

BUSHFIRE PROTECTION ASSESSMENT
FOR THE PROPOSED DEVELOPMENT
OF

LOT 92 in DP 1078055, LOT 5 in DP 25886
& LOTS 1 – 4 in DP 45956,
RAINBOW BEACH,
BONNY HILLS

FOR THE

ST VINCENTS FOUNDATION PTY LTD.



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Assessment Number	Document	Preparation Date	Issue Date	Directors Approval
B07616 -1	Final	28.11.2007	16.9.2008	<i>G.L.Swain</i>

EXECUTIVE SUMMARY

Australian Bushfire Protection Planners Pty Limited has been commissioned by the *St Vincents Foundation Pty Ltd*, to undertake the bushfire consultancy to inform the Concept Planning process, under the provisions of Part 3A [Major Projects] of the *Environmental Planning & Assessment Act 1979*, on the bushfire protection measures required for the proposed urban development on land known as Lot 92 in DP 1078055, Lot 5 in DP 25886 and Lots 1 – 4 in DP 45956, Rainbow Beach, Bonny Hills.

A Concept Plan application for the overall development and a separate Project Application for the constructed wetland, site filling and the open space/drainage/habitat corridor elements of the development have been submitted to the Department of Planning.

The land over which the Concept Planning and Project Planning Application has been lodged is land located on the eastern side of Ocean Drive, extending north from the existing residential development on the current northern edge of the township of Bonny Hills and bounded to the north by Ocean Drive and to the east by the back dunes of Rainbow Beach.

The whole of the land is currently zoned part Residential 2(a1) and part Rural 1(a1) and forms part of the Port Macquarie – Hastings Council's adopted Structure Plan for the Area 14 Urban Release Area between Lake Cathie and Bonny Hills.

The Concept Plan (copy shown on Page 8) identifies the future urban landuse within the site. In summary these land uses include residential and part village/commercial land uses on the northern part of the site, two (2) school sites located in the north-western and south-western parts of the site, an Eco Tourist site on the eastern edge of the site, district sporting fields in the western part and a central spine of Open Space/Drainage/Habitat Corridor. As indicated in the Concept Plan, the Open Space/Drainage/Habitat Corridor also adjoins existing urban/residential land to the south.

The Open Space/Drainage/Habitat Corridor is predominantly located within the southern portion of the site, separating the future urban areas from the existing urban development adjoining the site to the south. However in its north-eastern extent the corridor separates the proposed residential development precinct from a proposed Eco Tourist site and also the proposed residential/urban areas on the land adjoining to the east.

The Open Space/Drainage/Habitat Corridor will contain the existing water body and a proposed constructed wetland and will be revegetated with Swamp Mahogany / Paperbark / Swamp She Oak on the floodplain areas and Dry Blackbutt Open Forest in the area to the southeast and east of the proposed constructed wetland.

Over the life of the development, the corridor will contain mature vegetation eventually forming an area of bushfire prone vegetation within the southern portion of the site, linking with the existing bushfire prone vegetation in the eastern portion of the site (adjacent to the Sewer Treatment Plant and forest vegetation on adjoining lands).

In addition to the Open Space/Drainage/Habitat Corridor, a 50 metre wide vegetated corridor exists and is proposed to be retained and enhanced along the western aspect of the site forming a screen to Ocean Drive. This corridor contains Grey Iron Bark / Grey Gum [southern section of the corridor] and Paperbark / Swamp Mahogany / Swamp She Oak [northern section of the corridor].

The topography of the land within the site consists of a floodplain that extends west to east through the southern portion of the site, discharging into an existing creek line [Duchess Gully] that flows south to Bonny Hills, behind the coastal dune system. The floodplain turns to the northwest towards the intersection of Ocean Drive and Houston Mitchell Drive and extends further to the west, to the north of the existing residential development on St Kitts Way, Bonny Hills and the proposed southern school site and extending west, beyond Ocean Drive.

The landform to the north of the floodplain rises, in a series of connecting ridges, to the north at 5 – 10 degrees.

The Concept Plan indicates that urban / residential land use is proposed within the area occupied by the higher, undulating terrain in the northern and north-eastern portion of the site with a “*Northern School Site*” located adjacent to the Ocean Drive boundary in the north-western corner of the site. A “*Southern School Site*” is located adjacent to the western boundary, in the south-western corner of the site.

A proposed “*Eco Tourist Site*” precinct is located in the eastern portion of the site, beyond the Open Space/Drainage/Habitat Corridor and the Duchess Gully Creek.

Finally, it is noted that land adjoining the site is either currently developed or proposed for future development in a form that should be taken into consideration as part of the assessment of the Concept Plan Application and the Project Application. Those adjoining lands are described as follows:

- Land adjoining to the northeast of the site, currently zoned rural but proposed for rezoning to allow future urban / residential development;
- Land adjoining to the north of the site [north of Ocean Drive] zoned residential and proposed for future residential development;
- Residential subdivision land adjoining to the south, known as “Seawind Estate” and “Rainbow Beach Estate”, which either adjoin directly or via existing public open space to the proposed Open Space/ Drainage / Habitat Corridor.

The Project Application details the construction of the Open Space/Drainage/Habitat Corridor referred to above, including a constructed wetland and filling on the residential/urban portion of the site. The Open Space/Drainage/Habitat Corridor will also contain the existing water body and will be revegetated.

The Port Macquarie – Hastings Certified Bushfire Prone Land Map indicates that the development site contains the buffer zone to the Category 1 Bushfire Prone Vegetation which is shown mapped on the land to the west of Ocean Drive.

The Bushfire Prone Land Map also identifies that the development site contains Category 2 Bushfire Prone Vegetation, and the bushfire zone to this vegetation, located on the land surrounding the Sewer Treatment Plant and the vegetation on the Coastal Dune system along the eastern aspect of the site.

Whilst not mapped, the vegetation within the Open Space/Drainage/Habitat Corridor will, when fully established, be classified as bushfire prone vegetation under the provisions of Section 146 of the *Environmental Planning & Assessment Act 1979*.

The Director Generals Environmental Assessment Requirements [DGRs] for the Concept Plan for the residential subdivision (approximately 930 lots); School site; Playing Fields; Open Space; Constructed Wetland; Business/Retail Centre and Ecotourist site, issued on the 17/1/2007 includes, under the heading "*Key Issues*", Item 4 subheading "*Hazard Management and Mitigation*" Item 4.1, the following advice:

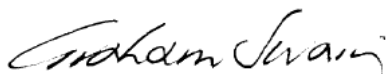
"Address the requirements of Planning for Bushfire Protection 2001 (or relevant policy)".

The Director Generals Environmental Assessment Requirements [DGRs] for the Project Plan for the Open Space and Constructed Wetland, issued on the 9/3/2007 includes, under the heading "*Key Issues*", Item 6 subheading "*Hazard Management and Mitigation*" Item 6.1, the following advice:

"Address the requirements of Planning for Bushfire Protection 2001(RFS) or relevant policy in the design of the proposal with regard to proposed adjacent land uses such as residential and schools".

[Since the receipt of the Director Generals Requirements [DGRs], *Planning for Bushfire Protection 2001* has been replaced by *Planning for Bushfire Protection 2006*. This report examines the DGRs under the provisions of the 2006 document].

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 the existing bushfire prone vegetation adjoining the development precincts and the vegetation within the re-vegetated Open Space/Drainage/Habitat Corridors within the site so as to address the aim and objectives of *Planning for Bushfire Protection 2006* and therefore Item 4.1 of the Directors Generals Requirements [DGRs] for the Concept Plan Application and Item 6.1 of the Director Generals Requirements [DGRs] for the Project Plan Application.



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

TABLE OF CONTENTS

EXECUTIVE SUMMARY	3
TABLE OF CONTENTS.....	6
SECTION 1	7
INTRODUCTION	7
1.1 Development Proposal.....	7
1.2 Aim of this Assessment.....	9
1.3 Statutory Requirements.....	9
1.3.1 Legislation.....	9
1.3.1 Legislation.....	9
1.3.2 Planning Policies.....	10
1.4 Documentation reviewed in this Assessment.....	11
1.5 Site Inspection.....	11
1.6 Authority Consultation.....	11
SECTION 2	12
PROPERTY DESCRIPTION	12
2.1 Location & Description.....	12
2.2 Existing Land Use.....	14
2.2 Proposed Land Use.....	14
2.3 Surrounding Land Use.....	15
2.4 Topography.....	17
2.5 Vegetation within the Subject Land.....	19
2.6 Vegetation within 140 metres of Development Precincts.....	23
2.7 Significant Environmental Features on the Subject Site.....	26
2.8 Known Threatened Species, Population or Ecological Community within the Property.....	26
2.9 Details and location of Aboriginal Relics or Aboriginal Place.....	27
SECTION 3.....	29
BUSHFIRE PROTECTION ASSESSMENT	29
3.1 Introduction.....	29
3.2 Determination of Asset Protection Zones.....	30
3.3 Determination of Asset Protection Zones for the future residential development constructed in the Residential Precinct as shown on the Concept Plan.....	30
3.4 Determination of Asset Protection Zones for the future Eco Tourist development constructed in the Tourist Precinct as shown on the Concept Plan.....	34
3.5 Determination of Asset Protection Zones for the future Northern School Site as shown on the Concept Plan.....	35
3.6 Determination of Asset Protection Zones for the future Southern School Site as shown on the Concept Plan.....	37
3.7 Assessment of Bushfire Attack (Construction Standards).....	38
3.8 Water Supplies for Firefighting Operations.....	39
3.9 Access.....	40
3.10 Bushfire Maintenance Plans and Fire Emergency Procedures.....	41
3.11 Emergency Evacuation.....	41
SECTION 4	43
CONCLUSION	43
SECTION 5	45
REFERENCES:	45
SECTION 6 – PLAN OF BUSHFIRE PROTECTION MEASURES	46
SECTION 7 – Site Photographs	47

SECTION 1

INTRODUCTION

1.1 Development Proposal.

This Bushfire Protection Assessment has been prepared at the request of the *St Vincents Foundation Pty Ltd* to inform the Concept Planning and Project Planning process, under Part 3A [Major Projects] of the *Environmental Planning & Assessment Act 1979*, on the bushfire protection measures required for the proposed urban development upon land known as Lot 92 in DP 1078055, Lot 5 in DP 25886 and 1 – 4 in DP 45956, Rainbow Beach Bonny Hills.

The Concept Plan indicates that urban/ residential land use is proposed within the area occupied by the higher, undulating terrain in the northern and north-eastern portion of the site with a “*Northern School Site*” located adjacent to the Ocean Drive boundary in the north-western corner of the site. A “*Southern School Site*” is located adjacent to the western boundary, in the south-western corner of the site.

A proposed “*Eco Tourist Site*” precinct is located in the eastern portion of the site, beyond the Open Space/Drainage/Habitat Corridor and the Duchess Gully Creek.

