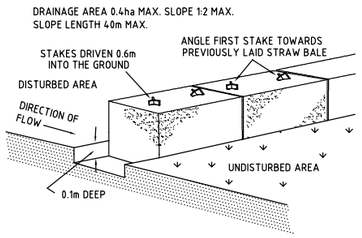
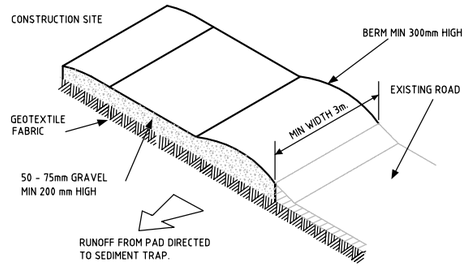
Appendix 5
Erosion and Sediment Control Plan



STRAW BALE SEDIMENT FILTER

NOT TO SCALE



STABILISED SITE ACCESS DETAIL

NOT TO SCALE

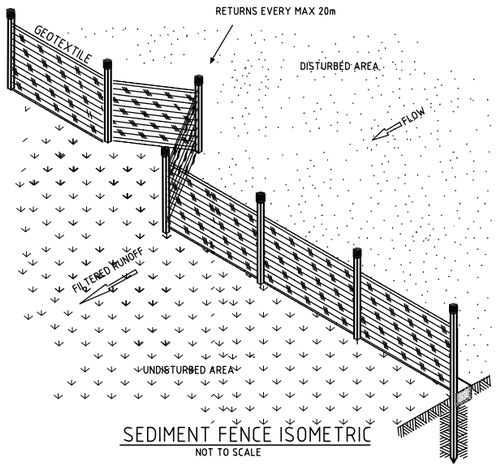
STABILISED SITE ACCESS CONSTRUCTION NOTES

1. STRIP TOP-SOIL AND LEVEL SITE
2. COMPACT SUB-GRADE
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE
4. CONSTRUCT 200mm THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30mm AGGREGATE. MINIMUM LENGTH SHALL BE 15 METRES OR TO THE BUILDING ALIGNMENT. MINIMUM WIDTH SHALL BE 3 METRES
5. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR SEDIMENT TRAP
6. LIMIT TO ONE ENTRY/EXIT POINT WHERE POSSIBLE

SEDIMENT BASIN CALCULATIONS

Site area	Site					
	Sth	West	Nth			
Total catchment area (ha)	0.54	0.78	1.66			
Disturbed catchment area (ha)	0.54	0.78	1.66			
Soil analysis						
% sand (faction 0.02 to 2.00 mm	90	90	90			
% silt (fraction 0.002 to 0.02 mm)	5	5	5			
% clay (fraction finer than 0.002 mm)	5	5	5			
Dispersion percentage	2.0	2.0	2.0			
% of whole soil dispersible	0.15	0.15	0.15			
Soil Texture Group	C	C	C			
Rainfall data						
Design rainfall depth (days)	5	5	5			
Design rainfall depth (percentile)	80	80	80			
x-day, y-percentile rainfall event	40.1	40.1	40.1			
Rainfall intensity: 2-year, 6-hour storm	12	12	12			
RUSLE Factors						
Rainfall erosivity (*R*-factor)	3110	3110	3110			
Soil erodibility (*K*-factor)	0.019	0.019	0.019			
Slope length (m)	30	30	30			
Slope gradient (%)	5	5	5			
Length/gradient (*LS*-factor)	1.01	1.01	1.01			
Erosion control practice (*P*-factor)	1.3	1.3	1.3	1.3	1.3	1.3
Ground cover (*C*-factor)	1	1	1	1	1	1
Calculations						
Soil loss (t/ha/yr)	78	78	78			
Soil Loss Class	1	1	1			
Soil loss (m^3/ha/yr)	60	60	60			
Sediment basin storage volume, m^3	5	8	17			

TABLE PREPARED IN ACCORDANCE WITH DEPARTMENT OF HOUSING 'BLUE BOOK' BASED UPON AN ASSUMED SOIL ANALYSIS..

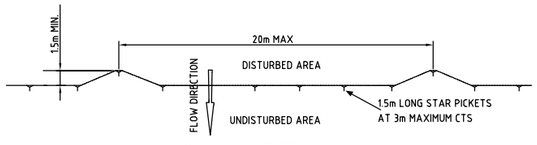


SEDIMENT FENCE ISOMETRIC

NOT TO SCALE

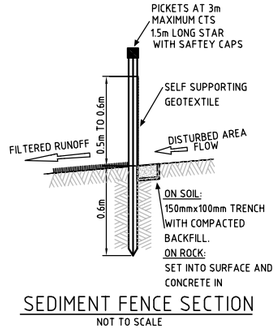
CONSTRUCTION SEQUENCE

1. WHERE POSSIBLE ALL SILT FENCES, PERIMETER BANKS, SEDIMENT BASINS AND OTHER SEDIMENT AND EROSION CONTROL STRUCTURES SHALL BE INSTALLED AS A FIRST STEP IN THE CONSTRUCTION SEQUENCE
2. CARRY OUT CLEARING WITHIN SCOPE OF WORKS AND BULK EARTHWORKS TAKING CARE TO MINIMIZE THE EXTENT OF DISTURBANCE DURING CONSTRUCTION
3. CARRY OUT BULK EARTHWORKS IN ACCORDANCE WITH THE ENVIRONMENTAL MANAGEMENT PLAN AND TAKING CARE TO MINIMIZE THE EXTENT OF DISTURBANCE
4. ALL DISTURBED AREAS ARE TO BE HYDROSEEDED AND STRAW MULCHED UPON COMPLETION OF THE BULK EARTHWORKS. SEEDED AREAS SHALL BE WATERED DURING AND AFTER CONSTRUCTION UNTIL A UNIFORMLY DISTRIBUTED DENSE VEGETATION COVERAGE IS ESTABLISHED
5. WHILE ANY AREAS REMAIN DISTURBED (ie BEFORE AND DURING RE-VEGETATION) ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE RETAINED
6. AREAS WHERE DEVICES ARE REMOVED ON COMPLETION OF WORKS SHALL BE RE-INSTATED TO PRE-CONSTRUCTION CONDITIONS



SEDIMENT FENCE PLAN

NOT TO SCALE



SEDIMENT FENCE SECTION

NOT TO SCALE

CONSTRUCTION NOTES

1. PROPOSED WETLANDS ARE TO BE UTILISED AS SEDIMENT BASINS DURING THE BULK EARTHWORKS/REGRADING WORKS.
2. PROPOSED WETLANDS TO BE CLEARED OF COLLECTED SEDIMENT PRIOR TO CONVERSION FROM SEDIMENT BASIN TO WETLAND.
3. EXISTING NATURAL WETLAND IS NOT TO BE DISTURBED DURING CONSTRUCTION WORKS.
4. FOLLOWING SITE INSPECTIONS IT HAS BEEN ASSUMED THAT THE SITE HAS LITTLE UPSTREAM CATCHMENT ALONG THE SOUTHERN AND EASTERN BOUNDARIES, THUS NO DIVERSION BANKS HAVE BEEN PROPOSED.

DATE PLOTTED: 29 May, 2007 - 10:29am
XREFs: X-400163-TITLE BASE PLAN
CAD FILE: N:\Cnt\10 W Series Jobs\W4681 - Salamander Bay ESC\PLOTS\W4681-001.dwg

REV	DATE	REVISIONS	DRN	CHK
A	18/05/07	INITIAL ISSUE	MZ	SB

CLIENT: HILL PDA

	PREPARED	CHECKED
DESIGNED:	SB	DP
DRAWN:	MZ	SB
APPROVED:	REVIEWED:	
PROJECT DIRECTOR DATE	PROJECT MANAGER DATE	

Cardno (NSW) Pty Ltd
ABN: 95 001 145 035
Level 3, 910 Pacific Highway, Gordon, NSW Australia 2072
Phone (+61 2) 9496 7700 Fax (+61 2) 9499 3902
Email: sydney@syd.cardno.com.au Web: www.cardno.com.au

HILL PDA

STAGE 1 - SALAMANDER WATERS

EROSION AND SEDIMENT PLAN - SHEET 2

DRAWING STATUS: FOR APPROVAL

DRAWING NUMBER: W4681-D-002

REV: A

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150mm A1 ON ORIGINAL

Appendix 6
Design Principles

SALAMANDER WATERS DESIGN PRINCIPLES

1.0 INTRODUCTION

1.1 Vision Statement

Salamander Waters is to be a prestige parkland residential estate which achieves a high standard of integration between individual residential design and the overall landscape setting. The design guidelines allow flexibility in the design and siting of individual homes but ensure that individual buildings do not dominate the visual character of the site. This approach is intended to allow flexibility in individual dwelling design, whilst ensuring that the overall visual quality of the locality is maintained.

Individual dwellings provide the maximum opportunity for a diverse range of building designs within the constraints of these requirements. The dwellings can range from single storey, double storey to split level. Every opportunity should be taken to vary each design and enhance the individual site features within the context of the design principles. This aim can be achieved by:

- Appointing a Town Architect to review all plans so they accord with the principles and relate to surrounding structures,
- Varying each layout to suit the site and to optimise the accommodation of various lifestyles,
- Providing individual forms, façade treatments, colours and materials,
- Varying setbacks.

2.0 SITING REQUIREMENTS

2.1 Subdivision

The minimum allotment size is 500m^2

2.2 Setbacks

Setbacks and siting requirements are an integral part of the overall landscape treatment for each dwelling. Varying setbacks to preserve mature trees and enhance the individual sites' features and landscape character is encouraged.

The setbacks of all dwellings shall comply with the APZ for the site.

2.3 Corner Lots

Specific requirements apply to setbacks and architectural treatment of corner lots to ensure an appropriate presentation is achieved to both street frontages.

2.4 Building Platform Cut and Fill

Siting of the building and external elements such as pools or garages should have regard to minimising the extent of cut and fill. Retaining walls and batters over 1 metre must be benched and landscaped.

Treatment of batters and retaining walls must be clearly indicated in the landscape and site works plans. Treated pine retaining walls will generally not be permitted within the front building setback or where visible from the street unless they are extensively planted to screen the wall.

2.5 Solar Orientation and Energy Efficient Design

Solar access and energy efficiency needs to be considered in the design and siting of the home in order to:

- achieve good solar access to the living areas,
- maximise solar access to public and private open spaces,
- provide appropriate external shading devices for all north, east and west windows,
- maximise cross flow ventilation.

Each dwelling is required to achieve compliance with thermal performance targets under BASIX (Building Sustainability Index). For more information visit www.basix.nsw.gov.au.

