development site, to the east of the Johnston Street carriageway, consists of rural and rural residential land use.

(c) **South**

The land adjoining the southern boundary, beyond the Bootles Lane carriageway contains existing rural land use. However, the western portion of this land is zoned for future residential development whilst a corridor of Open Space zoned land extends to the south, separating the future residential land from the existing rural residential land use to the east.

(d) **West**

The adjoining land to the west contains existing residential development and the Bona Vista Homestead estate.



Figure 2 – Site Locality Plan & Aerial Photograph

2.4 Topography.

Appendix 2 of *Planning for Bushfire Protection 2006* states that slopes should be assessed, over a distance of at least 100m from a development site and that the gradient of the land should be determined which will most significantly influence the fire behaviour to the site.

The land within the development site forms the top of a broad ridgeline that runs south to north with the land forming the future residential lots sloping gently to the southeast. The land that contains the retained Shale Gravel Transition Forest slopes to the southeast corner of the development site, to the intersection of Bootles Lane and Johnston Street [east] at a maximum of 5 degrees.

The effective slope of the land across the bushfire prone vegetation is therefore less than 5 degrees downslope to the southeast.

2.3 Vegetation within the Development Property.

Appendix A2.3 of *Planning for Bushfire Protection 2006* provides a methodology for determining the predominant bushfire prone vegetation for at least 140 metres in all directions from the future development on the site.

Vegetation is classified using Table A2.1 of *Planning for Bushfire Protection 2006*, which classifies vegetation types into the following groups:

- (a) *Forests [wet & dry sclerophyll forests];*
- (b) *Woodlands;*
- (c) *Plantations – being pine plantations not native plantations;*
- (d) *Forested Wetlands;*
- (e) *Tall Heaths;*
- (f) *Freshwater Heaths;*
- (g) *Short Heaths;*
- (h) *Alpine Complex;*
- (i) *Semi – arid Woodlands;*
- (j) *Arid Woodlands; and*
- (k) *Rainforests.*

The bushfire prone vegetation within 140 metres of the proposed residential lots consists of Shale Gravel Transition Forest in the proposed Public Reserve in the southeast of the development site. This vegetation will be allowed to regenerate to fully structure “Forest” vegetation having an area of more than one (1) hectare.

Whilst this vegetation and the “Forest” vegetation within the north-eastern portion of the site is currently mapped as Category 1 Bushfire Prone Vegetation, the vegetation within the north-eastern portion of the site will be removed as part of the proposed subdivision.

The Forest vegetation in the proposed public reserve will remain mapped as a bushfire hazard therefore bushfire protection measures will be required to those lots exposed to the bushfire threat.

2.6 Vegetation within 140 metres of Development Site.

The land to the north, east and south of the development site consists of rural or rural residential landuse with managed vegetation which is not deemed to be bushfire prone vegetation under Section 146 of the *Environmental Planning & Assessment Act 1979*.

The residential land to the west contains managed landscaped gardens.

2.7 Significant Environmental Features on the Property.

The property does not contain areas of Geological interest; Land slip areas or National Parks Estate, SEPP 14 Wetland, SEPP 44 Koala Habitat or Steep Lands [>18 degrees].

2.8 Known Threatened Species, Population or Ecological Community within the Property.

The Summary Flora Assessment prepared by Anne Clements & Associates Pty Limited records that the development property contains an Endangered Ecological Community [Shale Gravel Transition Forest]; a vulnerable species [*Acacia pudescens*] and fifteen [15] regionally vulnerable species including four species of particular conservation significance in western Sydney.

The report concludes that “*there are no flora constraints on the cleared former agricultural lands or vegetation in the centre east and north-east of the site*”.

2.9 Details and location of Aboriginal Relics or Aboriginal place.

An assessment of Aboriginal Archaeology on the site has been undertaken by AHMS. Studies and site investigations are believed to have satisfied the requirements of DECC.

SECTION 3

FIRE MANAGEMENT RESPONSIBILITIES

Fire management within the development site is the responsibility of:

3.1 Hawkesbury Shire Council.

The Hawkesbury Shire Council has responsibility, under Section 66 of the *Rural Fires Act*, to issue a notice in writing requiring an owner / occupier of any land within the LGA to carry out bushfire hazard reduction works on that land. Section 100E of the *Rural Fires Act* requires Council to issue bushfire hazard reduction certificates for hazard reduction to be undertaken on private lands.

3.2 New South Wales Rural Fire Service.

The NSW Rural Fire Service (RFS) has the responsibility for undertaking fire suppression activities, hazard management activities and other functions relative to emergency management, within its areas of operation. *Section 73* of the *Rural Fires Act (1997)* enables the Commissioner to carry out bush fire hazard reduction works on any land as required by a bush fire risk management plan if the work has not been carried out satisfactorily. Incurred costs can be recovered as a debt owed to the Crown.

