Bushfire Threat Assessment

Mixed Use and Multiple Dwelling Housing, 142-144 Dudley Road, Whitebridge, NSW

Prepared by:

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Document Status

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Approval for Issue

Name	Signature	Date
Matt Doherty		20-11-2013

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BPD-PD-26202

FPA AUSTRALIA
Bushfire Planning and Design Accredited

Summary

RPS has been engaged by SNL Building Constructions Pty Ltd to undertake a Bushfire Threat Assessment for a proposed multiple dwelling housing and mixed use development including strata subdivision over Lot 3 DP 26039; Lots 1, 2 and 3 DP 436503; Lot 4 DP 663765; Lots 1, 2 and 3 DP 349377; Lot 2 DP 26039 and Lot 3 DP 26039, 142-144 Dudley Road, Whitebridge, NSW.

The assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal, and to outline the minimum mitigation measures that would be required in accordance with the provisions of the PBP (2006) that has been released and adopted through the *Environmental Planning & Assessment Amendment* (Planning for Bush Fire Protection) *Regulation 2007* & the *Rural Fires Amendment Regulation 2007.* The assessment also considers Clause 44 of the Rural Fires Regulation 2008 (RF Regulation).

In order to determine whether the proposed development is bushfire-prone, and if so, which setbacks and other relevant Bush Fire Protection Measures (BFPM) will be appropriate, this assessment adheres to the methodology and procedures outlined in PBP (2006).

In summary, the following is recommended to enable the proposal to meet the relevant legislative requirements:

- A 20m APZ is required for the north eastern boundary of the site.
- A 35m APZ is required (but currently established) between vegetation south-west of the site over Dudley Road.
- Future dwellings within the site should have due regard to the specific considerations given in the BCA, which makes specific reference to the Australian Standard (AS3959 – 2009) construction of buildings in bushfire prone areas.
- Roads are to be constructed in accordance with the performance criteria for both residential subdivision and infill development within PBP 2006 as outlined in Section 7 of this report.
- Landscaping will be carried out in accordance with the proposed landscape architectural design which responds to the sites bushfire prone land zoning.
- The development will be linked to the existing mains water supply and that suitable hydrants be clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure should comply with AS2419.1, 2005.
- This assessment has been made based on the bushfire hazards in and around the site at the time of inspection and production (November 2013).
- Finally, the implementation of the adopted measures and recommendations forwarded within this report are based on a thorough assessment under the PBP(2006) to provide an adequate level of protection to life and property. The recommended bushfire protection measures will contribute to the amelioration of the potential impact of any bushfire upon the development estate, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

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1.0 Introduction

RPS has been engaged by SNL Building Constructions Pty Ltd to undertake a Bushfire Threat Assessment for a proposed multiple dwelling housing and mixed use development including strata subdivision over Lot 3 DP 26039; Lots 1, 2 and 3 DP 436503; Lot 4 DP 663765; Lots 1, 2 and 3 DP 349377; Lot 2 DP 26039 and Lot 3 DP 26039, 142-144 Dudley Road, Whitebridge, hereafter referred to as the 'site' (**Figure 1**). The site is recognised as Bushfire Prone Land (BPL) by Lake Macquarie City Council and has been mapped accordingly (**Appendix 1**).

The assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the *Planning for Bush Fire Protection, 2006* that has been released and adopted through the *Environmental Planning & Assessment Amendment* (Planning for Bush Fire Protection) *Regulation 2007* & the *Rural Fires Amendment Regulation 2007.*

In order to determine whether the proposed development is bushfire-prone, and if so, which setbacks and other relevant Bush Fire Protection Measures (BFPM) will be appropriate, this assessment adheres to the methodology and procedures outlined in PBP (2006) and Clause 44 of the Rural Fires Regulation 2008.

1.1 Site Particulars

Locality – 142-144 Dudley Road and 2 – 4 Kopa Street, Whitebridge, NSW

LGA – Lake Macquarie City Council

Titles – Lot 3 DP 26039; Lots 1, 2 and 3 DP 436503; Lot 4 DP 663765; Lots 1, 2 and 3 DP 349377; Lot 2 DP 26039 and Lot 3 DP 26039.

Area – Approximately 24,400m^2

Zoning – 2(2) Residential (Urban Living), 3(1) Urban Centre and 7(2) Conservation (Secondary).

Boundaries – The site is situated in a medium density residential area. Existing residential properties abut the north-western boundary of the site followed by Lonus Avenue. Dudley Road runs parallel to the south western border. The Fernleigh Track runs parallel to the south-eastern boundary which includes linear bands of vegetation in part on either side followed by Station Road. Kopa Street and the Kopa Street unformed road reserve run along the northern boundary.

Current Land Use – The site is largely vacant land with dwellings on two lots fronting Kopa Street.

Topography – The site slopes gently from the north west to the south east.

Climate / Fire History – The site lies within a geographical area with a Fire Danger Index (FDI) rating of 100. The typical climate in the Lake Macquarie Bushfire Management Committee (LBMFMC) area is subtropical and the bush fire season generally runs from August to March (LMBFMC 2011). Prevailing weather conditions associated with the bush fire season are north-westerly winds accompanied by high day-time temperatures and low relative humidity (LMBFMC 2011).

TITLE: FIGURE 1: SITE LOCATION	LOCATION: WHITEBRIDGE	DATUM: GDA 94 PROJECTION: MGA ZONE 56	DATE: 13/08/2013 PURPOSE: BTA	LAYOUT REF: 118415/drafting/wor... VERSION (PLAN BY): JS A-A4	

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1.2 Description of Proposal

The proposal will incorporate 87 Residential Units, 4 Commercial Units with associated parking, services and infrastructure and strata subdivision.

Refer to the Statement of Environmental Effects for a detailed description of the proposal.

Refer to **Appendix 2** for a copy of the design layout and architectural plans.

1.3 Objectives of Assessment

This assessment has been undertaken in accordance with Clause 44 of the RF Regulation. This BTA also addresses the six key Bush Fire Protection Measures (BFPMs) in a development assessment context being:

(1) The provision of clear separation of buildings and bush fire hazards, in the form of fuel-reduced Asset Protection Zones (and their components being Inner Protection Areas and Outer Protection Areas);

(2) Construction standards and design (Bushfire Attack Levels);

(3) Appropriate access standards for residents, fire-fighters, emergency workers and those involved in evacuation;

(4) Adequate water supply and pressure;

(5) Emergency management arrangements for fire protection and / or evacuation; and

(6) Suitable landscaping, to limit fire spreading to a building.

2.0 Methodology

2.1 Vegetation Assessment

Classification of vegetation on site has been carried out as follows:

- Reference to regional vegetation community mapping;
- On site vegetation assessment; and
- Aerial Photograph Interpretation (API) to map the vegetation classification and extent.

2.2 Slope Assessment

Slope Assessment has been undertaken as follows:

- Aerial Photographic Interpretation (API) in conjunction with analysis of digital topographic maps with a contour interval of 2m;
- Review of detailed survey; and
- On site slope assessment using a handheld inclinometer.

2.3 Significant Environmental Features

During a site survey, any potential significant environmental features were investigated. No significant features were identified on the site, primarily as a result of the site having been entirely cleared.

2.4 Significant Threatened Species

A search of the Atlas of NSW Wildlife Database was conducted on 15th August 2013. The Atlas includes records of threatened species listed under both the NSW *Threatened Species Act 1995* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. The results of the search found that no threatened species, populations or ecological communities occur on the site.

2.5 Cultural Significance

A search of The Aboriginal Heritage Information Management System (AHIMS) (**Appendix 3**) confirmed that there are no records of culturally significant artefacts on the site or within the surrounding area.

3.0 Vegetation Assessment

In accordance with PBP (2006), an assessment of the vegetation over a distance of 140m in all directions from the each development site was undertaken. Vegetation that may be considered a bushfire hazard was identified in all directions from the site. The vegetation classification is based on **Appendix 2** of PBP (2006).

Refer to **Table 1** and **Figure 2** for vegetation classifications.

Table 1 Vegetation Classification

Direction of Vegetation	Vegetation Community	Vegetation Classification (PBP, 2006)
North	Residential Properties	No Hazard
North-east	Remnant Vegetation	Forest
East	Residential Properties	No Hazard
South east	Fernleigh Track containing remnant vegetation	Low threat Vegetation
South-west	Dudley Road proceeded by vacant land and vegetation	Forest
North-west	Residential Properties	No Hazard

3.1 *Vegetation of the Fernleigh Track

The Fernleigh Track is an asset managed by Lake Macquarie City Council. The area of track adjacent to the site comprised of two linear strips of vegetation within which the track has been established within an old rail alignment (**Plate 1** and **2**). As shown in **Figure 2** the vegetation adjacent to the site is separated at its northern extent by approximately 50m and at its southern extent by the Dudley Road overpass. The total area of vegetation is 3500m^2 (comprising 1500m^2 on the western strip and 2000m^2 on the eastern strip) with a variable width of 5 metres to 15 metres on each side of the track. Given the Fernleigh Track has been established within a former rail alignment, the cutting depth and steepness increases when traversing in a southerly direction up until the Dudley Road overpass (**Plate 3** and **4**). Vegetation is generally comprised of remnant smooth-barked Eucalypts coupled with a semi- managed understorey of grasses, some shrubs, weeds (eg Lantana), and ferns (**Plates 1** to **4**). Due to the steepness of the cutting preventing ground fuel from building up, the ground fuel accumulation rates are likely to be less than the accepted accumulation rates adopted by PBP (2006), given that the steep slope would need to retain fuel over a period of 20 years.

An extreme bushfire event generating high levels of radiant heat is unlikely to threaten the site from the south-east due to the isolated narrow band (<30m wide) of vegetation located within the Fernleigh Track corridor, therefore unable to provide high fuel loads required to sustain an extreme bushfire. The resultant radiant heat is further reduced by the limited ground cover fuel loads (which contain a greater mass of fuels) that are unable to accumulate due to the steep slope.

It is also noted that PBP (2006) does not consider cycleways as a hazard and can therefore be included within an Asset Protection Zone (APZ). On this basis the vegetation has been considered as Low Threat Vegetation that does not represent a hazard and therefore does not require an APZ or further consideration under AS3959-2009.

Plate 1 Fernleigh Track abutting site boundary looking South

Plate 2 Fernleigh Track looking South

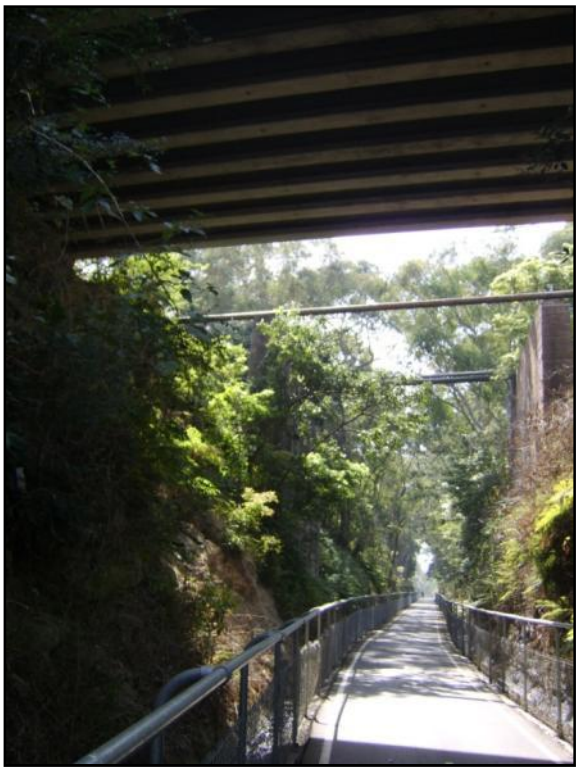
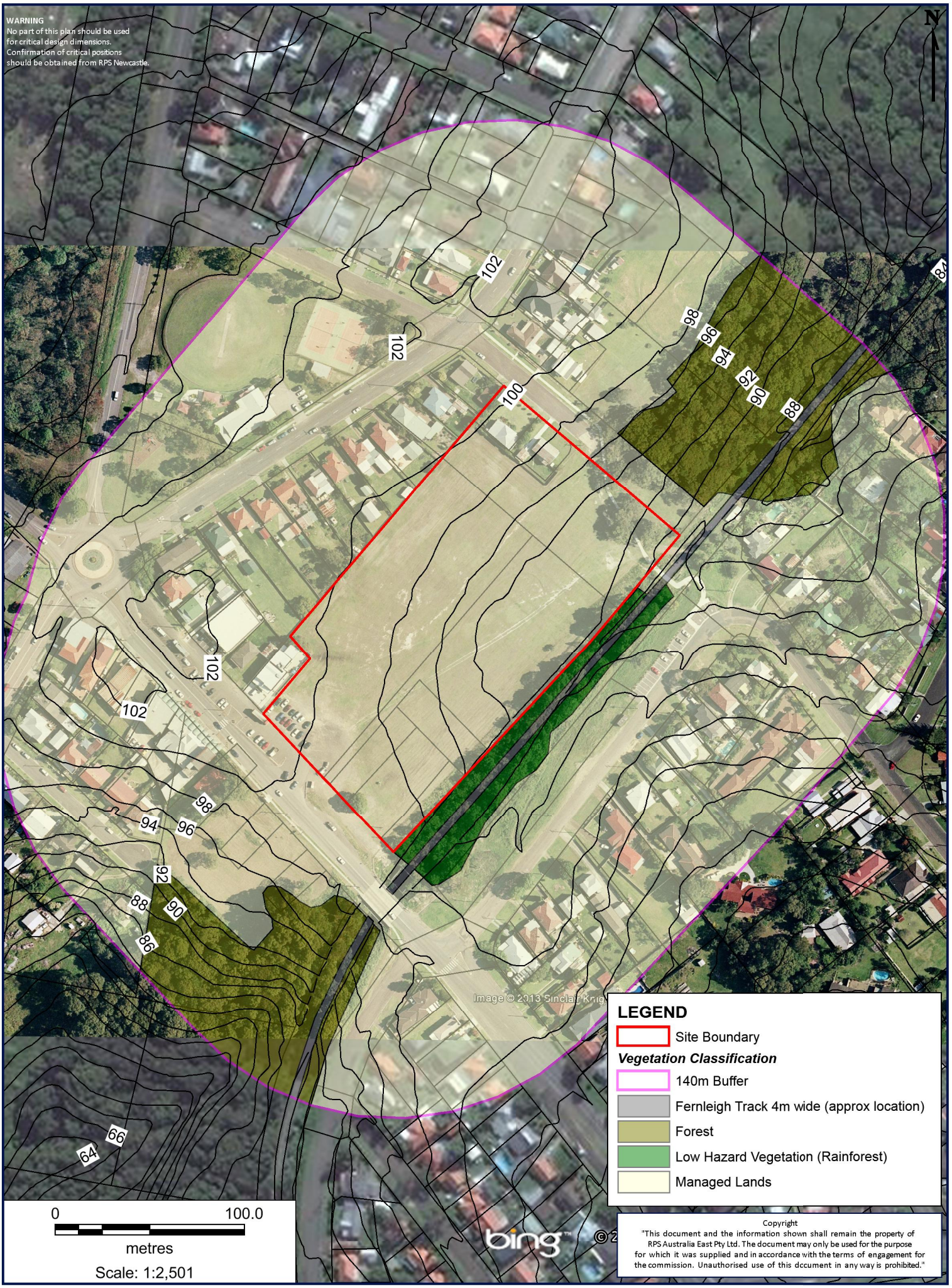


Plate 3 Fernleigh Track looking north underneath Dudley Road Overpass
Note person at end of track is standing at the Whitebridge entrance shown in **Plate 2** above

Plate 4 Typical batter vegetation composition (toward Dudley Road overpass)



TITLE: FIGURE 2 VEGETATION CLASSIFICATION	LOCATION: WHITEBRIDGE	DATUM: GDA PROJECTION: MGA ZONE 56	DATE: 6/11/2013 PURPOSE: BTA	LAYOUT REF: 118415/drafting/wor... VERSION (PLAN BY): MD A-A4	

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4.0 Effective Slope Assessment

In accordance with PBP (2006), an assessment of the slope over a distance of 100m the hazard direction from the site boundary was undertaken. The slopes leading away from the site have been evaluated to identify both the average slope and by identifying the maximum slope present. These values help determine the level of gradient which will most significantly influence the fire behaviour of the site.

The effective slope underneath the vegetation constituting the hazard is documented in **Table 2** below.

Table 2 Site Slope Assessment

Direction of Vegetation	Vegetation Classification (PBP, 2006)	Slope Class (Effective Slope)
North-east	Forest	Cross-slope
South-west	Forest	5-<10° Downslope

5.0 Determining Appropriate Setbacks

5.1 Asset Protection Zone's

An Asset Protection Zone (APZ) is an area surrounding a development that is managed to reduce the bushfire hazard to an acceptable level to mitigate the risk to life and property. The required width of the APZ varies with slope and the type of hazard. An APZ can consist of both an Inner Protection Area (IPA) and an Outer Protection Area (OPA). An APZ can include the following:

- lawns;
- discontinuous gardens;
- swimming pools;
- driveways;
- unattached non-combustible garages with suitable separation from the dwelling;
- open space / parkland; and
- car parking.

5.2 IPA (Inner Protection Area)

The IPA extends from the edge of the OPA. The IPA aims to ensure that the presence of fuels which could contribute to a fire event / intensity, are minimised close to the development. The performance of the IPA must be such that:

- there is minimal fine fuel at ground level which could be set alight by a bushfire; and
- any vegetation in the IPA does not provide a path for the transfer of fire to the development – that is, the fuels are discontinuous.