2.6 Privacy Considerations

Overlooking of adjoining residences and maintaining acoustic privacy between residences should be taken into account in siting of each home and in the positioning of windows and outdoor entertainment areas. Additional landscape screening within the property can assist in achieving these requirements.

2.7 Water Sensitive Urban Design

Rainwater tanks can help to reduce mains the demand on potable water supply by capturing roof runoff for 'on site' low quality domestic uses, such as toilet flushing and garden irrigation.

Each dwelling is required to achieve compliance water efficiency targets under BASIX (Building Sustainability Index). All houses will be required to install water tanks. For more information visit www.basix.nsw.gov.au

2.8 Landscape

The landscape treatment to the streets will incorporate landscaped verges of varying widths to soften the road edge and also create a less formal and more visually interesting feel to the overall development. These verges will be planted with native turf, shrubs and trees particularly rainforest species indigenous to the Port Stephens area, in accordance with the Landscape Plan.

3.0 BUILDING DESIGN

3.1 Height Form and Massing

A primary objective is to ensure that the building sits within the landscape and does not dominate it. Accordingly apart from the form of the actual building, its relationship to the site and the proposed landscape works will be major considerations.

The overall form and massing of the building is to be articulated by;

- building design elements including windows, awnings, balconies or screening,
- breaking down of scale to domestic level,
- incorporating visual interest to roof line and facades (maximum unbroken ridgeline 10m and maximum blank walls 5m),
- opportunities for linking various structures and creating external living areas.

3.2 Vehicle Access

There will be no direct access to individual lots from Port Stephens Drive.

Where laneways are provided, vehicular access should be from the rear of the site with dwelling orientated towards the street to provide casual surveillance.

3.3 Setbacks

Where allotments fall within the APZ, greater setbacks are required so that no habitable part of any building is located within the APZ.

Setbacks should comply with the following requirements:

- Minimum side setback of 900mm,
- Upper storey of a two-storey dwelling must be setback a minimum of 2m from the side boundary,
- Minimum rear setback of 2m,
- Upper storey of a two-storey dwelling must be setback a minimum of 6m and provide at least 50m^2 at the rear boundary for deep soil planting (outside the APZ).

Any proposed variation to the above will accord with the current applicable DCP.

3.4 Site coverage

The maximum site coverage of any dwelling will be 60%.

Site coverage means the portion of the site which is covered by a building having an impervious roof and excluding eaves up to 900mm wide, pergolas, gazebos or the like and paved landscape areas.

3.5 Building footprints

The footprint of any dwelling must not be greater than 400 square metres.

All filling for slabs shall be contained within the footprint.

3.6 Building Height

A maximum building height for dwellings is 9m or 8m for a dual occupancy.

3.7 Private Open Space

Private open space should be directly accessible from living areas, have adequate solar access and privacy. Each dwelling should provide a minimum of 50m^2 private open space with a principal useable area of 35m^2 and minimum dimension of 4m.

3.8 Roof Form

- Roof pitch to be between 25 and 35 degrees,
- Avoid large unbroken roof lines,
- Roof forms should be articulated to reduce the scale of the building and provide visual interest.

3.9 Garages

Garages should form an integral component of the building design, whether they are incorporated into the dwelling or designed as a separate building element linked to the dwelling.

Garage doors should be oriented away from the street where possible, and the scale of the opening reduced through the use of setbacks in the facade, intermediate piers or a combination of both.

Garages should not dominate the streetscape.

3.10 Entry

The entry area should be clearly defined in the overall building form and should also be visible from the street. However monumental entry "features" such as two storey porticos and large drive through entries will not be permitted.

3.11 Fencing

Side and rear fencing should have a maximum height of 1.8m.

Front fences should have a maximum height of 1.2m.

3.12 Eaves Overhangs Verandahs Pergolas and Sun Shading Devices

A minimum 600 mm eave overhang is required to all buildings. Verandahs and other shading devices such as pergolas are encouraged to reduce the scale of building facades and create visual interest.

3.13 Ancillary Structures and Buildings

Garages, sheds and outdoor entertaining areas are to be designed as an integral part of the main dwelling design.

Meter boxes, gas bottles, air – conditioning units, rainwater tanks and other utilities are to be screened from view or integrated into the building and fence or landscape design to minimise visual impact when viewed from the streets or surroundings.

3.14 Materials and Colour

Appearance of dwelling house and outbuildings including materials and colours are to complement the semi-rural surroundings. Earthy natural tones are encouraged to minimise visual impact of the development.

Any metal cladding to be used in the dwelling design must have permanent colour-treated finish.

Single colour buildings are not acceptable. Colours should be used to highlight the shape of building masses and detail elements.

3.15 Parking

One space is required for two bedroom dwelling and two spaces for three or more bedrooms.

4.0 SITE DESIGN

4.1 Habitat corridor

The design of the site shall provide for the habitat corridor as shown in the Site Concept Plan.

Lots fronting the habitat corridor shall ensure that views are retained. This can be achieved whereby planting areas fronting the corridor provide frames to existing views.

4.2 Pedestrian linkages

The interconnected system of streets and lanes shall be maintained as per the Site Concept plan.

Appendix 7
Bushfire Assessment

BUSHFIRE PROTECTION ASSESSMENT

FOR THE

PROPOSED RESIDENTIAL SUBDIVISION
ON
PART LOT 59 in DP8312563, No. 360

SOLDIERS POINT ROAD,
SALAMANDER BAY,

PREPARED FOR

PORT STEPHENS COUNCIL.

Australian Bushfire Protection Planners Pty Limited

Bushfire Mitigation Consultants
ACN 083 085 474
RMB 3411 Dog Trap Road
SOMERSBY 2250 NSW
Phone: (02) 43622112 Fax: (02) 43622204
Email: abpp@bigpond.net.au

BUSHFIRE PROTECTION ASSESSMENT

FOR THE

PROPOSED RESIDENTIAL SUBDIVISION

ON
PART LOT 59 in DP 8312563, No. 360

SOLDIERS POINT ROAD,
SALAMANDER BAY,

PREPARED FOR

PORT STEPHENS COUNCIL.

Report Number	Document	Preparation Date	Issue Date	Directors Approval
B06397	Final	15.1.2007	25.1.2007	*G.L.Swain*

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

EXECUTIVE SUMMARY

Australian Bushfire Protection Planners Pty Limited has been commissioned by Andrews Neil Pty Ltd, on behalf of Port Stephens Council, to prepare a Bushfire Protection Assessment for the residential subdivision of land within Part Lot 59 in DP 8312563, No 360 Soldiers Point Road Salamander Bay. [Herein called the "development site".

The development site is located to the northwest of Port Stephens Drive; southwest of the existing residential development constructed on Kanimbla Drive, Warramunga Close and Soldiers Point Road and is bounded to the northwest by the access road/fire trail within the former Port Stephens Drive carriageway. Beyond this former road alignment a large stormwater management lake/Playing Fields and Waste Transfer Station extend to the Mangrove Swamps of Cromartys Bay.

The landform within the development site consists of undulating sand dunes forming a low ridgeline that extends to the southwest through the centre of the development site.

The development proposal is for the residential subdivision of the central south-eastern portion of the site with a perimeter road extending from the western terminus of Kanimbla Drive, southwest to connect with Port Stephens Drive. The perimeter road also extends to the northeast from the terminus of Kanimbla Drive to the northern precinct of the subdivision, exiting onto the existing access road to the playing fields/Waste Transfer Depot.

The vegetation on the sand dune complex within the development site consists of Dry Sclerophyll Open Forest Tall Heath/Sclerophyll Forest on the flat land in the south-western corner of the development site. A small pocket of Wetland vegetation is located in the northern portion of the site, adjacent to the old Port Stephens Drive alignment.

The development site is adjoined to the northwest of two thirds of the north-western boundary by the existing playing fields and/or a large body of water held in a stormwater management lake. The vegetation to the northwest of the lake consists of Mangrove Swamps with the vegetation to the northwest of the remaining third of the north-western boundary consisting of Forested Wetlands/Tall Heath.

The vegetation on the development site and to the northwest of the north-western boundary is mapped, on the Port Stephens Bushfire Prone Land Map, as Category 1 Bushfire Prone Vegetation. The vegetation on the existing residential development to the northeast of the site and within the Horizons Golf Course to the south of Port Stephens Drive is not bushfire prone vegetation.

The construction of residential subdivision within a designated Bushfire Prone Area, or the buffer zone to a designated Bushfire Prone Area is Integrated Development as defined by Section 91(1) of the *Environmental Planning & Assessment Act* and requires the consent of the Commissioner of the NSW Rural Fire Service, under Section 100B of the *Rural Fires Act.*

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

Section 100B of the *Rural Fires Act* states that the Commissioner *"may issue a Bushfire Safety Authority for a development if the development complies with standards regarding setbacks, provision of water supply and other matters considered by the Commissioner to be necessary to protect persons, property or the environment from danger that may arise from a bushfire".*

This Bushfire Protection Assessment undertakes an assessment of the bushfire protection measures required to address the bushfire risk to the future residential subdivision [and construction of future dwellings on the lots within the subdivision], consistent with the specifications of *Planning for Bushfire Protection 2006,* the requirements of Section 46 of the Rural Fires Regulation and confirms that the development proposal complies with the objectives of *Planning for Bushfire Protection 2006.*

The Assessment also examines the proposal regarding the provision of Asset Protection Zones to the perimeter of the subdivision, access and water supply for firefighting operations, fuel management protocols and other matters considered necessary to mitigate the potential bushfire threat to persons, property and the environment from the danger that may arise from a bushfire within the adjoining bushfire prone vegetation.

The characteristics of the site as discussed in this report, together with the recommendations contained in this assessment, provide that the proposed development is suitable in terms of its intended use, in terms of bushfire protection to the future occupants and dwellings within the subdivision of the land.

Graham Swain
Director,
Australian Bushfire Protection Planners Pty Limited.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

TABLE OF CONTENTS

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

SECTION 1

INTRODUCTION

1.1 Development Proposal.

This Bushfire Protection Assessment has been prepared, at the request of Andrews Neil on behalf of Port Stephens Council, to support an application for the residential subdivision of Part Lot 59 in DP 8312563, No. 360 Soldiers Point Road, Salamander Bay.

The development proposal is for the residential subdivision of the central south-eastern portion of the site, between Kanimbla Drive and Port Stephens Drive containing approximately fifty nine residential lots and a ridge top park with a perimeter road extending from the western terminus of Kanimbla Drive, southwest to connect with Port Stephens Drive. The perimeter road also extends to the northeast from the terminus of Kanimbla Drive to the northern precinct of the subdivision, containing approximately thirty five residential lots, exiting onto the existing access road to the Playing Fields/Waste Transfer Depot.