3.3 New South Wales Fire Brigade.

The NSW Fire Brigade has the responsibility for undertaking fire suppression activities, and other functions relative to emergency management, within its area of operation and through Mutual Aid Agreements, provide assistance to the NSW Rural Fire Service, particularly for structural fire operations within the NSW Rural Fire Brigade Districts. Hazmat management within New South Wales is the responsibility of the NSW Fire Brigade.

3.4 Hawkesbury Bush Fire Management Committee.

The Hawkesbury Bushfire Management Committee has the responsibility for planning for co-ordinated fire fighting activities / hazard management activities on a local government level. It is not an operational organization, a fire fighting organization or a funding source for fire management activities.

The Bush Fire Management Committee is supported by the following provisions of the Rural Fires Act 1997:

- **Section 50** of the Act requires the Bush Fire Co-ordinating Committee to constitute a Bush Fire Management Committee for the whole of the area of any local Council area for which a rural fire district is constituted.
- **Section 51 (1A)** requires a Bush Fire Management Committee to report to the Bush Fire Co-ordinating Committee on the implementation of the requirements of the Bushfire Risk Management Plan.

- **Section 52** requires each Bush Fire Management Committee to prepare a draft bush fire management plan for their local areas which includes a plan of operations and a bush fire risk management plan.
- **Section 54** of the Act specifies that a draft bush fire risk management plan is to 'set out schemes for the reduction of bush fire hazards in the rural fire district or other part of the State'. A draft bush fire risk management plan may also restrict or prohibit the use of fire or other fire hazard reduction activities in all or specified circumstances or places to which the plan applies.

3.5 Public & Private Land Owners / Occupiers.

The Rural Fires Act, 1997 provides several legislative opportunities to require Public and private land owners and occupiers to manage hazardous fuels. These are listed below:

- **Section 63(2)** states that 'it is the duty of the owner or occupier of land to take the notified steps (if any) and any other practicable steps to prevent the occurrence of fires on, and to minimise the danger of the spread of fires on or from that land'.

In this section; '*notified steps*' means:

- (a) any steps that a bush fire risk management plan (or the Co-ordinating Committee) advises a person to take;
 - (b) that are included in a bush fire risk management plan applying to the land.
- **Section 87** allows the removal of hazards in the bush fire danger period by the provision of a permit system. The permits are valid for 21 days, excluding TOBAN days. Section 10 permits are not required to adhere to Part V provisions of the EPA Act 1979 in the assessment of impact, except for public authorities. An owner/occupier of private land must obtain from the NSW Rural Fire Service, a bushfire hazard reduction certificate before undertaking hazard reduction works on that land (Section 100E of the *Rural Fires Act 1997*).

The responsibility for the management of the land transferred to Council as Public Reserve shall remain the responsibility of Council to prevent fire from occurring within or escaping from the vegetation within the Reserve.