The presence of a few shrubs or trees in the IPA is acceptable provided that they:

- do not touch or overhang any buildings;
- are well spread out and do not form a continuous canopy;
- are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
- are located far enough away from any dwelling so that they will not ignite the dwelling by direct flame contact or radiant heat emission.

Woodpiles, wooden sheds, combustible material storage areas, large areas / quantities of garden mulch, stacked flammable building materials etc. are not be permitted in the IPA.

5.3 OPA (Outer Protection Area)

The OPA is located adjacent to the hazard. Within the OPA any trees and shrubs should be maintained in a manner such that the vegetation is not continuous. Fine fuel loadings should be kept to a level where the fire intensity expected will not impact on adjacent developments.

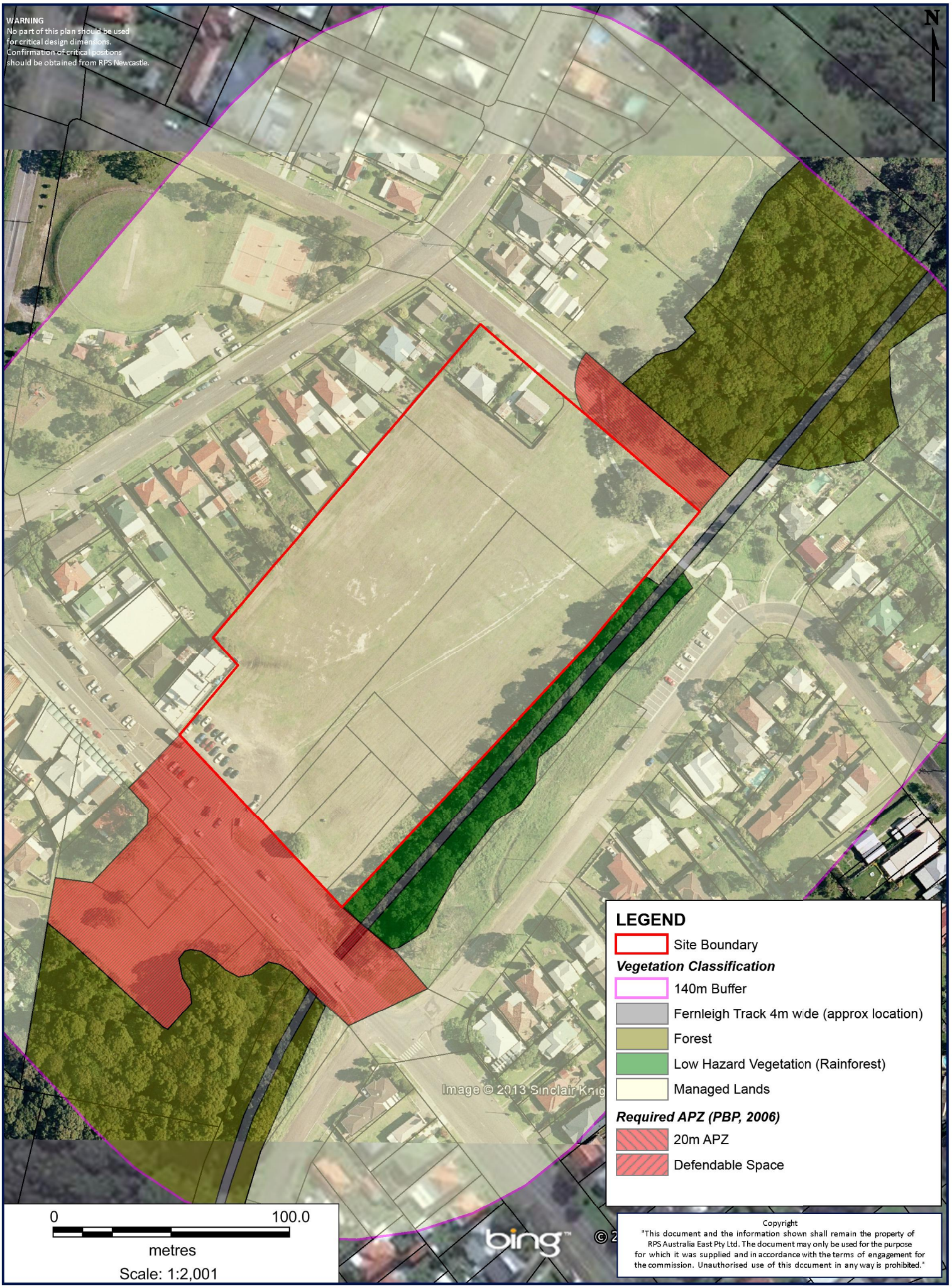
5.4 Determining the Appropriate Setbacks

The site lies within the Lake Macquarie LGA and therefore is assessed under a FDI rating of 100. APZs are applied in accordance with Table A2.4 and Table A2.7 within PBP (2006), to determine the appropriate width setbacks to the vegetation on and around the site. The APZ components are outlined in **Table 3** and **Figure 3**.

Table 3 Required APZ (PBP, 2006)

Direction of Vegetation	Vegetation Classification (PBP, 2006)	Slope Class (Effective Slope)	APZ
North-east	Forest	Cross-slope	20m
South-west	Forest	5-<10° Downslope	35m

The site is separated from the forest vegetation representing a hazard to the southwest by Dudley Road and as such no clearing is required to establish the APZ. Furthermore this area provides readily accessible defendable space.



TITLE: FIGURE 3 REQUIRED APZ (PBP 2006)	LOCATION: WHITEBRIDGE	DATUM: GDA PROJECTION: MGA ZONE 56	DATE: 6/11/2013 PURPOSE: BTA	LAYOUT REF: 118415/drafting/wor... VERSION (PLAN BY): MD A-A4

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6.0 Dwelling Design and Construction

The determinations of the appropriate Bushfire Attack Level (BAL) are based upon parameters such as weather modelling, fire-line intensity, flame length calculations, as well as vegetation and fuel load analysis. The determination of the construction level is derived by assessing the:

- Relevant FDI = 100
- Flame temperature
- Slope
- Vegetation classification; and
- Building location.

The following BAL, based on heat flux exposure thresholds, are used in the standard:

(a) **BAL – LOW** The risk is considered to be **VERY LOW**

There is insufficient risk to warrant any specific construction requirements but there is still some risks.

(b) **BAL – 12.5** The risk is considered to be **LOW**

There is a risk of ember attack.

The construction elements are expected to be exposed to a heat flux not greater than 12.5 k/m^2.

(c) **BAL – 19** The risk is considered to be **MODERATE**

There is a risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to radiant heat.

The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m^2.

(d) **BAL-29** The risk is considered to be **HIGH**

There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat.

The construction elements are expected to be exposed to a heat flux no greater than 29 kW/m^2.

(e) **BAL-40** The risk is considered to be **VERY HIGH**

There is much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front.

The construction elements are expected to be exposed to a heat flux no greater than 40 kW/m^2.

(f) **BAL-FZ** The risk is considered to be **EXTREME**

There is an extremely high risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front.
The construction elements are expected to be exposed to a heat flux greater than 40 kW/m^2.

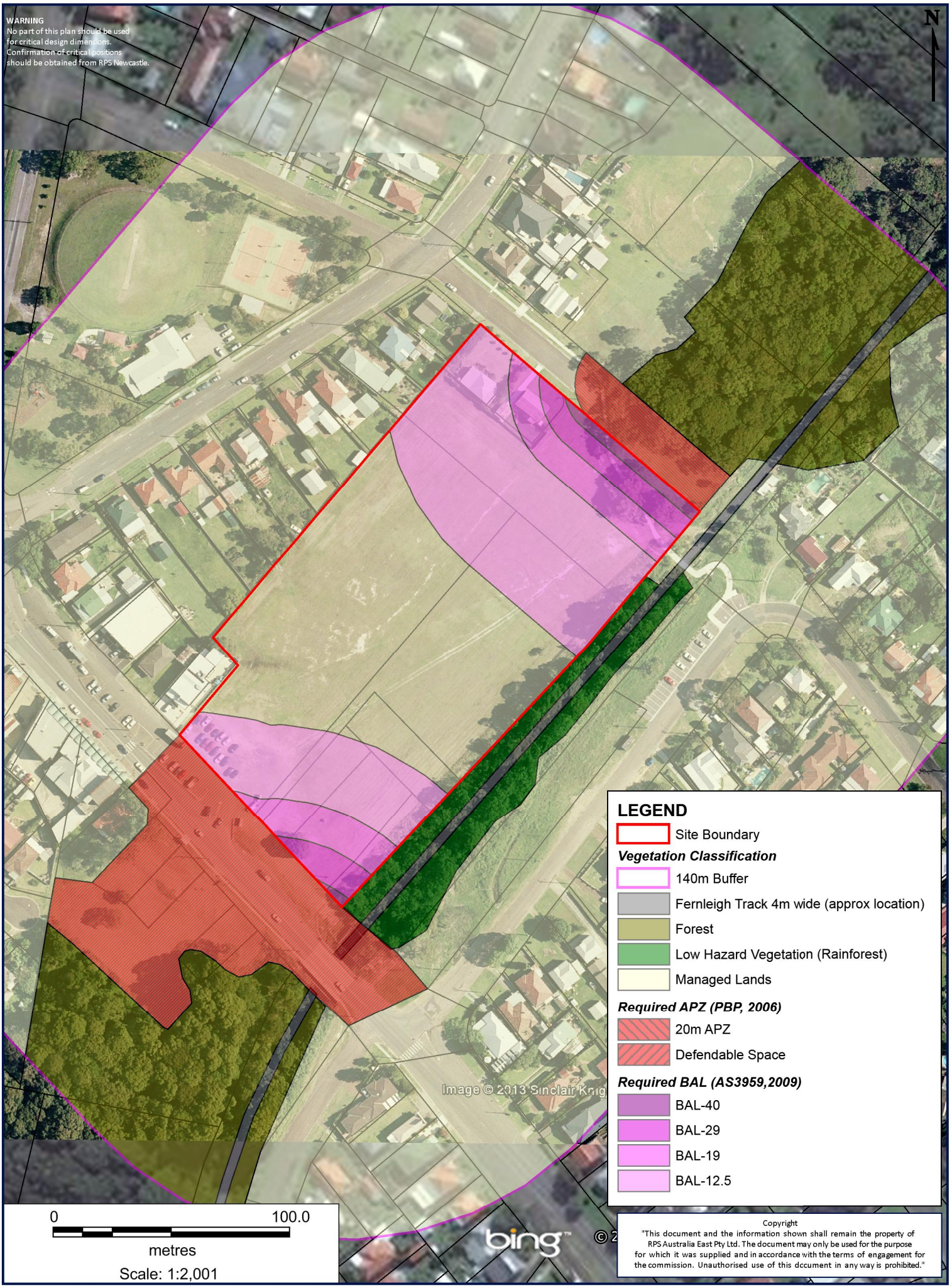
6.1 Bushfire Attack Level for the Proposed Development

Using the Addendum: Appendix 3 (NSW Rural Fire Service, 2010), the information relating to vegetation, slope as presented within this report and according to Table 2.4.2 of AS3959-2009 the BAL for the site was calculated.

Refer to **Table 3** and **Figure 4** for required BAL.

Table 4 Required BAL (AS 3959-2009)

Direction of Hazard	Vegetation Classification (PBP, 2006)	Slope Class	APZ	Separation Distance	BAL	Construction Section (AS3959-2009)
North-east	Forest	Cross-slope	20m	20-<25m	BAL – 40	Sect 5, 6, 7 and 8 of AS3959-2009 and Sect A3.7 of PBP Addendum Appendix 3.
				25-<35m	BAL – 29	
				35-<48m	BAL – 19	
				48-<100m	BAL – 12.5	
South-west	Forest	5-<10° Downslope	35m	35-<39m	BAL – 40	
				39-<53m	BAL – 29	
				53-<69m	BAL – 19	
				69-<100m	BAL – 12.5	



TITLE: FIGURE 4 REQUIRED BAL (AS3959-2009)	LOCATION: WHITEBRIDGE	DATUM: GDA PROJECTION: MGA ZONE 56	DATE: 6/11/2013 PURPOSE: BTA	LAYOUT REF: 118415/drafting/wor... VERSION (PLAN BY): MD A-A4

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7.0 Access

Property Access roads providing internal access for a Community Title or similar subdivision arrangements are required to be consistent with the provisions and associated acceptable solutions of Chapter 4.2.7; being Access for Internal Roads in Special Fire Protection Purposes (SFPP). Despite the reference to a SFPP, the proposed development is not a SFPP, and excluding the subdivision of land, the construction of medium density housing would be assessed as an 'infill development' as per PBP 2006.

Nevertheless, the PBP 2006 does not provide acceptable solutions designed for medium density residential developments. Accordingly, we have considered the Performance Criteria for both residential subdivision and infill development. The internal roads within the proposed development are capable of providing sufficient access to fire fighters whilst not obstructing evacuating occupants demonstrated by the 6m wide two way circulation and separated entry/ access driveways. As a minimum the development provides the following as adopted from the performance criteria with PBP (2006):

- be two-wheel drive all weather roads;
- not be hindered by an overuse of traffic calming devices such as speed humps and chicanes;
- be through roads, but if unavoidable then dead ends should be not more than 200 meters in length and clearly sign posted as dead ends;
- the capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes for all other areas. The proposal does not include any bridges;
- curves of roads are a minimum inner radius of 6 metres;
- public roads do not have a cross fall exceeding 3 degrees;
- maximum grade for sealed roads do not exceed 15^{o} and an average grade of not more than 10^{o} or other gradient specified by road design standards, whichever is the lesser gradient;
- have a minimum vertical clearance to a height of four meters at all times; and
- all roads provide two way circulation paths.

The development has been designed such that each dwelling is provided with 2 parking spaces (garage and carport or double garage) with further dedicated visitor parking (in accordance with LMCC DCP requirements), and no parking on either side of the road. Furthermore provisions in the neighbourhood management plan or strata management scheme can be established to restrict parking on internal roads. Additionally, a visual reminder in the form of signage can be erected alongside the internal roads to advise people unfamiliar with the development that internal parking along the access roads is not permitted.

The road network provide two points of ingress / egress from Kopa Street. All internal roads will be 6 metres in width with no parking on either side as discussed above with appropriate signage for residents and their visitors. The development affords access to defendable space between areas identified as potential bushfire hazards.

The access arrangements for the proposed development have been designed to provide a circulation path for all residents to evacuate in an orderly manner without obstructing arriving emergency personnel.

Refer to sheet 3 of the Architectural Plans in **Appendix 2**.

8.0 Landscaping

In areas that are prone to bushfire, the design and management of the landscape in the immediate vicinity of buildings have great potential to improve the chances of survival of people and buildings. Generally landscaping in and around a bushfire hazard should consider the following:

- Priority given to retaining species that have a low flammability;
- Priority given to retaining species which do not drop much litter in the bushfire season and which do not drop litter that persists as ground fuel in the bush fire season;
- Priority given to retaining smooth barked species over stringy bark; and
- Create discontinuous or gaps in the vegetation to slow down or break the progress of fire towards the dwellings.

The principles of landscaping for bush fire protection aim to:

- Prevent flame impingement on the dwelling;
- Provide for a defendable space for the property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed.

The proposed landscaping associated with the development on site has considered the principles of landscaping within bushfire prone land. Specifically:

- The landscape architectural design responds to the bushfire prone land zoning and incorporates local indigenous fire retardant species per PBP (2006) and LMCC requirements.
- Within the zone between the development and Fernleigh Track, landscaping will include areas of native grass supplementing small grouping of ground covers and shrubs. Trees will be planted such that gaps of 2-5 metres will be provided in the canopy cover at maturity.
- Trees planted adjacent to the Fernleigh Track will not overlap with the extant vegetation determined as ‘Low Threat Vegetation’ in section 3.

The landscaping will be managed in perpetuity under the neighbourhood management plan or strata management scheme.

Refer to **Appendix 4** Landscape Plans for further detail.

9.0 Water

Associated with any kind of development upon the land, water mains will be extended into the site. Provision of access to this supply should be provided for fire-crews in the form of readily accessible and easily located fire hydrants. Fire hydrant spacing, sizing and pressure should comply with AS 2419.1 – 2005. Hydrants are not to be located within any road carriageway. All above ground water service pipes external to the building are metal, including and up to any taps.

10.0 Fire Fighting Capability

The Charlestown branch of the NSW Fire Brigade would be amongst the first to attend any fire within the site in the first instance. To facilitate quick and efficient action by the Fire Brigade / Rural Fire Service upon arrival, it is recommended that all necessary connections / pumps etc be clearly marked and visible, and in good working order.

11.0 Conclusion and Recommendations

The proposed development will have to be carried out in accordance with the specifications contained within PBP (2006) as assessed and presented within this report.

The following recommendations have been prepared based on the deemed to satisfy assessment criteria outlined within PBP (2006), to ensure that an adequate level of protection to life and property on the site is provided to satisfy the aims and objectives of the PBP (2006).

In summary, the following is recommended to enable the proposal to meet the relevant legislative requirements:

- A 20m APZ is required for the north eastern boundary of the site.
- A 35m APZ is required (but currently established) between vegetation south-west of the site over Dudley Road.
- Future dwellings within the site should have due regard to the specific considerations given in the BCA, which makes specific reference to the Australian Standard (AS3959 – 2009) construction of buildings in bushfire prone areas.
- Roads are to be constructed in accordance with the performance criteria for both residential subdivision and infill development within PBP 2006 as outlined in Section 7 of this report.
- Landscaping will be carried out in accordance with the proposed landscape architectural design which responds to the sites bushfire prone land zoning.
- The development will be linked to the existing mains water supply and that suitable hydrants be clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure should comply with AS2419.1, 2005.

