

Attachments 3

Extraordinary Meeting of Council

Notice is hereby given that an Extraordinary Meeting of the Northern Beaches Council will be held at Mona Vale Memorial Hall, 1 Park Street, Mona Vale, on:

Thursday 2 June 2016

Commencing at 6.30pm for the purpose of considering items included on the Agenda.

Copies of business papers are available at the Customer Service Counters at Northern Beaches Council's offices Manly, Pittwater and Dee Why.

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******* END OF ATTACHMENTS *******

**WARRIEWOOD VALLEY SECTION 94 CONTRIBUTION PLAN
AMENDMENT 16, REVISION**

TABLED DOCUMENT



WARRIEWOOD VALLEY SECTION 94 CONTRIBUTIONS PLAN AMENDMENT 16, REVISION 2

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MAY 2016



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Part A: Preamble

Introduction

The Warriewood Valley Release Area (the Release Area) is located in the southern portion of the Pittwater Local Government Area (LGA), bordered by the Ingleside Chase Reserve and Escarpment to the west; Warriewood Wetlands to the south; Warriewood Sewerage Treatment Plant (STP) and the existing suburbs of Warriewood to the east and Mona Vale to the north. The redevelopment of Warriewood Valley commenced in the 1980s and is continuing today.

It is anticipated that at the completion of the Release Area, a total of 2,541 residential dwellings will house approximately 6,618 persons in (based on an average occupancy of 2.7 persons per household, ABS 2011 Census). The housing form includes detached dwelling, attached dwellings and residential apartment buildings.

In addition, the numbers of workers are also anticipated to increase as industrial and commercial uses will continue be accommodated within Warriewood Valley. The industrial and commercial development will be in the form of light industry, industrial units, high quality office units and, possibly, high technology development. The total expected area of industrial/commercial development is 32.68 hectares.

This Plan addresses the public services and facilities that will be required to meet the needs of the future residents and workers of the Release Area. It is anticipated that the population emanating from the Release Area will result in the need for augmented and/or additional:

- Traffic and transport facilities;
- Multi-functional creek line corridors;
- Public recreation and open space;
- Pedestrian and cycle facilities;
- Community Services;
- Library Services;
- Bushfire management facilities; and
- Plan management and implementation.

Under section 94 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) a consent authority is authorised to grant consent to a proposed development subject to a condition requiring the payment of a monetary contribution or the dedication of land free of cost, or both, for the provision of public services and facilities.

This Plan identifies the forecast future demands for public services and facilities generated by the development of the Release Area, the programs of works which will be implemented to meet these demands and the anticipated costs of these programs. Based on these inputs, a contribution rate has been calculated that will enable Council to deliver the infrastructure necessary to meet the forecast demand. The land subject to this Plan is identified in Figure 1.

This Plan has been prepared in accordance with the EP&A Act 1979 and *Planning and Assessment Regulation 2000* (EP&A Regulation) and takes into consideration the principles

of nexus, apportionment and reasonableness. This Plan was first adopted by Pittwater Council on 1 June 1998 and took effect from 11 June 1998. Since this time the Plan has been reviewed 19 times.

The life of this Plan is from 2016/17 to 2021/22 inclusive. This Plan will be monitored and subject to annual reviews to take account of projected growth, the community's needs, cost of local infrastructure and services and progress in providing scheduled works. For this reason the operation period of the Plan may be adjusted to suit.

Background

Development of Warriewood Valley Release Area up to 2008

The Warriewood Valley Release Area comprises approximately 195 hectares in total area and is the most significant urban release area on the Warringah-Pittwater Peninsula since the Forestville/Belrose urban releases of the 1970s.¹

The planning process to facilitate urban development in the Release Area was commenced by Warringah Council in the late 1970s and early 1980s. The rezoning of parts of the northern and southern end of Warriewood Valley for industrial and commercial development (comprising 28.98 hectares of land), with a small component of land zoned for medium density residential development, was undertaken in the mid-1980s. These early rezonings are referred to as Warriewood Valley Stage 1 Release.

In 1991 land in Warriewood and Ingleside was included in the State Government's Urban Development Program (now known as the Metropolitan Development Program). The remaining non-urban sections of the Warriewood Valley Release Area were investigated for their urban potential in conjunction with the Ingleside-Warriewood land release investigations by the newly formed Pittwater Council.

In 1995 Council produced and exhibited a strategy, drawn from a range of environmental and demographic studies, for the release of Ingleside and the remaining land in the Warriewood Valley Release Area known as the Ingleside/Warriewood Urban Land Release Draft Planning Framework 1995. Consultation with the community and various State government authorities highlighted the infrastructure difficulties associated with a land release at Ingleside and the potential regional environmental impacts.

In 1997 the Minister for Urban Affairs and Planning agreed to a restricted land release within Warriewood Valley only, comprising 110 hectares including 3.7 hectares for industrial and commercial development. The area within 400 metres of the Warriewood STP was deferred for future release. Council, in 1997 prepared a strategy to guide development of up to 1510 dwellings in Warriewood Valley known as the Draft Warriewood Valley Urban Land Release Planning Framework 1997.