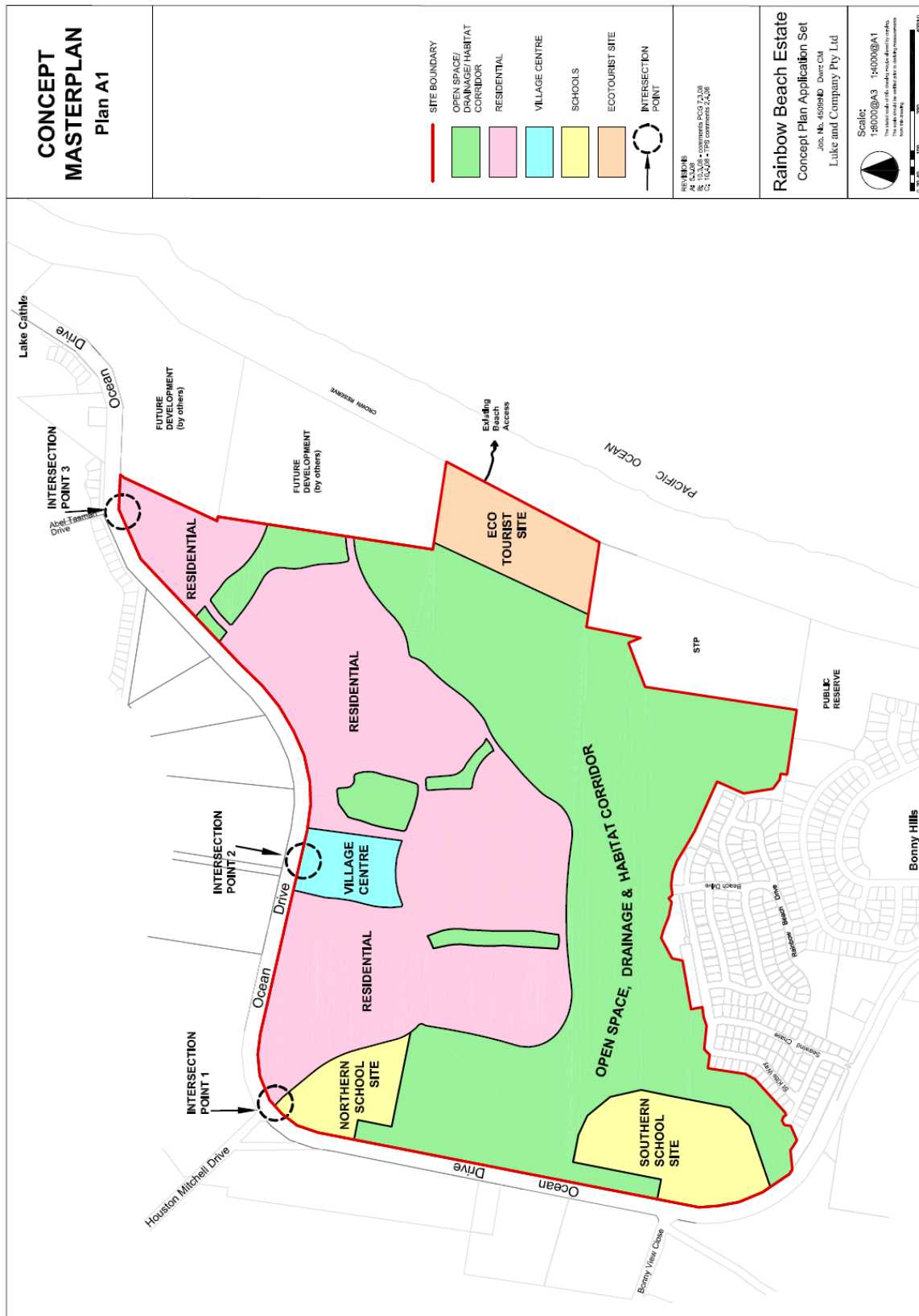
The Project Application details the construction of the Open Space/Drainage/Habitat Corridor referred to above, including a constructed wetland and filling on the residential/urban portion of the site. The Open Space/Drainage/Habitat Corridor will also contain the existing water body and will be revegetated.

Over the life of the development, the Open Space/Drainage/Habitat corridor will contain mature vegetation eventually forming an area of bushfire prone vegetation within the southern portion of the site, linking with the existing bushfire prone vegetation in the eastern portion of the site (adjacent to the Sewer Treatment Plant) and littoral forest vegetation on the Coastal Dunes and the vegetation on adjoining lands.

In addition to the Open Space/Drainage/Habitat Corridor, a 50 metre wide vegetated corridor exists and is proposed to be retained and enhanced along the western aspect of the site forming a screen to Ocean Drive.

[Refer to Concept Plan shown on Page 8].

Figure 1 – Copy of Concept Plan prepared by Luke & Company



1.2 Aim of this Assessment.

The aim of this assessment is to address the Director Generals Environmental Assessment Requirements [DGRs] for the Concept Plan for the residential subdivision (approximately 930 lots); School site; Playing Fields; Open Space; Constructed Wetland; Business/Retail Centre and Eco-tourist site, issued on the 17/1/2007 includes, under the heading “*Key Issues*”, Item 4 subheading “*Hazard Management and Mitigation*” Item 4.1, the following advice:

“Address the requirements of Planning for Bushfire Protection 2001 (or relevant policy)”.

The Director Generals Environmental Assessment Requirements [DGRs] for the Project Plan for the Open Space and Constructed Wetland, issued on the 9/3/2007 includes, under the heading “*Key Issues*”, Item 6 subheading “*Hazard Management and Mitigation*” Item 6.1, the following advice:

“Address the requirements of Planning for Bushfire Protection 2001(RFS) or relevant policy in the design of the proposal with regard to proposed adjacent land uses such as residential and schools”.

Since the receipt of the Director Generals Requirements [DGRs], *Planning for Bushfire Protection 2001* has been replaced by *Planning for Bushfire Protection 2006*. This report examines the DGRs under the provisions of the 2006 document.

1.3 Statutory Requirements.

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

1.3.1 Legislation.

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, 1997* (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.

Under the provisions of Part 3A, proponents of major projects are required to address the requirements of the Environmental Assessment as determined by the Director General of the Department of Planning.

These are issued as the Director Generals Requirements (DGRs). [Refer to Section 1.2 above for requirements relating bushfire matters within the DGRs].

(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. [NSW 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.

1.4 Documentation reviewed in this Assessment.

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

- Concept Plan Lot 92 in DP 1078055, Lot 5 in DP 25886 & Lots 1 – 4 in DP 45956 Rainbow Beach, Bonny Hills prepared by Luke & Company Pty Ltd;
- Preliminary Environmental Assessment & Identification of Issues – Open Space Corridor & Constructed Wetland prepared by EDAW, dated December 2006;
- Grants Head 1:25,000 Aerial Photograph;
- Grants Head 1:25000 Topographic Map;
- Port Macquarie – Hastings Council Bushfire Prone Land Map;
- Rainbow Beach, Bonny Hills Open Space Management Strategy prepared by Cardno, dated 19.8.2008;
- *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*.

1.5 Site Inspection.

Graham Swain of *Australian Bushfire Protection Planners Pty Limited* inspected the site and surrounding areas on the 24th September 2007 to assess the topography, slopes and vegetation classification within and adjoining the development property. Adjoining properties were also inspected to determine the surrounding land use / vegetation communities and land management.

1.6 Authority Consultation.

In accordance with the Director Generals Requirements, consultation with the NSW Rural Fire Service was held on the 20th November 2007. This consultation occurred between Mr Dan Copeland, Development Control Officer with the NSW Rural Fire Service and Graham Swain, Director of *Australian Bushfire Protection Planners Pty Limited*. There were no issues raised by Mr Copeland that warrants modification to the development layout or the contents of this report and the recommendations in respect to the provision of fire protection measures and compliance with the deemed-to-satisfy provisions of *Planning for Bushfire Protection 2006*.

PROPERTY DESCRIPTION

The proposal is for a Concept Plan approval for part Lot 92 on DP 1078055, Lot 5 in DP 25886 and Lots 1 – 4 in DP 45959 located at Rainbow Beach Bonny Hills [collectively referred to in this report as “the subject land”]. The subject land is located to the east of Ocean Drive, extending east to the backdunes of Rainbow Beach and the Lake Cathie/Bonny Hills Sewerage Treatment Plant, north from the existing residential development within the “Seawind” and “Rainbow Beach Estate” residential estates, through to Ocean Drive to the north. Lot 92 is just over 170 hectares in area and Lot 5 is 7.5 hectares in area. Lots 1 – 4 are smaller allotments [formerly road reserves].

Figure 2 – Extract from DP 1078055 showing the extent of Lot 92 & the location of Lots 1 – 4.

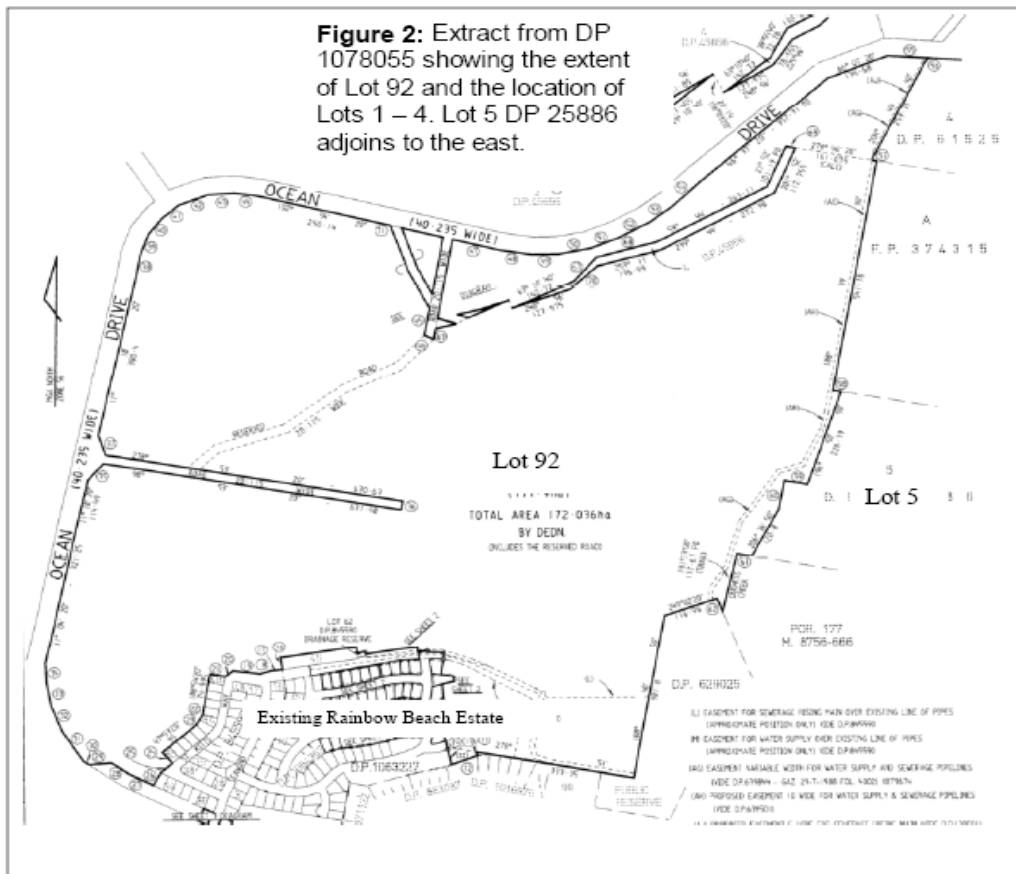


Figure 3 – Extract from DP 25886 showing the extent of Lot 5

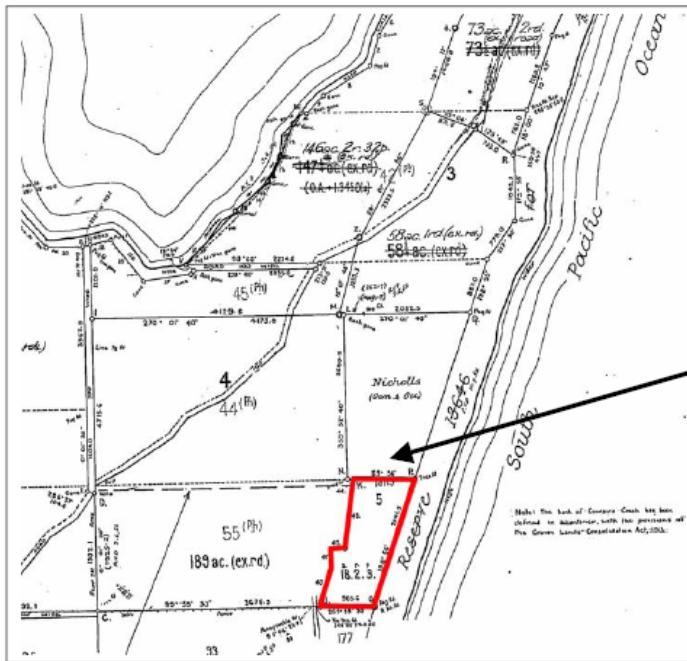


Figure 3: Extract from DP 25886 showing the extent of Lot 5 as edged in red.