The proposed road network within the central south-eastern development precinct extends from the perimeter road to provide a loop road network to the residential lots, around the perimeter of the ridge top park. An access road runs parallel to and links to Port Stephens Drive to provide access to the lots on the southern edge of the development precinct. The northern development precinct has the benefit of the existing road formation on the old alignment of Port Stephens Drive to provide a perimeter road to the northwest of the precinct and a loop road that provides separation to the Wetland Vegetation.

1.2 Aims of this Assessment.

The aims of this Bushfire Protection Assessment are:

- Review the Certified Port Stephens Bushfire Prone Land Map;
- Determine the classification of the vegetation on and surrounding the site in accordance with the vegetation classification system contained in *Planning for Bushfire Protection 2006*;
- Undertake an assessment to determine the slope of the land on and surrounding the development site;
- Undertake a Bushfire Hazard Assessment of the mapped Bushfire Prone Vegetation within the land to the northwest of the development site;
- Undertake a Bushfire Protection Assessment to determine bushfire protection strategies for the proposed subdivision that address the following matters:

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

(i) The provision of building setbacks (Asset Protection Zones) from vegetated areas and the siting of buildings to minimize the impact of radiant heat and direct flame contact;
(ii) Fire fighting water supplies;
(iii) Access requirements for emergency service vehicles;
(iv) Construction standards to be used for the future buildings within the proposed development to minimize the vulnerability of buildings to ignition from radiation and ember attack;
(v) Land management responsibilities; and
(vi) Evacuation management.

1.3 Statutory Requirements.

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

1.3.1 Legislation.

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

Planning and development within NSW is regulated by the *Environmental Planning & Assessment Act, 1997* (EPA Act). This Act was amended in August 2002 by the *Rural Fires & Environmental Assessment Legislation Amendment Act, 2002.* In relation to bushfire planning for new residential, rural residential and special fire protection developments in bushfire prone areas in NSW, the following section of the EPA Act applies:

- Section 79C(1) states *"In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:*

  - *The likely impacts of the development (e.g. natural hazards such as bushfire threat)*
  - *The suitability of a site for development (e.g. bushfires)*

- Section 91(1) defines the subdivision of Bushfire Prone Land for residential and rural residential subdivision and the construction of special protection developments that are located in a Bushfire Prone Area as integrated development, which requires authorization under Section 100B of the *Rural Fires Act 1997.*

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

(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.

The *Rural Fires Act* was amended in August 2002 by the *Rural Fires & Environmental Assessment Legislation Amendment Act, 2002.* In relation to bushfire planning for new residential, rural residential and special fire protection developments in bushfire prone areas in NSW, the following section of the Act applies:

- Section 100B provides for the issue, by the Commissioner of the NSW Rural Fire Service, of a Bushfire Safety Authority for development which creates the subdivision of bushfire prone land for residential and rural residential development and construction of special fire protection developments located within a Bushfire Prone Area.

  Applications for a Bushfire Safety Authority must be lodged as part of the development application process and must demonstrate compliance with *Planning for Bushfire Protection 2006* and other matters which are considered necessary, by the Commissioner, to protect persons, property and the environment from the impact of bushfire.

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.

The following section relates to planning for new residential, rural residential and special fire protection developments in bushfire prone areas in NSW:

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

- Section 46 of the *Rural Fires Regulation* provides details of the matters that are required to be addressed for the issue of a *Bushfire Safety Authority* under Section 100B of the *Rural Fires Act.*

(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 (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 residential and rural residential subdivision, Special Fire Protection and Industrial Developments in bushfire prone areas.

Section 79BA of the *Environmental Planning & Assessment Act* states that:
"development consent cannot be granted for any purpose (other than a subdivision of land that could lawfully be used for residential or rural residential purposes or development for a special fire protection purpose) on bushfire prone land unless the consent authority:

- *Is satisfied that the development conforms to the specifications of Planning for Bushfire Protection 2006 or:*

- *The consent authority has consulted with the Commissioner of the NSW Rural Fire Service concerning measures to be taken with respect to the development to protect persons, property and the environment from danger that may arise from a bushfire".*

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

The document does not give total guidance on matters dealing with the subdivision of bushfire prone land for residential development or development of a special protection purpose as the Commissioner may determine, under Section 100B of the *Rural Fires Act,* additional measures that are considered necessary to protect the development against the impact of bushfire.

1.4 Documentation Reviewed.

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

- Contour Plan of the Development Site prepared by Andrews Neil Pty Ltd;
- Proposed Subdivision Layout prepared by Andrews Neil Pty Ltd, Project No. 04107, Drawing No. P01 dated 13.12.2006;
- Port Stephens Council Certified Bushfire Prone Land Map;
- *Planning for Bushfire Protection 2006* prepared by the NSW Rural Fire Service.

1.5 Site Inspection.

Graham Swain of *Australian Bushfire Protection Planners Pty. Limited* inspected the development property on the 15th October 2006 to assess the topography, slopes, vegetation classification and land use within and adjoining the development site. Visual assessment was undertaken to determine likely fire paths, influence of terrain on wind patterns within the bushfire prone vegetation and an assessment of access and egress to the development site. Adjoining properties were also inspected to determine the surrounding land use / land management.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

SECTION 2
DESCRIPTION OF DEVELOPMENT SITE

2.1 Location & Description.

The land within the development site consists of Part Lot 59 in DP 8312563, No. 360 Soldiers Point Road, Salamander Bay.

The development site has an irregular shape and occupies the land to the northwest of Port Stephens Drive, southwest of the existing residential development constructed on Kanimbla Drive, Warramunga Close and Soldiers Point Road and is bounded to the northwest by the fire trail within the former Port Stephens Drive carriageway. Beyond this former road alignment a large stormwater management lake/Playing Fields and Waste Transfer Station extend to the Mangrove Swamps of Cromartys Bay.

The Horizons Golf Resort adjoins the south-eastern aspect of Port Stephens Drive.

The landform within the development site consists of undulating sand dunes forming a low ridgeline that extends to the southwest through the centre of the development site. The landform of the surrounding lands is level.

2.2 Existing Land Use.

The development site is vacant vegetated land in the ownership of Port Stephens Council.

2.3 Adjoining Land Use.

The north-western boundary of the development site is bounded by the former carriageway of Port Stephens Drive which contains a paved and or gravel road formation that extends along the western boundary of the development site. The land use beyond the north-eastern length of the road alignment consists of a large stormwater management lake/playing fields and Waste Transfer Station.

The land use to the northwest of the south-western length of the road alignment consists of vacant vegetated land.

Residential development adjoins the north-eastern aspect of the development site with the Horizons Golf Resort occupying land to the south of Port Stephens Drive, to the south of the development site.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

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, having regard to the vegetation found.

The topography of the land within development site forms a low sand ridgeline that extends to the southwest through the central south-eastern portion of the site. This ridgeline falls to the southeast from AHD 36 metres to AHD 6 metres [14 degrees] on Port Stephens Drive, with level land on the Horizons Golf Resort extending further to the southeast. The ridgeline turns to the northwest to form a level section of land at AHD 6 metres within the south-western corner of the site.

The north-western aspect of the ridgeline falls, initially, from AHD 36 metres to a lower bench at 12 – 22 metres AHD before falling to 6 metres on the former alignment of Port Stephens Drive. The vacant land to the northwest is level at approximately 4 metres AHD and forms the flood plain to Cromartys Bay.

The land form of the playing fields is level.

The north-western slope of the ridgeline slopes to level of the former road alignment at between 2 – 10 degrees and is punctuated by short steep gullies which fall to the north-west.

The topography of the land within the adjoining residential development adjoining the north-eastern boundary of the central development precinct falls to the northeast at < 5 degrees.

2.5 Vegetation Communities on the land within the Development Site.

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

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

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

(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 ridgeline within the development site contains Dry Sclerophyll Open Forest with a shrubby understorey. The vegetation on the level land within the south-western corner of the development site contains Dry Sclerophyll Forest with a shrubby/heath understorey.

The Wetlands within the northern portion of the development site contain Forested Wetlands vegetation with cleared land occupying the old quarry on the site.

2.6 Vegetation Communities adjoining the Development Site.

The vegetation on the Horizons Golf Resort land, to the southeast of the development site, consists of managed fairways with narrow rows of managed remnant Dry Sclerophyll Forest located between the Fairways. The adjoining residential land to the northeast contains managed landscaped gardens.

The vacant land to the northwest of the south-western corner of the development site contains a mixture of Forested Wetlands and Open Woodland, with a heath understorey, with SEPP 14 Wetlands and Mangrove Swamp extending further to the northwest to the foreshore of Cromartys Bay.

The stormwater management lake contains no vegetation, save for scattered Melaleuca trees which are dying due to continuous water inundation. The sports fields contain managed lawns/landscaped gardens with Mangrove Swamp extending further to the northwest, beyond the lake/ sports fields and Waste Transfer Station, to the foreshore of Cromartys Bay.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

2.7 Significant Environmental Features on the land within the Development Site.

The development site does not contain any significant environmental features such as SEPP 14 Wetlands; SEPP 26 Littoral Rainforests; Areas of Geological interest; Steep Lands [>18 degrees]; Land slip areas or National Parks Estate. The development site does contain an area of SEPP 44 Koala Habitat.

2.8 Known Threatened Species, Populations, Endangered Ecological Communities or Critical Habitat on the land within the Development Site.

The site contains a small area of wetland located adjacent to the former Port Stephens Road alignment, within the north-eastern portion of the site, and SEPP 44 Koala Habitat. The proposed development layout does not impact upon the wetland area and a Koala Habitat corridor is being retained along the north-western aspect of the central south-eastern development precinct.

2.9 Details of Aboriginal/European Heritage within the Development Site.

There are no known Aboriginal sites, relics or European heritage within the development site.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

SECTION 3
FIRE MANAGEMENT RESPONSIBILITIES

Fire management within the development site is the responsibility of:

3.1 Port Stephens Council.

The Port Stephens 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 Council 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 Port Stephens Bush Fire Management Committee.

The Port Stephens 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:

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

- ***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 Private Land Owners / Occupiers.

The Rural Fires Act, 1997 provides several legislative opportunities to require 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*).

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

SECTION 4

BUSHFIRE HAZARD ASSESSMENT

4.1 Definitions.

Planning for Bushfire Protection 1991 defines *Bushfire Hazard* as the "*availability of fuel".* The document also defines threat as being a *"measure of the scale of impact or significance in terms of hazard and risk".*

Planning for Bushfire Protection 2006 defines bushfire risk as *"the chance of a bushfire igniting, spreading and causing damage to assets of value to the community. Risk may be rated as extreme, major, moderate, minor or insignificant and is related to the vulnerability of the asset".*

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:

(a) Determine vegetation distance, type and class as follows:
Identify all vegetation in each direction from the site for a distance of 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 deemed to be prone to bushfire threat and therefore require the provision of Asset Protection Zones.