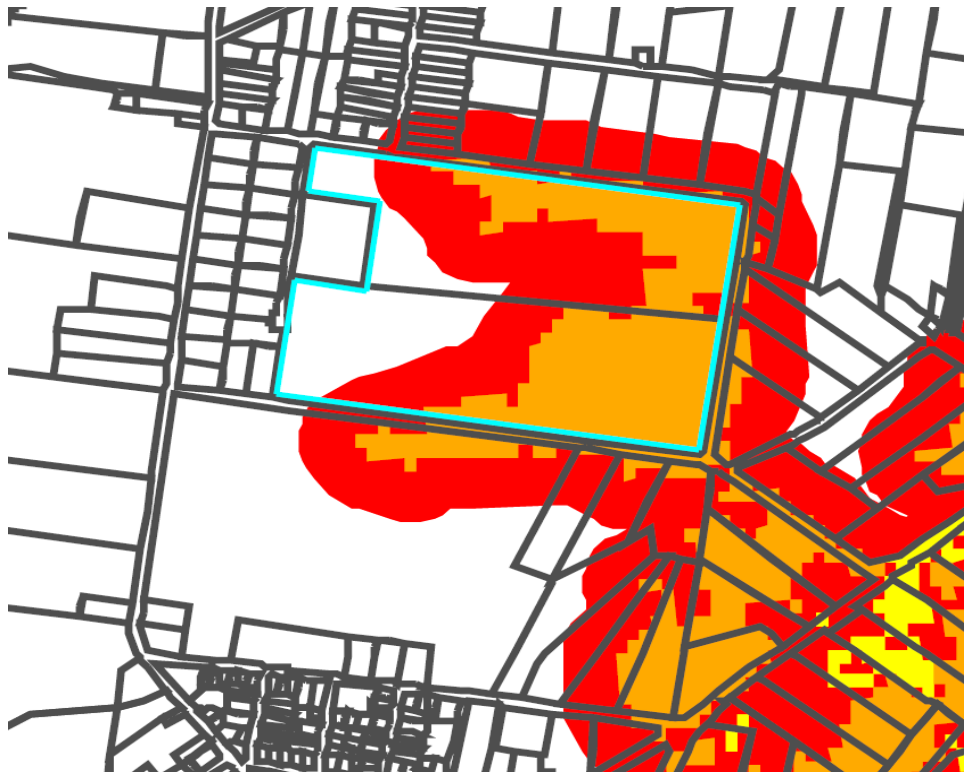
SECTION 4

PRECINCT LEVEL ASSESSMENT

4.1 Certified Bushfire Prone Land Map

The following Figure 3 is a copy of an extract of the Certified Hawkesbury Council Bushfire Prone Land Map showing the extent of the Category 1 Bushfire Prone Vegetation on the development site

Figure 3 – Plan of Bushfire Prone Land



4.2 Precinct Level Assessment of Bushfire Prone Vegetation.

Planning for Bushfire Protection 2006 provides the following procedure for assessing a development at a defined precinct level in order to determine whether the development is bushfire prone and if so, be the need to provide appropriate setbacks [Asset Protection Zones]:

- (a) *Determine vegetation distance, type and class as follows:*
Identify all vegetation in each direction from the site for a distance of at least 140 metres, and then consult Table A2.1 to determine the vegetation formation which predominates;
- (b) *Determine the average slope of the land between the predominant vegetation class and the development.*

Table 1 summarises the information provided in Section 2 of this report, to undertake a precinct level assessment to determine those aspects of the development precinct that require provision of Asset Protection Zones.

Table 1. Precinct Level Assessment.

Aspect	Existing Land Use	Predominant Vegetation within 140 m of Development	Predominant vegetation class [Table A2.1 BfBFP]	Effective Slope of land for 100m.	Comments
North	Existing Rural Development	Managed Agricultural lands	Nil	Level.	The adjoining vegetation is not bushfire prone.
East	Existing Rural Development	Managed Agricultural lands	Nil	< 5 degrees downslope to the east	The adjoining vegetation is not bushfire prone.
South	Existing Rural Development	Managed Agricultural lands	Nil	Level to < 5 degrees upslope to the south	The adjoining vegetation is not bushfire prone.
West	Residential development	Managed Curtilage	Nil	Level	The adjoining vegetation is not bushfire prone.

The Bushfire Prone Land Map accurately maps the existing vegetation within the property as Bushfire Prone Category 1 Vegetation. However, the development will remove all of this vegetation except for the Shale Gravel Transition Forest located in the south-eastern corner of the development site.

As the adjoining lands do not contain vegetation that could lawfully be classified as Bushfire Prone Vegetation, under Section 146 of the *Environmental Planning & Assessment Act*, the vegetation in the proposed Public Reserve remains the only area of bushfire prone vegetation on the site.

Furthermore, whilst the land within the Fernadell precinct is impacted by the bushfire prone vegetation in Bona Vista, future residential development of the Fernadell precinct will be separated by a 34 metre width road reserve, exceeding the minimum setback required by *Planning for Bushfire Protection 2006*. Therefore, this precinct is also excluded from examination within this report.

SECTION 5

BUSHFIRE PROTECTION ASSESSMENT

5.1 Introduction.

The Director General, in issuing the requirements for the Environmental Assessment under Part 3A of the *Environmental Planning & Assessment Act* has requested that a review be undertaken to determine the requirements for bushfire protection to the future dwellings within Stages 2 – 5, that address the provisions of *Planning for Bushfire Protection 2006*.

Planning for Bushfire Protection 2006 provides a methodology to determine the Asset Protection Zones and Bushfire Attack / Construction Standards required for habitable buildings in development for residential purposes that are designated as bushfire prone.

Sections 5.2 and 5.3 of this report use the methodology provided by *Planning for Bushfire Protection 2006* to determine the deemed-to-satisfy Asset Protection Zones and construction standards required for the construction of the residential development on the site.

Planning for Bushfire Protection 2006 also provides deemed-to-satisfy specifications on the provision of access and water supplies for firefighting operations and emergency access/egress and the management protocols for Asset Protection Zones and landscaping. These matters are examined in Sections 5.4 – 5.8 of this report.