Figure 3 - Aerial Photograph of Development Site & adjoining lands



2.2 Existing Land Use.

Some seven hectares of the original Lot 92 has already been developed as a residential estate [Rainbow Beach Estate Stages 1, 2 & 3] to the south. The remainder of the property contains two dwellings in a rural setting. The majority of the subject land is used for cattle grazing and other agricultural pursuits.

Historic landform modification conducted in association with a former development approval for an international sports resort during the 1980s, resulted in the construction of artificial drainage lines and bulk earthworks. The entire site has been zoned for residential development since 1984 and a recent amendment to the Hastings LEP2001 introduced a rural zoning to formalise the buffer to the Sewerage Treatment Plant located in the south-eastern corner of the property.

Figure 4 – Extract from Hastings LEP 2001

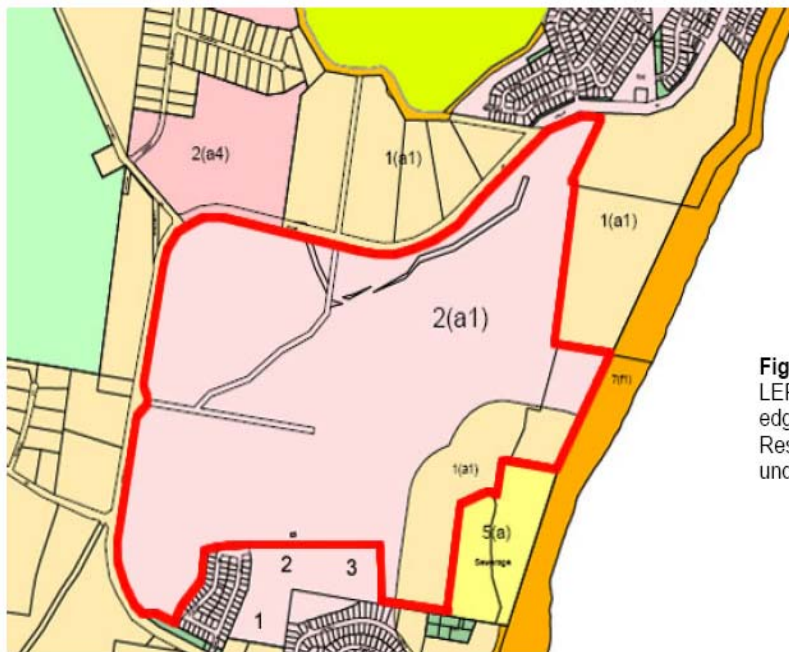


Figure 4: Extract from Hastings LEP 2001 showing subject land edged in red and zoned part 2(a1) Residential and part 1(a1) Rural under the provisions of this LEP.

2.2 Proposed Land Use.

In accordance with the Port Macquarie – Hastings Council's adopted Urban Growth Strategy for Area 14 ["Structure Plan"], which encompasses the subject land, the proposed urban development of the land includes residential development, community facilities, a business centre, Eco Tourist development, primary and high school facilities with associated playing fields and the remainder of the site used for passive open space, drainage and habitat corridors.

Figure 5 – Extract from the Port Macquarie – Hastings Council's Lake Cathie – Bonny Hills Master Plan showing proposed land use on the subject land & on adjoining properties.

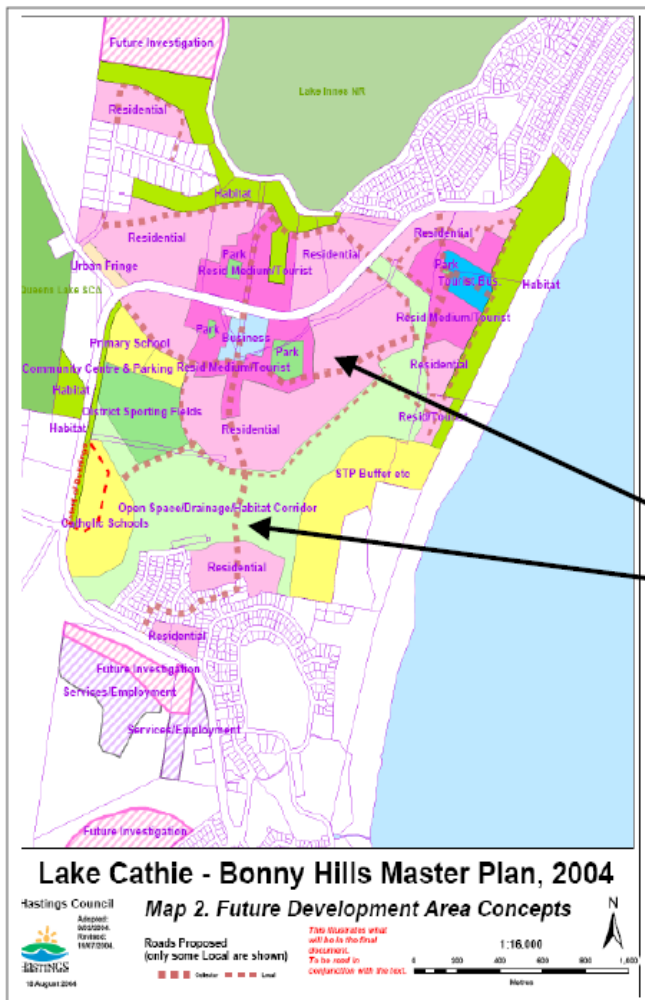


Figure 5: Extract from Port Macquarie – Hastings Council's Lake Cathie – Bonny Hills adopted Master Plan. As this is not a Master Plan under the provisions of SEPP 71, it is now generally referred to as the Area 14 Structure Plan.

Subject Land
 Part Lot 92, Lot 5 and
 Lots 1 - 4

2.3 Surrounding Land Use.

Figure 5 [above] provides an indication of the future land uses adjoining the subject land; however the following details the present land uses surrounding the future development precincts as shown on the Concept Plan.

2.3.1 Residential Precinct.

The Concept Plan identifies the future urban land uses within the subject land, located within the area occupied by the higher, undulating terrain in the northern portion of the site.

Ocean Drive adjoins the northern boundary of this precinct with existing rural residential development location beyond the Ocean Drive carriageway. [This land is zoned for future residential/tourist development].

The land to the east of the residential precinct consists of vacant rural land over which a current application is before Council for residential subdivision as identified in the Lake Cathie – Bonny Hills Master Plan.

The land to the south and southeast of the residential precinct forms the Open Space/Drainage/Habitat corridor identified on the Concept Plan and the Lake Cathie - Bonny Hills Master Plan. This corridor contains an existing waterbody and proposed constructed wetland as well as areas of re-vegetated open Space and drainage corridors.

This Open Space/Drainage/Habitat extends to the southwest of the residential precinct, with the proposed District Sporting Fields forming the future land use to the southern portion of the western aspect of the residential precinct. The proposed Northern School Site completes the proposed land use to the western aspect of the future residential precinct.

The current land use within the District Sporting Fields and Northern School Site is grazed agricultural land.

2.3.2 Tourist Precinct.

The Tourist Precinct occupies the north part of Lot 5 in DP 25886, located in the eastern portion of the subject land, adjacent to the back-dunes to Rainbow Beach.

The land to the north comprises vacant agricultural land, over which a current application is before Council for residential subdivision as identified in the Lake Cathie – Bonny Hills Master Plan. The land to the east of the tourist precinct is vacant Crown Land that extends to Rainbow Beach.

The land to the south of the tourist precinct, within the subject site, forms the buffer zone to the Sewerage Treatment Plant, located to the southeast of the site. This buffer zone will be retained as a managed curtilage to the future tourist facility.

The land to the west of the tourist precinct forms the habitat corridor to Diggers Gully Creek, with the proposed constructed wetland further to the west, extending west to the residential precinct.

2.3.3 Northern School Site.

The northern school site precinct is located to the southwest of the residential precinct, in the north-western corner of the subject land. Ocean Drive adjoins the western aspect of the precinct with existing rural/industrial land located to the west of Ocean Drive.

The District Sporting Fields adjoin the southern aspect of the northern school precinct.

2.3.4 Southern School Site.

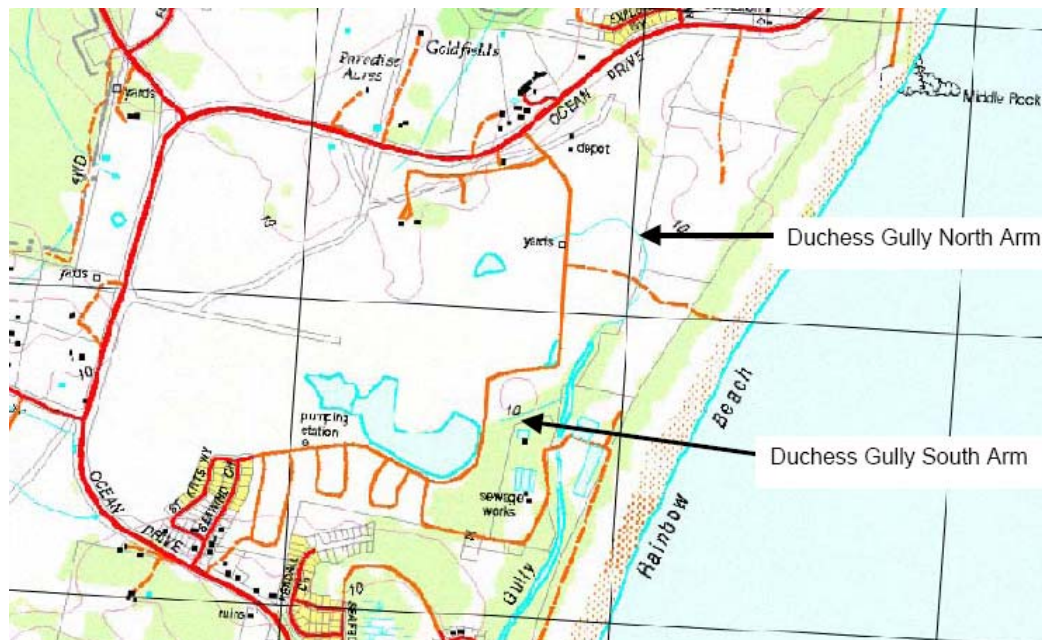
The southern school precinct is located within the south-western portion of the subject land, adjacent to Ocean Drive, opposite the intersection of Ocean Drive/Bonny View Close. The precinct forms a semi-circular shape to the east, with the District Sporting Fields to the northeast and the Open Space/Drainage/Habitat corridor to the east and southeast aspects.