The existing vegetation within the development site is Bushfire Prone. The proposed development will modify/remove the vegetation from within the subdivision footprint. However, some bushfire prone vegetation will remain within the south-western corner of the site and along the north-western aspect, within the Koala Habitat corridor and within the small area of wetland.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

Table 1. Precinct Level Assessment

Aspect	Existing Land Use	Predominant vegetation within 140 m of Development	Predominant vegetation formation [Table A2.1, *PBP 2006*]	Effective slope of land to distance of 100m.	Comments
Northeast	Existing Residential Development	Landscaped Gardens	Nil	< 5 degrees downslope to the northeast	The landscaped gardens are not Bushfire Prone Vegetation
Southeast	Horizons Golf Resort	Managed Fairways	Nil	Level	The vegetation on the Golf Course is not Bushfire Prone
Southwest of development site	Horizons Golf Course	Managed Fairways	Nil	Level	The vegetation on the Golf Course is not Bushfire Prone
Northwest of south-west corner of the site	Vacant Land	Forested Wetlands/ Woodland with Coastal Heath	Forested Wetlands	Level	This vegetation is bushfire prone.
Northwest of central portion of North-western boundary	Stormwater Management Lake	Nil – this lake extends more than 140 metres beyond the site with Mangrove Swamps further to the N.W	Nil	Level	This aspect is not bushfire prone
Northwest of northern portion of North-western boundary	Stormwater Lake + Sports Fields [narrow band of vegetation to stormwater channel]	Nil – the Sports Fields extend more than 140 metres beyond the development site	Nil – The narrow bands of vegetation to the stormwater channel do not contain sufficient area to be classified	Level	This aspect is not bushfire prone.

4.3 Bushfire Hazard Assessment.

Planning for Bushfire Protection 2006 does not provide a methodology for determining bushfire hazard – it defers instead to Bushfire Prone Land determined in accordance with the "*Bushfire Prone Land Mapping Guideline"*, issued by the Rural Fire Service on the 7th April 2004.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

To be able to undertake a bushfire hazard assessment the ***Department of Planning*** document *Circular C10 (1983)* provides a suitable methodology. This methodology rates the vegetation and slope and provides an index value to each. The overall Bushfire Hazard Score is determined by multiplying the Vegetation Index by the Slope Index.

4.3.1 Assessment to Determine the Bushfire Hazard to the Development.

The vegetation that presents the highest potential bushfire threat to the development is the Forested Wetlands/Coastal Heath to the northwest of the south-western corner of the development site [the remainder of the north-western aspect is protected by the existing stormwater management lake and sports fields].

The Forested Wetlands/Coastal Heath vegetation has a vegetation index score of 2.8. The effective slope is level with a slope index score of 1.0. Therefore the Bushfire Hazard Score for the Forested Wetlands/Coastal Heath is 2.8 x 1.0 = 2.8, which equates to a numerical Bushfire Hazard Rating of Moderate.

The Dry Sclerophyll Forest which will be retained within the Habitat Corridor has a vegetation index score of 2.8. The effective slope is < 10 degrees with a slope index score of 2. Therefore the Bushfire Hazard Score for the Dry Sclerophyll Forest is 2.8 x 2 = 5.6, which equates to a numerical Bushfire Hazard Rating of High.

4.4 Assessment of Bushfire Threat.

Bushfire Threat is the "*measure of scale of impact or significance in terms of hazard and risk*".

The bushfire risk, to the future residential development within the subdivision, will be from bushfires advancing from the northwest/southwest, through the Forested Wetlands/Coastal Heath vegetation, entering the development site and impacting upon the retained vegetation in the Habitat Corridor along the north-western edge of the residential precinct and in the southwestern corner of the site.

The potential bushfire threat to the new buildings within the site is High with the likely bushfire impact being a short period of extreme levels of radiant heat, flying embers and dense smoke given off by the Coastal Heath vegetation.

SECTION 5
BUSH FIRE PROTECTION ASSESSMENT

5.1 Introduction.

Section 46(1) (g) of the *Rural Fires Regulation 2002* requires that an application for a *Bushfire Safety Authority* must include a bushfire assessment for the proposed development (including the methodology used in the assessment) that addresses the extent to which the development provides:

- *asset protection zones;*
- *the siting and adequacy of water supplies for fire fighting operations;*
- *capacity of public roads to handle increased volumes of traffic during a bushfire emergency;*
- *whether or not public roads link with the fire trail network and have two way access;*
- *the adequacy of access and egress for the purposes of emergency response;*
- *the adequacy of bushfire maintenance plans and fire emergency procedures and;*
- *the construction standards to be used for building elements.*

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 Asset Protection Zones and construction standards required for the construction of the future dwellings on the site. The remaining items identified by Section 46(1) (g) of the *Rural Fires Regulation* are examined in Sections 5.4 – 5.6 of this report.

5.2 Determination of Asset Protection Zones – Future Residential Development .

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

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

(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 Tables A2.4 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 Zones for the construction of future residential dwellings on the site.

The Koala Habitat Corridor along the north-western aspect of the central development precinct is 100 metres wide, measured from the outer edge of the proposed perimeter road and the fire trail within the former Port Stephens Road alignment. The Lake and Sports Fields provide an effective barrier against the advance of fire into the north – eastern portion of this corridor. The result will be limited bushfire attack from the 100 metre wide vegetated corridor in this section of the subdivision however, fires will have the potential to travel along the corridor from the southwest.

Fires will also have the potential to advance into the south-western corner of the site, from the adjoining vegetated lands, impacting upon the south-western portion of the development. It is therefore recommended that Port Stephens Council should prepare and implement the recommendations of a Fuel Management Plan for the vegetation within the habitat corridor.

The central south-eastern precinct contains a ridge top park. The vegetation within this park will consist of a retained tree canopy within a managed community park, therefore removing the potential bushfire risk from this area of the subdivision.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

Table 2. Determination of Asset Protection Zones – Residential Development.

Aspect	**Vegetation within 140m of development**	**Predominant Vegetation Formation Class** ***[Table A2.1 Planning for Bushfire Protection 2006]***	**Effective Slope of Land**	**Recommended Width of Asset Protection Zone** ***[Table A2.4 Planning for Bushfire Protection 2006]***	**Compliance with Specifications of Table A2.4** ***Planning for Bushfire Protection 2006***
Southeast of Port Stephens Drive	Managed Fairways within Golf Course	Nil	Level	None Required.	Yes
Southeast of Northern Development Precinct	Landscaped Gardens to existing residential development on Maneera Close	Nil	Level	None Required	Yes
North of development	Landscaped gardens to existing residential development on Soldiers Point Road & Kanimbla Drive	Nil	< 5 degrees down slope to the north east	None Required	Yes
West of southern portion of the subdivision	Dry Sclerophyll Forest & Forested Wetlands/ Coastal Heath	Dry Sclerophyll Forest [FDI 100]	9 degrees downslope across habitat corridor	35 metre APZ [25m IPA + 10m OPA] provided perimeter by road + setback to dwellings	Yes
Northwest of central portion of subdivision	100m wide corridor of Dry Sclerophyll Forest	Dry Sclerophyll Forest [FDI 100]	2 – 5 degrees downslope	25 metres APZ [15mIPA + 10m OPA] provided by perimeter road + setback to dwellings	Yes
Southwest & Northwest to Wetlands	100m wide corridor of Forested Wetlands	Forested Wetlands [FDI 100]	Level	15 metre APZ [IPA] provided by perimeter road	Yes

Assessment Results:

The proposed subdivision layout provides Asset Protection Zones that either comply with or exceed the widths of the Asset Protection Zones specified by Table A2.4 of *Planning for Bushfire Protection 2006.*

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

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 in accordance with the following classifications:

- *Less than 20 metres*
- *From 20 metres but not greater than 30 metres*
- *Greater than 30 metres but not greater than 50 metres*
- *Greater than 50 metres but not greater than 80 metres*
- *Greater than 80 metres but not greater than 100 metres.*

(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 and the appropriate level of construction.

Five categories of Bushfire Attack are determined. They are:

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

- Low
Insignificant ember attack, radiation heat no greater than 14.5 KWm² or is greater than 100 metres from all woody vegetation.
- Medium
Significant ember attack with radiation heat greater than 14.5 KWm² and no greater than 16 KWm² (Level 1 Construction AS3959-1999).
- High
Significant ember attack and possible flame contact, radiation heat greater than 16 KWm² and no greater than 21 KWm² (Level 2 Construction AS3959-1999).
- Extreme
Significant ember attack and possible flame contact, radiation heat greater than 21 KWm² and no greater than 31 KWm² (Level 3 Construction AS3959-1999).
- Flame Zone
Within the Flame Zone and / or greater than 31 KWm² (Construction outside scope of AS3959-1999).

Table 3 provides a summary of the Bushfire Attack Assessment and provides recommendations on the resultant construction standards for the future dwellings within the proposed subdivision.

Table 3. Bushfire Attack Assessment – Construction Standards

Aspect	**Vegetation within 140m of development**	**Predominant Vegetation Class *[Table A2.1 Planning for Bushfire Protection 2006]***	**Effective Slope of Land**	**Minimum Width of Asset Protection Zone *[Table A2.5 PfBFP 2006]***	**Level of Bushfire Attack. Construction in accordance with Australian Standard A.S 3959 – 1999**
West of the southern portion of the subdivision	Dry Sclerophyll Forest; Forested Wetlands; Coastal Heath	Dry Sclerophyll Forest [FDI 100]	9 degrees down slope	35 metres provided as an Inner Protection Area [Road + setback]	Extreme Attack – Level 3 Bushfire Construction standards.
Northwest of central portion of subdivision	100m wide corridor of Dry Sclerophyll Forest	Dry Sclerophyll Forest [FDI 100]	2 – 5 degrees down slope	35 metres provided as an Inner Protection Area [Road + setback]	Extreme Attack – Level 3 Bushfire Construction standards.
Northwest & Southwest to Wetland	Forested Wetlands	Forested Wetlands [FDI 100]	Level	> 20 metres provided by perimeter road	Extreme Attack – Level 3 Bushfire Construction standards.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

Assessment Recommendations:

- The assessment of bushfire attack has identified that the future dwellings constructed adjacent to the bushfire prone vegetation on the south-western and north-western aspects of the subdivision require the implementation of Level 3 construction standards in accordance with Australian Standard A.S 3959 -1999 *"Construction of Buildings in Bushfire Prone Areas".*

- Buildings constructed beyond the first row of dwellings on the south-western and north-western perimeter of the subdivision and within 100 metres of the bushfire prone vegetation, shall be constructed to comply with Level 1 specifications of A.S. 3959 -1999.