In 2001, Council, following a decision by Sydney Water to cap the Warriewood STP, produced and adopted a planning strategy for land within the 400 metres of the Warriewood STP known as the STP Buffer Sector Draft Planning Framework 2001. The inclusion of the buffer areas in the Warriewood Valley Release Area resulted in an anticipated development

¹ Total size of the Release Area under the Warriewood Valley Strategic Review Addendum 2014.

of 1886 dwellings in 190 hectares including 32.68 hectares for industrial/commercial development. At the time, it was recognised that another 39.6 hectares located either side of Boondah Road would be subject to further planning investigations.

On 1 September 2008, Council adopted the *Warriewood Valley Section 94 Plan (Amendment 16)* based on the anticipated development of 190 hectares, comprising 1886 dwellings and 32.68 hectares for industrial/commercial development.

Impact of the 2009 Development Contributions Reform

In 2009 the Minister for Planning, responding to the impact of high development costs on new housing supply and the Global Financial Crisis, introduced a Ministerial Direction that limited development contribution rates to \$30,000 per new dwelling/residential lot and \$20,000 per new dwelling/residential lot for greenfield/release areas and existing residential areas respectively. Council was successful in seeking an exemption from the cap enabling a contribution rate up to \$62,100 to be levied for each new dwelling/residential lot in Warriewood Valley (via a new Ministerial Direction issued 10 July 2009). That Direction also required Council to commission an independent review of the Plan.

In October 2009, Hill PDA was commissioned to undertake the review of the Plan. The key findings of the independent review are as follows and have been taken into consideration:

- “1. The Plan’s cost of works are appropriate, and if anything are a modest underestimate (in the order of \$1 million). The underestimate may be a result of Council’s choice of contingencies, design and project management rates. Appropriate contingencies should range between 5 and 10% and a design and project management cost of 15% should be applied (with the exception of the Library Services and Plan Administration and Management Elements). Whilst the application of the CPI is in keeping with DoP guidance, Council may consider the use of the BPI as an appropriate alternative in some circumstances.*
- 2. The Plan should fund 100% of works relating to through traffic routes as these works would not have been required should development within Warriewood Valley have not occurred. Notwithstanding this, it is recommended that 25% of costs are reapportioned from the Plan to the wider community for works within Jacksons Road and 15% of costs for Garden Street (for access improvements to the Centro Warriewood Shopping Centre) to account for ‘external’ regional traffic demands.*
- 3. Council seeks approval from the Minister to secure the library book component of the Library element of the Plan in order to recoup expended funds (demonstrated through a Business Plan) and that contributions are secured within the current \$62,100 cap at the rationalisation of other elements within the Plan.*
- 4. Council will need to manage the administrative and management processes of the Plan so that administration costs in the future amount to no greater than 4% of the total cost of works in the Plan (CPI adjusted). We do not consider it appropriate to apply an NPV to administration costs.*
- 5. The application of the parameters utilised by the Plan’s financial models which are now subject to restrictions due to the Minister’s cap have resulted in a financial risk to Council. The Council should seek to review the Plan and generate a new financial model in accordance with the requirements as set out in the draft Local Government Development*

Contributions Guidelines 2009 utilising a NPV method to manage the cash flow and determine contribution rates.

6. *This independent review concludes that the Warriewood Valley Section 94 Plan could not reasonably be reduced so that it would fall under the \$20,000 threshold advocated by the Minister's Direction."*

Additionally, Hill PDA recommended that:

"Based on the outcomes of this review, as a minimum we recommend that Council takes the third option and seeks the Minister's permission for the Plan to exceed the maximum rate of \$20,000 per equivalent dwelling. To address the full scope of matters identified by this review however, we recommend a number of additional mechanisms are implemented by Council. These mechanisms are summarised, in no set order, below.

1. *Secure the \$62,100 Cap and seeks recoupment of the library books that was forward-funded under the Plan.*
2. *Review the Plan to address the funding shortfall as a result of the \$62,100 cap; and reduce levels of infrastructure provision and scope of works; cost of capital works should identify specific allowances for: the net cost of undertaking the works; escalation costs; co-ordinating contractor (principal contractor) site set-up and site supervision (preliminaries); co-ordinating (principal contractor) margins; design and project management and contingencies ensuring no items are missed, improve accountability and transparency and enable improved budgetary management.*
3. *In conjunction with 2, design and implement a new financial model consistent with the principles set out in the draft Local Government Development Contribution Guidelines 2009 prepared by the DoP.*
4. *Review the development density within appropriate sectors of Warriewood Valley (with the intention of increasing the number of equivalent dwellings that could be developed) may assist in reducing the funding shortfall and so long as any potential increase in density reduces, rather than compounds, the financial shortfall by increasing the need for infrastructure (notably recreation facilities).*
5. *In conjunction with 4, Council should develop and adopt a strategy to encourage rapid completion of the land release as well as addressing incomplete or delayed take up rates known as the 'development tail'."*

On 3 May 2010, Council adopted the *Warriewood Valley Planning Framework 2010* (Planning Framework 2010), resulting in an increase of dwelling density in appropriate sectors and the establishment of a strategy to encourage the take-up rate for development. A total of 2,012 dwellings and industrial/commercial development within 32.68 hectares was now anticipated across the 199 hectares of land.² Concurrently, Council commenced a review of its Plan to account for the new development anticipated under the 2010 Planning Framework including a review of the identified works schedule aimed at reducing infrastructure and services due to the funding shortfall from contributions.