5.2 Determination of Asset Protection Zones.

Appendix 2 of *Planning for Bushfire Protection 2006* provides the following procedure for determining setback distances (Asset Protection Zones):

- (a) *Determine vegetation formations as follows:*
 - Identify all vegetation in all directions from the site for a distance of 140 metres;
 - Consult Table A2.1 to determine the predominant vegetation type; and
 - Select the predominant vegetation formation as described in Table A2.1.
- (b) *Determine the effective slope of the land under the predominant vegetation Class.*
- (c) *Determine the appropriate fire [weather] area in Table A2.2.*
- (d) *Consult Table A2.5 and determine the appropriate setback [Asset Protection Zone] for the assessed land use, vegetation formation and slope range.*

Table 2 provides a summary of this assessment and the resultant widths of the Asset Protection Zone/s to be established to the bushfire prone vegetation within the proposed Public Reserve. Fire Danger Index for the site is 100.

Table 2. Determination of Asset Protection Zones. FDI – 100

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Table A2.1)	Effective Slope of Land	Width of Asset Protection Zone [Table A2.4 of Pf BFP]	Width of Asset Protection Zone Provided	Compliance with Table A2.4.
<i>All aspects of the lots in Stages 2 & 5 that adjoin the Public Reserve</i>	Shale Gravel Transition Forest	Forest [Area of vegetation > one [1] hectare in size deemed to be bushfire prone]	3 – 4 degrees down slope.	25 metres.	25 metres separation to Bushfire Prone vegetation provided by road reserve + setback to buildings	Yes

Assessment Results:

The 25 metre width of the Asset Protection Zones to the future lots that adjoin the Shale Gravel Transition Forest in the future Public Reserve is provided by the 15.0 metre wide perimeter road reserve plus a 10.0 metre wide building line setback to the future dwellings.

This setback complies with the deemed-to-comply setback provided by Table A2.5 of *Planning for Bushfire Protection 2006*, required for Level 3 construction of the future dwellings which adjoin the bushfire hazard.

5.3 Assessment of Bushfire Attack (Construction Standards).

Part 2.3.4 of the Building Code of Australia states that a Class 1 building that is constructed in a *designated bushfire prone area* must be designed and constructed to reduce the risk of ignition from a bushfire while the fire front passes. Part GF5.1 states that a Class 2 or 3 building constructed in a *designated bushfire prone area* is to provide a resistance to bushfires in order to reduce the danger to life and minimize the risk of the loss of the building.

Australian Standard A.S. 3959 -1999 is the enabling standard that addresses the performance requirements of both Parts 2.3.4 and Part GF5.1 of the Building Code of Australia. Therefore, the construction of the Class 1, 2 and Class 3 buildings within the development shall be constructed to comply with the specifications of this Standard.

Appendix A3.6 of *Planning for Bushfire Protection 2006* provides the following procedure for determining bushfire attack at construction stage for a building within a designated bushfire prone area:

- (a) Determine vegetation formation types and sub-formation types around the building;
- (b) Determine the separation distance between each vegetation formation and the building;
- (c) Determine the effective slope of the ground for each vegetation formation;
- (d) Determine the relevant FDI for the Council Area;
- (e) Match the relevant FDI, appropriate vegetation formation, separation distance and effective slope to determine the category of bushfire attack.

Five categories of Bushfire Attack are determined. They are:

- **Low:**
Insignificant ember attack, radiation heat or is greater than 100 metres from all woody vegetation.
- **Medium: (Level 1 Construction AS3959-1999).**
Significant ember attack with radiation heat no greater than 12.5 KWm²,
- **High: (Level 2 Construction AS3959-1999).**
Significant ember attack and possible flame contact, radiation heat greater than 12.5 KWm² and no greater than 19 KWm²
- **Extreme: (Level 3 Construction AS3959-1999).**
Significant ember attack and possible flame contact, radiation heat greater than 19 KWm² and no greater than 29 KWm²
- **Flame Zone: (Construction outside scope of AS3959-1999).**
Within the Flame Zone and / or greater than 29 KWm²

Table 3 provides a summary of the level of Bushfire Attack Assessment for the future residential buildings within the subdivision and provides recommendations on the resultant construction standards for a Fire Danger Index [FDI] of 100.