- All of the future dwellings in the proposed subdivision shall have a protection device installed that minimizes the accumulation of combustible materials in the roof gutters and valleys. Such protection device shall have a flammability index rating of less than 5, measured against the performance standards of A.S 1530.2

5.4 Access Standards for Firefighting Operations.

5.4.1 Adequacy of Public Roads.

Port Stephens Drive is constructed to an arterial road standard and provides adequate access for emergency vehicles and increased traffic during emergency events in the area. The proposed perimeter road links to Port Stephens Drive in the southeast and the existing access road to the Sports Fields/Waste Transfer Station. This road has recently been reconstructed and provides two-way access for heavy garbage trucks – therefore providing suitable emergency access for firefighting vehicles.

5.4.2 Fire Trail Access to two-way Public Roads.

There is an existing formed fire trail constructed within the former Port Stephens Drive carriageway. This fire trail shall be retained and maintained with locked gates provided at the junction with the Waste Transfer Station Road and Port Stephens Drive.

5.4.3 Emergency Response Access / Egress.

Chapter 4 of *Planning for Bushfire Protection 2006* provides specifications on the design and construction of Public Roads, including the perimeter and internal roads, within a residential development which is deemed to be bushfire prone.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

The specifications for public roads are:

- *Roads shall be designed for two-wheel drive all weather access;*
- *Perimeter roads shall be two-way with a minimum carriageway width of 8.0 metres, kerb to kerb, with shoulders on each side to allow traffic to pass in opposite directions;*
- *Roads shall be through roads. Dead ends shall not be more than 200 metres in length and incorporate a 12m outer radius turning circle;*
- *The capacity of road surfaces/bridges in a subdivision with reticulated water supply shall be 15 tonnes;*
- *Curves of roads shall have a minimum inner radius of 6 metres and a minimum outer radius of 12 metres;*
- *Vertical clearance above the road surface shall be 4.0 metres;*
- *All public roads eight metres wide shall locate services outside parking reserves to ensure accessibility to the reticulated water supply;*
- *All public roads between 6.5 & 8 metres in width shall be No Parking on one side with services (hydrants) located opposite the parking side;*
- *Public Roads less than 6.5 metres in width shall provide parking bays clear of the road formation and locate services outside the parking bays;*
- *Single lane one-way roads shall be no less than 3.5 metres in width with parking bays provided clear of the road formation;*
- *Parking Bays shall be 2.6 metres wide from kerb to the edge of the road formation;*
- *All access roads directly interfacing the bushfire hazard shall provide roll top kerbing to the hazard side of the road.*

Vehicular access to the subdivision is via an extension of Kanimbla Drive and a perimeter road that links with Port Stephens Drive in the south and the existing public road to the Sports Fields and Waste Transfer Station in the north. Internal loop roads provide access to the lots within the subdivision with an emergency access link from the loop road around the ridge top park to the extension of Kanimbla Drive.

The perimeter and internal roads shall be constructed to the specifications of *Planning for Bushfire Protection 2006* with the minimum carriageway width of the perimeter road being eight (8) metres. The minimum width of the internal roads being six (6) metres, providing that there is “No Parking” to both sides of the carriageway and parking is provided in designated parking bays clear of services.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

5.5 Water Supplies for Firefighting Operations.

A reticulated water supply is available to the site from a service provided by Hunter Water. This service shall be extended into the development site with hydrants installed in accordance with A.S. 2419.1 – 1994.

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 firefighters 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.

An additional firefighting water resource is available within the stormwater management Lake. This resource can be safely accessed by fire appliances if the mains supply fails during major bushfire events. Therefore it is considered that additional static water supplies [tanks] are not necessary within the subdivision.

5.6 Emergency Management for Fire Protection / Evacuation.

The north-western aspect of the subdivision will be subject to impact from fires burning within the Dry Sclerophyll Forest/ Forested Wetlands and Heath vegetation on the vacant land to the west of the development side and from the retained Dry Sclerophyll Forest within the Habitat Corridor. With the widths of Asset Protection Zones recommended, the potential impact is likely to be extreme levels of radiant heat on the perimeter dwellings, ember attack and smoke on all of the dwellings in the proposed subdivision.

The fuel management of the Habitat Corridor will be necessary to minimize the potential bushfire threat and therefore a Fire Management Plan shall be prepared for the management of the vegetation within the Habitat Corridor.

Safe evacuation from the subdivision can be undertaken utilizing the internal road network with alternate egress points providing safe egress from the subdivision, to either Soldiers Point Road in the north or Port Stephens Drive to the south.

The provisions of Section 63 of the *Rural Fires Act,* the maintenance of the Asset Protection Zones within the perimeter road reserve will be undertaken in accordance with the protocols of the Fire Management Plan prepared for the management of the Habitat Corridor.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

The management of the Asset Protection Zones on the individual lots and the maintenance of the bushfire protection measures applied to the structures shall be controlled by way of a Covenant on the titles of those lots so burdened.

5.7 Bushfire Hazard Management.

The intention of bushfire hazard management is to prevent flame contact to a structure, reduce radiant heat to below the ignition thresholds for various elements of a building, to minimize the potential for wind driven embers to cause ignition and to reduce the effects of smoke on residents and firefighters.

Careful attention shall be given to species selection of landscaping within the Asset Protection Zone, 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.

5.7.1 Fuel Management.

A diligent approach to the management of bushfire fuel levels is required to the land within the subdivision. Management of the Asset Protection Zones 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 Inner Protection Area, within the Asset Protection Zone, 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;
- Separate the tree canopy and shrub connectivity with defined landscaped garden beds;
- 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;
- Maintain minimal fine fuel loading at ground level within the Inner Protection Area and landscaped area (nominally 3 tonnes / hectare);

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

- Trees and shrubs are acceptable provided that they are spread out and do not form a continuous canopy, are not species that retain dead material and are located away from the buildings to minimize radiant heat and direct flame attack.
- 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;

5.7.2 Management Responsibilities.

*Section 63(2**)*** of the *Rural Fires Act* 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 Coordinating Committee) advises a person to take;

(b) that are included in a bush fire risk management plan applying to the land.

The owners of the future lots in the subdivision will be responsible for the maintenance of the Asset Protection Zones in accordance with the specifications of *Planning for Bushfire Protection 2006.* To ensure that the Asset Protection Zone is maintained, it is recommended that a Section 88b Instrument, under the Conveyancing Act of 1919, be created on the title of the proposed lots so burdened.

The management of the Habitat Corridor shall rest with Port Stephens Council and the fuel management of this vegetation will be undertaken in accordance with the Fire Management Plan prepared for this corridor.

5.8 Adequacy of Sprinkler Systems & other Fire Protection Measures.

There are no sprinkler systems required or recommended.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

SECTION 6
BUSHFIRE MANAGEMENT STRATEGIES

Strategies to mitigate the potential bushfire risk to the future dwellings in the subdivision of the land are as follows:

6.1 Strategy 1 – Provision of Asset Protection Zones.

Asset Protection Zones shall be provided in accordance with Table 4.

Table 4. Asset Protection Zones to the future Dwellings on the western, north-western & south-western perimeter of the subdivision.
[Refer to Figure 1 – Section 8 of this report]

Aspect	**Vegetation within 140m of development**	**Predominant Vegetation Formation Class *[Table A2.1 Planning for Bushfire Protection 2006]***	**Effective Slope of Land**	**Recommended Width of Asset Protection Zone *[Table A2.4 Planning for Bushfire Protection 2006]***	**Compliance with Specifications of Table A2.4 *Planning for Bushfire Protection 2006***
West of southern portion of the subdivision	Dry Sclerophyll Forest & Forested Wetlands/ Coastal Heath	Dry Sclerophyll Forest [FDI 100]	9 degrees downslope across habitat corridor	35 metre APZ [25m IPA + 10m OPA] provided perimeter by road + setback to dwellings	Yes
Northwest of central portion of subdivision	100m wide corridor of Dry Sclerophyll Forest	Dry Sclerophyll Forest [FDI 100]	2 – 5 degrees downslope	35 metres APZ [25mIPA + 10m OPA] provided by perimeter road + setback to dwellings	Yes
Southwest & Northwest to Wetlands	100m wide corridor of Forested Wetlands	Forested Wetlands [FDI 100]	Level	> 15 metre APZ [IPA] provided by perimeter road	Yes

6.2 Strategy 2 – Management of Asset Protection Zones.

The Asset Protection Zones shall be maintained in accordance with the specifications of Appendix 5 of *Planning for Bushfire Protection 2006.*

6.3 Strategy 3 – Fire Management Plan.

A Fire Management Plan shall be prepared that establishes the management protocols for the fuel management of the Habitat Corridor. The fuel management of the Habitat Corridor shall remain the responsibility of Port Stephens Council.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

6.4 Strategy 4 – Covenant for the Management of the Asset Protection Zones and Bushfire Protection Measures.

It is recommended that a Section 88b Instrument, under the Conveyancing Act of 1919, be created on the title of the proposed lots burdened by the provision of the Asset Protection Zone to ensure that the management of the Asset Protection Zones is in accordance with the specifications of *Planning for Bushfire Protection 2006*.

6.5 Strategy 5 – Management of Ridge Top Park.

The remnant vegetation within the Ridge Top Park shall be maintained as managed parklands having a retained tree canopy with landscaped gardens/low fuel areas.

6.6 Strategy 6 – Access for Firefighting Operations & Emergency Evacuation.

The access provisions to subdivision shall comply with the specifications of Section 4 [Public Access] of *Planning for Bushfire Protection 2006.*

The perimeter road shall be constructed to a minimum width of eight (8.0) metres. The internal road network shall be constructed to a minimum width of 6.0 metres with “No Standing” to both sides of the carriageway and parking is provided in designated parking bays clear of services. Passing Bays/lay-bys shall be located adjacent to the hydrant positions and the road formation shall be constructed to carry a fully laden Category 1 Rural Fire Service Tanker of 15 tonne GVM.

6.7 Strategy 7 – Provision of Fire Trail.

The existing formed fire trail constructed within the former Port Stephens Drive carriageway shall be retained and maintained with locked gates provided at the junction with the Waste Transfer Station Road and Port Stephens Drive.

6.8 Strategy 8 – Water Supplies for Firefighting Operations.

The existing HunterWater reticulated service shall be extended into the development site with hydrants installed in accordance with A.S. 2419.1 – 1994. Hydrants shall have guaranteed a flow rate of 10 litres/second.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

Fire hydrants shall be accessible and located such that a fire appliance 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 firefighters 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.