The Ocean Drive carriageway extends to the west, with existing rural residential development located to the west of Ocean Drive and rural land located to the southwest of Ocean Drive.

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 following figure is an extract from the Grants Head 1:25,000 topographic map showing the subject site.

Figure 6 – Topographic Map of the Subject Site



2.4.1 Topography within Subject Land.

The landform within the subject site is dominated by the floodway to Duchess Gully which is located as shown on Figure 6, within the eastern and south-eastern portions of the site. The floodway spreads, from several multi-cell box culverts located in the western and south-western quadrants of the site, across the alluvial plain and constructed lake system and discharges directly into the south arm of Duchess Gully, which is a creek that collects all the surface runoff from the site.

The floodplain slopes to the east at less than 2 degrees and separates in the west, running to the northeast and southeast of the future southern school site. The residential land to the south rises gently to the south, whilst the land to the north of the flood plain within the future residential precinct, forms into low ridge lines and knolls that rise to the north and are separated by gully lines that flow to the south and north, across Ocean Drive.

The overland flow path to Duchess Gully North Arm extends along the eastern boundary of the future residential precinct.

2.4.2 Topography of the land beyond the Development Precincts.

Residential Precinct.

(a) North.

The topography of the land to the north of the residential precinct falls gently across Ocean Drive to the north at < 5 degrees.

(b) East.

The topography of the land to the east of the residential precinct forms a series of low ridges/knolls that rise at > 5 degrees to the east of the gully line to Duchess Gully and to the east of the subject land.

(c) South.

The topography of the land to the south of the residential precinct forms the floodplain to Duchess Gully and slopes to the south & southeast at < 2 degrees.

(d) Southwest & West.

The topography of the land to the southwest and west of the residential precinct forms the north-western arm of the floodplain and falls at < 2 degrees to the southwest and west.

Tourist Precinct.

The tourist precinct is sited on a level bench to the west of the dune system to Rainbow Beach, with the land to the north forming the toe of the ridgeline to the north, rising at > 5 degrees to the north. To the east the dunes fall to the beach at < 5 degrees, whilst the land to the south, within the buffer zone to the Sewerage Treatment Plant, is level.

The land to the west of the tourist precinct slopes to the west into the Duchess Gully corridor, rising to the west to form the floodplain which rises to the west and northwest at < 2 degrees.

Northern School Site

(a) North & Northeast

The northern school site is located on land that rises to the north of the north-western arm of the floodplain with the land to the northeast, within the residential precinct, rising at > 5 degrees above the site to a low knoll located to the south of Ocean Drive.

The land to the north of Ocean Drive rises to the north at > 5 degrees to form a low knoll to the north of the intersection of Ocean Drive/Houston Mitchell Drive.

(b) Southeast.

The topography of the land to the southeast of the northern school site currently slopes to the southeast. However the construction of the future District Playing Fields will modify the landform to provide a level aspect to the future school.

(c) West.

The topography of the land to the west of Ocean Drive rises gently at < 2 degrees to the west across the continuation of the floodplain, to the west of Ocean Drive.

Southern School Site.

The southern school site is located on land that forms the eastern toe of a low ridge that extends to the west from the confluence of the south-western and north-western floodplain corridors, rising to the west at > 5 degrees.

(a) Northeast, East & Southeast.

The land to the northeast, east and southeast of the southern school site forms the floodplain to Duchess Gully and falls to the northeast, east and southeast of the precinct at < 2 degrees.

(b) West.

The topography of the land to the west of the southern school site rises to the west at > 5 degrees to a low ridgeline with its apex to the west of Ocean Drive.

(c) Southwest.

The land to the southwest of the southern school site, beyond Ocean Drive, forms the continuation of the floodplain and rises to the southwest at < 2 degrees.

2.5 Vegetation within the Subject Land.

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 existing vegetation within the subject site consists predominantly of pasture grassland forming part of the present agricultural landuse.

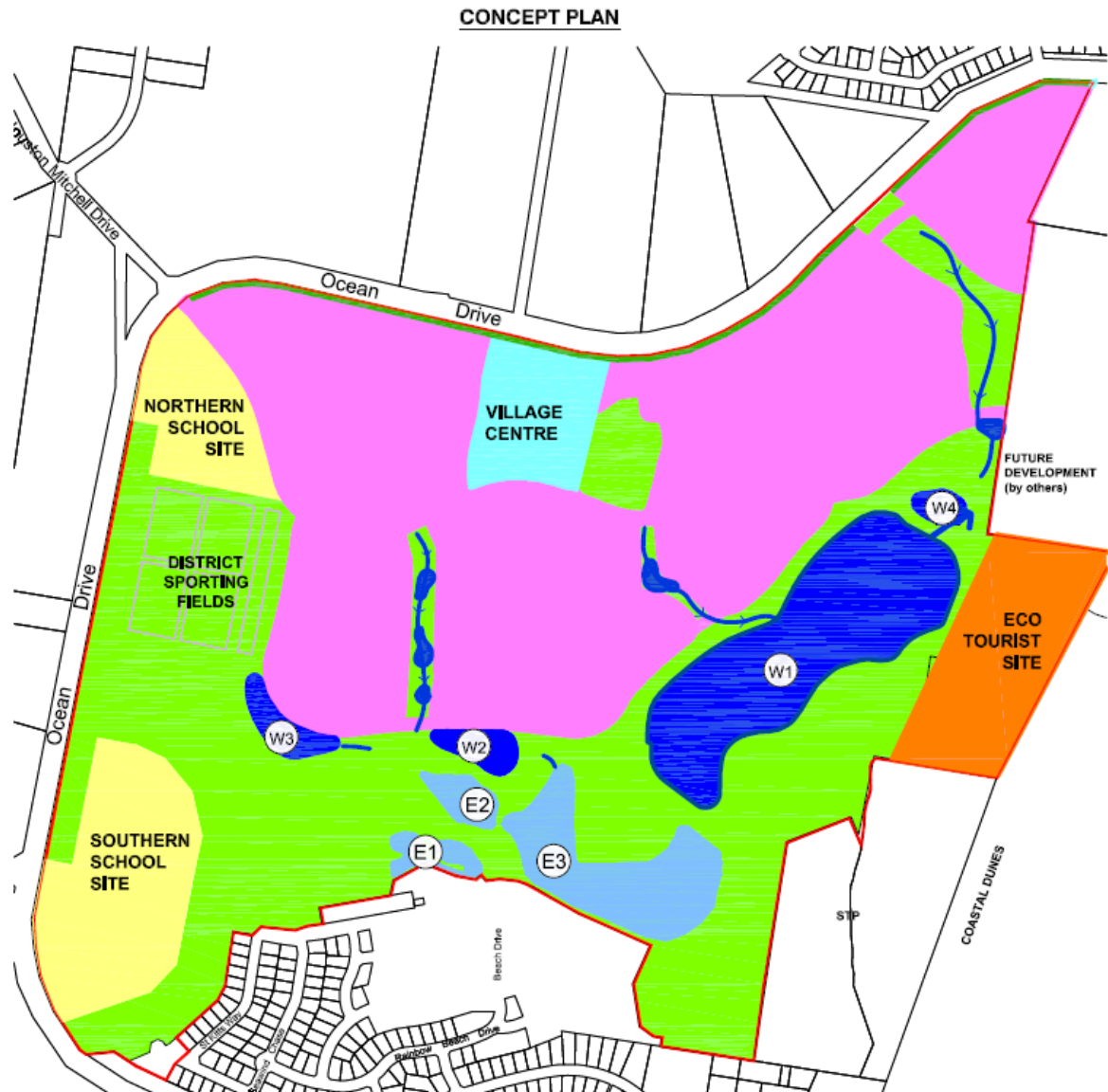
A narrow strip [less than 50m wide] of remnant forest and wetland vegetation forms a screen corridor along the western aspect of the northern school site precinct, and will be extended and enhanced to the south to form a screen to the western aspect to the southern school site. The south-eastern corner of the site contains an area of Dry Blackbutt Open Forest which extends into the adjoining Sewerage Treatment Works.

A narrow corridor of Swamp Oak forest occupies the drainage line which extends along the eastern boundary, turning to the northwest across the north-eastern corner of the site.

The Open Space/Drainage/Habitat corridor located to the south of the residential precinct, to the east of the southern school site, to the west of the proposed tourist precinct and to the north of the existing residential development to the south, will contain the existing water body and a proposed constructed wetland and will be revegetated. Over the life of the development, the corridor will contain mature vegetation eventually forming an area of bushfire prone vegetation within the southern portion of the site, linking within the existing bushfire prone vegetation in the eastern portion of the site [within and adjacent to the Sewerage Treatment Plant and Coastal Dune system].

The Rainbow Beach, Bonny Hills Open Space Management Strategy prepared by Cardno provides details on the wetland re-vegetation, including the species/vegetation communities proposed. Figures 7 & 8 [below] are extracts from the Open Space Management Strategy with Figure 7 providing details on the wetland locations on the Concept Plan and Figure 8 providing details on the proposed vegetation within the Open Space Corridor.

Figure 7 – Extract from the Cardno Open Space Management Plan showing wetlands on the Concept Plan.



LEGEND

	Site Boundary	E1	Prototype Wetlands for Stage 2 and 3
	Residential	E2	Existing Wetland Lake
	Village Centre	E3	Existing Eastern Lake
	Schools	W1	Constructed Wetlands for Eastern Development Area
	Eco Tourist Site	W2	Constructed Wetlands(North School Site, Playing Fields and Western Residential Area)
	Open Space Corridor	W3	Low Level Connection between northern and southern development

Figure 8 – Extract from the Cardno Open Space Management Plan showing vegetation management units and future vegetation within the Open Space corridor.



LEGEND

- Site Boundary
- Open Space Corridor Boundary
- Aquatic Features
(refer Plan No 713501-WRP-01&02)
- Proposed Urban Development
- Eco Tourist Site
(Not Included In this VMP)

VEGETATION MANAGEMENT UNITS

- Vegetation Type Boundary
- 10 VMU Number (refer Table here In)
- Biodiversity Protection
- Biodiversity Enrichment
- Managed Parkland

2.6 Vegetation within 140 metres of Development Precincts.

Residential Precinct.

(a) North.

The predominant vegetation on the land to the north of the residential precinct, beyond Ocean Drive, consists of managed grassland with an area of Forested Wetland extending across Part Lot 34 in DP 803801, located to the north of the western portion of the residential precinct. The Hastings Bushfire Prone Land Map records this vegetation as Category 2 Bushfire Prone Vegetation with the buffer zone to the vegetation not reaching within 100 metres of the boundary of the site.

(b) East.

The predominant vegetation on the land adjoining the eastern boundary of the residential development precinct is managed grassland. However, part of the eastern aspect to the precinct adjoins the vegetated Open Space/Drainage/Habitat corridor within the subject site. This corridor contains a narrow corridor [$< 50\text{m}$] of Swamp Oak Forest.

(c) South, Southeast & Southwest.

The Open Space/Drainage/Habitat corridor to the south, southeast and southwest of the residential precinct will contain the existing water body and a proposed constructed wetland, and will be revegetated. Over the life of the development, the corridor will contain mature Forested Wetland vegetation eventually forming an area of bushfire prone vegetation within the southern portion of the site.

The Cardno Vegetation Management Plan indicates that the south-eastern [except for exposure to a short length of Blackbutt and She Oak Forest adjacent to the north-eastern end], southern and south-western edge of the residential precinct will adjoin a managed Parkland precinct which will provide part of the Asset Protection Zone to the future residential development.

(d) West.