² Total size of the Release Area under the *Warriewood Valley Planning Framework 2010*. This area included residential sectors not yet masterplanned/ rezoned 2(f) under Pittwater LEP 1993. It did not include the 39.6 hectares located either side of Boondah Road, known as the Southern Buffer.

In June 2010 however, a further direction was issued to Pittwater Council capping the contribution rate under the Plan at \$20,000. At the time, the contribution rate had increased to \$71,610 per dwelling/lot. Council subsequently sought an exemption from the cap and a Ministerial Direction was issued on 15 September 2010 enabling Council to levy up to \$62,100 per lot/dwelling. It was acknowledged that the Plan has not been reviewed since 2008 and had not accounted for the additional dwellings that resulted from the 2010 Planning Framework.

On 13 May 2011, the then Minister for Planning and Infrastructure issued a further direction to Council exempting Council from the \$20,000 cap and permitting Council to levy up to \$62,100 per lot/dwelling in Warriewood Valley. The Minister's letter also reminded Council:

"It is expected you will continue with the review of the Contributions Plan as required by the Local Contributions Review Panel in July 2009. Any draft plan should be consistent with the findings of the Review Panel and the Warriewood Valley Study."

Findings of Warriewood Valley Strategic Review 2012

In April 2011, Council, in partnership with the then Department of Planning and Infrastructure (DP&I), undertook a strategic review of all undeveloped lands in Warriewood Valley Release Area following a recommendation by the Planning Assessment Commission (PAC) when it determined a Part 3A application for 14-18 Boondah Road, Warriewood in January 2011. The review was overseen by a probity auditor and informed by a suite of consultant studies. The review resulted in the co-authored Warriewood Valley Strategic Review Report 2012 (Strategic Review Report 2012).

Critically, the review was informed by an economic feasibility study, the Warriewood Valley Economic Feasibility Study.³ Assuming a contribution amount of \$50,000 per lot/dwelling (\$2011/12), the study found that:

"Low density residential (i.e. small lot housing and townhouse dwellings) generally offer better viability given the lower construction cost and sale values. As a rule of thumb, for small lot housing and townhouse development (above ground parking), minimum dwelling density thresholds should be at 30 dwellings per hectare."⁴

Based on this advice, the Strategic Review Report 2012 recommended increasing the density of certain undeveloped lands to 32 dwellings per hectare, whilst reducing the contribution rate to \$50,000 per dwelling/lot. The Strategic Review Report 2012 was endorsed by the Director-General of the then DP&I in May 2013 and was subsequently adopted by Council on 12 June 2013. The strategy forecast a total of 2,510 dwellings and 32.68 hectares of industrial/commercial development across potentially 199 hectares of land. Council was advised that with the exception of the Community Facilities element (which would involve an extension to the existing facility rather than replacement), the cumulative impact of the additional dwellings resulting from the increase in density and additional infrastructure commensurate with the added dwellings, and the revised contribution rate starting at \$50,000 (base year 2011/12) to be indexed annually would not impact Council's

³ Hill PDA (2011).

⁴ Ibid, 28.

ability to deliver the remaining infrastructure. In adopting the Strategic Review Report, a subsequent review of the Section 94 Plan was earmarked as a priority. Following the adoption of the Strategic Review Report in June 2013, work commenced to revise and update the Section 94 Plan.

In 2014, in finalising the review of the Section 94 Plan, Hill PDA was requested to review their advice from 2012 to ensure this was still current. HillPDA revised their initial recommendation, recommending that a rate of \$55,000 (\$2011/12) would be viable in light of significant improvements in the residential market in the period since their original advice had been prepared.

Findings of *Warriewood Valley Strategic Review Addendum Report 2014*

In 2014 a review of the undeveloped properties not afforded a dwelling yield or planning direction under the Strategic Review Report was completed by Council. This review, known as the *Warriewood Valley Strategic Review Addendum 2014* (Addendum Report 2014), confirms those properties capable of development opportunity and refined the Release Area boundary. This resulted in an additional 17 dwellings being expected within the Release Area.

A total of 2,451 dwellings are now anticipated in Warriewood Valley, having accounted for those sectors unlikely to develop to its maximum permissible density where environmental or other constraints exist. Based on the expected number of dwellings, the total population anticipated in Warriewood Valley is 6,618 people (based on household occupancy rate of 2.7 persons per dwelling).⁵ Industrial/commercial development will occur on 32.68 hectares of land already zoned for this purpose.

Following the completion of the Strategic Review Report 2012 and Addendum Report 2014, a major review of the *Warriewood Valley Section 94 Contributions Plan (Amendment 16)* was undertaken by Council. Based on the findings of both studies, the Plan was revised with a residential contribution rate commencing at \$55,000 (\$ 2011/12). A contribution rate for commercial and industrial development was derived from this rate.