It is also recommended that a fast fill access point be provided to the Lake, allowing for filling of Rural Fire Service Tankers.

6.9 Strategy 9 – Building Construction.

- The future dwellings constructed adjacent to the bushfire prone vegetation on the south-western and north-western aspects of the subdivision shall be constructed to the specifications of Level 3 construction standards in accordance with Australian Standard A.S 3959 -1999 *"Construction of Buildings in Bushfire Prone Areas".*

- Buildings constructed beyond the first row of dwellings on the south-western and north-western perimeter of the subdivision and within 100 metres of the bushfire prone vegetation, shall be constructed to comply with Level 1 specifications of A.S. 3959 -1999.

- All of the future dwellings in the proposed subdivision shall have a protection device installed that minimizes the accumulation of combustible materials in the roof gutters and valleys. Such protection device shall have a flammability index rating of less than 5, measured against the performance standards of A.S 1530.2

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

SECTION 7

CONCLUSION

This report has been prepared, on behalf of Port Stephens Council, for the residential subdivision of Part Lot 59 in DP 8312563, No. 360 Soldiers Point Road, Salamander Bay.

The development site is impacted by the Port Stephens Bushfire Prone Land Map and the proposed residential subdivision is Integrated Development under the provisions of Section 91 (1) of the *Environmental Planning & Assessment Act.* The development proposal is for the subdivision of the development site into approximately 94 residential lots within the central southern portion and northern portion of the site with a vegetated habitat corridor retained along the north-western portion of the site and a managed ridge top park occupying the central ridge line in the central south-eastern portion of the development site.

The development includes the provision of a perimeter road and Asset Protection Zones to the north-western aspect of the future residential lots so as to address the requirements of the NSW Rural Fire Service and to mitigate the potential threat of exposure to the impact of bushfires burning in the bushfire prone vegetation to the west of the south-western portion of the site and within the vegetation retained in the habitat corridor.

All other aspects of the development site adjoin non-bushfire prone land and therefore do not necessitate the provision of Asset Protection Zones, including those aspects adjoining the ridge to park.

The recommendations provided in this report address the specifications of *Planning for Bushfire Protection 2006* in regard to the provision of Asset Protection Zones, access and water supplies for firefighting operations and construction standards to the future dwellings within the subdivision. These measures address the aims and objectives of *Planning for Bushfire Protection 2006* and mitigate the potential impact of a bushfire burning in the adjacent bushfire prone vegetation.

The recommendations contained within this report also address requirements of Section 46(1) (g) of the *Rural Fires Regulation 2002* as a prerequisite for the issue of a Bushfire Safety Authority under Section 100B (4) of the *Rural Fires Act - 1997* for the subdivision application. The following table summarises the extent to which the subdivision proposal conforms with, or deviates from, the requirements of Section 46 (g) of the *Rural Fires Regulation 2002*.

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

Table 5. Compliance with Section 46(g) of the Rural Fires Regulation

Requirements of Section 46(g) of Rural Fires Regulation		Compliance
(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 Required

The proposed development conforms to the performance criteria for residential subdivision of bushfire prone land as recommended in Chapter 4 of *Planning for Bushfire Protection 2006.*

REFERENCES:

- N.S.W Rural Fire Service – *Planning for Bushfire Protection 2006*;
- N.S.W Rural Fire Service – Draft Threatened Species Hazard Reduction List for the Bushfire Environmental Code (2003);
- *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".*
- *Port Stephens Bushfire Prone Land Map.*

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

SECTION 8

FIGURE 1

PLAN OF ASSET PROTECTION ZONES

Tel. 612 43622112 / 612 43621184
Email. abpp@bigpond.net.au

LEGEND

- SITE BOUNDARY
- ASSET PROTECTION ZONE
- EXISTING FIRE TRAIL MAINTAINED
- PLAYING FIELDS
- EMERGENCY ACCESS
- LAKE
- LOCKED GATE

N

DRAWING NOT TO SCALE

PLAYING FIELDS

EXISTING FIRE TRAIL MAINTAINED

ACCESS TO PLAYING FIELDS & WASTE TRANSFER STATION

GATE TO FIRE TRAIL

MANGROVE SWAMP

STAGE 1
WETLANDS AREA

20m APZ

20m APZ

SOLDIERS POINT ROAD

MANOORA CLOSE

EXISTING RESIDENTIAL DEVELOPMENT

LAKE

STAGE 2

KANIMBLA DRIVE

EMERGENCY ACCESS

HABITAT CORRIDOR FUEL MANAGED

35m APZ

MANAGED PARK

BUSHFIRE PRONE VEGETATION

WARRAMUNGA CLOSE

GATE TO FIRE TRAIL

PORT STEPHENS DRIVE

HORIZONS GOLF COURSE

STAGE 1 - 34
STAGE 2 - 60
TOTAL - 94

ABPP

RMB 3411 Dog Trap Road
Somersby NSW 2250

Tel: 612 43622112 / 612 43621184
Fax: 612 43622204 Mob: 0427 622204
Email: abpp@bigpond.net.au

Job No: B06397	Drawing No: F1
Drawn by: GS	Date: 24.01.07

Amendment		Date
A		
B		
C		

Figure 1

Plan of Bushfire Protection Measures
360 Soldiers Point Road, Salamander Bay

Source: Andrews Neil

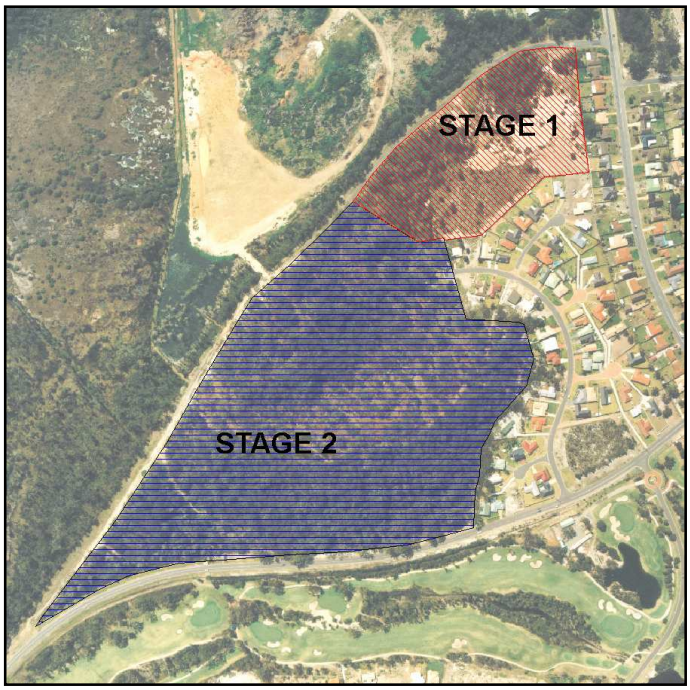
Appendix 8
Traffic Impact Assessment

Better Transport Futures

Mark Waugh Pty Limited
ABN 67 106 169 180
Transport Planning & Engineering

Proposed Salamander Waters Residential Development Salamander Bay, NSW

Andrews Neil Pty Ltd



Traffic Impact Statement
April 2007

Mark Waugh Pty Ltd
ACN 106 169 180
ABN 67 106 169 180
P O Box 114
NEW LAMBTON
NSW 2305
Telephone: +61 2 4952 5592
Facsimile: +61 2 4952 5573
E-mail: jmwaugh@bigpond.net.au

Contents

Document History and Status

Issue	Rev.	Issued To	Qty	Date	Approved
Draft	Rev01	Andrews Neil Pty Ltd	1	19th January 2007	M Waugh
Draft	Rev02	Andrews Neil Pty Ltd	1	29th January 2007	M Waugh
Final	Rev03	Andrews Neil Pty Ltd	1	7th February 2007	M Waugh
Final	Rev04	Andrews Neil Pty Ltd	1	4th April 2007	M Waugh

Printed:	4 April, 2007
Last Saved:	4 April, 2007
File Name:	C:\Documents And Settings\All Users\Documents\MW Pty Ltd\Projects\Projects ON HOLD\P290 AN Salamander\Report\P290 AN Salamander Bay Residential TIA Rev04.Doc
Author:	Sean Morgan
Name of Organisation:	Andrews Neil Pty Ltd
Name of Project:	Proposed Residential Rezoning, Salamander Bay NSW
Name of Document:	Traffic Impact Assessment Report
Document Version:	FINAL
Project Number:	P290

1. Introduction

Mark Waugh Pty Ltd was commissioned by Andrews Neil Pty Ltd to prepare a Traffic Impact Assessment for the proposed residential subdivision rezoning off Port Stephens Drive and Soldiers Point Drive, Salamander Bay, NSW. This work has been completed as a desk top study using information provided by Andrews Neil and sourced from Port Stephens Council. The work is required as part of a submission to the Department of Planning under Part 3A of the Environmental Planning and Assessment Act.

This report presents the findings of the traffic investigations and assessment of the proposal. It is structured as follows:

- **Chapter 2** outlines the existing situation in the vicinity of the subject site, including discussion on the planned development growth within the vicinity and road network changes to support it.

- **Chapter 3** describes the traffic and parking features of the proposal.

- **Chapter 4** details the assessment of traffic operations related to the proposal

- **Chapter 5** summarises the findings of this investigation, outlining conclusions and recommendations for the traffic operations of the site to support the development application for the proposal.

2. Existing Situation

2.1 Background and Site Location

The subject site is located on a parcel of land off Port Stephens Drive and Soldiers Point Road at Salamander Bay. It is bounded to the south by Port Stephens Drive and by Soldiers Point Road to the east. There are a number of existing access points to the site and adjacent residential development from Port Stephens Drive and by Soldiers Point Road. The western boundary of the site is formed by a proposed cycleway contained within an old road reserve (Old Soldiers Point Road.)

The general location of the site is shown below in **Figures 2.1 and 2.2**.