The western aspect of the residential development precinct currently contains managed grassland vegetation. As this area will form the future northern school site/District Sports Fields, this land will contain managed landscaped gardens.

Eco Tourist Precinct.

(a) North.

The proposed residential land to the north of the tourist precinct contains managed grassland which will become managed landscaped gardens within the future urban development of this land.

(b) East.

The Coastal Dune system to the east of the future tourist precinct contains Banksia Heath [Tall Coastal Heath]. This vegetation has been mapped on the Hastings Bushfire Prone Land Map as Category 2 Bushfire Prone Vegetation.

(c) South.

The land to the south of the future tourist development, forming the buffer zone to the Sewerage Treatment Plant, contains remnant scattered Coastal Banksia Heath with a managed grassy understorey.

This vegetation has been mapped on the Hastings Bushfire Prone Land Map as Category 2 Bushfire Prone Vegetation. However, site validation of the accuracy of the Bushfire Prone Land Map has confirmed that only a narrow band of unmanaged Coastal Banksia Heath occupies the southern portion of Lot 5, adjacent to the southern boundary of the subject site.

(d) West.

The western aspect of the tourist development forms the vegetated corridor to Duchess Gully, beyond which is the open floodplain and proposed constructed Wetland within the Open Space/Drainage/Habitat corridor. This corridor partly contains Dry Blackbutt Open Forest and will be revegetated to form a narrow corridor of Open Forest between the tourist precinct and the constructed wetland.

Therefore, over the life of the development, this corridor will contain mature Forest vegetation, ranging in width between 50 – 150 metres, eventually forming an area of bushfire prone vegetation within the southern portion of the site, linking to the bushfire prone vegetation surrounding the Sewerage Treatment Plant.

Northern School Site.

(a) Northeast.

The future residential development precinct adjoins the north-eastern aspect of the northern school site and will not contain bushfire prone vegetation.

(b) South.

The future District Sporting Fields occupy the land to the south of the northern school site and will not contain bushfire prone vegetation.

(c) West.

The land immediately to the west of the northern school site, within the subject site, contains a 50 metre wide strip of Forested Wetland [Paperbark, Swamp Mahogany, Swamp She Oak].

The land beyond the Ocean Drive carriageway consists of rural land and industrial development. The Hastings Bushfire Prone Land Map records that the vegetation on this land constitutes Category 1 [Forest] Bushfire Prone Vegetation. Site validation of the Bushfire Prone Land Map has confirmed that the map is incorrect and that the rural land contains scattered trees within a grazed paddock with forest vegetation in the National Park located further to the west [$> 100\text{m}$ from the Ocean Drive carriageway]. The industrial land on the corner of Ocean Drive and Houston Mitchell Drive contains a managed curtilage beneath a remnant tree canopy.

Southern School Site.

(a) Northeast, east and southeast.

The southern school site adjoins the Open Space/Drainage/Habitat corridor which will be revegetated and over the life of the development and the corridor will contain mature Forested Wetland vegetation, eventually forming an area of bushfire prone vegetation within the southern portion of the site.

(b) West.

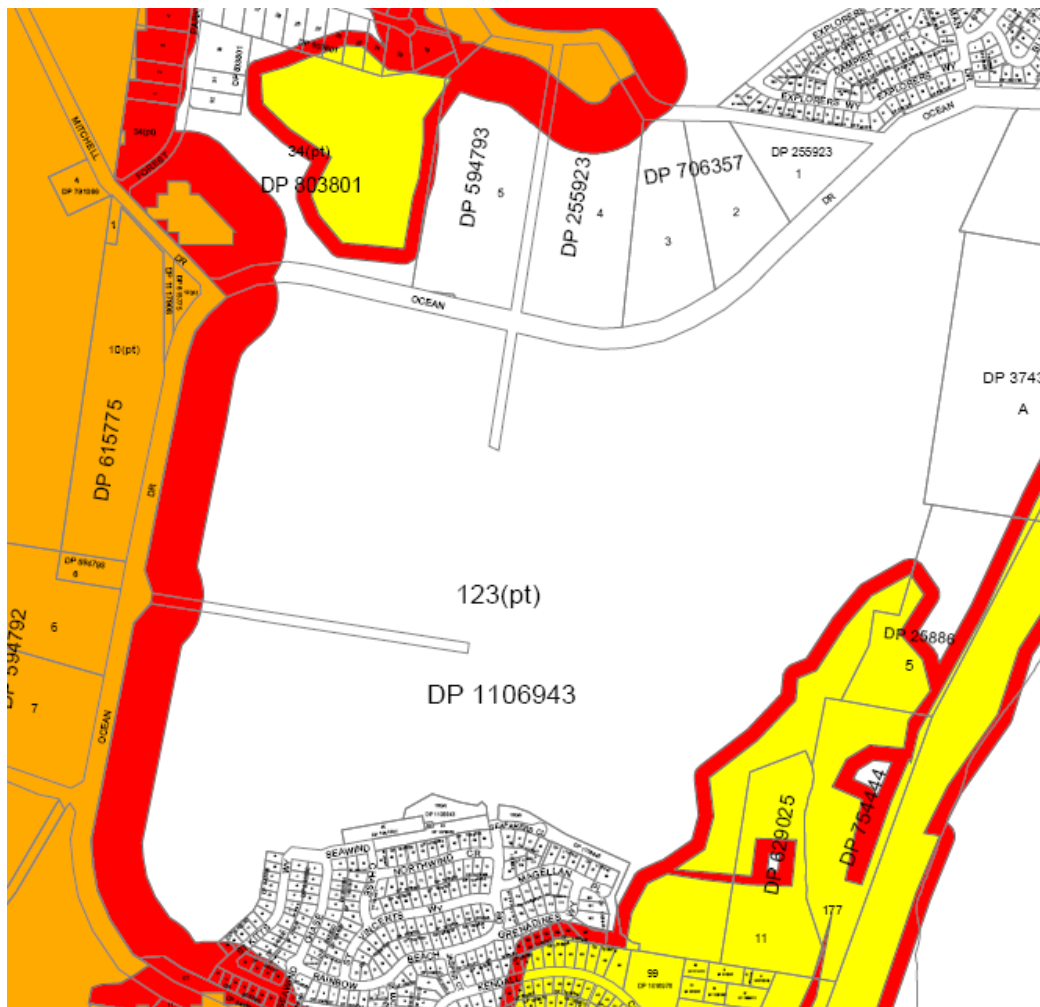
The land immediately to the west of the southern school site, within the subject site, contains a 50 metre wide strip of Open Forest [Grey Gum & Grey Iron Bark].

The land to the west of the southern school site, beyond the Ocean Drive carriageway and to the north of Bonny View Close, consists of rural residential development, with managed curtilages to the cottages and managed grazing land on the remainder of the properties. This vegetation is incorrectly mapped on the Hastings Bushfire Prone Land Map as Category 1 [Forest] Bushfire Prone Vegetation. The managed curtilage/managed grazing land is not deemed to be bushfire prone vegetation.

(c) Southwest.

The land to the southwest of the southern school site, beyond the Ocean Drive carriageway, is mapped on the Hastings Bushfire Prone Land Map as Category 1 Bushfire Prone Vegetation. The land is rural grazing land with scattered Swamp Mahogany, Wet Blackbutt and Broad Leaf Paperbark vegetation which resembles Category 1, Group 2 [Woodland] Bushfire Prone Vegetation.

Figure 9 – Extract of Hastings Bushfire Prone Land Map.



2.7 Significant Environmental Features on the Subject Site.

The subject site does not contain significant environmental features such as SEPP 14 Wetlands; SEPP 26 Littoral Rainforests and SEPP 44 Koala Habitat. The property does not contain areas of Geological interest; Land slip areas or National Parks Estate or Steep Lands [>18 degrees]. The subject site contains the floodplain and riparian corridor to Duchess Gully.

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

A Threatened Species Impact Assessment including an 8-part test was undertaken by Mr. Kel Mackay and David Bray in 1997. Since 1997 the site has continued to be used for grazing purposes and has not, since then been substantially modified.

The 1997 report concluded that the existing conservation values of the land were considered to be low, with no recovery potential.

There were no endangered fauna and flora species identified within the development site, and were not considered likely to occur in the future due to the absence of suitable habitat on the site. A more recent study undertaken as part of the Council's Area 14 Structure Plan, identifies a small area of regeneration Swamp Mahogany Forest in the south-western section of the subject land that will be retained in the Open Space/Drainage/Habitat corridor.

The Cardno Vegetation Management Plan records the regrowth Paper Bark / Swamp Mahogany / Swamp She Oak vegetation located to the west of the northern school site as containing elements of *Swamp sclerophyll on coastal plains EEC*. This vegetation community also occurs within the Open Space corridor to the south of the residential precinct and to the northeast and southeast of the southern school site.

The Open Space corridor within the north-eastern portion of the residential development contains Swamp Oak regrowth which is *Swamp Oak Floodplain Forest on Coastal Floodplains EEC*.

A Wallum Froglet habitat is located to the north of the existing Lagoon, within the Open Space corridor [to the south of the residential precinct].

2.9 Details and location of Aboriginal Relics or Aboriginal Place.

A survey of archaeological sites on the northern portion of the subject land by Collins in 1996 resulted in the recording of 159 stone artifacts at 9 separate locations within and surrounding the subject land. A subsequent study of the southern portion of the property was undertaken by Collins and preliminary results of this study indicate that similar types of relics, as referred to in the study for the northern area, are located in this area of the subject land.

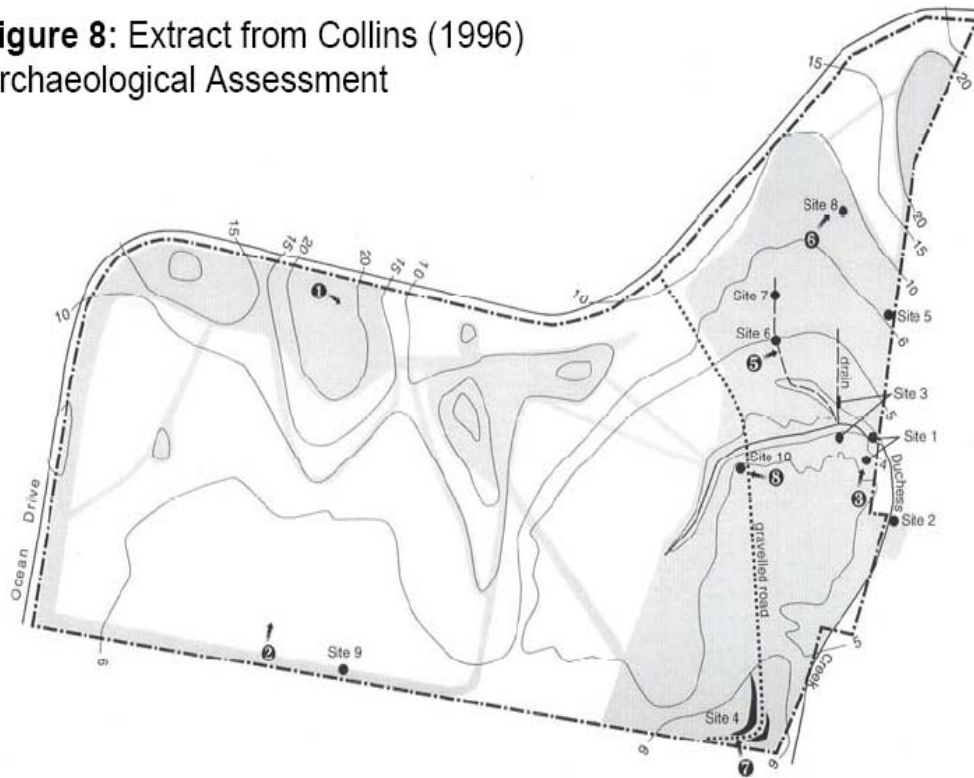
The long term management of the sites identified by Collins, 1996 include:

- Documentation and removal of artifacts by authorised and appropriate persons following receipt of required consent and consultations;
- Stabilisation and access restriction of site such that no human disturbance would occur in the area; or
- Use of the land for urban development, but with notification of future landowners that the site may/does include aboriginal artifacts, and include notification of the associated provisions of the National Parks & Wildlife Act 1974.