Exemption from section 94 cap

On completion of the Warriewood Valley Strategic Review and the review of the *Warriewood Valley Section 94 Contributions Plan* (revision known as Plan No 15, Amendment No 16, Revision 1), the Minister for Planning and Environment issued a further section 94E direction on 22 February 2015 revoking the earlier direction of 13 May 2011.

This revocation direction effectively permits Council to levy beyond the previous cap of \$62,100 per new lot/dwellings in Warriewood Valley. The earlier section 94E direction exempting the Plan from the \$20,000 cap remains in force.⁶

⁵ Australian Bureau Statistics 2011, *2011 Census*.

⁶ Section 94E Direction issued 28 August 2012.

Cessation of certain elements

Sufficient funds have been collected to fund the works associated with certain elements of this Plan, namely the provision of public library facilities, bushfire protection works and Apollo Street facilities. As such, contributions toward these elements are no longer required. Works associated with the provision of public library facilities, bushfire protection works and Apollo Street facilities have already been completed (refer to Appendix A), while works associated with provision of bushfire protection infrastructure are still to be completed (refer to Appendix B).

Works associated with the Ponderosa Parade Precinct were forward-funded in 1990 to facilitate development of the Stage 1 Release (refer to Appendix A). Contributions attributed to the Ponderosa Parade Precinct works are still being collected.

Summary elements within the Works Schedule

This plan has adopted only one works schedule made up of the following elements:

- Traffic and transport,
- Multi-functional creek line land acquisition,
- Multi-functional creek line works,
- Public recreation and open space,
- Pedestrian and cycleway network,
- Community facilities,
- Bushfire protection, and
- Plan management and implementation.

Each element contains a list of the proposed works items. Further information on the works schedule, including cost estimates of each proposed works item is provided in Appendix B.

Summary of the remaining expenditure

The works to be provided by funds generated by this Plan are summarised in Table 1.1. Refer to Section 3.0 for more detail on each plan element. The individual projects and timing is specified in the works schedule at Appendix A.

Table A: Summary of works schedule

Element	Remaining expenditure (\$2016/17)
Traffic and transport	\$21,985,506
Multi-functional creek line corridor (rehabilitation works)	\$8,026,344
Multi-functional creek line corridor (land acquisition)	\$3,553,393
Public recreation and open space	\$24,434,973
Pedestrian and cyclist network	\$2,249,957

Community facilities	\$7,697,831
Bushfire protection	\$493,312
Administration and plan management	\$1,026,620
Total	\$69,467,936

Summary of contribution rates by development type: 2016/17 to 2021/22

Table B: Summary of contribution rates by development type

Development type	Contribution rate 2016/17	Contribution rate 2017/18	Contribution rate 2018/19	Contribution rate 2019/20	Contribution rate 2020/21	Contribution rate 2021/22	Unit
Residential	\$63,760	\$65,673	\$67,643	\$69,672	\$71,763	\$73,915	per dwelling
Business Parks and Industrial Estates (outside of Ponderosa Parade)	\$142.07	\$146.33	\$150.72	\$155.24	\$159.90	\$164.69	per square metre
Business Parks and Industrial Estates (within Ponderosa Parade)	\$193.53	\$199.34	\$205.32	\$211.48	\$217.82	\$224.36	per square metre

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Part B: Management of the Plan

1.0 Introduction

1.1 Name of this Plan

This Plan is called the *Warriewood Valley Release Area Section 94 Contributions Plan (Amendment 16, Revision 2)*.

1.2 Purpose and objectives of this Plan

The primary purpose of this Plan is enable Council to levy payment of a monetary contribution, a dedication of land, or, in lieu thereof, to accept the provision of material public benefits (including the dedication of land) or the carrying out of works in kind, towards the provision, extension or augmentation of services and facilities that will, or are likely to be, required as a consequence of development in Warriewood Valley.

Accordingly the objectives of this Plan are to:

- Provide the framework for the efficient and equitable determination, collection and management of development contributions towards the provision of services and facilities;
- Ensure that adequate public services and facilities are provided as part of any new development within a reasonable timeframe;
- Ensure that the existing Pittwater community is not unreasonably burdened by the provision of public infrastructure required (either fully or in part) as a result of the ongoing development and re-development of Warriewood Valley;
- Provide an overall strategy for the co-ordinated delivery of services and facilities consistent with Council's strategic intent;
- Provide a comprehensive and transparent strategy which is implemented for the assessment, accounting and review of development contributions made under Section 94 of the EP&A Act and EP&A Regulation for Warriewood Valley Release Area; and
- Indicate a program of works and expenditure for the provision of public services and facilities required as a result of development.

1.3 When does this Plan commence?

This takes effect from the date on which public notice was published (pursuant to clause 31(4) of the EP&A Regulation).