This assessment has been made based on the bushfire hazards in and around the site at the time of inspection and production (November 2013).

Finally, the implementation of the adopted measures and recommendations forwarded within this report are based on a thorough assessment under the PBP(2006) to provide an adequate level of protection to life and property. The recommended bushfire protection measures will contribute to the amelioration of the potential impact of any bushfire upon the development estate, but they do not and <u>cannot</u> guarantee that the area will <u>not</u> be affected by bushfire at some time.

12.0 Bibliography

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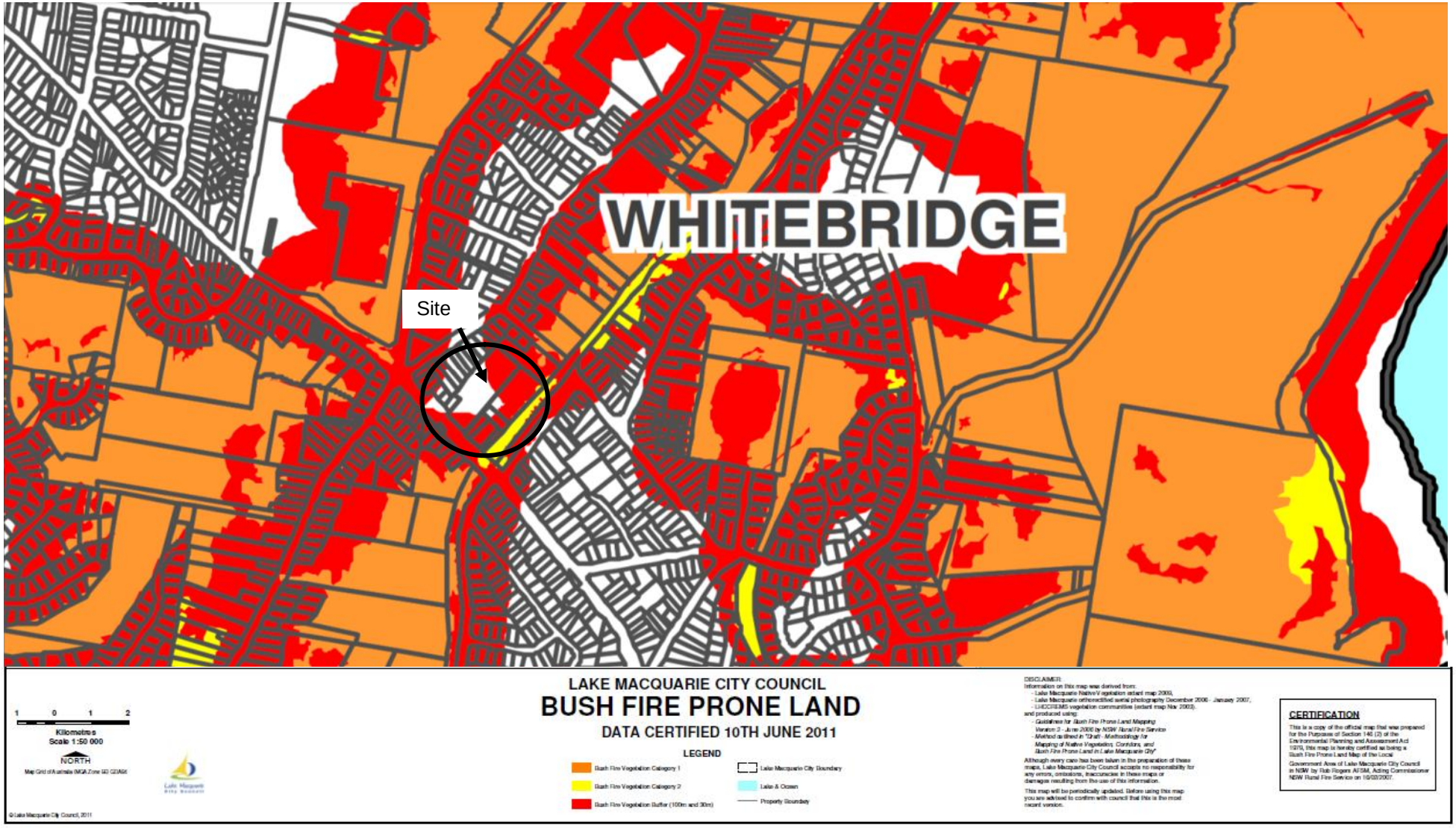
Appendix 1

Bushfire Prone Land Map


WHITEBRIDGE
Site
LAKE MACQUARIE CITY COUNCIL
BUSH FIRE PRONE LAND
DATA CERTIFIED 10TH JUNE 2011
LEGEND
Bush Fire Vegetation Category 1
Bush Fire Vegetation Category 2
Bush Fire Vegetation Buffer (100m and 30m)
Lake Macquarie City Boundary
Lake & Ocean
Property Boundary
1 0 1 2
Kilometres
Scale 1:50 000
NORTH
DISCLAIMER:
CERTIFICATION

Appendix 2

Architectural Plans

PROPOSED MIXED USE COMMUNITY TITLE DEVELOPMENT
LOT 1 - 3, DP 436503, LOT 1 - 3, DP349377, LOT 4, DP663765, LOT 4 - 5 , DP 26039, 2 - 4 KOPA ST &
142 - 146 DUDLEY RD, WHITEBRIDGE
FOR SNL BUILDING CONSTRUCTIONS PTY LTD

DATE:	4 OCT 2013
SHEET NO:	3
JOB REF NO:	13132
SCALES:	1:800 @ A3

DATE	REVISION	ISS
20-8-13	Amend levels & plans	1
29-8-13	Issued for Pre DA	2
3-10-13	Issued for Pre DA	3

Kim Gerrish
BUILDING DESIGN PTY LTD
PO Box 386 KURRI KURRI.....NSW.....2327
46-48 Station Street, Weston....NSW....2326
p:(02) 49371529 w: www.kgbdesign.com.au
m:0417656186 e:kim@kgbdesign.com.au

OVERALL SITE LAYOUT

OVERALL SITE LAYOUT

SCALE 0m 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

LEGEND

AU	8 x 2 BEDROOM APARTMENTS	CTH	4 x 3 BEDROOM CORNER TOWN HOUSE	GTH	11x3 BEDROOM & LOFT GARDEN TOWN HOUSE	DT	3 x 2 BEDROOM TERRACE	GV	6 x 4 BEDROOM VILLA	CKT	2 x 2 BEDROOM CORNER TERRACE		PROPOSED STREET TREES & LANDSCAPING	35	EXISTING TREE SEE LANDSCPE ARCHITECTS PLAN FOR DETAILS
CU	4 x COMMERCIAL OFFICE - RETAIL UNITS	TH	24 x 3 BEDROOM WITH UPPER LOFT TOWN HOUSE	FT	9 x 2 BEDROOM TERRACE HOUSE	CDT	2 x 2 BEDROOM CORNER TERRACE	CGV	1 x 3 BEDROOM & STUDY VILLA		EXISTING WALK & CYCLE WAY FERNLEIGH TRACK		EXISTING NATURAL VEGETATION		VISITOR CAR PARKING SPACE
PU	2 x 3 BEDROOM PENTHOUSE	GT	2 x 3 BEDROOM GARDEN TOWN HOUSE	CFT	1 x 2 BEDROOM CORNER TERRACE HOUSE	AGV	9 x 4 BEDROOM ADAPTABLE HOME	KT	4 x 2 BEDROOM TERRACE		PROPOSED ROAD 6000 WIDE & 3500 WIDE RESERVES		DIRECTION OF TRAFFIC FLOW		DISABLED CAR PARKING SPACE

34 EXISTING TREE SEE ARBORIST REPORT FOR DETAILS

Building Sustainability Assessments

CORPORATE MEMBER
Building Designers Association Victoria

Certificate Number XXXXXXXXXX
Accreditation Number VIC/BDAV/13/1491
Signature _____ Date xx/xx/2013

SHEET 3

Appendix 3

Cultural Heritage Search

Office of Environment & Heritage
NSW GOVERNMENT

AHIMS Web Services (AWS)
Search Result

Your Ref Number : Eco AHIMS
Client Service ID : 117357

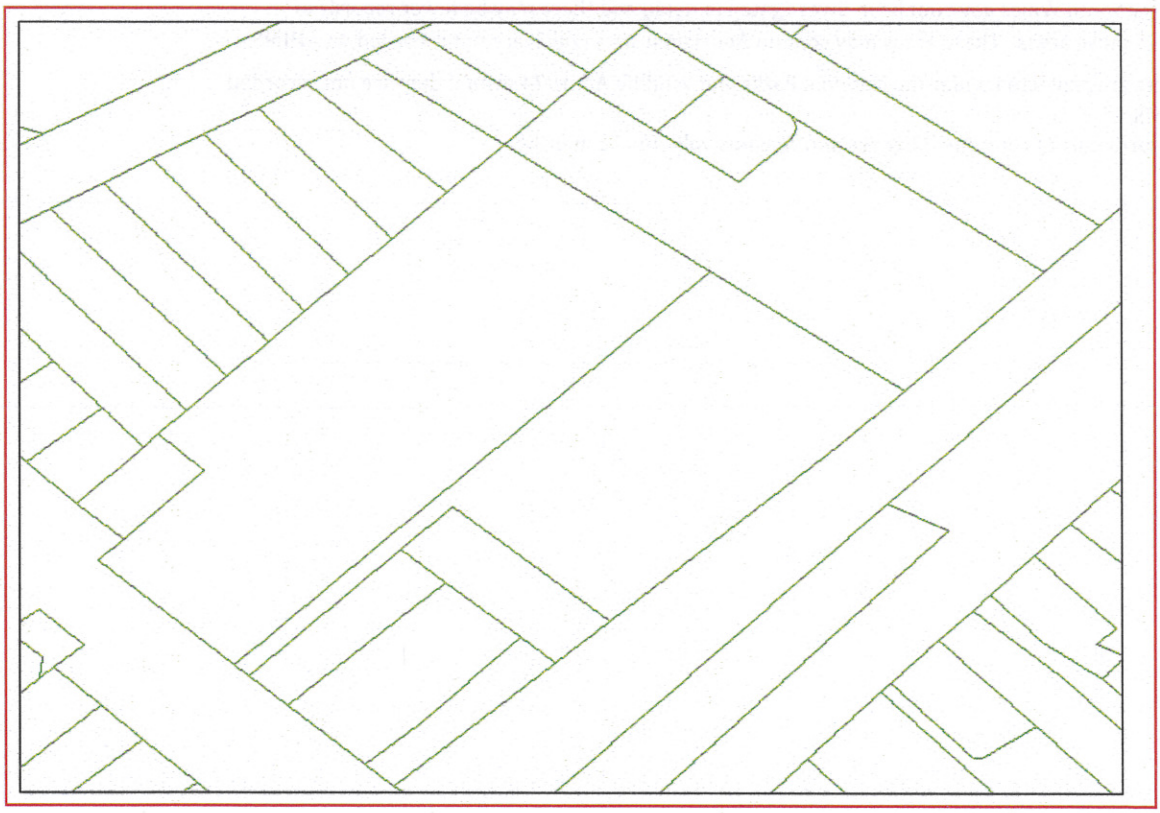
RPS Australia East Pty Ltd -Hamilton
Accounts Payable Fortitude Valley PO Box 237
Brisbane Queensland 4006
Attention: Cultural Heritage Team Administrator
Email: clh@rpsgroup.com.au

Date: 20 November 2013

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 379346 - 379564, Northings : 6350282 - 6350527 with a Buffer of 0 meters, conducted by Cultural Heritage Team Administrator on 20 November 2013.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

PO BOX 1967 Hurstville NSW 2220
43 Bridge Street HURSTVILLE NSW 2220
Tel: (02)9585 6345 (02)9585 6471 Fax: (02)9585 6094

ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

Appendix 4

Landscape Plans

MANSFIELD URBAN

places spaces people

Urban Design • Integrated Landscape Architecture • Strategic Urban Planning
Community Consultation • Master Plans • Visual Analysis Civic & Open Space
Design • Sustainable • Community Design • Project Management • Consultancy

LANDSCAPE MASTER PLAN

DUDLEY ROAD AND KOPA STREET

WHITEBRIDGE NSW

Issue A November 15 , 2013.

Client : SNL Building P/L
22 PENDLEBURY Rd Cardiff
NSW 2285
PH: 02 49 54 8866

1.0 BACKGROUND

1.1 Introduction

Whitebridge is a suburb of Newcastle located approximately 15 kilometres from the Newcastle CBD and about 3.0 kilometres form the Charlestown shopping and business precinct.

Whitebridge is characterised by low density single dwelling housing predominantly built in the 1940's and 50's on large lots. These dwellings are mostly single storey with a mix of materials for cladding and roofing types.

Streets are wide and generally without planned street trees, overhead power is present on all roads and footways generally occur on one side of the street only.

The landscape character of the area is dominated by the remnant bushland areas which are extensive and the scattered tall canopy native trees that occur within dwelling lots.

Some large lots have experienced higher density with newer projects taking advantage of the large lots and zoning to increase housing density.

Access to open space is easy with sporting facilities and playgrounds nearby. The Fernleigh Track is adjacent to the proposed development site and provides excellent recreational opportunities for a broad age group.

Both primary and secondary schools are within walking distance.

Local shops are located adjacent to the proposed development site.

1.2 The Site

The proposed site is known as Lot 1-3 D.P. 436503, Lot 1-3 DP 349377, Lot 4 DP 663765, Lot 4-5 DP 26039.

Total Site area is 24398.81 square metres (roughly 2.5 ha).

The site slopes toward the north east and is constrained by an conservation zone to the east.

Image 1- existing site. North is to the top of the page.

The site is bounded by Kopa Street to the North, the Fernleigh Track to the east, Dudley Road to the South and existing residential to the west.

The site is adjacent to the existing Whitebridge shopping precinct.

1.3 The Proposal

The proposal consists of a Development Application to Lake Macquarie City Council by SNL Building Pty Ltd for the construction of 87 dwellings, access roads and associated open space.

Four commercial units are included in the proposal and these units will front Dudley road on the same alignment as the existing commercial buildings.

The Dudley Road street presentation will be designed to allow a visual corridor into the site form Dudley road. This corridor will separate the proposed commercial and urban space from five dwellings posed along Dudley Road.

Part of the site is zoned 7C Ecological and accounts for 3892m2 of the site.

The Kopa Street alignment will contain residential dwellings only, continuing the existing residential theme.

Two residences currently located on Kopa Street will be demolished to make way for new dwellings as part of this proposal.

The proposal includes areas of both private and shared open space in a series of connected spaces, each with a dedicated purpose and design character tailored to the needs of the residents and commercial tenants.

These spaces can be broadly described as -

- Kopa Street Streetscape
- Dudley Road streetscape
- Internal streetscapes
- Commercial Urban Space
- Internal Open Space
- Internal private space.
- Conservation zone
- Presentation to Fernleigh Track.

This document is primarily concerned with the landscape and urban design proposals for these areas.

2.0 SITE ANALYSIS

Site Context

Community and Current Use

The site is currently cleared and vacant. There is no current use or development on site.

The site is well located for both pedestrian and vehicular connections to local facilities and to a broader context which includes a regional center at Charlestown.

The local shopping Centre is adjacent to the site. This is in the form of a separated 'high street' complete with bus stop, pedestrian crossing and on street parking.

A desire line for pedestrian access is noted in a diagonal formation across the site connecting the Fernleigh Track crossing and the Whitebridge Shopping centre

Both primary and high schools are within the site context less than 800m walk.

Sporting facilities, clubs, play grounds and the Fernleigh Track provide recreational options.

Dudley Beach is less than 2.0 kilometers to the east.

The Fernleigh Track pedestrian connection is currently located part way across the north eastern portion of the site.

This alignment will be modified to keep the connection outside the site boundary.

Kopa Street looking east

Looking south west across the site from the existing path connection to the Fernleigh Track. The site is cleared of vegetation in this direction with one Callistemon species shown. The fence shown is located on the site boundary and will remain. The existing commercial (Bottle Shop) is visible at the top of the site.

The Conservation Zone adjoins the fence line.

Existing dwelling in Kopa Street to be demolished.

Existing Whitebridge commercial center and shops.

Existing Site Landscape

The existing landscape may be described as degraded with a Kikuyu and Couch grass cover over an undulating surface.

The LMCC Vegetation Community Map appears to show an area of remnant Scribbly Gum Open Woodland Vegetation Community on site however the arborist report and survey location of trees has identified four trees (Tree 15, 18, 19 and 20) in the north east corner of the site plus a large Camphor Laurel (Tree 1) on the Dudley Road boundary.

The condition of the 4 trees is described in detail in the arborists report.

The Fernleigh Track on the north east boundary is vegetated with the two communities noted on the LMCC Vegetation Community Map.

Existing Context Landscape Character

The landscape surrounding the site can be broadly separated into two main character types – remnant bushland and sub-urban.

The Fernleigh Track has a community of tall canopy Eucalypts with some understory and grasses associated with the relevant vegetation community.

The surrounding streets have typical mature sub-urban landscape typologies with a mix of natives and exotics in formalized settings.

Typical street presentation – Lonus Avenue to the west of the site.

Existing Zoning

3892 sq mtrs of land adjacent to the Fernleigh Track boundary is zoned 7 C Ecological and as such this land will not be developed.

Landscape improvements will be made to this area of land and it is expected that the ecological value of the corridor will increase from the current condition.

Existing Trees on Site

Current vegetation cover is minimal with a small group of Eucalypts in the north east corner. These trees have been identified in the arborists report by Treeology Pty Ltd dated August 2013.