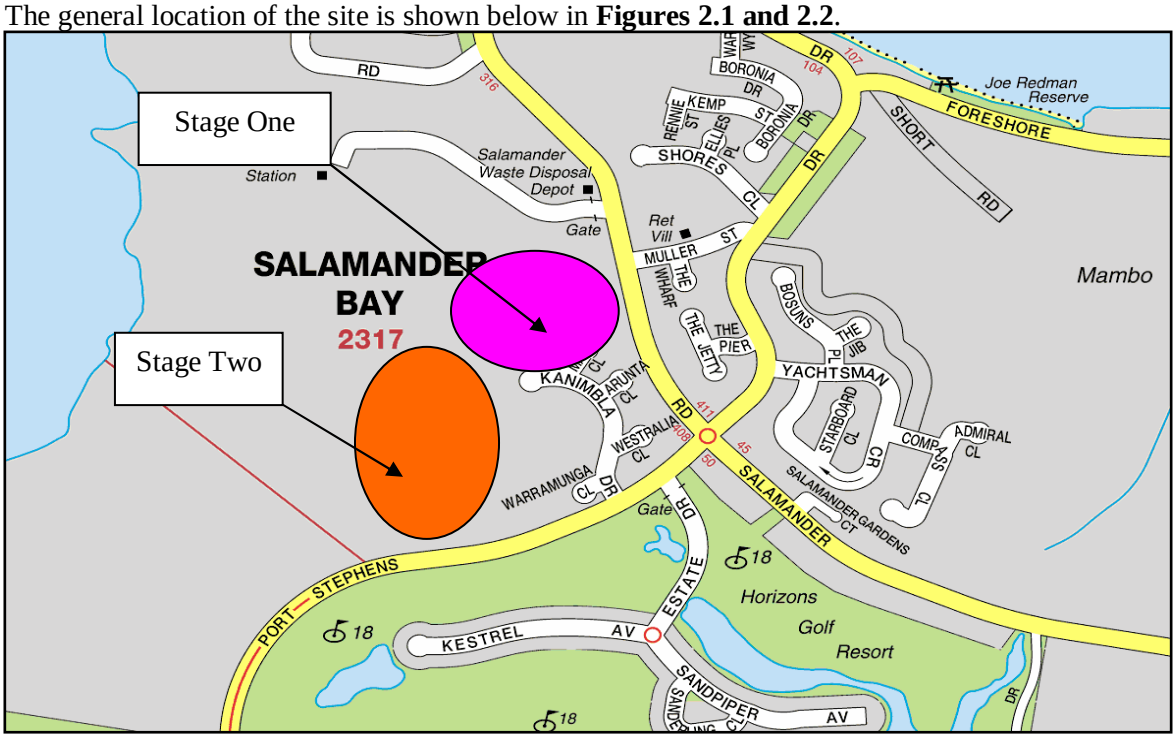


Figure 2.1 – Site Location

Figure 2.2 – Local Context Map

An aerial detailed plan for the subject development site is shown below:

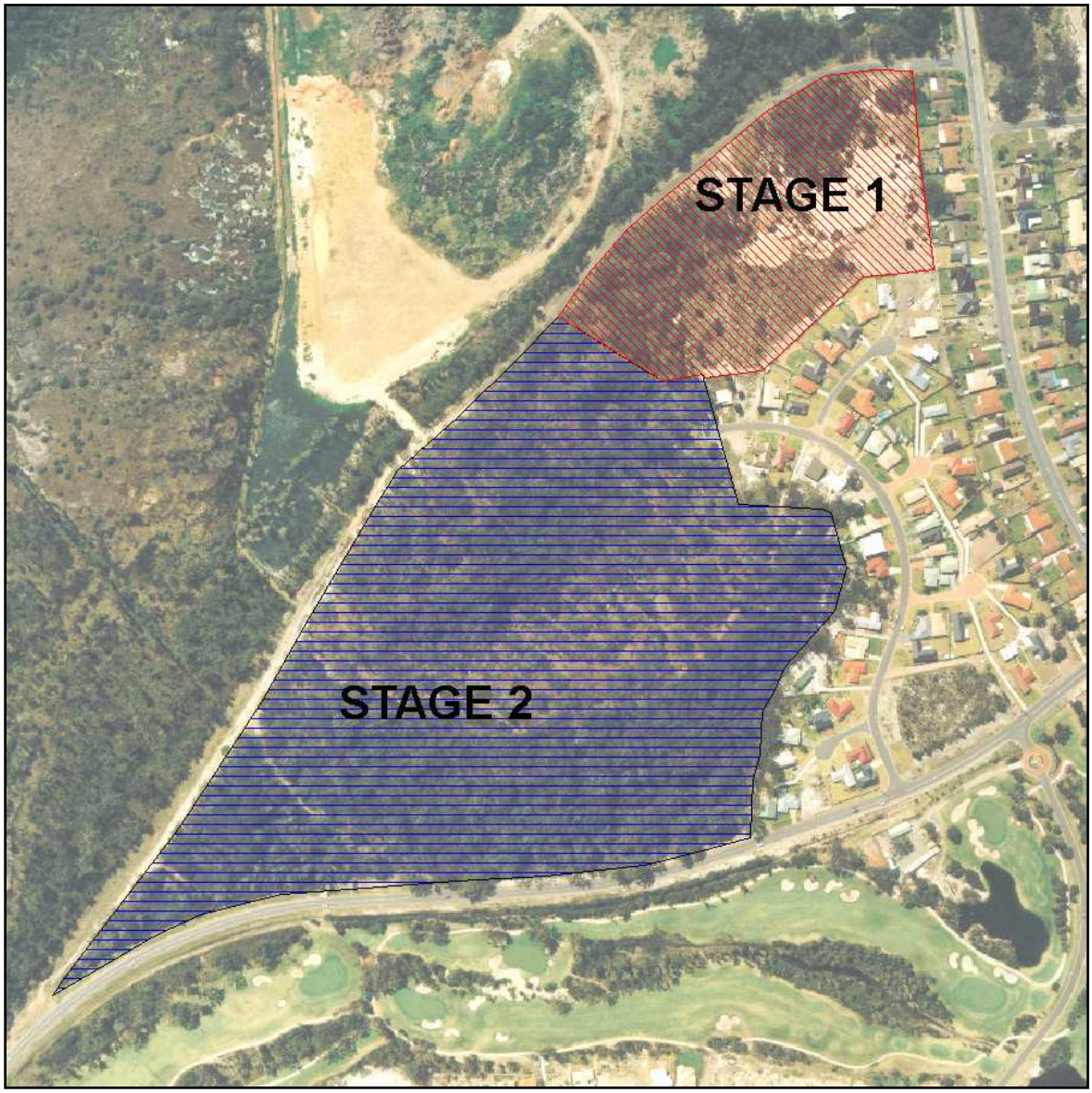


Figure 2.3 – Aerial View of Site Location

2.2 Local Road System

2.2.1 Road Characteristics

Port Stephens Drive is the main road through the locality. Port Stephens Drive provides a vital link between Salamander Bay and localities to the north and Nelson Bay Road to the east. Nelson Bay Road provides the main road route for the Port Stephens peninsula area and connects to the Pacific Highway to the west as well as providing access to Newcastle to the south-west of the site's locality. In the vicinity of the subject site, it provides a single lane of travel in both directions and has a posted speed limit of 60 km/h. There are no footpaths provided along this length of Port Stephens Drive and there are street lights along the majority of its length. It provides an overall width in the order of 12 metres and allows kerb side parking along the majority of its length.

Port Stephens Drive connects with Soldiers Point Road via a roundabout controlled intersection. Soldiers Point Road provides a connection to the north to Soldiers Point. It provides a single lane of travel in both directions and has a posted speed limit of 50 or 60 km/h. It provides a connection to a number of residential dwellings along its length, with direct access to the road as well as connections via local roads to residential development. There is an existing roundabout at the junction to the north of the subject site that provides access into the area proposed for playing fields. There is also a roundabout approved for the access junction for the proposed playing fields, and the northern access to the subject site.

2.3 Traffic Volumes

2.3.1 Traffic Data

Traffic data has been provided for this project by Port Stephens Council. Council have indicated that the current traffic flows in the general locality of the site on Port Stephens Road were in the order of 5,000 vehicles per day in 1995. From data previously collected by Mark Waugh Pty Ltd, current daily traffic flows are in the order of 6,300 vehicles per day along this road. Assuming that peak hour flows typically represent 10% of daily traffic flows, this would indicate that peak flows along Port Stephens Road would be in the order of 630 vehicles per hour two-way.

Using Table 4.5 from the RTA Guide to Traffic Generating Developments (reproduced below), it can be seen that the ultimate capacity for Port Stephens Road this location is around 2,500 vehicles per hour. For the current traffic flows along this road (630 during the peak hours) it can be seen that the level of service for road users is B or C.

Table 4.5
peak hour flow on two-lane rural roads (veh/hr)
(Design speed of 100km/hr)

Terrain	Level of Service	Percent of Heavy Vehicles			
		0	5	10	15
Level	B	630	590	560	530
	C	1030	970	920	870
	D	1630	1550	1480	1410
	E	2630	2500	2390	2290
Rolling	B	500	420	360	310
	C	920	760	650	570
	D	1370	1140	970	700
	E	2420	2000	1720	1510
Mountainous	B	340	230	180	150
	C	600	410	320	260
	D	1050	680	500	400
	E	2160	1400	1040	820

Source: RTA Guide to Traffic Generating Developments, version 2.2 dated October 2002.

No data is available for Soldiers Point Road. However, it is considered that the flows along this road would be similar or lower than for Port Stephens Drive.

2.4 Intersection Control and Operation

The major intersection in the vicinity of the site is the roundabout controlled intersection of Port Stephens Drive and Soldiers Point Road. This roundabout controlled intersection and provides a good level of control and service to all road users. There are a number of minor intersections in

the general vicinity of the site, providing access to residential development. These intersections are all simple give way controlled intersections, allowing for all turning movements.

2.5 Road Network Improvements

It is understood there are no major road network improvements planned in the vicinity of the subject site, apart from normal road maintenance performed by Council. With the low traffic flows and pedestrian movements it can be seen that the existing road layout provides an adequate level of service for all users.

2.6 Public Transport, Pedestrians and Cyclists

Public transport in the vicinity of the site is limited. Port Stephens Coaches provide a service to connect with Newcastle and Sydney on a daily basis in both directions. There are no regular bus services to this location.

Cyclists are able to use the public roads in the vicinity of the site. There are limited dedicated cycle facilities however the generally low traffic flows together with the wide road carriageways allow cyclists to use the road network to access the local attractions.

There are limited footpaths in the general vicinity of the site with pedestrians able to use verges or the roads, given the low traffic volumes and low pedestrian demands.

3. Proposed Development

3.1 Development and Access Arrangements

The proposal for the subject site is to develop a residential subdivision, with a total of around 94 lots once the development is fully constructed. The development will be constructed in two main stages, with the first stage providing approximately 34 residential lots. The second stage will provide the balance of 60 lots. The plans for the residential development show that access to the development will be provided via a single existing access on Soldiers Point Road during stage one and a secondary access in Stage two via Port Stephens Drive. The Soldiers Point Road access is also proposed to provide access to new playing fields planned by Council to the north of the subject site through the already approved roundabout junction, and the existing roundabout on Soldiers Point Road.

Access to the development will also be provided via a connection to Kanimbla Drive, an existing residential cul-de-sac providing access to some 55 residential lots.

This assessment is for the full development of 94 lots.