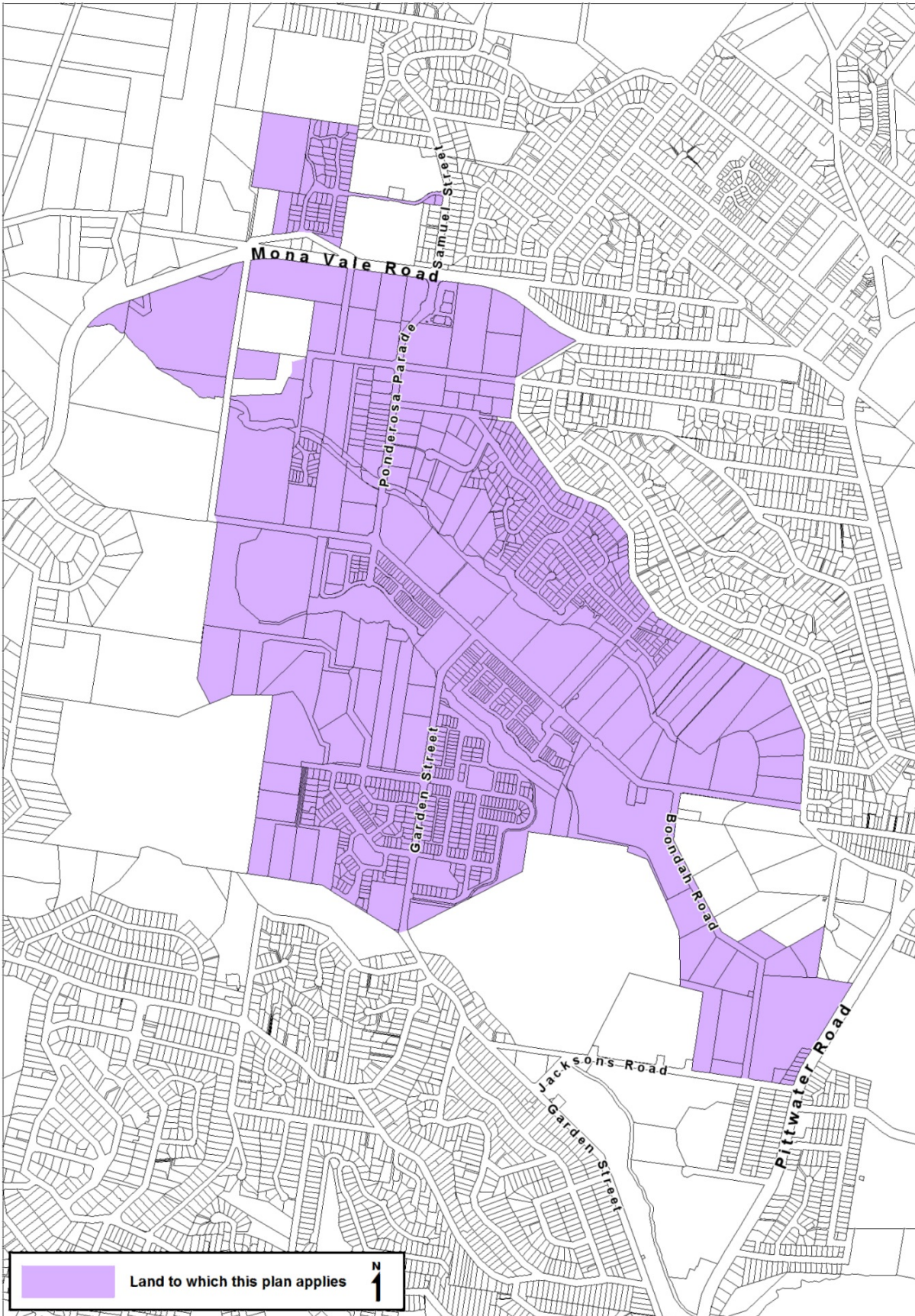
Development applications determined on or after this date will be subject to the provisions of this Plan.

1.4 Land to which this Plan applies

This Plan applies to land within and adjacent to the Warriewood Valley Release Area, as identified in Figure 1. This land is referred to in this Plan as the Warriewood Valley catchment.

As certain properties outside of the Release Area directly access the Warriewood Valley road network and therefore place a demand on the amenities, facilities and services provided for under this Plan, Council will also levy development that occurs on this land.

Residential development on land outside of the Warriewood Valley catchment is subject to a separate contributions plan – refer to the *Pittwater Section 94 Contributions Plan for Residential Development 2015*.

Figure 1: Land to which this plan applies

1.5 Development to which this Plan applies

This Plan applies to all residential, commercial and industrial development that would result a commensurate increase in demand for infrastructure and services of the type provided for by this Plan. This includes:

- Residential development, including land subdivision, which would result in the creation of additional private lots/dwellings,
- Commercial and light industrial development within areas designated for such development,
- Other commercial development within areas designated for residential development.

Where development is of a type not specifically stated in this Plan that will result in demand for local infrastructure and services, Council will determine an appropriate contribution rate based on the rates specified in this Plan.

1.6 Operation period of this plan

This Plan provides an administrative framework for the provision of local infrastructure and services up to the end of the 2020/21 financial year.

This Plan will be monitored and subject to annual reviews to take account of projected growth, the community's needs, cost of local infrastructure and services and progress in providing scheduled works. The projects identified this Plan will be undertaken as funds become available, with section 94 contributions pooled with other Council funding sources and where available, grant funding sources. For this reason the operation period of the Plan may be adjusted to suit.