There is a large Angophora costata (Salmon Gum) adjacent on the western boundary. Rear courtyard design for dwellings 74 and 75 will take into account the effect of excavation on the TPZ for this tree and the arborists advice will be sought to provide an assessment of impact for the tree.

Two mature Liyy Pillis are located on the boundary in the far north western corner. It is intended for these trees to remain as a screen if possible.

The Existing Tree Plan appears as an appendix.

Looking north east across the site to the Fernleigh Track.

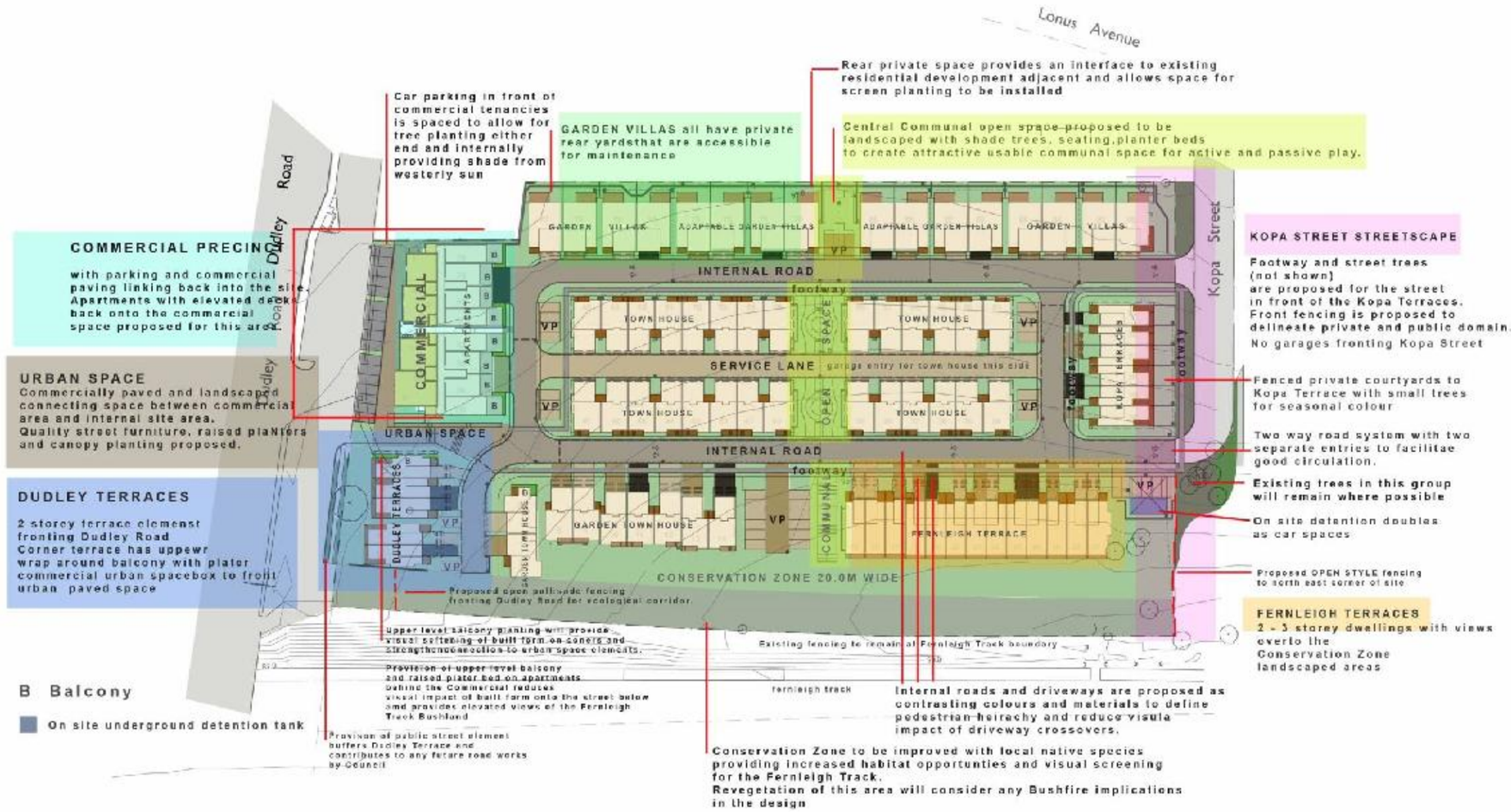
The mature trees are located within the Fernleigh Track easement.

3.0 KEY LANDSCAPE ISSUES

The Key landscape issues identified for the project include

- Lack of existing vegetation
- Inadvertently increasing Bushfire risk.
- Integration of high density dwellings within a low density landscape context.
- Presentation of development to the streets on Dudley Road and Kopa Streets
- The provision of an 'Urban' landscape for the commercial area of the development.
- Access and circulation
- Parking
- Communal Open space.

The Spatial Analysis Overview has been developed to identify key landscape areas of the proposal as a basis for developing landscape concepts.



WHITEBRIDGE SPATIAL ANALYSIS OVERVIEW

NOTE : proposed trees not shown this plan for clarity purposes.

4.0 LANDSCAPE DESIGN CONCEPT

OVERVIEW

Generally, the landscape design intent will be informed by the Key Issues found to form the Concept as a response.

The landscape design will also follow the **Landscape Design Principles** and focus on the following main areas as key areas of the site.

- Conservation zones
- Presentation to Fernleigh Track.
- Dudley Road streetscape
- Kopa Street Streetscape
- Internal streetscapes
- Commercial Urban Space
- Internal Open Space
- Internal private space.

The landscape is designed to support a high density urban landscape within a low density residential setting adjacent to a Conservation Zone.

To achieve this outcome the landscape treatment will effectively be segmented into use type with emphasis on performance outcomes.

1. Improve the performance of the conservation zone without introducing unnecessary risk to the site.
2. Improve the performance of the communal open space, street presentation and connections to the broader landscape context
3. Improve the performance of the private landscape spaces
4. Introduce an urban space that will perform as a multi use space for both commercial and private use.

The **Landscape Design Principles** focus upon specific elements and opportunities of the project and have guided the development of the overall plan. They will also form the basis for the detailed design. The **Design Principles** are listed below.

1. **Sustainability and Respect** of Local Context by using native species to provide habitat in the conservation zone and smaller exotic/native combinations in the residential landscape.
2. **Visual Connections** to the surrounding context including the connection to Dudley Road and bushland opposite the site in Kopa Street and along the Fernleigh Track.
3. **Defining** an internal street and ensuring the street is legible.
4. **Promoting Pedestrian Access**, permeability and Safety
5. **Incorporating Diverse And Accessible Green Spaces**
6. **Evocative** planting palette to create a sense of place.

.

WHITEBRIDGE LANDSCAPE MASTERPLAN

LANDSCAPE DESIGN

KEY SITE AREAS.

CONSERVATION ZONE

The CONSERVATION ZONE is located adjacent to the Fernleigh Track and run the length of the site.

With the exception of the south east corner, the width of the conservation zone is 20.m and contributes 3,892 square metres of unbuilt land to the site. This significant parcel of land provides an opportunity for improvement of the ecological value of the land

The intention of the landscape proposal for this area of the site is t revegetate this area of land to improve both ecological value and amenity from its existing condition.

Plant selection will be primarily from the Coastal Plains Smooth-Barked Apple Woodland plant communities where those species are commercially available.

Suitable species from these communities include as tall canopy species

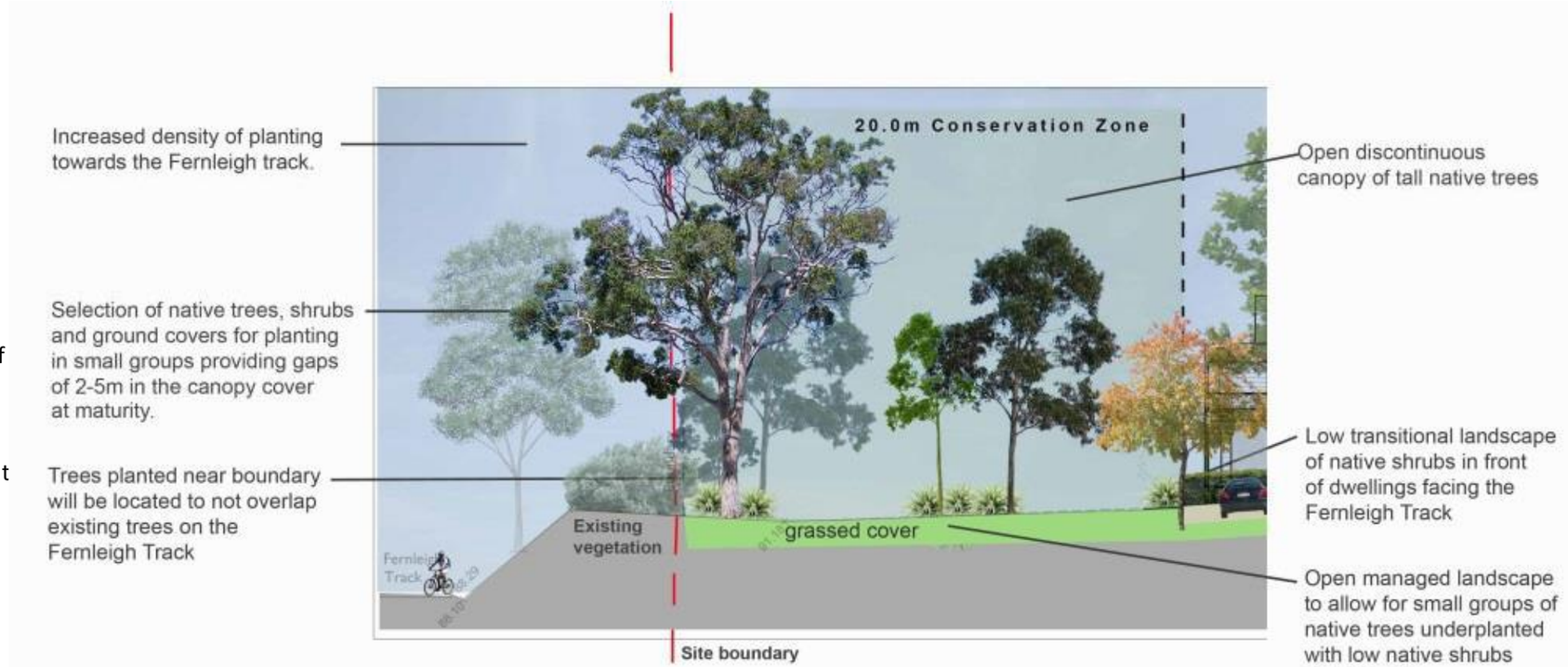
- Angophora costata (Smooth Barked Apple)
- Corymbia gummifera (Red Bloodwood)
- Eucalyptus capitellata (Brown Stringy Bark)

As mid canopy shrubs

- Allocasurina littoralis
- Leptospermum polygalifolium
- Lambertia formosa
- Acacia myrtifolia

As ground covers

- Lomandra oblique
- Impereta cylindrica
- Dillwnia retorta



CONSERVATION ZONE SECTION- TYPICALCENTRE SITE

Planting for the conservation zone closest to the Fernleigh Track will be undertaken using current revegetation techniques with tube stock being planted in protective sleeves and then heavily mulched.

Planting closer to the dwellings will be installed in dedicated planting beds with more mature stock.

PRESENTATION TO THE FERNLEIGH TRACK

The current cycle/pedestrian connection from the Fernleigh Track towards Kopa Street will be realigned further east outside of the site to connect with the pathway currently on the northern side of Kopa Street. These works will not form part of this application.

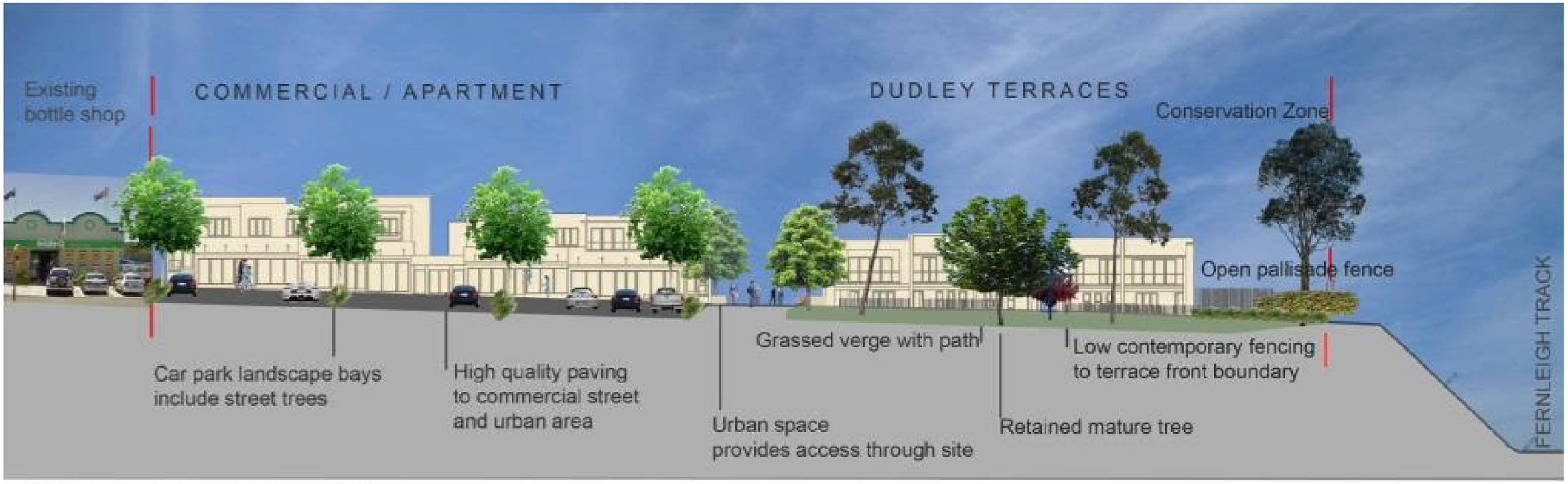
The re-alignment of the path connection north will allow the continuation of the conservation zone further north and east within the site. This will provide effective screening from the path into the site as there is ample opportunity for increasing density should that be required at this point.

Dwellings are set back 20.0m from the eastern boundary and will be only partially visible from the crossing point. The final path configuration is unknown at this stage.

DUDLEY ROAD STREETSCAPE

The Dudley Road streetscape aims to continue the existing commercial character currently existing along Dudley Road to thre west of the proposal.
This commercial extension will continue east in the proposal for part of the site frontage with the balance of the site frontage proposed as residential. These two separate land uses will be separated by an 'Urban' space that will provide access to the site and spatial separation between residential terraces and the commercial space.

Parking bays will be located at the front of the commercial space and four landscape bays will provide separation of the parking spaces and an opportunity to provide shade trees in the car park area.



Dudley Road Elevation
SCALE 1:400

KOPA STREET STREETSCAPE

Kopa Street at present is a short street on the north east boundary of the site.

Two dwellings currently facing Kopa Street on the south west side of the street will be demolished as part of the proposal for the site.

The Kopa St Image 1 shows the existing dwellings plus the existing connecting pathway to the Fernleigh Track. This path connection will be removed as part of the proposal and replaced by others.

The Landscape Design intent for Kopa Street is to create a strong residential character by providing a foot path in front of the Kopa Street terraces that links back into the site and links the terraces as a street element.

The proposed dwellings facing Kops Street will have a street presence and entry facing the street with fencing that clearly delineates public and private spaces.

Street trees proposed for Kopa Street will provide a transition to the bushland character opposite. The species proposed for this area is *Elaocarpus reticulatus* 'Prima Donna' (Pink Blueberry Ash) , a native evergreen tree to 8.0m which is adaptable to the site and will perform well in this orientation and sheltered location.

Within the front courtyards, low hedges will be planted along the fencing lines allowing space for a small turfed area adjacent to the pathways connecting the street to the front door.

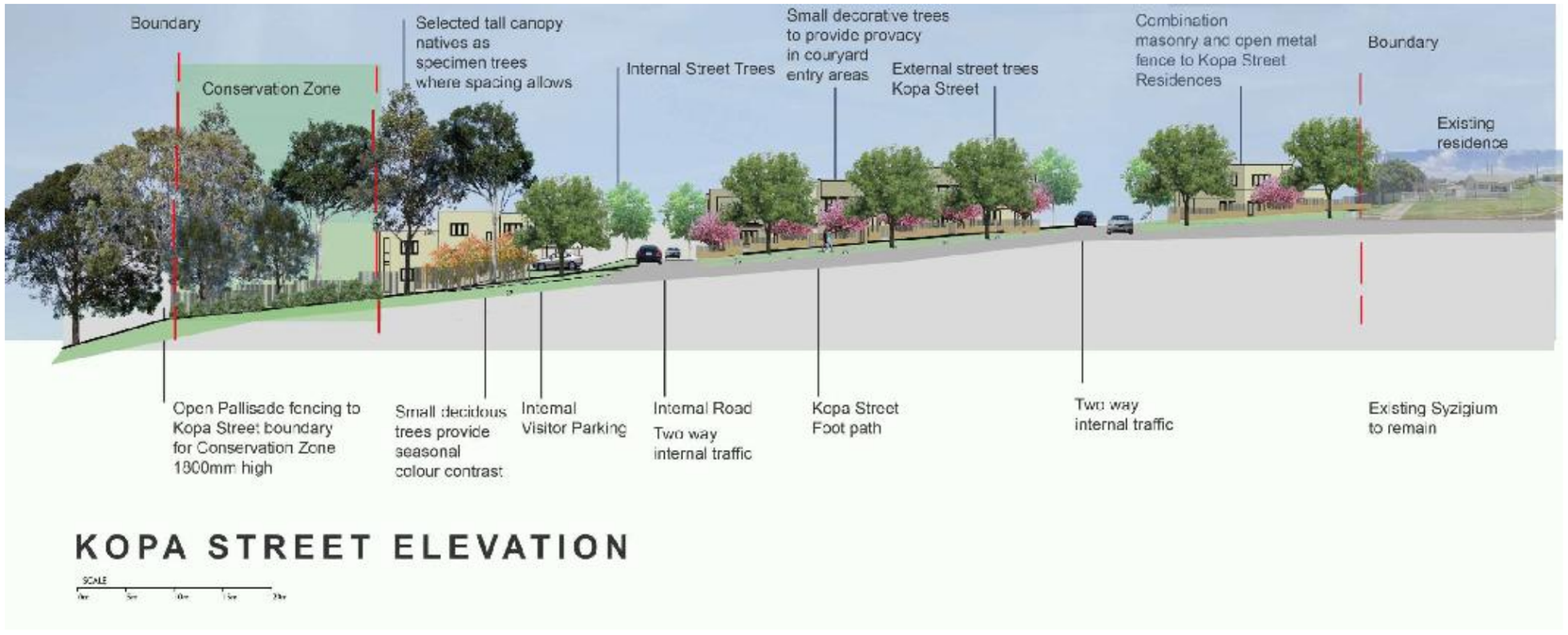
Small decorative trees such as *Lagerstroemia indica* (crepe Myrtle) will be planted inside the fence lines to provide a residential setting and privacy for residents from the street. This species will be maintained to a single trunk to prevent overcrowding in the space.