**Table 3 Bushfire Attack Assessment – Determination of Construction Standards to Future Dwellings
Fire Danger Index [FDI] – 100**

Aspect	Predominant Vegetation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land	Minimum width of Asset Protection Zone [Table A2.4 PFBFP 2006]	Level of Bushfire Attack [Table A3.3 of PFBFP 2006]	Construction Standard in accordance with A.S.3959
All aspects of the lots in Stages 2 & 5 that adjoin the Public Reserve	Shale Gravel Transition Forest	3 - 4 degrees down slope to the southeast.	25 metres separation to Bushfire Prone Vegetation.	Extreme	Level 3 construction standards required. [Refer to Note 1]

Assessment Results:

The only buildings which will have an exposure to a bushfire hazard are those dwellings located on the bushland interface. Whilst the level of bushfire attack has been established in the assessment process above as being extreme the potential fire run across the vegetation in the Reserve will vary from approximately 100 metre to 200 metres without further continuity to other bushfire prone vegetation.

The fire behaviour potential will therefore not result in fires with extreme levels of radiant heat but rather short duration radiant heat impacts. For this reason, it is recommended that the potential levels of bushfire attack can be addressed in the provision of Level 1 construction standards, in accordance with the specifications of Australian Standard A.S 3959 -1999 *“Construction of Buildings in Bushfire Prone Areas*, to the first row of dwellings that adjoin the bushfire prone vegetation in the Public Reserve.

5.3 Water Supplies for Firefighting Operations.

The future residential subdivision of the land will have a reticulated water supply connected to the Sydney Water Supply mains. The dwellings in the future subdivision of the land will be connected to this reticulated water supply.

The reticulated water supply in the subdivision shall include the provision of a ring main with Hydrants installed in accordance with the specifications of Australian Standard A.S 2419.2 and have a minimum flow rate of 10 litres / second.

Fire hydrants shall be accessible and located such that a tanker can park within a maximum distance of 20 metres from the hydrant and the habitable building must be located such that a fire at the furthest extremity can be attacked by fire-fighters using two 30 metre hose lines and a 10 metre water jet. A clear unobstructed path between the hydrant and the most distant point of the building cannot exceed 90 metres.

Hydrant locations shall be delineated by blue markers placed on the hydrant side of the centreline of the road pavement.

5.4 Access for Fire Fighting Operations.**5.4.1 Public Roads:**

The subdivision of the land within Lot 14 in DP 865977 & Lot 132 in DP 1025876 will create new lots which will have vehicular access directly off perimeter and internal roads which will be constructed to the deemed-to-satisfy specifications for Public Roads as defined by Chapter 4 of *Planning for Bushfire Protection 2006*. The roads will have a minimum 8.0 metre seal width which complies with the minimum width of a perimeter public road required by the NSW Rural Fire Service.

5.4.2 Fire Trail Access.

The subdivision plan provides for the construction of a perimeter road to the bushfire prone land interface, therefore no fire trails are required.

5.4.3 Emergency Response Access / Egress.

The subdivision layout provides emergency response access/egress in the form of a looped road network from Bootles Lane and Johnston Street with alternate routes to all three existing public roads.

Emergency access to the bushfire prone vegetation in the Public Reserve is available to all sides of the Reserve via existing public roads or the perimeter roads within the subdivision.

5.5 Adequacy of Bushfire Maintenance Plans and Fire Emergency procedures.

The Hawkesbury Bushfire Risk Management and Operational Plans adequately address the bushfire maintenance and fire emergency procedures for the management of the bushfire vegetation and the operational procedures during fire events in the local area.

5.6 Emergency Management for Fire Protection / Evacuation.

The proposed residential development will be subject to the impact of fires burning within the bushfire prone vegetation retained in the Public Reserve within the southeast corner of the development site. The potential fire behaviour within this vegetation will not be sufficient to cause the need for evacuation of the residents living in the adjoining dwellings.

5.7 Bushfire Hazard Management.

Careful attention shall be given to species selection of landscaping within the lots adjacent to the vegetation within the Reserve, their location relative to their flammability, avoidance of continuity of vegetation [separation horizontally and vertically] and ongoing maintenance to remove flammable fuels. Methods of bushfire hazard management include mowing of lawns and manual removal of combustible material, particularly within the landscaped areas.

Management of the vegetation within the development precinct shall comply with the recommendations of Appendix A5.4 & Appendix A5.5 of *Planning for Bushfire Protection 2006* and the Rural Fire Service “*Standards for Asset Protection Zones*”.

Management of the landscaped gardens shall comply with the following:

- Maintain a clear area of low cut lawn or pavement adjacent to the buildings;
- Keep areas under fences, fence posts, gates & trees raked and clear of combustible fuels;
- Utilise non-combustible fencing and retaining wall structures;
- Maintain tree canopies and shrubs so that they are clear of the building by at least five metres;
- Utilise non-flammable materials such as Scoria, pebbles and recycled crushed bricks as ground cover to landscaped gardens in close proximity to buildings;
- Landscape species selection shall be drawn from those that are considered to be species which are “*fire retardant*” and do not promulgate the spread of fire.