1.7 Relationship with other plans and policies

This Plan repeals and replaces the *Warriewood Valley Section 94 Contributions Plan – Plan No. 15 (Amendment 16) (Revision 1)* adopted by Council on 15 December 2014.

This Plan is consistent with Council's adopted strategic framework for the Warriewood Valley Release Area and complements *Pittwater Local Environmental Plan 2014*, *Pittwater 21 Development Control Plan*, *Warriewood Valley Landscape Masterplan and Design Guidelines (Public Domain) May 2016* and *Warriewood Valley Roads Masterplan May 2016*. However, developers and owners should check all relevant Council plans and policies for further information and development standards that may relate to their site.

1.8 Savings and transitional arrangements

A Development Application lodged prior to this Plan being adopted and not yet determined will be determined in accordance with the Section 94 Contributions Plan in force at the date of determination of the Development Application. This criterion applies notwithstanding the date of lodgement of the Development Application.

1.9 Definitions

The definitions relating to this Plan not stated below have the same definition as those contained in the Council's LEP and DCP.

Applicant means the person, company or organisation submitting a Development Application.

ABS means the Australian Bureau of Statistics.

Base year refers to 2011/12 when the major review of this Plan was completed.\

Contribution means the dedication of land, the making of a monetary contribution or the provision of a material public benefit, as referred to in Section 94 of the EP&A Act.

Council means Pittwater Council.

CPI^(A) means the All Groups Consumer Price Index (Sydney) as published by the Australian Bureau of Statistics.

CPI^(F) means the forecast CPI (June on June) as published by BIS Shrapnel Economic Forecast.

DCP means a Development Control Plan adopted by Council.

Embellishment means the enhancement of any public facility provided by the council by the provision of services, facilities or works.

EP&A Act means the Environmental Planning and Assessment Act 1979, as amended.

EP&A Regulation means the Environmental Planning and Assessment Regulation 2000, as amended.

LEP means a Local Environmental Plan made by the Minister under Section 70 of the EP&A Act.

LGA means the Pittwater Local Government Area.

Planning agreement means a planning agreement referred to in Section 94 of the EP&A Act 1979.

SEPP Seniors Living means SEPP (Housing for Seniors and People with a Disability) 2004.

Works Schedule means the schedule of public facilities and services for which Section 94 contributions may be required. It also includes the likely timing of provision of those public facilities based on projected rates of development.

Where a definition is not contained in this Plan, the LEP or DCP then the following documents, in order of preference, shall be used to determine the meaning of the word.

1. The EP&A Act;
2. The RP&A Regulation;
3. Other Acts and Regulations of the NSW Parliament; and
4. The latest edition of the Macquarie Dictionary.

2.0 Administration and operation of this Plan

2.1 How does this Plan operate?

Section 94 of the EP&A Act permits a consent authority to levy developers to provide or assist in providing new public facilities and services required as a result of new development. The mechanism to require the contribution is through the development assessment or complying development process.

In determining a development application or issuing a complying development certificate, a consent authority may impose a condition of development consent requiring the payment of a monetary contribution, dedication of land and/or works in kind, in accordance with the provisions of this Plan.

This Plan identifies the contribution rate applicable to various forms of development and the infrastructure that will be delivered via developer contributions under this Plan.

The parameters and assumptions used to calculate the contribution rate and the future works schedule are dynamic. As a result, this Plan will be reviewed periodically.

Contributions made under this Plan are monitored and managed by a financial model developed by Council. Information on the contributions received, and details of how these contributions have been applied toward the provision of infrastructure described in this Plan, will be reported in Council's annual financial statement. A register of contributions received under this Plan will also be maintained and made publicly available on request.

2.2 Section 94E Direction

This Plan is exempt from the monetary contributions cap imposed by the then Minister for Planning and Infrastructure on 28 August 2012 issued under section 94E of the EP&A Act.

This Plan was previously capped at \$62,100 per dwelling/lot,⁷ however on 22 February 2015 this Ministerial Direction was revoked by the Minister for Planning and Environment. This revocation direction effectively permits Council to levy beyond the previous cap of \$62,100 per new lot/dwellings in Warriewood Valley.

2.3 How will contributions be imposed?

In accordance with the EP&A Act, section 94 contributions under this Plan will be imposed as a condition of development consent or as a condition on a Complying Development Certificate.

⁷ Ministerial Direction issued 13 May 2011.

2.4 How is the contribution amount calculated?

2.4.1 Attributes of the financial model

This Plan utilises a future cash flow model to calculate the contribution amount. The purpose of the financial model is to provide Council with a tool to calculate developer contributions and to allow Council to test the impact of changes to key assumptions to inform its decision making processes over the life of the plan.

Council's contributions model matches future estimated income streams against future estimated infrastructure and land acquisitions, applying assumptions on anticipated investment return on funds held in reserve and movements in forecast CPI^(F). The model aims to achieve an overall annual balanced financial position throughout the life of the Plan in order to minimise financial risk to Council.