Towards the Fernleigh Track and the Conservation Zone area of the street, vegetation will be selected to enhance the conservation zone amenity and value. This will consist of a range of tall canopy natives such as Eucalypts, Casurinas plus smaller shrubs such as Melaleuca and Banksia with ground covers planted more densely towards the track to provide connectivity with the existing vegetation where possible.

The Conservation Zone boundary will be fenced with open palisade style fencing to 1800mm and this will be screened and back planted with low groundcovers such as *Lomandra* and *Westringia.* Fencing is located in this area to provide privacy and security to residents and the Conservation Zone area generally. The planting in this corner of the site will also assist with reducing and tempering views into the site from the Fernleigh Track crossing area.

Fencing for the residential dwellings is a combination of masonry and metal panel infill to a height of 1500mm to allow partial visual permeability plus some privacy.

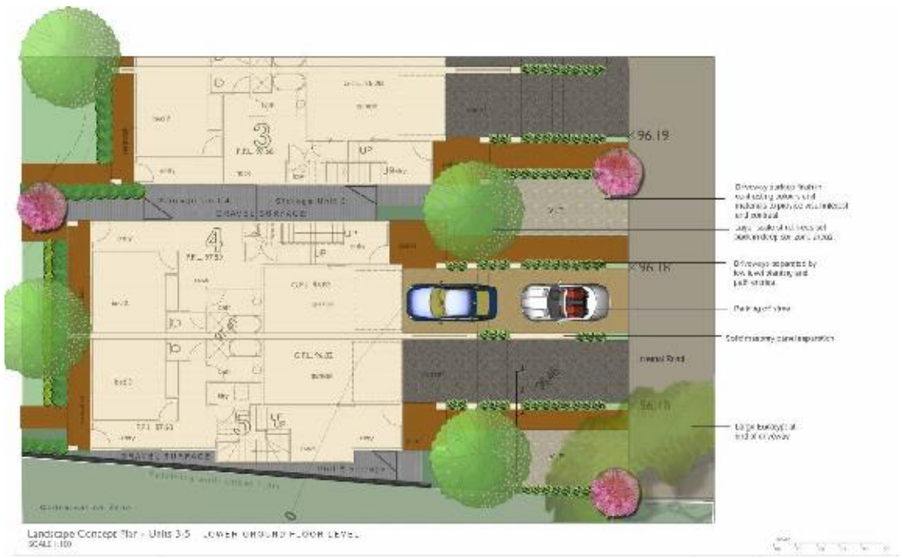
Fencing details follow in this document.



INTERNAL STREETSCAPES AND PRIVATE SPACE

1 DUDLEY TERRACES

DWELLINGS 1-5



2 FERNLEIGH TERRACE

Dwellings 19-25

The Fernleigh Terraces are a series of two story and three storey dwellings that overlook the Conservation Zone towards the Fernleigh Track.

These dwellings have garages and entries that front the internal road and up to three balconies at the rear (south/eastern elevation) that overlook the conservation zone natural vegetation.

These dwellings have a quiet peaceful aspect and look directly into tall canopy vegetation, some of which is existing as part of the existing ecological corridor vegetation and some is proposed as part of the improvements to be made to the Conservation Zone.

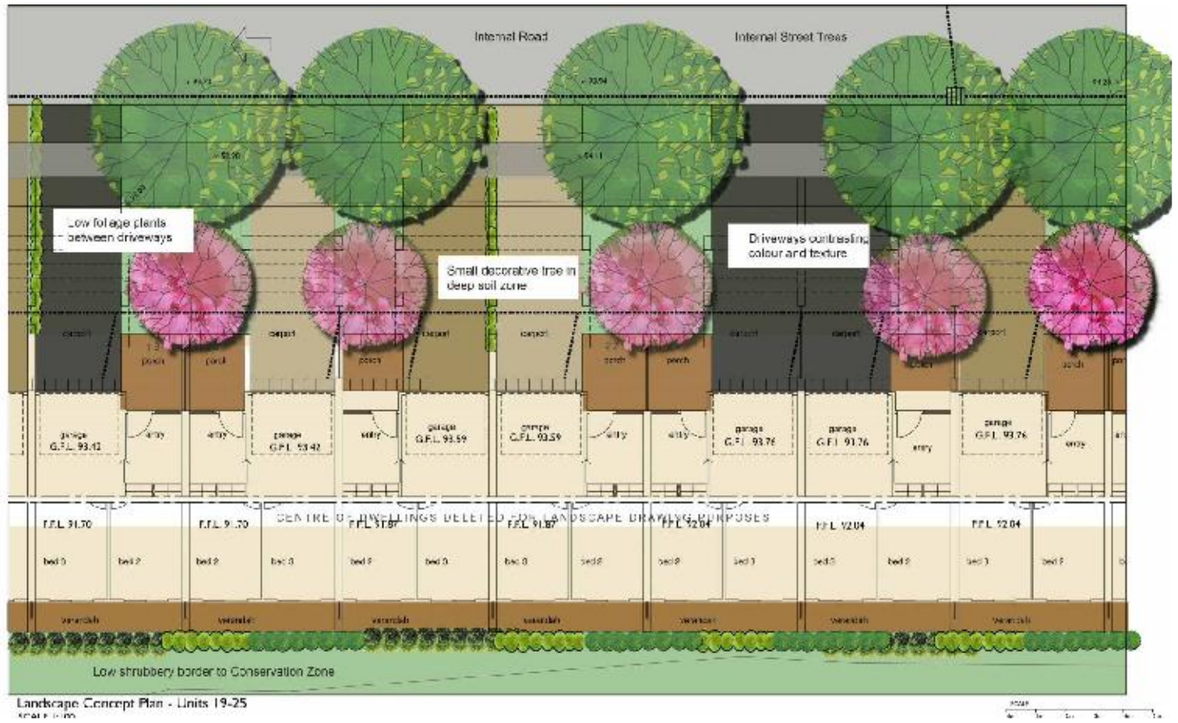
At the lower level of these dwelling on the eastern side a series of low native massed plantings will be installed adjacent to balcony railings to soften the built edge and transition the built form into the natural landscaped area.

The landscape for these dwellings will be 'borrowed' from the conservation zone on this elevation.

On the western elevation (internal street elevation) the dwellings have upper balconies that overlook the street into the canopies of the street trees (*Pyrus* 'Capital') . At ground level, driveways and garage doors will be contrasting in colour and materials with deep soil zone planting opportunities between some driveways for small evergreen or deciduous trees such as *Buckinghamia celsissima* (Ivory Curl Tree) or *Lagerstroemia indica* (White) . The private garden spaces between the driveways will be mass planted with grassy tough groundcovers such as L*omandra* 'Tanika' or *Dianella* 'Little Rev" to soften the driveway entries and provide textural contrast between the hard surfaces.

White Crepe Myrtle

Ivory Curl Tree Flower



Fernleigh Terrace dwellings 19-25

Plan and elevation

3 KOPA STREET TERRACES

Kopa Street terraces introduce a terrace built form to Kopa Street that sits wholly within its own block on the street.

All dwelling face the street and have both front and rear entry doors.

The Kopa Street presentation does not have any garage and this provides space for a small courtyard adjacent to the street.

The courtyard contains a path that is offset from the direct line of site to the front door. This assists with privacy and provides the resident with an opportunity for passive surveillance of the street if required.

Additionally, a front fence and gate are provided here in a combination of masonry pillar and decorative metal panel infill 1200mm – 1500mm in height maximum. This provides another layer of filtered views to the street and sets the separation between public and private space.

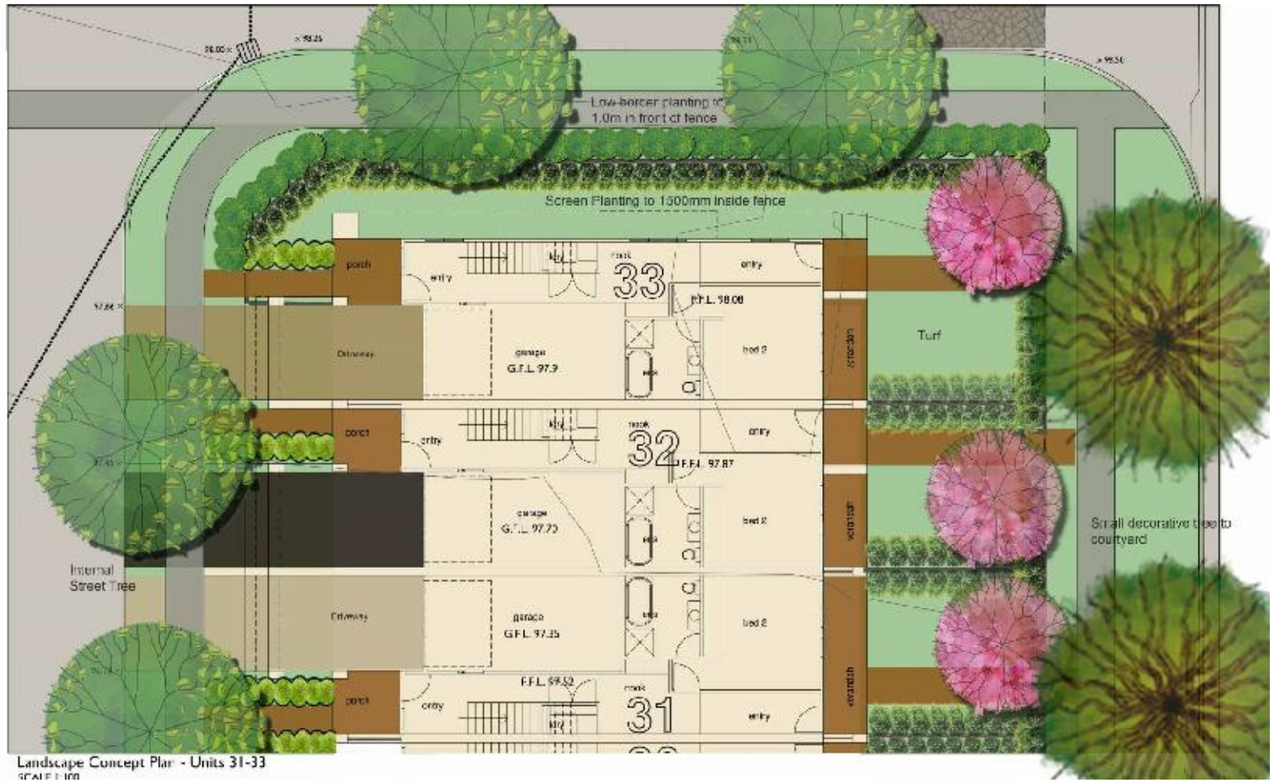
Sufficient room is available within the front courtyards for the provision of a small lawn area, hedging and a small decorative deciduous tree – *Largerstroemia indica* (Crepe Myrtle) or possibly *Tibouchina* 'Alstonville'.

Street trees are located in the public verge and within the internal road system.

Entry paths at the internal street presentation are more open with massed planting strips between driveways.

Opportunities for street trees in the road verge create shade in the summer months to the upper levels of the dwellings.

Dwelling 63 is separated from the entry road by a timber screen fence to 1500mm high and dense hedge planting either side. This has provided a side yard that adds amenity to both the dwelling and the street presentation also providing a buffer from entry traffic.



Landscape Concept Plan - Units 31-33 Kopa Street Elevation (East)

Landscape Concept Plan - Units 31-33 Internal Road Elevation (West)

Tibouchina'Alstonville' as alternate

Courtyard tree for Kopa Sreeet

Terraces

4 APARTMENTS

DWELLINGS 81 AND 82

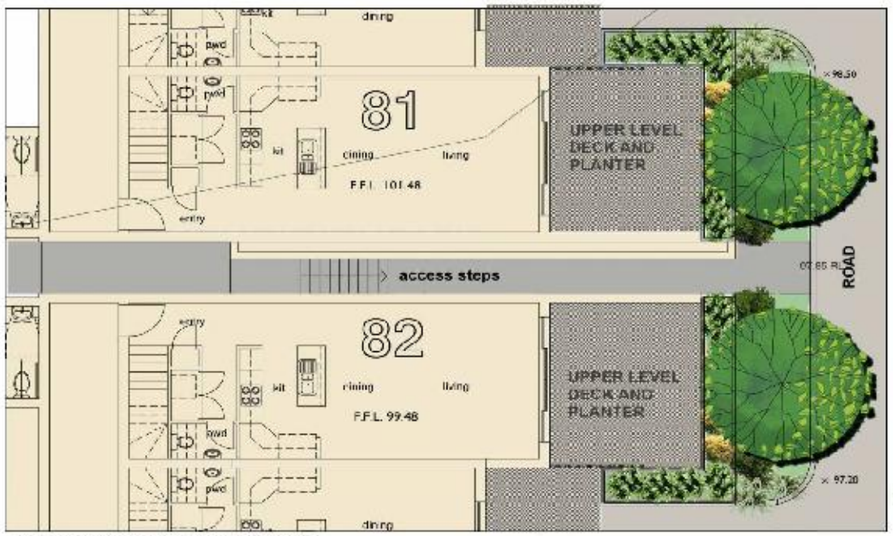
Apartments on the site are located behind the commercial units and face north across the site. These apartments have elevated views with large elevated deck areas designed with raised planter boxes at the edge.

Garaging is cleverly designed to be accessible from the side so the visual impact on the street is reduced.

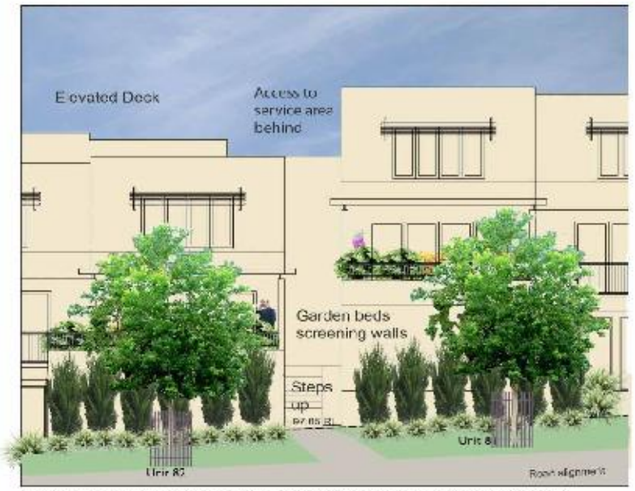
The road reserve provides opportunities for deep soil zone planting of the internal street trees.

Balcony access provides opportunites for passive surveillance across the site.

Blank walls facing the internal street will be planted with screening plants such as *Cupressus sempivirens* (Italian Cyprus) spaced at centres and kept trimmed to provide vertical interest.



Landscape Concept Plan - Units 81-82
SCALE 1: 100



Landscape Concept Plan - Units 81-82 Internal Road Elevation (East)
SCALE 1:100

COMMERCIAL URBAN SPACE

The commercial urban space is locate adjacent to the Dudley Road boundary and separates the commercial built form from the residences of the Dudley Terraces.

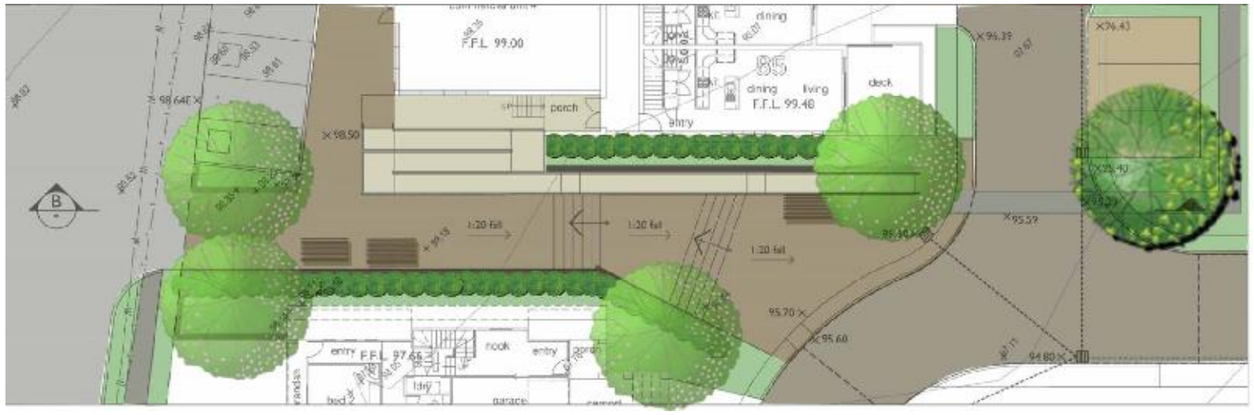
This area also provides a transitional zone between the internal site spaces to the north east and the external public spaces fronting Dudley Road to the south west.