[Refer to the Figure 10 below which shows "Figure 8 Extract from Collins Archaeological Assessment"].

Figure 10 – Extract from the Collins [1996] Archaeological Assessment.

Figure 8: Extract from Collins (1996)
Archaeological Assessment



Recorded site locations in relation to surveyed areas (shaded). SOURCE: JP Collins - "Proposed Meridian Residential Subdivision Bonny Hills NSW Mid-North Coast: Archaeological Assessment December 1996.

SECTION 3

BUSHFIRE PROTECTION ASSESSMENT

3.1 Introduction.

The Director Generals Environmental Assessment Requirements [DGRs] for the Concept Plan for the residential subdivision (approximately 930 lots); School site; Playing Fields; Open Space; Constructed Wetland; Business/Retail Centre and Eco-tourist site, issued on the 17/1/2007 includes, under the heading “Key Issues”, Item 4 subheading “Hazard Management and Mitigation” Item 4.1, the following advice:

“Address the requirements of Planning for Bushfire Protection 2001 (or relevant policy)”.

The Director Generals Environmental Assessment Requirements [DGRs] for the Project Plan for the Open Space and Constructed Wetland, issued on the 9/3/2007 includes, under the heading “Key Issues”, Item 6 subheading “Hazard Management and Mitigation” Item 6.1, the following advice:

“Address the requirements of Planning for Bushfire Protection 2001(RFS) or relevant policy in the design of the proposal with regard to proposed adjacent land uses such as residential and schools”.

Since the receipt of the Director Generals Requirements [DGRs], *Planning for Bushfire Protection 2001* has been replaced by *Planning for Bushfire Protection 2006*.

Planning for Bushfire Protection 2006 provides a methodology to determine the Asset Protection Zones required for habitable buildings in development for residential purposes and the construction of “Special Fire Protection Purposes” [Schools and Tourist developments] that are designated as being bushfire prone.

Section 3.3 of this report uses the methodology provided by *Planning for Bushfire Protection 2006* to determine the deemed-to-satisfy Asset Protection Zones for the future residential development located within the residential development precinct as shown on the Concept Plan. Sections 3.4, 3.5 and 3.6 examine the Asset Protection Zone requirements for the “Special Fire Protection Developments” shown on the Concept Plan as the Tourist Development and the Northern and Southern School Sites.

Planning for Bushfire Protection 2006 also provides a methodology to determine the construction standards to the future buildings erected in each of the development precincts.

Section 3.7 examines these requirements and provides recommendations on the requisite level of construction as defined by Australian Standard A.S 3959 – 1999 “*Construction Standards for Buildings in Designated Bushfire Prone Areas*”.

The planning document 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 3.8 – 3.12 of this report.

3.2 Determination of Asset Protection Zones.

Appendix 2 of *Planning for Bushfire Protection 2006* provides the following procedure for determining setback distances (Asset Protection Zones) for residential development constructed in a defined Bushfire Prone Area:

- (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.*

3.3 Determination of Asset Protection Zones for the future residential development constructed in the Residential Precinct as shown on the Concept Plan.

The residential precinct is located within the northern portion of the subject land and is only encumbered by a small portion of the buffer zone to the bushfire prone vegetation adjoining the north-western corner of the precinct, as mapped on the Hastings Bushfire Prone Land Map. As stated previously, the Bushfire Prone Land Map inaccurately records the vegetation to the west of Ocean Drive, between Houston Mitchell Drive and Bonny View Close as Category 1 Bushfire Prone Vegetation.

Never-the-less, the Open Space/Drainage/Habitat corridor that is located to the south, southwest and to the east of the residential precinct will regenerate with Forested Wetland and Dry Sclerophyll Open Forest in area sufficient for this vegetation to be deemed as bushfire prone vegetation.

Therefore, Table 1 undertakes an assessment to determine the requisite widths of Asset Protection Zones to future dwellings within the residential/urban precinct. This assessment utilises the existing land use on the adjoining properties rather than the potential land use as defined by the Lake Cathie – Bonny Hills Master Plan. The Fire Danger Index [FDI] for the site is 80:

Table 1. Determination of Asset Protection Zones for future dwellings located in the residential/urban precinct. FDI – 80

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Table A2.1 of P/BFP 2006]	Effective Slope of Land	Width of Asset Protection Zone [By Calculation]	Width of Asset Protection Zone Provided	Compliance with Table A2.4.
<i>North [north of Ocean Drive]</i>	Managed agricultural land and She-oaks on Pt Lot 34 in DP 803801	Forested Wetland	< 5 degrees down slope to the north.	20 metres for Forested Wetland vegetation	> 20 metres provided by Ocean Drive carriageway	Yes
<i>North East & East</i>	She-oaks in narrow riparian corridor	Forested Wetlands	< 3 degrees down slope	15 metre IPA for Forested Wetland vegetation	Minimum 15 metres provided by perimeter road & building setback	Yes
<i>South East [eastern portion]</i>	Revegetated She-oaks & Blackbutt Open Forest in Open Space/ Drainage/ Habitat corridor	Forested Wetlands / Forest	< 2 degrees down slope	15 metre IPA for Forested Wetland vegetation; 20 metre IPA for Forest vegetation	Minimum 20 metres provided by perimeter road & building setback	Yes
<i>South East</i>	Constructed wetland	Freshwater Wetlands	Level	10 metres IPA for Freshwater Wetlands	Minimum 20 metres provided by Managed Parkland & perimeter road + building setback	Yes
<i>South</i>	Revegetated She-oaks & Melaleuca in Open Space/ Drainage/ Habitat corridor	Forested Wetlands	< 2 degrees down slope	15 metre IPA for Forested Wetland vegetation	Minimum 25 metres provided by Managed Parkland and perimeter road + building setback	Yes
<i>South West</i>	Revegetated She-oaks & Melaleuca in Open Space/ Drainage/ Habitat corridor	Forested Wetlands	< 2 degrees down slope.	15 metre IPA for Forested Wetland vegetation.	Minimum 25 metres provided by Managed Parkland and perimeter road + building setback	Yes.

Comment:

The revegetated Open Space/Drainage/Habitat Corridor will predominantly contain Forested Wetland Vegetation [She-oaks, Melaleuca and Swamp Mahogany], therefore with an effective slope across the floodplain of less than two [2] degrees downslope, the requisite width of Asset Protection Zone for Residential Development across the southern and south-western edge of the future residential development is 15.0 metres.

The urban/residential development proposed, as shown on the Concept Plan, is predominantly separated from the Open Space/ Drainage/ Habitat Corridor to the south and southwest by perimeter roads and Managed Parkland on the urban interface. The perimeter roads and Managed Parkland will provide an Asset Protection Zone width which exceeds the requisite 15 metre width required by *Planning for Bushfire Protection 2006*.

To the southeast of the residential precinct the proposed Managed Parkland separates the future residential development from the Constructed Wetland. This separation, combined with the width of the perimeter road and building setback, exceeds the minimum width of Asset Protection Zone required to address any bushfire threat from the wetland vegetation.

The south-eastern corner of the residential precinct adjoins Blackbutt and Swamp She Oak Forest within the Open Space corridor along the eastern boundary of the site. The Managed Parkland does not extend to this aspect of the future residential precinct however the width of the perimeter road and building setback provide the requisite width of Asset Protection Zone required by *Planning for Bushfire Protection 2006*.

The Concept Plan indicates extension of open space physically connected to the Open Space/Drainage/Habitat Corridor at three (3) points into the urban/residential precinct (*Refer Attachment A – Plan of Asset Protection Zones*).

With the exception of the eastern corridor, the remaining two habitat corridors will be managed as Parkland and will therefore not present a bushfire threat to the adjoining residential development. The eastern corridor contains Swamp Oak [EEC] vegetation, which, with the proposed Blackbutt re-vegetation along the eastern boundary will act as a narrow band of bushfire prone vegetation that divides the residential precinct in the north-eastern corner of the precinct.

In such case a minimum 10 metre wide Asset Protection Zone shall be provided to both sides of this corridor. This setback is provided by the width of the perimeter road and setback to the buildings.

Similarly, it is noted that this connecting corridor will provide/locate a bushfire source on the boundary of the site adjoining to the east, and the Asset Protection Zone requirements for the development of this adjoining site should be considered in detailed planning for future development upon that adjoining site.

Development/revegetation of the Open Space/Drainage/Habitat Corridor will also impact upon the existing urban/ residential development located south of the subject site. In regard to this urban/residential interface with the Open Space/Drainage/Habitat Corridor, the following recommendations are made:

The existing residential lots in the subdivision shown as “Seawind Chase,” that adjoin directly onto the Open Space/Drainage/Habitat Corridor have not been constructed to withstand bushfire attack and therefore shall have a 30 metre wide Asset Protection Zone. This will require that the management and maintenance of the Open Space/Drainage/Habitat Corridor adjacent to these lots is maintained by the public authority as “Parkland”, within 30 metres from the existing buildings on these lots.

This management/maintenance regime must be considered in the preparation of the Project Application final landscape form within the Open Space/Drainage/Habitat Corridor.

The existing lots in the subdivision known as “Rainbow Beach Estate - Stages 1, 2 and 3” do not adjoin directly onto the Open Space/Drainage/Habitat Corridor, but are separated by existing public dedicated open space of varying widths (minimum 29.5 metres in width). This existing public dedicated open space is managed by the public authority as “Parkland”. Providing the existing public open space continues to be managed by the public authority as parkland, no further Asset Protection Zone is required to these existing urban/ residential lots.

However, given that the open Space/Drainage/Habitat Corridor on the subject land is proposed to be dedicated to the public authority as open space and will form a continuous corridor adjoining the existing lots in the Rainbow Beach Estate, the continuance of this management/maintenance regime on this interface must be considered in the preparation of the Project Application final landscape form within the Open Space/Drainage/Habitat Corridor.

3.4 Determination of Asset Protection Zones for the future Eco Tourist development constructed in the Tourist Precinct as shown on the Concept Plan.

The proposed Eco Tourist Precinct is located within the eastern portion of the subject land [on Lot 5 in DP 25886], adjacent to the vegetation on the Coastal Dune system to Rainbow Beach and is a “*Special Fire Protection Development*”.

Table 2 undertakes an assessment to determine the requisite widths of Asset Protection Zones to future Tourist facility. The Fire Danger Index [FDI] for the site is 80:

Table 2. Determination of Asset Protection Zones for the future Eco Tourist Development. Fire Danger Index [FDI] – 80

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Table A2.1 of P/BFP 2006	Effective Slope of Land	Width of Asset Protection Zone – by calculation	Width of Asset Protection Zone Provided	Compliance with Table A2.6.
North	Managed Grasslands on adjoining land [Future residential development] + Coastal Heath	Managed Grassland + Tall Heath	< 5 degrees upslope.	Nil for managed grassland; 39 metres for Tall Heath vegetation adjacent to the north-eastern corner	39 metres – provided by setback from vegetation	Yes
East	Coastal Heath on dunes to Rainbow Beach	Tall Heath	< 3 degrees down slope	47 metre IPA for Tall Heath vegetation	47 metres provided by setback from vegetation	Yes
South	Remnant Coastal Heath & Coastal Heath	Tall Heath	Level	44 metre IPA for Tall Heath vegetation	44 metres provided by managed buffer zone to STP	Yes
West & North west	Dry Blackbutt riparian corridor vegetation to Duchess Gully + She-oaks & Melaleuca	Forested Wetland & Forest	Level	54 metre IPA for Forest; 44 metres for Forested Wetland vegetation	54 metres provided by setback to buildings	Yes.