It is recommended that a Section 88B Instrument, under the provisions of the Conveyancing Act of 1919, shall be created on the title of the lots within the development within exposure to the bushfire hazard, to ensure ongoing management of the nominated Asset Protection Zone and the combustible fuels within the landscaped gardens.

5.8 Adequacy of Sprinkler Systems & other Fire Protection Measures.

There are no sprinkler systems required or recommended.

5.9 Staged Development.

The construction of the subdivision will be undertaken over five [5] stages.

Stage 1 contains twenty nine [29] lots and is located north of Bootles Lane in the south-western corner of the estate. Approval for Stage 1 has been granted with construction commenced.

Stage 2 contains sixty two lots and is located to the east of Stage 1 and adjoins the bushfire prone vegetation in the Public Reserve. This stage will create the Asset Protection Zones to the vegetation in the Reserve and have perimeter roads to the bushfire hazard interface and the eastern and northern edges. The grassland vegetation within residual land will be managed by slashing/grazing.

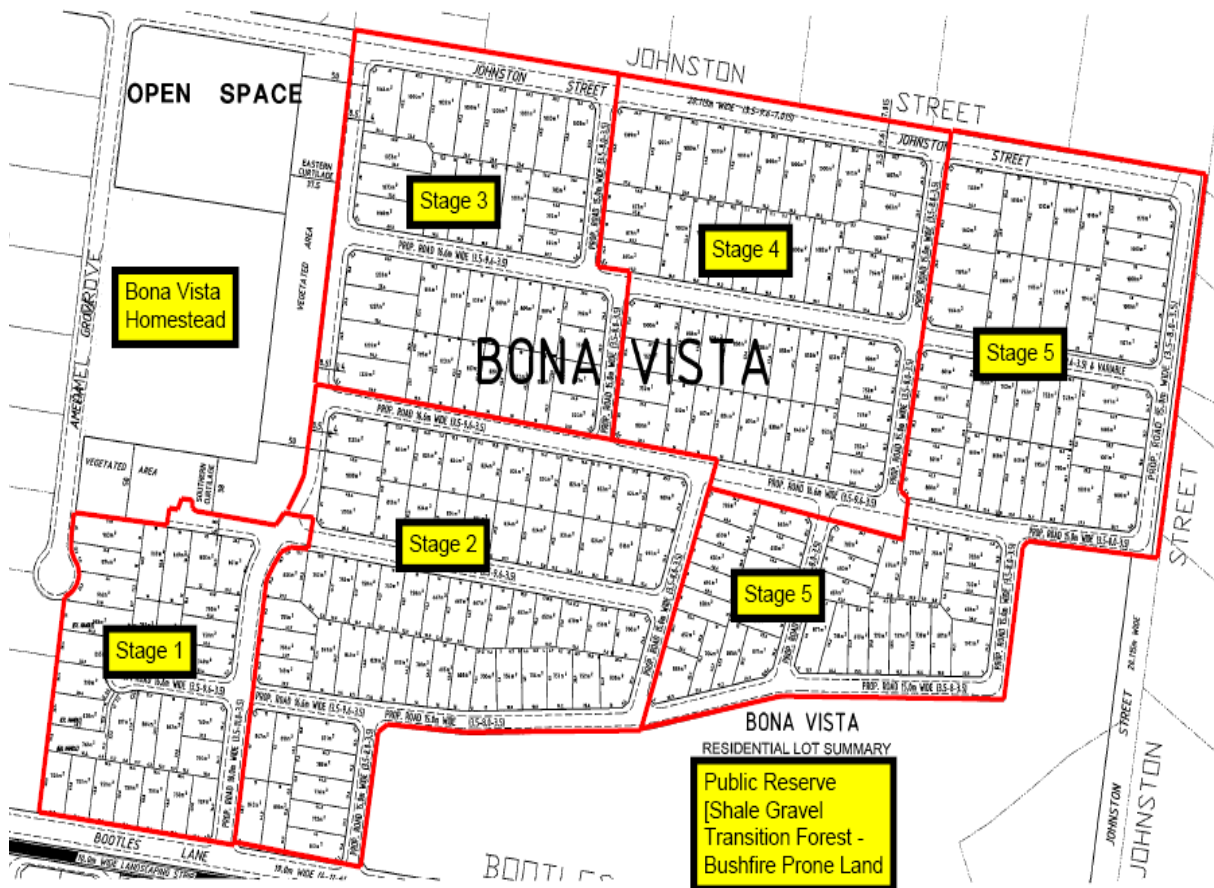
Stage 3 contains thirty eight [38] lots and is located to the north of Stage 3, extending to Johnston Street in the north and providing access to the north. This stage is not impacted by the bushfire prone vegetation however the grassland vegetation on the residual land to the east will be managed by slashing/grazing.