The area is planned to provide all ability access via a ramped access adjacent to the commercial buildings, seating and shade for meeting and lunching and a signature tree selection that identifies the entry to the site.

The area also acts as a transitional space to accommodate levels changes and as such has a series or descending platforms into the site that take up the level change.

A planter box approximately 600mm high is adjacent to dwelling 1 and incorporates a decorative screen to provide screening and a landscape backdrop for the urban space.

Finished are high quality with robust street furniture and paving from a proprietary or custom palette with super advanced tree species (200 litre) installed in tree pits.



Typical paving treatment – Urbanstone samples

SFA – Concourse seating

Typical seat – Street and Park Furniture – Grindle Seat.

Pyrus 'Chanticleer' as specimen tree for urban area

Sample metal screens to be placed on top of planter between

Dwelling 1 and Urban space

INTERNAL OPEN SPACE

The internal open space creates an important link throughout the site and provides a central area for large tree planting, seating, structured planting beds and pathway linkages plus active and passive play. It is roughly divided into three zones – western, eastern and central.

The most western part of the open space is designed as a quiet restful area shaded by two Gleditsia tricanthos 'Sunburst' . This deciduous tree creates the central planting theme and ties all of the open space together . The tree has been chosen because of its graceful form, spectacular seasonal colour and reliable growth habit. It is also seasonal allowing sun access to these areas during winter with branch patterning creating sculptural interest. The tree has very small leaves when shedding in Autumn and as such does not create a nuisance.

Cameliia sasanqua- hardy evergreen

Hedge to car park area

The two central areas are more formal in design with a central path dividing around a circular garden bed that provides the setting for the Gleditsia.

These areas are spacious enough with a width of 15.0m to provide for mass panted areas to screen the adjacent dwellings and for a small lawn area that incorporates seating off the path area. Level changes are taken up with 3 steps either side of the central planting beds area.

Ground covers in this area are designed to be mass planted with Trachelopsermum asicatiucum (Asian Jasmine) a preferred selection due to its dense growth habit and low profile in addition to Raphaolepsis 'Springtime' as a hedge element.

Shrubs will be included in areas adjacent to side yards as hedge planting to 1500mm. The intention for planting in this area is to keep the visual accessibility open using CPTED principles but to create a soft ground plane and peripheral edges with canopy shade.

The most easterly space is designed as a broad set of platforms with wide cascading steps that lead out to the ecological open space. This area can be used for reading, seating or playing and is wide enough at 3.5m to contain small groups

This area is bounded by evergreen hedging such as Syzigium 'Blaze' or Camellia sasanqua planted to create a dense hedge to screen the car park area.

CENTRAL COMMUNAL SPACE

Raphaolepis 'Springtime'

Trachelospermum asicaticum

FENCING

A variety of fencing styles have been incorporated into the landscape design.

Generally timber lapped treated pine fencing or open metal palisade fencing with hedging is the preferred for internal lot fencing where applicable.

Fencing at the rear of units along the western boundary will be replaced with like for like where required. OR replaced with 1800mm lapped treated pine paling fencing.

Existing chain wire mesh fencing on the eastern boundary adjoining the Fernleigh Track will remain or replaced with like for like where required,.

Dudley Road fencing for the Dudley Road terraces will be installed as 900mm high powder coated picket fencing with gates into front courtyards.

Fencing along Kopa Street is low masonry to 900mm with open metal infill panels to support the contemporary architecture of the terraces.

Fencing of private side yard spaces adjacent to the central open space areas will be rendered masonry 1800mm high with hedging fronting the public space.

Where fencing is partially visually permeable , landscape screening will form part of the internal courtyard space against the fence to provide additional vegetative screening.

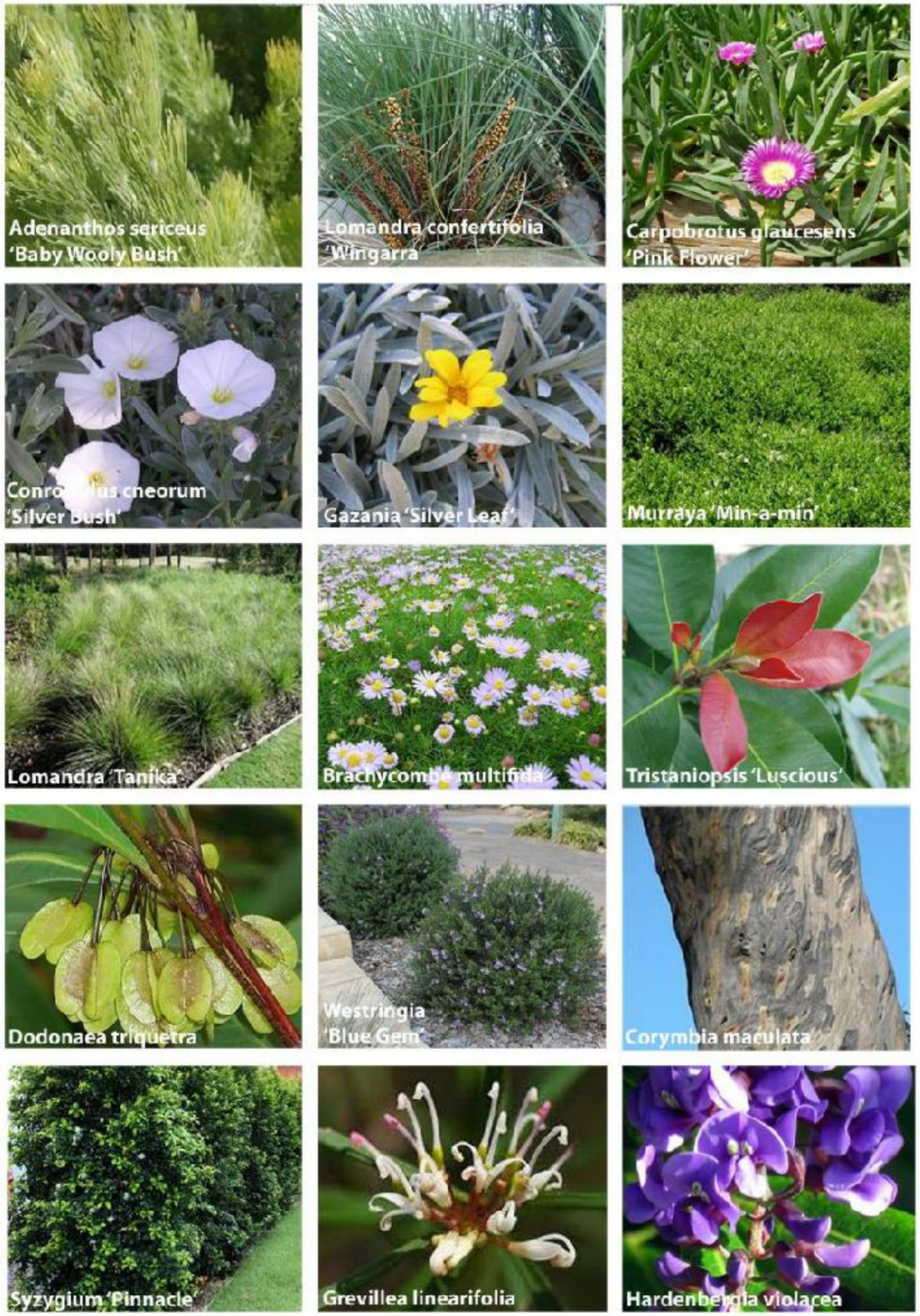
Treated pine lapped - Typical internal side fencing between units if required and to western boundary if required.

KOPA STREET TYPICAL FENCING STYLES

Combination masonry and metal panel infill fence style with planting

DUDLEY ROAD TYPICAL FENCING STYLES

Low picket fence and gates with hedge planting behind.



PLANTING PALETTE

AN EVOCATIVE PLANTING PALETTE TO CREATE A SENSE OF PLACE

The planting palette is guided by the following design principles:

1. Conservation Zone - plants species have been chosen from the Coastal Smooth Barked Apple vegetative association.
2. Minimise maintenance across the development.
3. Provide shade whilst also providing visual amenity.
4. Emphasises a soft colour palette of Silver, Grey and Green foliage with some colour highlights.
5. Mass planting to create density.

The following species have been selected to achieve the project objectives and meet the design principles:

- Tristaniopsis 'Luscious'
- Conrolrulus cneorum 'Silver Bush'
- Gazania 'Silver Leaf'
- Westringia 'Blue Gem'
- Murraya min-a-min
- Grevillea linearifolia
- Dodonaea triquetra
- Syzygium 'Pinnacle'
- Adenanthos sericeus 'Baby Wooly Bush'
- Carpobrotus glaucesens 'Pink Flower'
- Hardenbergia violacea
- Lomandra 'Tanika'
- Lomandra confertifolia 'Wingarra'
- Brachycombe mutifida
- Corymbia maculata

COMPLIANCE WITH LMCC DCP 1

The proposal has considered the requirements of the LMCC DCP 1in its approach to landscape design.

It has done this by:

- Conserving the biodiversity of the Region through considered plant selection.
- Impacts of the development on existing site native flora and fauna is limited due to the lack of extensive site vegetation. Where possible trees will be retained.
- By improving the ecological value of the site.
- By maintaining the desired character of Whitebridge and achieving an urban response to the landscape respondent to the increased density of the urban infill development proposed.
- By providing opportunity for landscaping within the front setbacks, presenting traditional dwelling frontages to existing streetscapes.
- By providing private open space with the desired solar access oriented to the north east where possible.
- By reducing the areas of hard surface where possible.
- By developing different landscape precincts within the development that respond to the building typologies proposed.
- By providing relevant communal space and landscaping within the development.
- By providing safe shared pedestrian and vehicle access to the site.
- Raised thresholds are used to identify the commencement of the internal roads.
- Street plantings throughout the site have selected to provide shaded streets and pedestrian walkways in addition to providing scale to the proposed built form.
- The streetscape has been designed to integrate seamlessly with the front on the dwellings to give the appearance of a much large, user friendly space within the streetscape.

CONSULTANTS DECLARATION.

This document has been complied by Helen Mansfield who is qualified as a category 3 consultant with Lake Macquarie City Council

Registered Landscape Architect 1426 AAILA

CONCLUSION

- Generally, the landscape that supports this development will contribute visually and ecologically to the local area.
- The development provides each unit holder with a differential landscaped character.
- The street character is maintained allowing for lots that face Regent Street along with lots internalised within the site.
- Careful landscape design and tree placement will result in residential style of landscape that will complement the existing local landscape character.
- The site is zoned as Bushfire Prone Land, therefore the landscape design responds to this classification. Plant species will incorporate local indigenous fire retardant species as per Lake Macquarie requirements.
- Entrance to the developments internal dwellings will be via the extension of the existing Harbord and Wood Streets into shared pedestrian/traffic zones.
-

APPENDIX

Existing Tree Plan

Spatial Analysis plan

Landscape Master Plan

Communal Open Space Plan

Dudley Road Elevation

Kopa Street Elevation

Dwellings 1 – 5

Dwellings 3,4,5

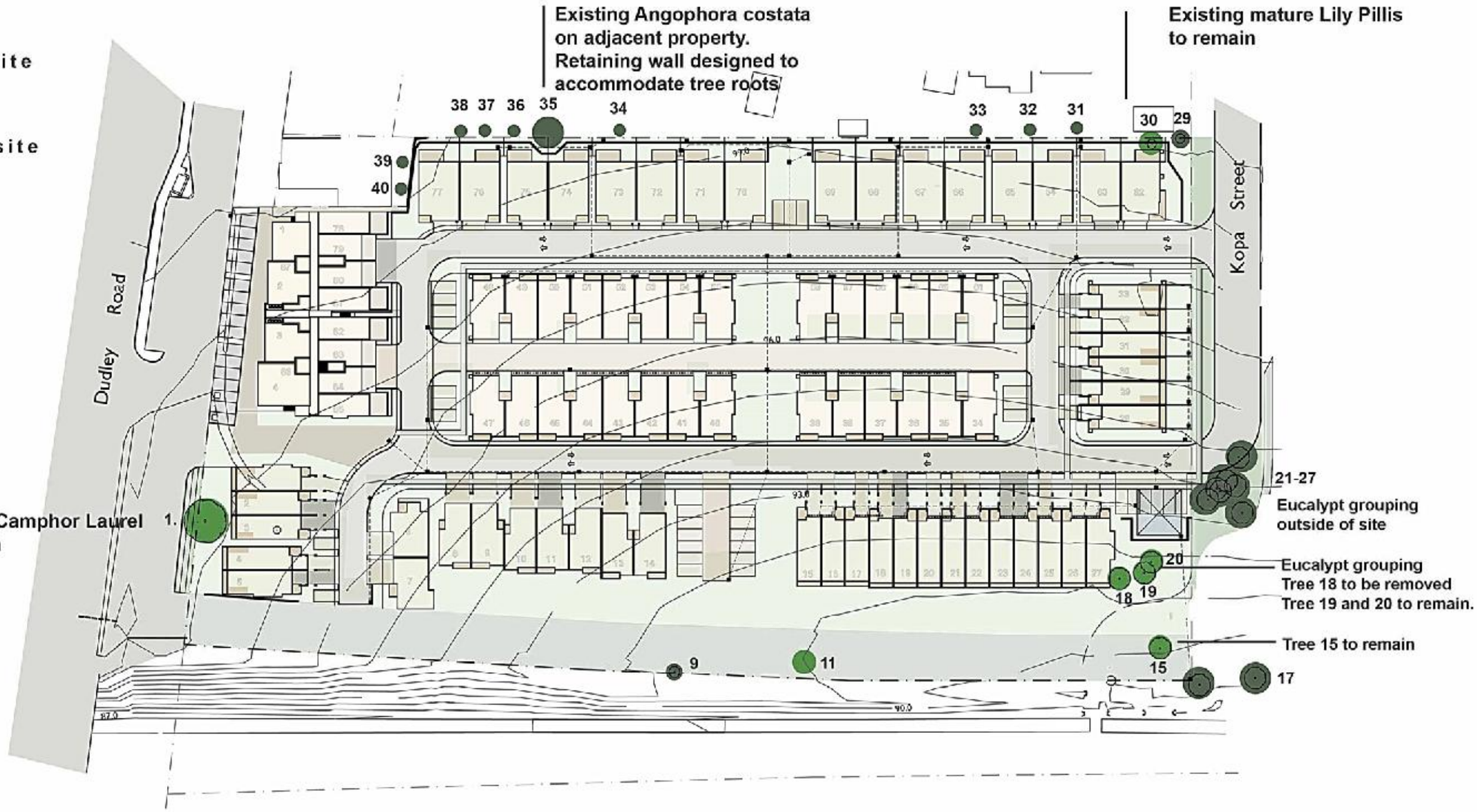
Dwellings 19 – 25

Dwellings 31-33

Dwellings 81-82

Trees on site

Trees off site



WHITEBRIDGE EXISTING TREES

For further information refer to theTreeology Report.