Income

The model calculates estimated income based on projected development over the remaining timeframe multiplied by the applicable contribution rate. For residential development, the model calculates contributions on a per dwelling/lot basis. For commercial/industrial development, contribution rates are calculated on a square metre basis, utilising the total developable area of the site (total site area minus any creek line corridor land).⁸

The contribution rate is indexed annually from the base year (2011/12). As discussed previously in Part A, based on the findings of the Strategic Review Report 2012, this Plan has adopted a base residential rate of \$55,000 (\$2011/12). A contribution rate for commercial and industrial development was then derived from the adopted residential rate based on the infrastructure demand generated by this form of development. For industrial and commercial development the base contribution rate is \$121.65 and (excluding contributions toward Ponderosa Parade) and \$166.05 (including contribution toward Ponderosa Parade) (\$2011/12).

The index rate applied is an average of forecast annual CPI^(F). The indexation rate used for 2012/13 to 2015/16 was 2.77%. Due to changes in the forecast CPI^(F), the indexation rate for 2016/17 to 2021/22 a rate of 3% has been modelled.

For the purpose of anticipating investment return, the model estimates interest based on the prior year's cumulative closing balance multiplied by an estimated annual interest rate.⁹

Expenditure

The plan has adopted a singular works schedule. The model consolidates all proposed works items into one overall summary plan to enable Council to obtain an overall picture of land acquisition, works and plan management costs across the life of the plan. For the purpose of indicating how funds will be

⁸ Creek line corridor land is defined as the area of land 25 metres from the creek centreline.

⁹ BIS Shrapnel Economic Forecast.

allocated, the model groups expenditure in elements. Further information on the works schedule including more detailed cost estimates is provided in Appendix B.

For works, Council's approach to cost estimation is to seek professional cost estimates (internal and external). Cost estimates are formulated on the basis of design, material costs, contract costs, build costs and associated project management costs and where possible are based on current IPART benchmark costs for infrastructure. The last review of works costs was undertaken in 2015/16.

For land acquisition costs, estimates are sought from independent land valuers. Land acquisition costs are indexed in the same manner as infrastructure works. Valuations of creekline corridor land were last undertaken in June 2015, while valuations for active open space acquisition were undertaken in February 2016.

The model calculates estimated future expenditure by indexing the budgeted expenditure to the projected year of expense, resulting in future year dollar expenditure. The indexation is applied annually from the year following the latest expenditure review date.

For works and land acquisition the indexation rate used is 4.125%. This figure represents an average of the forecast NSW Public Works Building Price Index (BPI) between 2013 and 2016,¹⁰ plus a 1% allowance for risk in cost inflation.

Initial cost estimates and land valuations prepared for the purposes of this Plan will be reviewed on an annual basis.

2.4.2 Apportionment between different development types

The model recognises that different development types have different demand for infrastructure. The contribution rate applying to different development types has been calculated based on the expected demand for infrastructure generated by the particular form of development. This approach ensures that contribution rates for all forms of development are equitable and reasonable.

Land in the Warriewood Valley Release Area is zoned for a variety of land uses, including R3 Medium Density Residential, IN2 Light Industrial and B7 Business Park. This Plan recognises that different development types create different demand for infrastructure. As such, the requirement to contribute to the range of infrastructure planned to be delivered under this Plan, varies depending form and location of the proposed development. This requirement has been determined on the basis of the demand likely to be generated by the proposed development.

Table 1 below outlines the development required to contribute toward each infrastructure element. As shown in Table 1, certain development types do not contribute toward particular elements as it is considered that there is no reasonable nexus between the development and the infrastructure need to require a contribution toward these elements. Contributing development types

¹⁰ NSW Public Works (2013) *Building Price Indices*.

are discussed in further detail in the proceeding chapters in relation to each plan element.¹¹

In addition, for particular plan elements, a specific adjustment is undertaken in recognition of the different level of demand generated by different forms of development. These adjustments are undertaken for the traffic and transport element and the pedestrian and cyclist network element. This is discussed in further detail below.

Table 1: Summary of contributing development

Element	Development Type			
	Residential Development	SEPP Seniors Living	Business Parks and Industrial Estates	Commercial -Other
Traffic and transport	✓ *	✓ *	✓	<i>To be determined by Council based on infrastructure demand likely to be generated by the development</i>
Multi-functional creek line corridors	✓	✓	✓	
Community facilities	✓	✓	✗	
Public recreation and open space	✓	✓	✗	
Pedestrian and cycleway network	✓ *	✓ *	✓	
Ponderosa Parade drainage	✗	✗	✓ **	
Administration & plan management	✓	✓	✓	✓

* Except development in Sectors 20, 202 & 203.

** Only development in Sectors 7, 102, 103, 104 and 105.

Calculation of contribution toward Traffic and Transport element

The contribution toward the Traffic and Transport element for each development type is determined utilising the relevant trip generation rate as published by the NSW Roads and Maritime Services (RMS).¹²

Based on the prevailing residential rate for Traffic and Transport an adjustment is applied to ascertain a contribution rate for other development types.