Stage 4 contains forty seven [47] lots and adjoins the eastern side of Stage 3, extending north to Johnston Street in the north and providing access to the north.

This stage is not impacted by the bushfire prone vegetation however the grassland vegetation on the residual land to the east will be managed by slashing/grazing.

Stage 5 contains fifty four [54] and occupies the balance of the land to the east of Stage 2 and Stage 4 with the southern portion adjoining the bushfire prone vegetation within the Public Reserve. This stage will create the Asset Protection Zones to the vegetation in the Reserve and have perimeter roads to the bushfire hazard interface and the eastern and northern edges.

Figure 4 – Staging Plan



SECTION 6

RECOMMENDATIONS

Recommendation 1:

Asset Protection Zones shall be provided to the widths as nominated in Table 4. (Section 9 “*Plan of Bushfire Protection Measures*”).

Table 4. Asset Protection Zones.

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Table A2.1)	Effective Slope of Land	Width of Asset Protection Zone [Table A2.4 of Pf BFP]	Width of Asset Protection Zone Provided	Compliance with Table A2.4 of Pf BFP.
<i>All aspects of the lots in Stages 2 & 5 that adjoin the Public Reserve</i>	Shale Gravel Transition Forest	Forest [Area of vegetation > one [1] hectare in size deemed to be bushfire prone]	3 - 4 degrees down slope.	25 metres.	25 metres separation to Bushfire Prone vegetation provided by road reserve + setback to buildings	Yes

Recommendation 2:

The Asset Protection Zones and the landscape gardens within each lot so burdened shall be maintained as an Inner Protection Area in accordance with Appendix 5 of *Planning for Bushfire Protection 2006* and the NSW Rural Fire Service’s “*Specifications for Asset Protection Zones*”.

Management of the landscaped gardens shall comply with the following:

- Maintain a clear area of low cut lawn or pavement adjacent to the buildings;
- Keep areas under fences, fence posts, gates & trees raked and clear of combustible fuels;
- Utilise non-combustible fencing and retaining wall structures;
- Maintain tree canopies and shrubs so that they are clear of the building by at least two metres;
- Utilise non-flammable materials such as Scoria, pebbles and recycled crushed bricks as ground cover to landscaped gardens in close proximity to buildings;
- Landscape species selection shall be drawn from those that are considered to be species which are “*fire retardant*” and do not promulgate the spread of fire.

Recommendation 3:

An 88B Covenant, in accordance with the provisions of the Conveyancing Act of 1919, shall be created on the title of the future residential lots, burdened by the Asset Protection Zone provision, to ensure the ongoing management of the landscaped gardens/residual vegetation within the development in accordance with the provisions of an Inner Asset Protection Zone [Curtilage to dwellings].

Recommendation 4:

The minimum construction standard to the future dwellings within Stages 2 & 5, with an exposure to the bushfire prone vegetation on the Public Reserve shall be Level 1 construction standard, in accordance with the specifications of Australian Standard A.S 3959 - Second Edition 1999 and Amendment 1, 2000, *"Construction of Buildings in Bushfire Prone Areas"*.

Recommendation 5:

The future public access roads shall be constructed to the widths provided in the Masterplan for Bona Vista prepared by Brown Consulting (NSW) Pty Ltd.

Recommendation 6:

The Sydney Water Supply mains shall be extended, to service the future residential development, in accordance with the specifications of Australian Standard A.S 2419.2. Hydrants shall have a flow rate of 10 litres / second with blue pavement marks provided to locate hydrant positions.

Fire hydrants shall be accessible and located such that a tanker can park within a maximum distance of 20 metres from the hydrant and the habitable building must be located such that a fire at the furthest extremity can be attacked by fire-fighters using two 30 metre hose lines and a 10 metre water jet. A clear unobstructed path between the hydrant and the most distant point of the building cannot exceed 90 metres.

Blue hydrant markers shall be provided to locate the positions of the hydrants. The markers shall be positioned on the hydrant side of the centreline of the road pavement.

SECTION 7

CONCLUSION

Australian Bushfire Protection Planners Pty Limited, at the request of the *Johnson Property Group*, has undertaken the bushfire consultancy to update the bushfire protection measures to the proposed residential subdivision of at Pitt Town, and specifically for Lot 14 in DP 865977 & Lot 132 in DP 1025876, (Bona Vista), Bootles Lane and Johnston Street, Pitt Town.