ISSUE	DATE	COMMENTS
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DRAWN SR | DESIGN HM | PROJECT NO. 1316 | DRAWING Master Plan

CHECKED | SCALE 1:1000 @ A3 | DRAWING NO. Sk01

SCALE 0m 10m 20m 30m 40m 50m

LOCATION Lots 1,2, & 3 DP 436503, Lots 1,2,3 DP 349377, Lot 4 DP 663765, and Lots 2 & 3 DP 26039, Dudley Road & Kopa Street, Whitebridge

CLIENT SNL

PROJECT Proposed Development

BASE PLANS SUPPLIED BY: Land Development Solutions Pty Ltd

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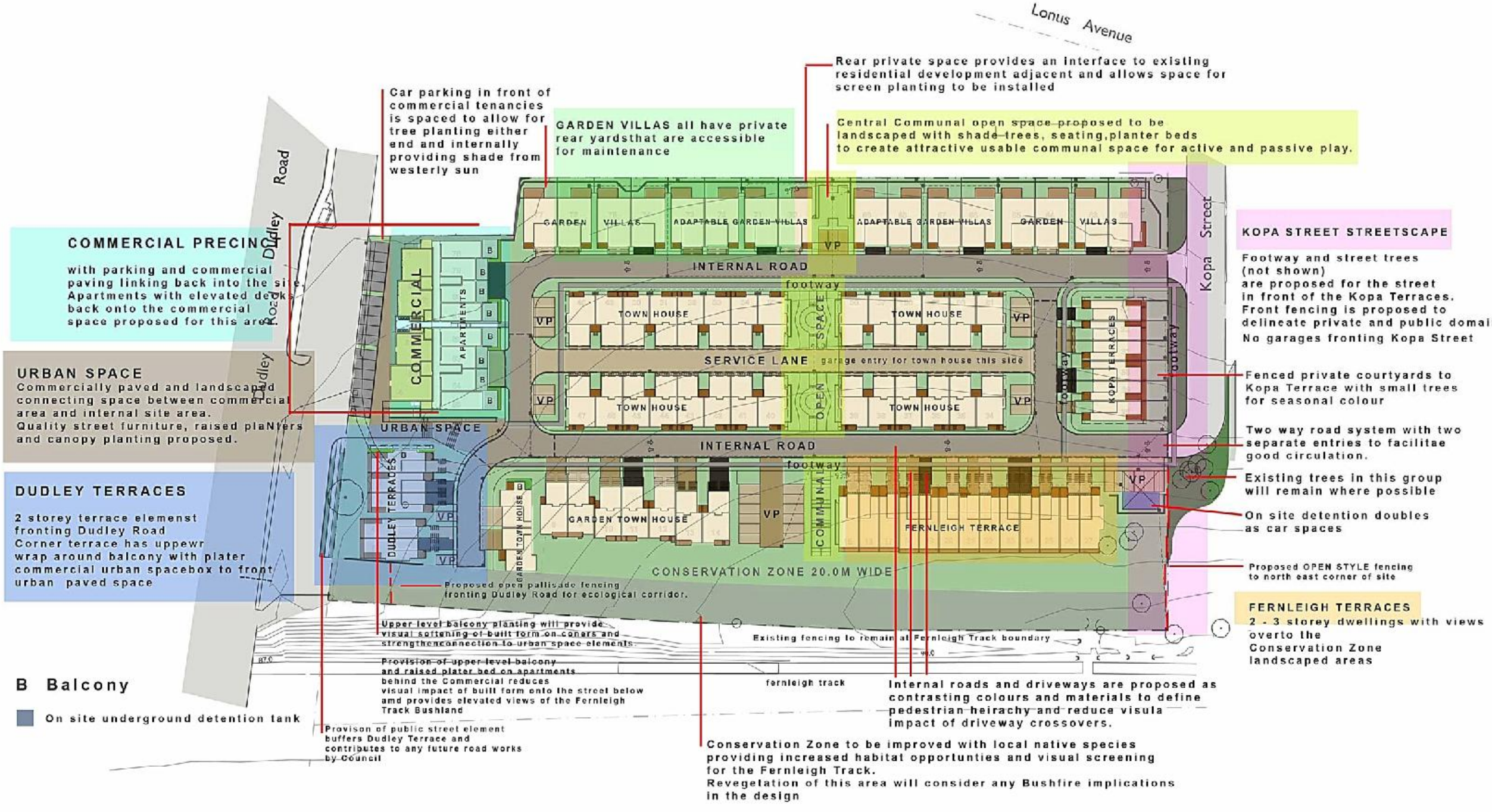

WHITEBRIDGE SPATIAL ANALYSIS OVERVIEW

SCALE

NOTE : proposed trees not shown this plan for clarity purposes.

ISSUE	DATE	COMMENTS
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-	22.10.13	-

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SCALE 0m 10m 20m 30m 40m 50m

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WHITEBRIDGE LANDSCAPE MASTERPLAN

SCALE
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ISSUE	DATE	COMMENTS
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-	22.10.13	-

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CHECKED | SCALE 1:1000 @ A3 | DRAWING NO. Sk01
LOCATION Lots 1,2, & 3 DP 436503, Lots 1,2,3 DP 349377, Lot 4 DP 663765, and Lots 2 & 3 DP 26039, Dudley Road & Kopa Street, Whitebridge
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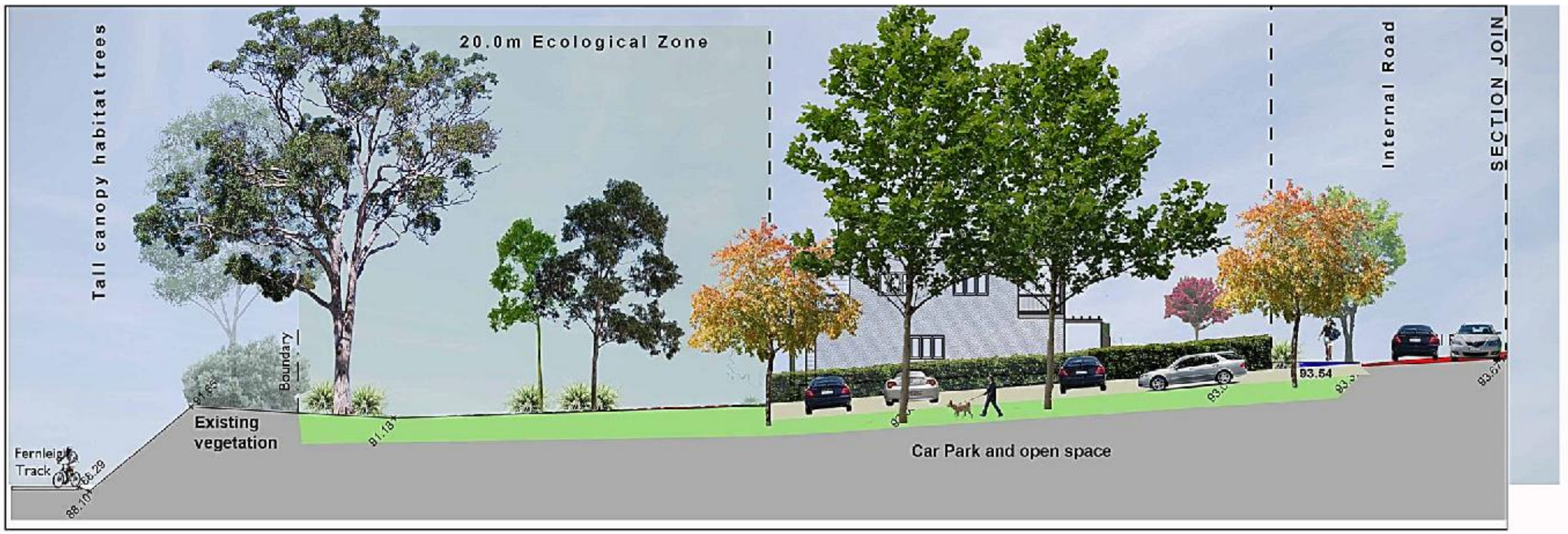

Section A - Communal Open Space
SCALE 1:200

Section A - Communal Open Space
SCALE 1:200

SCALE
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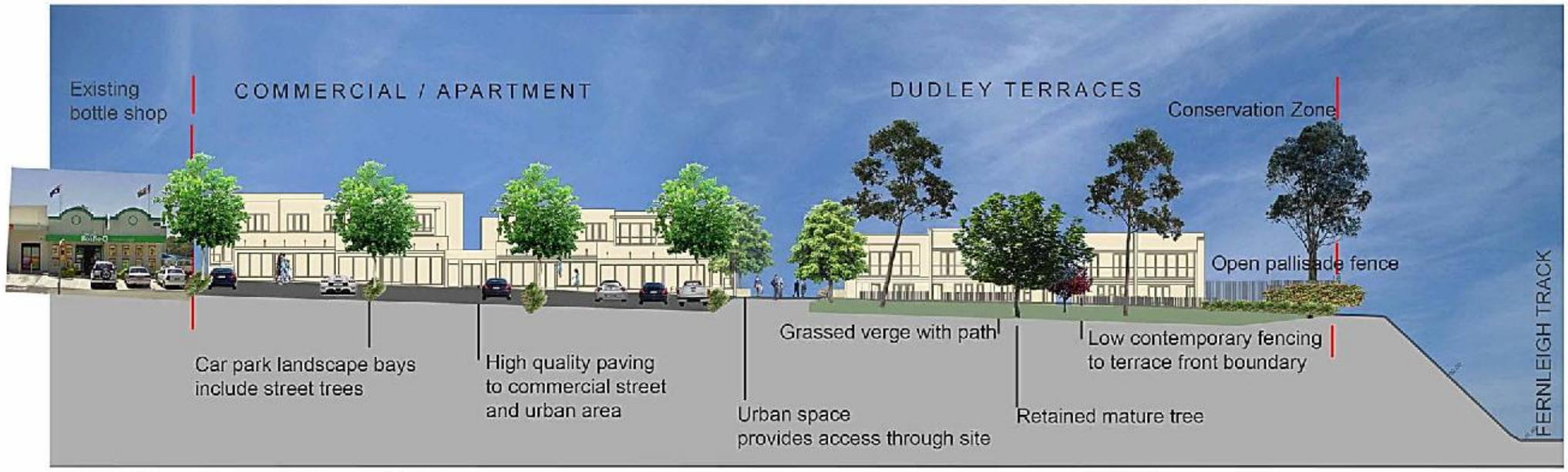

Dudley Road Elevation
SCALE 1:400

Dudley Road Elevation
SCALE 1:400

SCALE 0m 5m 10m 15m 20m

ISSUE	DATE	COMMENTS
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-	30.10.13	-

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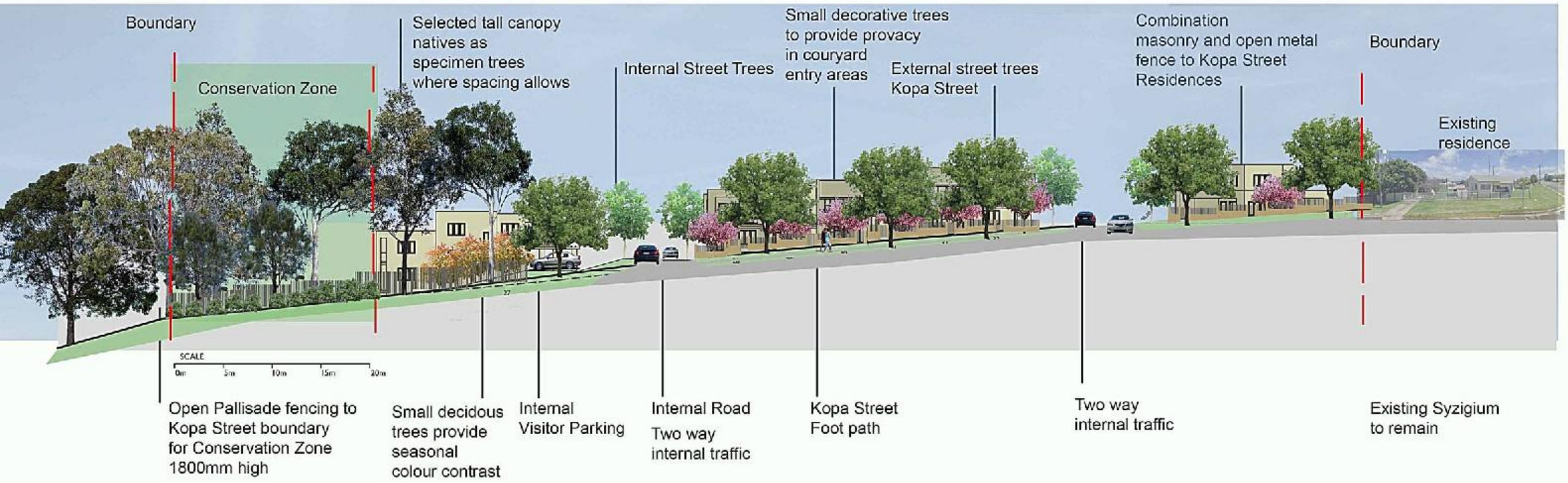

Kopa Street Elevation

SCALE 1:400

SCALE
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ISSUE	DATE	COMMENTS
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-	25.10.13	-

DRAWN SR | DESIGN HM | PROJECT NO. 1316 | DRAWING Kopa Street Elevation

CHECKED | SCALE 1:400 @ A3 | DRAWING NO. Sk16 | LOCATION Lots 1,2, & 3 DP 436503, Lots 1,2,3 DP 349377, Lot 4 DP 663765, and Lots 2 & 3 DP 26039, Dudley Road & Kopa Street, Whitebridge

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Landscape Concept Plan - Units 3-5 Internal Road Elevation
SCALE 1:100

Planting at base of street trees in this location

Smal decorative tree as feature

Landscape Concept Plan - Units 1-5 Dudley Road Elevation
SCALE 1:100

SCALE
0m 1m 2m 3m 4m 5m

ISSUE	DATE	COMMENTS
-	15.11.13	-

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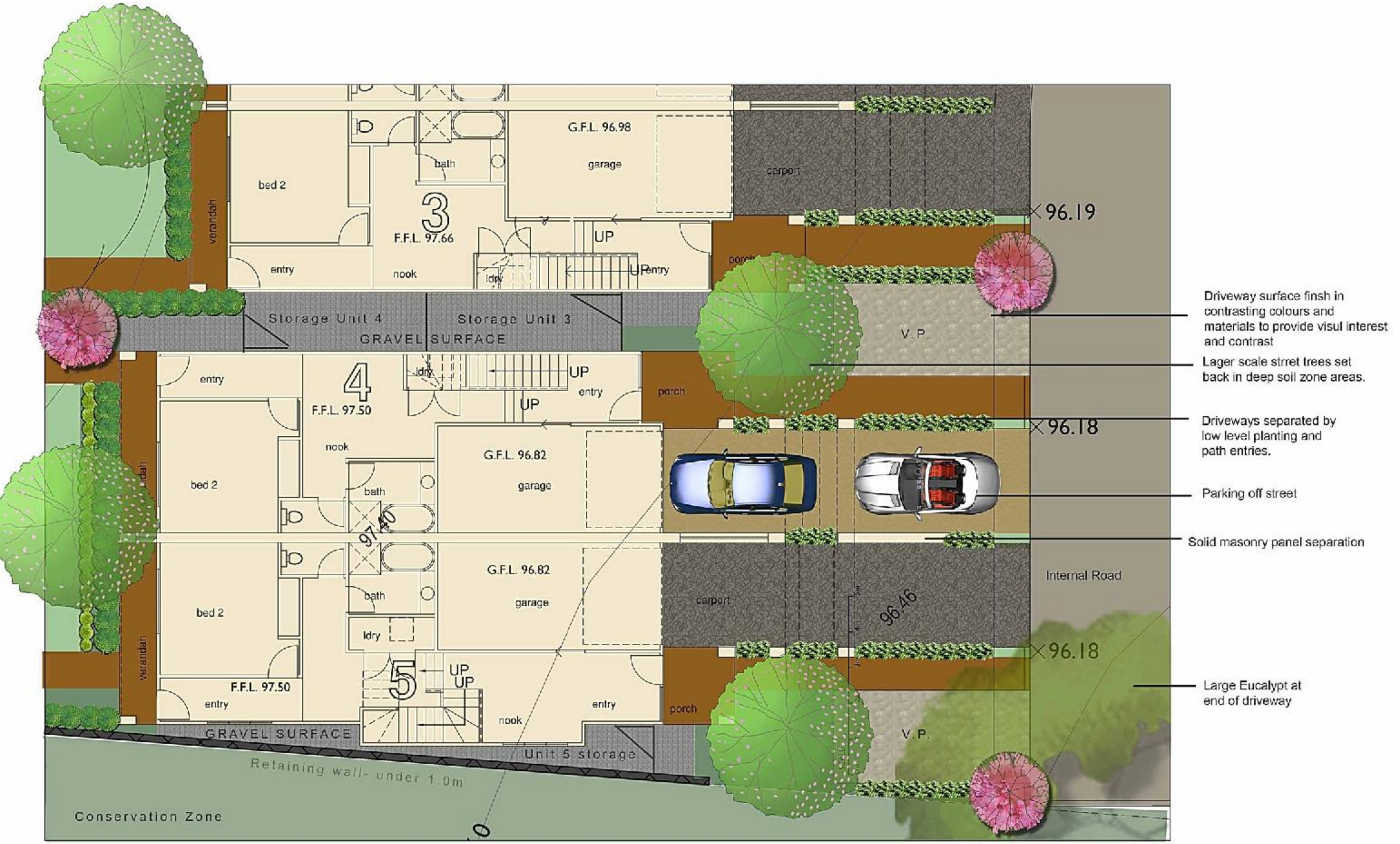

Landscape Concept Plan - Units 3-5 LOWER GROUND FLOOR LEVEL

SCALE 1:100

SCALE 0m 1m 2m 3m 4m 5m

ISSUE	DATE	COMMENTS
A	15.11.13	FOR DA
-	13.11.13	-

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CHECKED | SCALE 1:400 @ A3 | DRAWING NO. Sk18 | LOCATION Lots 1,2, & 3 DP 436503, Lots 1,2,3 DP 349377, Lot 4 DP 663765, and Lots 2 & 3 DP 26039, Dudley Road & Kopa Street, Whitebridge