Comment:

The Eco Tourist development within the eastern portion of the site is adjoined to the east and south by Tall Coastal Heath vegetation. The land to the east falls to the beach at 3 degrees, therefore a 47 metre wide Asset Protection Zone is required to the east of the development footprint. A 44 metre wide setback will be required to the south – within the buffer zone to the Sewerage Treatment Works.

The western and north-western aspects of the Eco Tourist precinct is exposed to the corridor of Dry Blackbutt Forest to Duchess Gully and within the Open Space/Drainage/Habitat Corridor vegetation located to the west of the creek, extending west to the Constructed Wetland. This vegetation will be more than 50 metres wide for most of the length of the corridor and it is therefore recommended that a 54 metre Asset Protection Zone be provided to the western aspect of the future Tourist facility, measured from the edge of the vegetation in the creek line.

Future planning of built form for the Tourist precinct shall take into account the Asset Protection Zone provisions of *Planning for Bushfire Protection 2006* (or then relevant policy).

3.5 Determination of Asset Protection Zones for the future Northern School Site as shown on the Concept Plan.

The proposed Northern School Site is located within the north-western corner of the subject land, east of Ocean Drive, south of the intersection of Houston Mitchell Drive and Ocean Drive, and is a “*Special Fire Protection Development*”. Table 3 undertakes an assessment to determine the requisite widths of Asset Protection Zones to future school buildings. The Fire Danger Index [FDI] for the site is 80:

Table 3. Determination of Asset Protection Zones for the Northern School Site. Fire Danger Index [FDI] – 80

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Table A2.1 of P/BFP 2006	Effective Slope of Land	Width of Asset Protection Zone – by calculation	Width of Asset Protection Zone Provided	Compliance with Table A2.6.
North east	Landscaped gardens within residential precinct	Nil	> 5 degrees upslope.	Nil	None required	N.A.
South	Managed grasslands within District Sporting Fields	Nil	Level	Nil	None required	N.A.
West	50m wide corridor of Melaleuca Forest + Ocean Drive + Grazed grassland on agricultural land	Melaleuca Forest reclassified as “Rainforest” due to narrow corridor of vegetation	< 5 degrees upslope to the west	21 metre IPA for “Rainforest” vegetation	Minimum 21 metres provided by setback to buildings	Yes.
North west	Ocean Drive carriageway + grazed grassland + managed remnant Open Forest	The vegetation to the N.W of the school site west of Ocean Drive is not bushfire prone	< 5 degrees upslope beyond Ocean Drive	Nil	> 30 metres provided by managed carriageway to Ocean Drive & building setback	Yes

Comment:

The northern school site occupies the land within the north-western corner of the subject land, with the future residential precinct adjoining the north-eastern aspect, the District Sporting Fields to the south and the Ocean Drive carriageway to the west and northwest. The Hastings Bushfire Prone Land Map records the vegetation on the land to the west of Ocean Drive as Category 1 Bushfire Prone vegetation and the 100 metre wide buffer zone to this mapped bushfire prone vegetation extends across the northern school site.

Site validation of the accuracy of the Bushfire Prone Land Map has found that the vegetation to the west of the Ocean Drive carriageway is in fact grassland on grazing paddocks in Pt Lot 10 in DP 615775 and a stand of remnant Open Forest trees with a managed understorey to the existing buildings located on the land on the corner of Houston Mitchell Drive and Ocean Drive.

This vegetation is not vegetation that could lawfully be deemed to be Bushfire Prone Vegetation under the provisions of Section 146 of the *Environmental Planning & Assessment Act 1979* and in accordance with the methodology for the determination of bushfire prone vegetation provided in the NSW Rural Fire Service document “*Guideline for Mapping Bushfire Prone Vegetation*”.

Planning for Bushfire Protection 2006 recommends that where a development adjoins grassland vegetation that as a precautionary measure, a 10 metre wide Asset Protection Zone be provided to development. The managed carriageway to Ocean Drive and the building setback to Ocean Drive will provide a separation of > 30 metres between the future school buildings and the grassland vegetation to the west.

The northern school precinct will also contain a narrow [< 50m] band of retained Melaleuca [Forested Wetland] vegetation in a corridor along the western boundary of the northern school site. The southern portion of the northern school site is impacted by this corridor.

Whilst the vegetation formation within the corridor is Melaleuca Swamp Forest [which is connected to the Forested Wetland in the Open Space/Drainage/Habitat corridor and therefore bushfire prone vegetation], due to the corridor being 50 metres wide, the vegetation is reclassified to “Rainforest” under the provisions of *Planning for Bushfire Protection 2006*. The resultant Asset Protection Zone is determined, by calculation and a 21 metre wide setback is required to the future school buildings, measured from the eastern edge of the vegetated corridor.

Future planning of the built form for the northern school site shall take into account the Asset Protection Zone requirements of Table A2.6 of *Planning for Bushfire Protection 2006*.

3.6 Determination of Asset Protection Zones for the future Southern School Site as shown on the Concept Plan.

The proposed Southern School Site is located within the south-western portion of the subject land, generally to the east of the Ocean Drive/Bonny View Close intersection and is a “*Special Fire Protection Development*”.

Table 4 undertakes an assessment to determine the requisite widths of Asset Protection Zones to future school buildings. The Fire Danger Index [FDI] for the site is 80.

Table 4. Determination of Asset Protection Zones for the Southern School Site. Fire Danger Index [FDI] – 80

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Table A2.1 of P/BFP 2006	Effective Slope of Land	Width of Asset Protection Zone – by calculation	Width of Asset Protection Zone Provided	Compliance with Table A2.6.
North east, east & south east	She-oaks & Melaleuca Forest within Open Space/Drainage/Habitat corridor to the northeast, east and southeast of the school site	Forested Wetland	< 2 degrees down slope.	47 metres	Minimum 47 metres provided by setback of buildings from Open Space/Drainage/Habitat corridor	Yes
West – north of Bonny View Close	Managed grasslands beyond Ocean Drive – 50m wide band of Open Forest	Nil to grassland vegetation. Forest vegetation reclassified to “Rainforest” due to narrow width of vegetation	> 5 degrees upslope to the west	21 metres	Minimum 21 metres provided by setback of buildings from vegetation in corridor	Yes
West – south of Bonny View Close	Broad Leaf Paperbark, Wet Blackbutt & Swamp Mahogany regrowth on grazing land	Regenerating Forested Wetland	< 2 degrees upslope to the west	41 metre IPA for Forested Wetland vegetation	Minimum 41 metre setback provided by Ocean Drive carriageway + setback to buildings	Yes.

Comment:

The southern school site occupies a semi-circular parcel of land within the south-western portion of the subject land, between Ocean Drive and the revegetated Open Space/Drainage/Habitat corridor which will predominantly contain Forested Wetland Vegetation [She-oaks & Melaleuca].

Therefore, with an effective slope across the floodplain of less than 2 degrees downslope, the requisite width of Asset Protection Zone for the “*Special Fire Protection*” buildings on the school site is 47.0 metres.

The Hastings Bushfire Prone Land Map records the vegetation on the land to the west of Ocean Drive as Category 1 Bushfire Prone vegetation and the 100 metre wide buffer zone to this mapped bushfire prone vegetation extends across the southern school site.

Site validation of the accuracy of the Bushfire Prone Land Map has found that the vegetation to the west of the Ocean Drive carriageway is in fact managed curtilages and grassland within grazing paddocks on Lots 6 & 7 in DP 594792 and Lot 6 in DP 594793, being the land to the north of Bonny View Close.

This vegetation is not vegetation that could lawfully be deemed to be Bushfire Prone Vegetation under the provisions of Section 146 of the *Environmental Planning & Assessment Act 1979* and in accordance with the methodology for the determination of bushfire prone vegetation provided in the NSW Rural Fire Service document “*Guideline for Mapping Bushfire Prone Vegetation*”.

However, the western aspect of the southern school site, to the north from Bonny View Close, contains a 50 metre wide band of Open Forest bushfire prone vegetation which, due to its narrow width can be reclassified as “*Rainforest*” bushfire prone vegetation as it forms a linear corridor of vegetation that connects to the regenerated vegetation in the Open Space/Drainage/Habitat corridor to the north.

This corridor of vegetation is on land that rises to the west at > 5 degrees with the requisite width of Asset Protection Zone being 21 metres.

The western aspect of the southern school site, to the south from Bonny View Close, consists of the Ocean Drive carriageway with regenerating paperbark, Swamp Mahogany and Wet Blackbutt vegetation forming Forested Wetland vegetation. This land rises to the west at < 2 degrees, therefore the requisite Asset Protection Zone width to the school buildings is 41 metres, provided by the Ocean Drive carriageway and the setback to the buildings.

Future planning of the built form for the southern school site shall take into account the Asset Protection Zone requirements of Table A2.6 of *Planning for Bushfire Protection 2006*.

3.7 Assessment of Bushfire Attack (Construction Standards).

Part 2.3.4 of the Building Code of Australia [BCA] 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.

In NSW the Building Code of Australia bushfire protection provisions are applied to [via a State variation to the BCA for NSW] Class 1, 2, 3 buildings, Class 4 parts of buildings and Class 9 buildings that are “*Special Fire Protection Purposes (SFPPs)*”.

Australian Standard A.S. 3959 -1999 – “*Construction of Buildings in Designated Bushfire Prone Areas*” 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 and the special NSW provisions. Therefore, the construction of the Class 1, 2, 3 and Class 9 [*Special Fire Protection Purpose*] buildings within 100 metres of the bushfire prone vegetation interface shall be constructed to comply with the specifications of this Standard.

Appendix 3 of *Planning for Bushfire Protection 2006* provides a procedure for determining bushfire attack at construction stage for a building within a designated bushfire prone area.

However, the Asset Protection Zone widths recommended in this report are based on the residential buildings, which are located adjacent to the Asset Protection Zones, being constructed to the specifications of Level 3 as defined by Australian Standard A.S. 3959 -1999, and that the “*Special Fire Protection Purpose*” buildings [Schools and Eco Tourist development] are constructed to comply with a radiant heat loading of less than 10kWm² [Level 1 construction standards].

Appendix A3.3 *Planning for Bushfire Protection 2006* states that “*the level of construction cannot fall to less than Level 1 construction where any part of the building is closer than 100 metres to the source of bushfire attack*”. Therefore, the minimum construction standard to buildings located less than 100 metre from the bushfire prone vegetation interface shall be constructed to Level 1 standards as defined by A.S. 3959 – 1999.

Future assessment of the construction standards of buildings constructed on the subject land shall be undertaken at development application stage.

3.8 Water Supplies for Firefighting Operations.

The future development on the subject land will have a reticulated supply connected to the Council mains supply. The reticulated water supply 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.

3.9 Access.

Public roads, property access roads and fire trails shall comply with the deemed-to-satisfy specifications of Section 4.1.3 of *Planning for Bushfire Protection 2006*. Urban perimeter roads located on the bushfire hazard interface shall be two-way, through roads with a minimum paved width of 8.0 metres kerb to kerb.