The precincts to the north of Hall Street, namely Blighton, Cleary and Thornton are greater than 100 metres from the bushfire prone vegetation within Bona Vista and are therefore not within a bushfire prone area and are not examined in this report. Furthermore, whilst the land within the Fernadell precinct is impacted by the bushfire prone vegetation in Bona Vista, future residential development of the Fernadell precinct will be separated by a 34 metre width road reserve, exceeding the minimum setback required by *Planning for Bushfire Protection 2006*. Therefore, this precinct is also excluded from examination within this report.

The Department of Planning [DOP] has approved an application, under Part 3A of the *Environmental Planning & Assessment Act* for the residential subdivision of land within Lot 14 in DP 865977 & Lot 132 in DP 1025876, Bootles Lane and Johnston Street, Pitt Town. As part of the Environmental Assessment requirements for the subdivision the Minister has requested a review of the bushfire protection measures to the development in accordance with the specifications of *Planning for Bushfire Protection 2006*.

The property contains an area of Shale Gravel Transition Forest [EEC] which is located within the south-eastern corner of the development site. This vegetation will be retained within a proposed Public Reserve and will remain classified as bushfire prone vegetation.

The deemed-to-comply specifications require that an Asset Protection Zone of 25 metres be provided between the future dwellings on those lots which face the bushfire prone vegetation and the boundary of the Public Reserve.

This setback is provided in the form of a 15.0 metre wide road reserve and a 10.0 metre width building line setback to those buildings adjoining the bushfire hazard.

The bushfire attack assessment undertaken in this report has determined that these buildings should also be constructed to comply with Level 3 constriction standards in accordance with Australian Standard A.S. 3959 – 1999.

However, the level as fire behaviour within the vegetation on the Reserve will not be such that warrants this level of construction and it is therefore recommended that those dwellings exposed the bushfire hazard shall be constructed to comply with Level 1 construction in accordance with A.S 3959 – 1999.

All matters relating to the provision of access and water supplies for fire fighting operations are addressed in the subdivision design.

The following table summarises the extent to which the Concept Plan conforms to the deemed-to-satisfy specifications of *Planning for Bushfire Protection 2006*.

Table 5. Compliance with the deemed-to-satisfy provisions of *Planning for Bushfire Protection 2006*.

Bushfire Protection Measure	Compliance with deemed-to-satisfy provisions of <i>Planning for Bushfire Protection 2006</i> .
(I) Asset Protection Zone setbacks	YES
(II) The siting and adequacy of water supplies for fire fighting	YES
(III) Capacity of public roads to handle increased volumes of traffic in the event of a bushfire emergency	YES
(IV) Public roads that link with the fire trail network have two - way access	YES
(V) Adequacy of emergency response access and egress	YES
(VI) Adequacy of bushfire maintenance plans and fire emergency procedures	YES
(VII) Building construction standards	YES
(VIII) Adequacy of sprinkler systems and other fire protection measures to be incorporated into the development	Not applicable

The proposed development, as represented by the Masterplan Plan layout prepared by Brown Consulting (NSW) Pty Ltd, complies with the “Deemed-to-Satisfy” specifications set out in Chapter 4 (Performance Based Control) and the aim and objectives of *Planning for Bushfire Protection 2006*.

REFERENCES:

- N.S.W Rural Fire Service – *Planning for Bushfire Protection 2006*;
- *Environmental Planning & Assessment Act – 1979*;
- *Rural Fires Act – 1997*;
- *Rural Fires and Environmental Assessment Legislation Amendment Act 2002*;
- *Rural Fires Regulation 2002*;
- NSW Rural Fire Service – *Guideline for Bushfire Prone Land Mapping 2002*;
- *Threatened Species Conservation Act 1995*;
- *Native Vegetation Act*;
- *Bushfire Environmental Assessment Code 2003*;
- Building Code of Australia;
- Australian Standard A.S 3959-1999 “*Construction of Buildings in Bushfire Prone Areas*”.
- *Hawkesbury Shire Bushfire Prone Land Map*

SECTION 8 – SITE PHOTOGRAPHS



Photograph No. 1 – Taken from Stage 1 looking east across Stage 2 to the Shale Gravel Transition Forest in the Public Reserve



Photograph No. 2 – Looking southeast from Stage 2 to continuation of Shale Gravel Transition Forest in the Public Reserve to the south of Stage 2



Photograph No. 3 – Looking southeast from Stage 2 to the continuation of the Shale Gravel Transition Forest in the Public Reserve to the south of Stages 2 & 3.



Photograph No. 4 – Taken from Bootles Lane looking northwest through the Shale Gravel Transition Forest within the Public Reserve.

SECTION 9

Figure 5 – PLAN OF BUSHFIRE PROTECTION MEASURES