3.2 Traffic Generation

The level of traffic generation from the development proposal has been assessed using the rates available from the standard RTA guidelines for Traffic Generating Developments. These Guidelines indicate a range of traffic generation rates depending on the type land use activity.

The RTA guidelines indicate the critical movement periods for residential are during the morning and afternoon peak periods. These movements are associated with work and school trips. Morning peak flows are generally more critical, as the afternoon peak flows often occur over a longer time frame with less of a peak. For the purposes of this assessment, it has been assumed that the morning and afternoon traffic flows are similar.

The RTA Guide to Traffic Generating developments indicates that typical traffic generation rates for residential subdivisions such as the subject site are 0.85 trips per dwelling during the peaks and 9 trips per dwelling per day.

These rates have been applied to the existing development on Kanimbla Drive to assess the current traffic flows along this road. Using the standard rates it can be seen that the current peak hour two-way flow on Kanimbla Drive would be in the order of 47 vehicles at its southern end where it connects with Port Stephens Drive. Daily flows would be in the order of 495 vehicles two-way.

For the full development of 94 lots using the standard rates the peak hour flows would be in the order of 80 vehicle movements and 846 vehicle movements per day. This traffic will be split between Kanimbla Drive and Soldiers Point Drive.

These flow rates have been applied in the traffic analysis for these investigations, to ensure robustness of design.

3.3 Site Access

Vehicle access to the site for the initial stage will be via the newly constructed access to the north of the existing residential lots on Soldiers Point Road. This new access road has been constructed to provide access to the recreational land to the north of the subject site. A roundabout has already been approved by Council for this junction control. The residential traffic flows and the future

recreational uses will mostly generate traffic at different times of the day and week and have been assumed to not impact on the traditional peak on street activity periods.

During the second stage of the development, a connection road will be provided through the site allowing for a connection between Soldiers Point Road and Port Stephens Drive. A connection will also be provided between this connecting road and Kanimbla Drive. Kanimbla Drive currently ends at its northern end at a turning head forming the head of the cul-de-sac.

A new intersection will be provided to connect the second stage of the development to Port Stephens Drive. This will again be a simple give way controlled intersection.

This road layout provides a number of benefits to the residential area, mainly by:

- Protecting the environmental amenity of Kanimbla Drive by allowing traffic from Stages One and Two to access Soldiers Point Road and Port Stephens Drive without impacting on the existing environment of Kanimbla Drive.
- Allowing local access flows to be dispersed at multiple intersections and thus assisting in retaining high service levels on the adjacent road network.
- The use of a service road to avoid direct property access to Port Stephens Drive eliminates the prospect of individual driveway access and maintains the existing level of access control for this road.

3.4 Traffic Distribution

Traffic associated with the proposed development will be split in a number of directions. Local shopping is provided to the east at Salamander shopping centre, with major shopping attractions being to the south in Newcastle. Other attractions to the east would be the coastal areas such as Nelson Bay and Shoal Bay. To the south, the major attraction would be Nelson Bay Road that provides connection to Newcastle as well as access to the national highway network.

The majority of work related trips will be in the direction of Newcastle and Raymond Terrace, with some local commuter travel as well as leisure and other trips created by activity more to the east of the site.

For the purposes of this assessment, it is considered that 70% of the trips during the peak periods will have an origin/destination to the south and the balance will be east (30%).

3.5 Pedestrians and Cyclists

Pedestrian access to the site would be via existing facilities on the adjacent road network. Pedestrian footpaths could be provided with the development, if required by Port Stephens Council design guide. However, it is considered that due to the low traffic flows no pedestrian paths need to be provided, in line with the surrounding road network. A proposed pedestrian/cycle way is planned along the northern boundary of the site, providing a connection between Port Stephens Drive, the recreational area to the north of the site and Soldiers Point Road.

3.6 Public Transport Facilities

It is not considered that the size of this development will generate a significant increase in demand for public transport use. Residents of this development will have access to the existing facilities in the general vicinity of the site.

3.7 Site Operations and Access Arrangements

The site plans for the proposed development application are presented in **Appendix A** to this report. Overall access geometry would need to meet the requisite Council standards for residential subdivision. The internal road layout will need to be designed in accordance with Council residential subdivision code taking into account intersection controls, pedestrian requirements as well as road geometry requirements such as carriageway width etc.

The technical analysis of the site access points is discussed further in **Section 4.**

3.8 Parking Requirements

It can be seen that the new development will require parking for the residents but that it can be contained within the site. As per Council design requirements, there will be garage requirements for the future development as well as driveway requirements etc. This will need to be designed and provided in accordance with Council requirements.

4. Assessment of Transport Operations

4.1 Site Access Operations

Access to the proposed development will be via intersections on Port Stephens Road and Soldiers Point Road. These intersections will be simple give way controlled intersection sallowing for all turning movements.

4.2 Road Network Performance and Capacity

From Section 2.3 above, it can be seen that the current traffic flows in the vicinity of the site are relatively low and well within acceptable limits. The proposed development will increase the general volume of traffic, with peak hour traffic generation in the order of 80 additional trips. Assuming 70% use Port Stephens Drive this would increase the two-way flow on this road by 56 vehicles per hour. This would indicate the level of service would remain at B or lower end of C during the critical peak hours.

This would mean that there would be little if any change to the existing level of service of B for road users along Port Stephens Drive. Level of service B is defined as "*This level is in the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is less than that of the level of Service A*".

Level of service C is defined as "*service level is also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level*". It can be seen that the additional traffic will have a minor impact on existing traffic flows and represent an increase of less than 10%.

The future recreational uses will generate traffic at other times of the day and week to that of residential traffic and have been assumed to not impact on the traditional peak on street activity periods.

The key issue will therefore be the operation during the peak periods of the intersection of the site entry points and the intersection of Port Stephens Drive and Soldiers Point Road.

4.3 Intersection of Port Stephens Drive and the site entry

The additional traffic associated with the proposed development has been determined above to assess the impact of the main entry to the development on Port Stephens Drive. The layout of this access point will need to be designed in accordance with Council requirements, taking into account the traffic flows and the speed environment. The intersection is located in a 60 km/h speed zone.

It is useful to consider the Austroads threshold levels for intersection capacity under uninterrupted flow conditions. **Table 4.1** below presents these thresholds. Where traffic flows fall within these limits intersection operation is essentially at no delay or interruption for approaching drivers other than to obey the requisite road rules.

Table 4.1 Intersection Capacity – Uninterrupted Flow Conditions

Road Type	Light Crossing or turning volumes Maximum Design Hour Volumes, Two-way (vph)		
Two Lane through Roadway	400	500	650
Cross Road	250	200	100
Four Lane through roadway	1000	1500	2000
Cross road	100	50	25

Source: Austroads Guide to Traffic Engineering Practice - Part 5, 1988

It can be seen that with the current two-way peak hour flows being in the order of 630 vehicles per hour, the maximum cross road flow could be up to 100 vehicles per hour, without any delays to road users. It can be seen that with the development flows of the order of 56 vehicles per hour could use this access, well below the threshold point of 100 vehicles per hour. This indicates that no intersection modelling is required, as all traffic movements will operate at a level of service of 'A'.

It is considered that this intersection should be similar to the existing intersections of the site, with a simple give way controlled intersection. There will be no requirement to widen Port Stephens Road due to the current width of this road.

4.4 Intersection of Site Access and Soldiers Point Road

It can be seen that this intersection will operate to a similar standard to that on Port Stephens Drive. Traffic flows are expected to be much lower so this intersection would again operate with minimal delays and congestion. Again, no intersection modelling is required and the proposed roundabout control at the junction with the proposed playing filed access, and the existing roundabout control will provide a high level of control, including safety benefits through acting as forms of speed control on these roads.

It is considered that this intersection should be similar to the existing intersections of the site, with a simple give way controlled intersection. There will be no requirement to widen Soldiers Point Road due to the current width of this road.

4.5 Road Safety

Both the proposed access points are located on relatively straight sections of road. This ensures that sight visibility requirements can be met for the posted speed limits. It is considered that both of the access points can provide a safe and appropriate level of service and safety for all road users.

The roundabout junction controls will also act as traffic calming devices, reducing speeds on the access roads to the estate.

It is considered that street lights should be provided as part of the intersection works, to ensure good visibility during poor lighting conditions.

4.6 Pedestrian and Cyclist Facilities

It can be seen that the future pedestrian movements associated with the proposed development will be relatively low. It is considered that the proposed development will not require any additional pedestrian facilities to be provided.

As part of the development of the site, it is proposed to provide a high standard pedestrian and cycle link along the northern boundary of the site. This will provide a link between Port Stephens Drive and the recreational facility to the immediate north of the site as well as provide a link for future residents of the development to use.

4.7 Public Transport

It can be seen that the proposed development will have a minimal impact in terms of public transport demand. No additional facilities will need to be provided as part of this development.

4.8 Internal Road Network

All of the internal roads will be designed in accordance with Council requirements and will operate under a posted speed limit of 50 km/h. All of these roads will be under the control of Council and as such need to comply with Council's standards for residential estate roads. All roads will allow for two way traffic movements.

5. Summary and Conclusions

5.1 Summary

From the study work, the following summary is provided:

1. The proposal is to provide a residential subdivision with up to 94 lots, which will be developed over two stages. This assessment has been completed for the full development.
2. The site is located on the north-western corner of the intersection of Port Stephens Drive and Soldiers Point Road, Salamander Bay. Both of these roads are council roads. From previous work, it is considered that the traffic flows on Port Stephens Drive are in the order of 630 vehicles per hour in the peak. Flows on Soldiers Point Road are considered to be similar or lower.
3. It has been assumed that the standard rates for residential developments from the RTA Guide to Traffic Generating Developments could apply, giving some 80 vehicles per hour two-way during the peak hours.. The intersections of the development with both Port Stephens Road and Soldiers Point Road will both operate well, with the existing and proposed round about controls resulting in little if any delay and improved safety through speed control for all road users.
4. The future recreational uses to the north of the subject site have been assumed to generate traffic at other times of the day and week to that of residential traffic and have been assumed therefore to not impact on the traditional peak on street activity periods.
5. The two access points to connect the subject site with the road network will both have adequate capacity. The roundabouts at the northern access will provide a higher order of junction control than is actually required, providing an improved level of safety benefit to local road users. Due to the width of both of these roads no road widening will be required to accommodate the traffic flows.
6. Internal pedestrian movements will be catered for with a mixture of off road footway/cycle ways and footways along the side of roads as per Council design guide requirements.

5.2 Conclusion

From the study, it is concluded that the existing road system is able to cater for the traffic demands of the proposed development and it is recommended that the subdivision be approved on traffic grounds.

Appendix A Site Layout