Internal public roads shall have a minimum paved width of 6.5 metres, and internal roads between 6.5 and 8.0 metres shall provide no parking on one side with services [hydrants] located on this side to ensure accessibility to reticulated water for fire fighting operations.

Cul-de-sac roads shall not exceed 200 metres in length and incorporate a minimum 12.0 metre outer radius turning circle.

3.9.1 Access to Urban/ Residential Development

The access to the urban/residential development precinct and the northern school site will be from Ocean Drive at the three locations as shown on the Concept Plan. A perimeter road will be required to the residential precinct, adjacent to those aspects which contain, or will contain in the future, bushfire prone vegetation. This requirement will also apply to both sides of the Open Space corridor in the north-eastern portion of the residential precinct.

These perimeter road provisions should be considered in detailed planning of the built form and/or subdivision pattern of these future development areas.

3.9.2 Access to Tourist Site

A perimeter road/fire trail shall be provided to the Eco Tourist development with the primary public road access to this precinct extending off the road network within the adjacent proposed residential estate to the north. This access shall be located clear of the Blackbutt Forest located in the Open Space corridor to the west so as to provide safe egress from the tourist precinct

This road access and perimeter road/ fire trail provisions should be considered in detailed planning of the built form upon the Eco Tourist site.

3.9.3 Access to School Sites

Perimeter road access, or a fire trail, will be required to the aspects of the southern school site which adjoin the Forested Wetland vegetation in the Open Space corridor and also between the school sites [north & south] and the vegetated corridor along Ocean Drive. This can be in the form of an access road or fire trail. These perimeter road / fire access trail provisions should be considered in detailed planning of the built form upon these school sites.

3.10 Bushfire Maintenance Plans and Fire Emergency Procedures.

The Hastings Bushfire Risk Management and Operational Plans address the management of the bushfire vegetation and the operational procedures during fire events in the Port Macquarie – Hastings Local Government Area.

However, these plans do not identify the management protocols required to address the responsibility, under Section 63 of the Rural Fires Act, for the management of the vegetation in the Open Space/Drainage/Habitat corridor/s within the subject land.

It is therefore recommended that a Fire Management Plan be prepared, in concert with the Vegetation Management Plan, for the fuel management of the vegetation within the area of Open Space/Drainage/Habitat land that is identified on the Concept Plan and also the management of the Asset Protection Zones to the future residential and existing residential development, tourist and school sites within the development precincts, where they form part of the management of the Open Space/Drainage/Habitat.

The management prescriptions of the Fire Management Plan shall address those measures required to meet the provisions of Section 63 of the *Rural Fires Act 1997* whilst specifically recognising the need to protect the plant communities in the low-lying parts of the property [wetlands, estuarine vegetation and Swamp Mahogany Forest].

The implementation of the recommendations of the Fire Management Plan shall rest with Port Macquarie – Hastings Council. Site specific Fire/Asset Protection Zone Management Plans shall be prepared for the Eco Tourist development and the two school sites. The responsibility for the implementation of each of these plans shall remain with the owners/managers of each site.

3.11 Emergency Evacuation.

The evacuation of future residents in the proposed residential precinct, the eco tourists and the students/teachers/parents of the two schools proposed in the Concept Plan is the responsibility of the NSW Police and Emergency Services.

However, it is recommended that a site specific Evacuation Plan be prepared for the Eco Tourist development and each school. The Evacuation Plan shall also address evacuation due to the threat from bushfire.

SECTION 4

CONCLUSION

The aim of this report is to address the Director Generals Environmental Assessment Requirements [DGRs], which for the Concept Plan for the Residential Subdivision (approximately 930 lots); School site; Playing Fields; Open Space; Constructed Wetland; Business/Retail Centre and Eco-tourist site included, under the heading “*Key Issues*”, Item 4 subheading “*Hazard Management and Mitigation*” Item 4.1, provides the following advice:

“Address the requirements of Planning for Bushfire Protection 2001 (or relevant policy)”.

The Director Generals Environmental Assessment Requirements [DGRs] for the Project Plan for the Open Space and Constructed Wetland, issued on the 9/3/2007 included, under the heading “*Key Issues*”, Item 6 subheading “*Hazard Management and Mitigation*” Item 6.1, the following advice:

“Address the requirements of Planning for Bushfire Protection 2001(RFS) or relevant policy in the design of the proposal with regard to proposed adjacent land uses such as residential and schools”.

[Since the receipt of the Director Generals Requirements [DGRs], *Planning for Bushfire Protection 2001* has been replaced by *Planning for Bushfire Protection 2006*. This report examines the DGRs under the provisions of the 2006 document].

In accordance with the specific requirements of the Director Generals Requirements [DGRs] this report has assessed the requirements of *Planning for Bushfire Protection 2006* in reference to the provision of bushfire protection measures required to the future residential, tourist and school development on the subject land.

The design of the urban / residential components of the development shown on the Concept Plan has taken into account the requirements of *Planning for Bushfire Protection 2006*. In particular the future perimeter roads, building setbacks and Managed Parkland which will separate these areas from the Open Space/Drainage/Habitat Corridor provide the requisite Asset Protection Zones and access requirements to the future urban development.

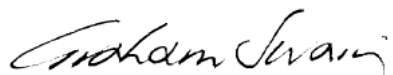
The location of the two (2) school sites, the Eco Tourist site are impacted by a direct interface with bushfire prone land, (either existing or due to revegetation of the Open/Space/Drainage/ Habitat Corridor).

It has been noted that planning for the future development/built form of each of these sites shall take into account the minimum widths of Asset Protection Zones listed in this report, and provide perimeter road and / or fire trail access provisions where applicable.

Detailed design of landscaping / revegetation of the Open Space/Drainage/Habitat Corridor [as shown on the Cardno Vegetation Management Plan] shall also take into consideration the following bushfire protection measures:

- Provide a minimum 30 metre wide Asset Protection Zone as managed “Parkland” adjoining the Seawind Chase existing lots on the adjoining site to the south of the Open Space/Drainage/Habitat corridor;
- Ensure that a managed “Parkland” regime is maintained on the existing public lands adjoining the existing Rainbow Beach subdivision;
- Ensure that the Parkland along the south-eastern, southern and south-western aspects of the residential precinct and the open space corridors that extend into the residential precinct are fuel managed in order that there is no connection to bushfire prone land within the Open Space/Drainage/Habitat Corridor.

In conclusion, the overall design of the Concept Plan Application and the Project Application adequately address and comply with the deemed-to-satisfy provisions of *Planning for Bushfire Protection 2006*.



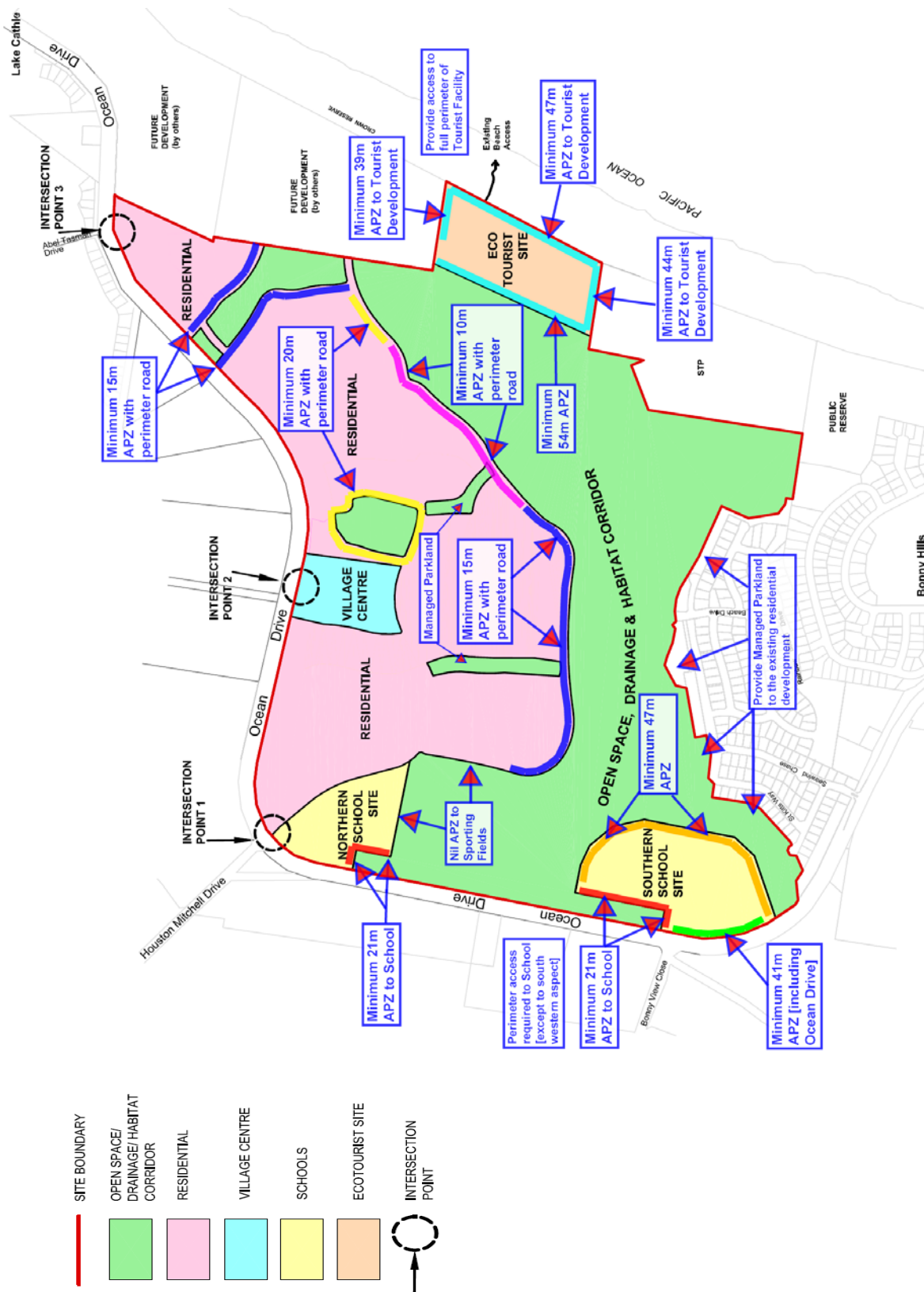
Graham Swain,
Managing Director,
Australian Bushfire Protection Planners Pty Limited

SECTION 5

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*”.
- *Hastings Bushfire Prone Land Map*.

SECTION 6 – PLAN OF BUSHFIRE PROTECTION MEASURES



SECTION 7 – Site Photographs



Photograph No. 1 – Looking Northeast across Tourist Precinct showing Coastal Heath on Crown Land to the east.



Photograph No 2 – Looking east across Duchess Gully to the Tourist Precinct.



Photograph No. 3 – Looking from Duchess Gully, southwest along northern edge of Forest Vegetation in south-eastern corner of site.



Photograph No. 4 – Taken from Duchess Gully looking west across flood plain [Constructed Wetland, Open Space/Drainage/Habitat Corridor].



Photograph No. 5 – Looking to the southwest across existing water body to existing dwellings in “Seawind Estate”.



Photograph No. 6 – Looking north east across proposed District Sporting Fields to Residential Precinct.



Photograph No. 7 – Looking southeast across Open Space/Drainage/Habitat Corridor from Southern School Site.



Photograph No. 8 – Looking south along the 50m wide vegetated corridor to the west of the Southern School Site.