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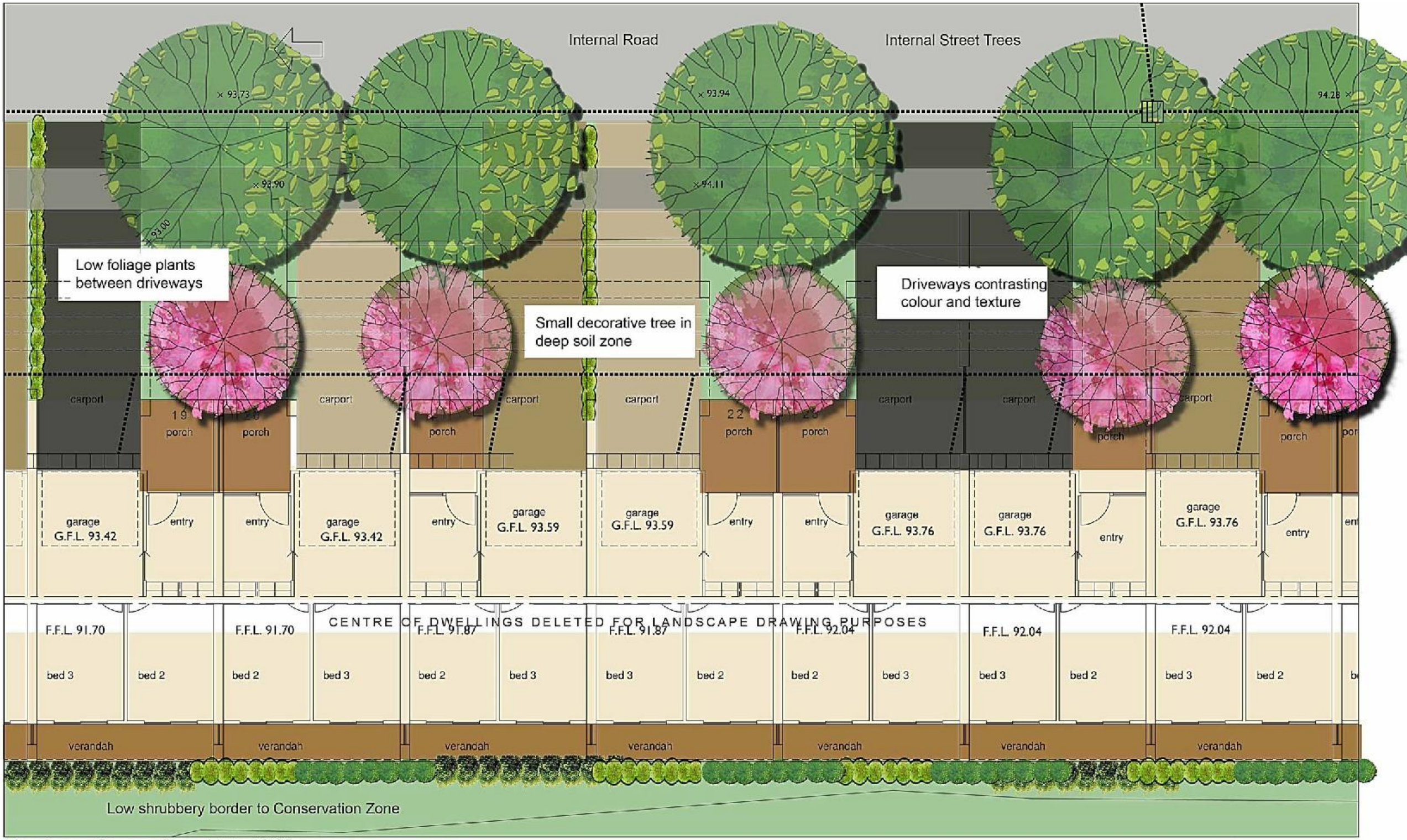

Landscape Concept Plan - Units 19-25

SCALE 1:100

SCALE 0m 1m 2m 3m 4m 5m

ISSUE	DATE	COMMENTS
-	13.11.13	-

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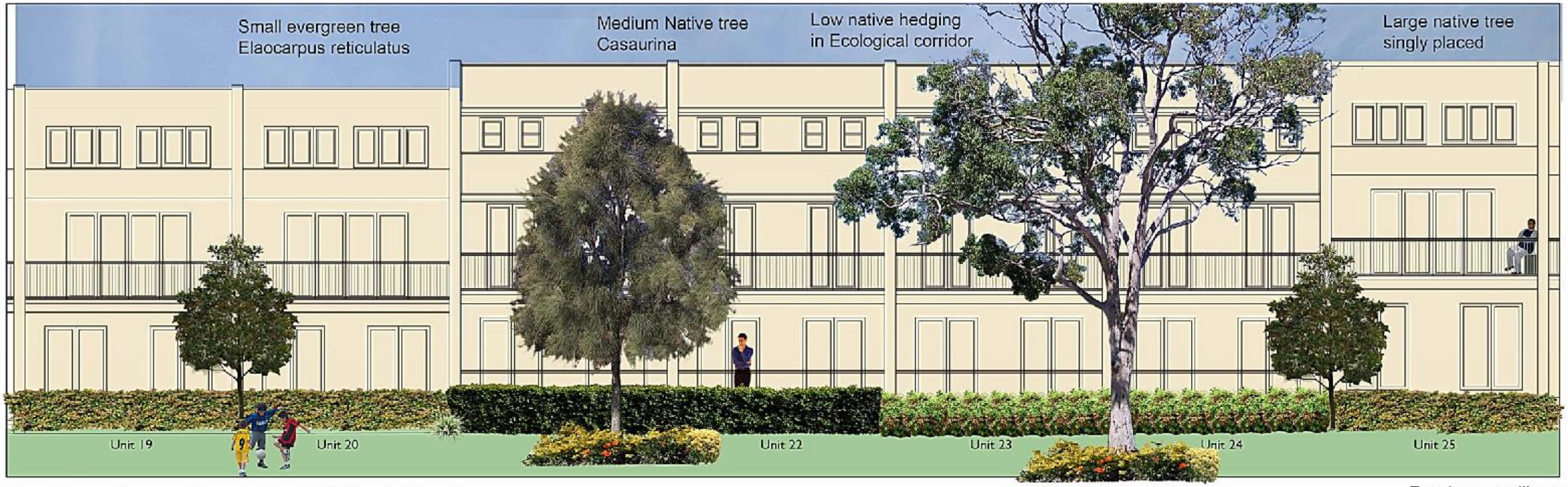

Landscape Concept Plan - Units 19-25 South Elevation
SCALE 1:100

Massed underplantings

Passive surveillance

Landscape Concept Plan - Units 19-25 Internal Road Elevation (North)
SCALE 1:100

Massed planting between driveways.

SCALE
0m 1m 2m 3m 4m 5m

ISSUE	DATE	COMMENTS
-	13.11.13	-

DRAWN SR | DESIGN HM | PROJECT NO. 1316 | DRAWING Landscape Concept Plan - Units 19-25 Elevations | CLIENT SNL

CHECKED | SCALE 1:100 @ A3 | DRAWING NO. Sk26 | LOCATION Lots 1,2, & 3 DP 436503, Lots 1,2,3 DP 349377, Lot 4 DP 663765, and Lots 2 & 3 DP 26039, Dudley Road & Kopa Street, Whitebridge | PROJECT Proposed Development

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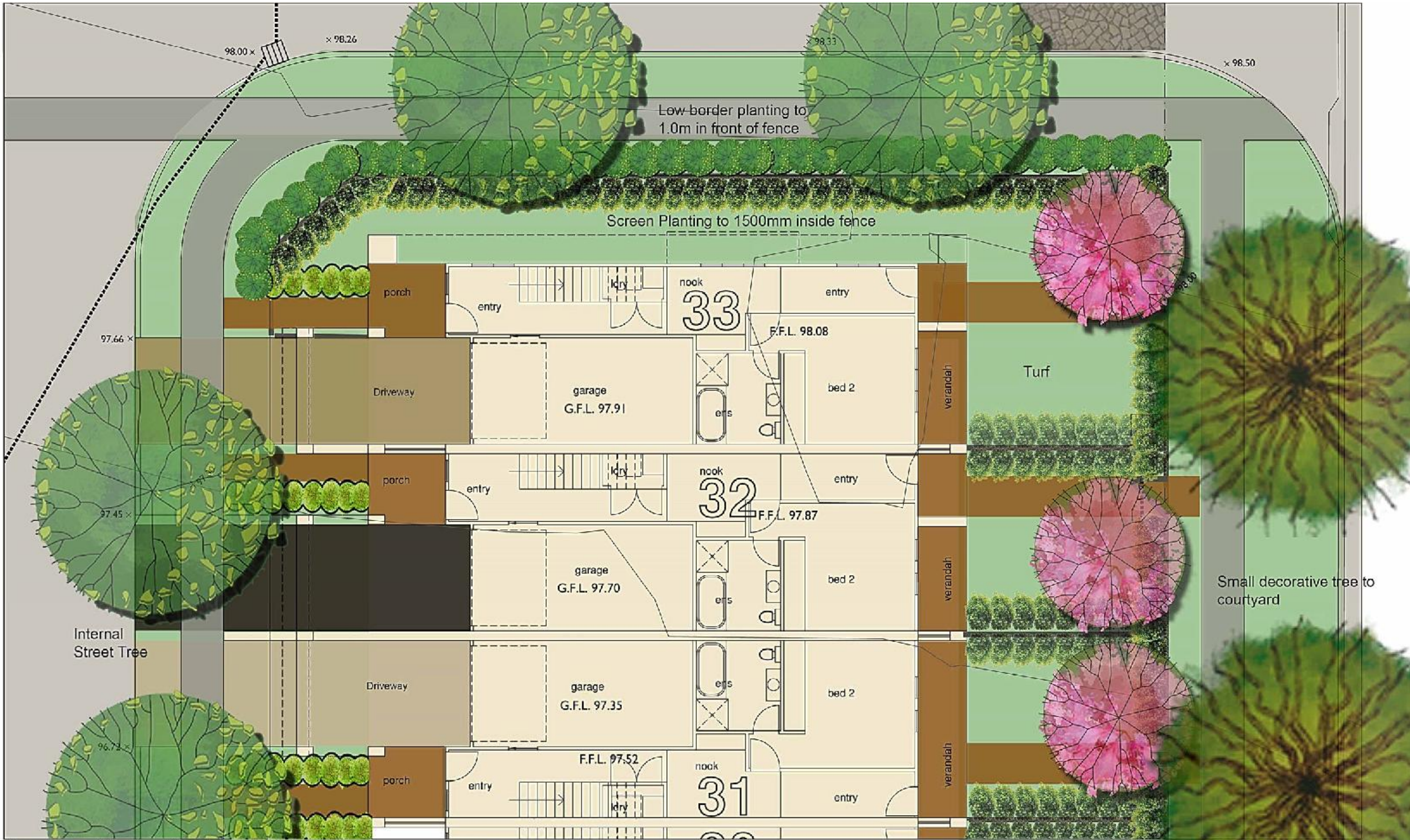

Landscape Concept Plan - Units 31-33
SCALE 1:100

ISSUE	DATE	COMMENTS
-	13.11.13	-

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Landscape Concept Plan - Units 31-33 Kopa Street Elevation (East)
SCALE 1:100

Landscape Concept Plan - Units 31-33 Internal Road Elevation (West)
SCALE 1:100

SCALE
0m 1m 2m 3m 4m 5m

ISSUE	DATE	COMMENTS
A	15.11.13 - 13.11.13	FOR DA

DRAWN: SR | DESIGN: HM | PROJECT NO: 1316
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DRAWING: Landscape Concept Plan - Units 31-33 Elevations

LOCATION: Lots 1,2, & 3 DP 436503, Lots 1,2,3 DP 349377, Lot 4 DP 663765, and Lots 2 & 3 DP 26039, Dudley Road & Kopa Street, Whitebridge

CLIENT: SNL

PROJECT: Proposed Development

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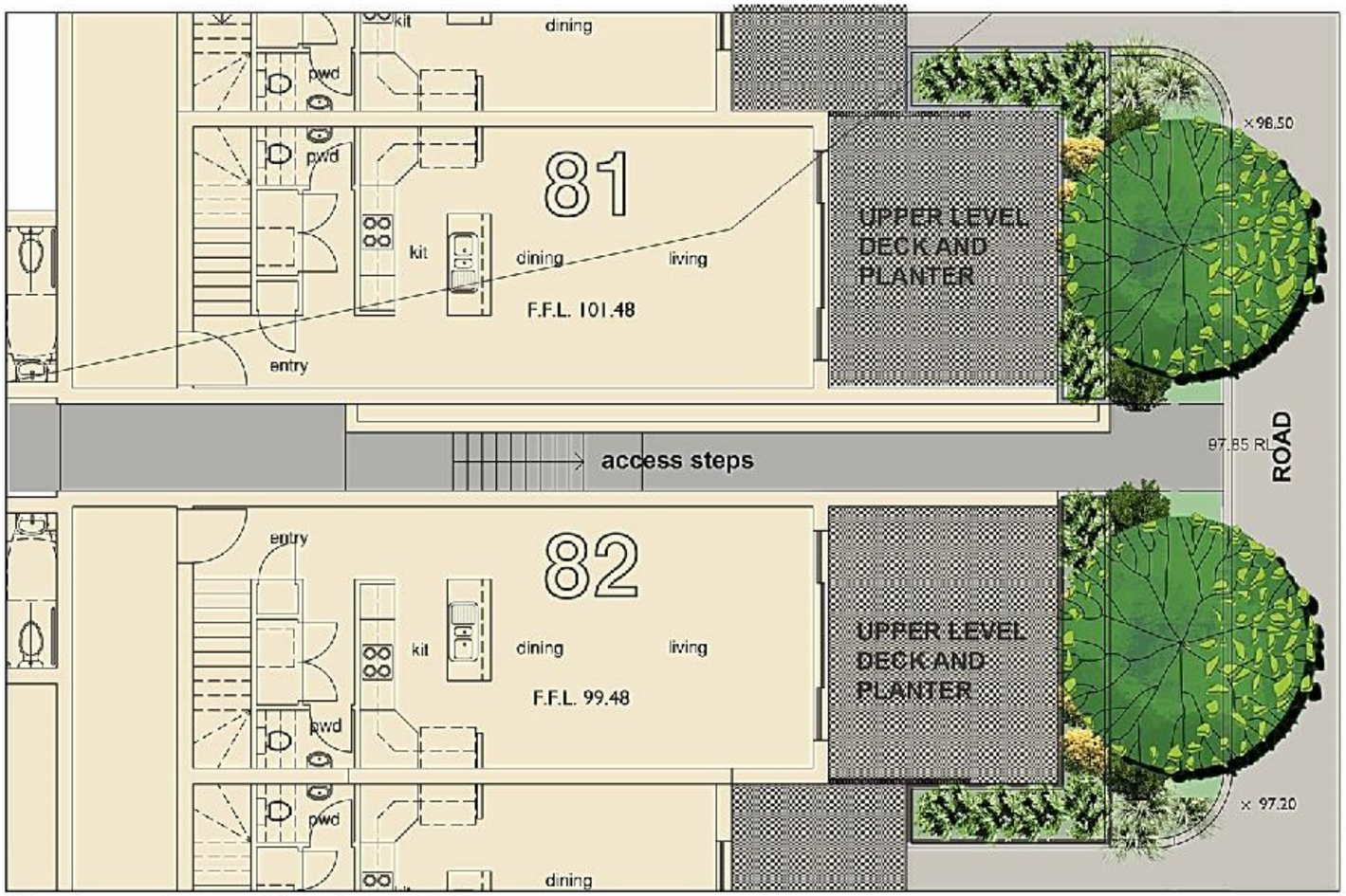
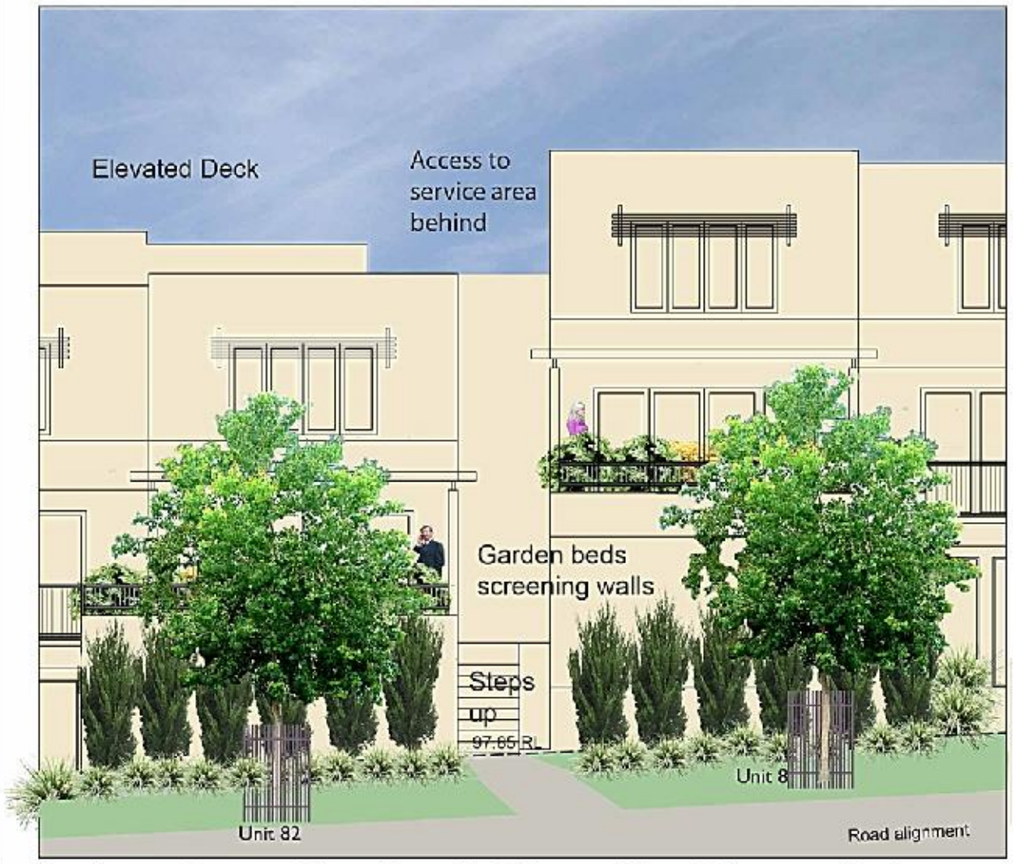


Landscape Concept Plan - Units 81-82
SCALE 1:100



Landscape Concept Plan - Units 81-82 Internal Road Elevation (East)
SCALE 1:100

SCALE
0m 1m 2m 3m 4m 5m

ISSUE	DATE	COMMENTS
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-	13.11.13	-

DRAWN SR | DESIGN HM | PROJECT NO. 1316 | DRAWING Landscape Concept Plan - Units 81-82
CHECKED | SCALE 1:100 @ A3 | DRAWING NO. Sk33 | LOCATION Lots 1,2, & 3 DP 436503, Lots 1,2,3 DP 349377, Lot 4 DP 663765, and Lots 2 & 3 DP 26039, Dudley Road & Kopa Street, Whitebridge
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PROJECT Proposed Development
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