¹¹ Refer to Part D: Strategies to Provide Public Facilities and Services.

¹² NSW Transport (2002) *Guide to Traffic Generating Developments*; NSW Transport (2013) *Technical Direction TDT 2013/04a*.

As the majority of development within the Warriewood Valley Release Area is expected to be residential, a base rate of 9 vehicle movements per day per dwelling (the RMS standard for a single residential dwelling) has been adopted with no adjustment being applied. For other forms of development, an adjustment factor has been applied to ensure an equitable contribution rate is levied for different development types (Table 2 below outlines this adjustment methodology).

Table 2: Calculation of contribution toward Traffic and Transport element

Development Types	RMS Trip Generation Rate (vehicles movements per day)	Adjustment Factor (as a % of the prevailing residential contribution toward Traffic and Transport)*
Residential (base)	9 per dwelling	No adjustment
SEPP Seniors Living developments:		
Independent living dwellings	5 per dwelling	$5/9 \times 100 = 55\%$
Assisted living residences		
(i) Serviced self-care housing	2 per dwelling	$2/9 \times 100 = 22\%$
(ii) Residential care facilities/Nursing homes	0.64 per dwelling	$0.64/9 \times 100 = 7\%$
Industrial and commercial (business parks and industrial estates)	4.6 per 100 sqm (or 18.4 per 400 sqm)*	$18.4/9 \times 100 = 204\%$
Commercial - other	To be determined based on RMS Guidelines.	-

* For the purpose the calculation, this Plan adopts an average lot size of 400 m² for a single dwelling, based on an average density of 25 dwellings per hectare across the Release Area.

Calculation of contribution toward Pedestrian and Cyclist Network

This Plan recognises that although commercial and industrial development will generate a need for Pedestrian and Cyclist facilities, this demand will not be to the same magnitude as residential development. As planning authorities within New South Wales have not yet established direct ratios for generation and provision of pedestrian and cyclist facilities for users of commercial and industrial areas, Council has applied an adjustment based on daily utilisation.

It is considered that while residents have access to pedestrian and cyclist facilities 7 days a week, generally workers within commercial and industrial developments will only have access to these facilities 5 out of 7 days a week (71% of the week). Given their reduced call on the provision of these facilities, commercial and industrial developments will be levied at 71% of the residential contribution toward this element.

2.5 When are the contributions payable?

Council's policy in relation to the timing of payments of monetary contributions required under this Plan is as follows.

2.5.1 Developments involving Land Subdivision only

Payments are required under this Plan prior to the issue of any Construction Certificate for the carrying out of any subdivision works; or prior to the issue of the Subdivision Certificate where no Construction Certificate is required, including excavation.

Where the land subdivision works will create a lot to accommodate multiple dwellings being constructed on this lot, and the actual quantum of dwellings is unknown (i.e. not part of the development consent for the land subdivision), the Section 94 contribution is not to be applied to this lot at this time. The contribution must be applicable at the time when Council consents to the actual number of dwellings to be constructed on this lot.

2.5.2 Other Developments that require a Construction Certificate

All other developments, including the construction of multiple dwellings on a single parcel of land, monetary contributions required under this Plan will be payable prior to the issue of any Construction Certificate for the development, including any excavation.

2.5.3 Developments involving both Subdivision and Building Works

Payment is to be made before the release of a Construction Certificate or Subdivision Certificate, whichever occurs first.

Where the land subdivision works will create a lot to accommodate multiple dwellings being constructed on this lot, and the actual quantum of dwellings is unknown (i.e. not part of the development consent for the land subdivision), the Section 94 contribution will not be applied to this lot at this time. The contribution will be levied at the time when Council consents to the actual number of dwellings to be constructed on the lot.

2.5.4 Other developments not requiring the issuing of a Construction Certificate

Payment is to be made prior to the issuing of the first Occupation Certificate or commencement of the use, whichever occurs first.

2.4.5 Staged developments

Where a development is proposed to take place in stages, in order to provide certainty in cash-flow and minimise risk, Council will require the payment of

contributions to coincide with the proposed staging, requiring payment of the relevant contributions prior to the issue of any Construction Certificate or Subdivision Certificate (whichever occurs first) for each stage.

2.6 How are the contributions to be paid?

The EP&A Act provides that development contributions may be met by payment of a monetary contribution, the dedication of land, the carrying out of works in kind or the provision of a material public benefit or any combination of these methods. Each of these methods is considered a form of payment. Any agreement by Council to accept non-monetary contributions will not alter the total calculated contribution payable and no amendment to the contribution condition to reduce the calculated amount will be made. The method of satisfying a contribution does not change the obligation to make the contribution.

2.6.1 Monetary contribution

The usual means of satisfying a condition of consent requiring a section 94 contribution is via a monetary contribution. Payment must be in the form of cash, debit or credit card, or bank cheque. Personal and company cheques or direct debit are not accepted.

2.6.2 Planning Agreement

An Applicant may choose to negotiate a planning agreement with Council under Sections 93C to 93L of the EP&A Act. This agreement may involve a proposal to dedicate land, carry out works in kind and/or provide a material public benefit.

Contributions through a planning agreement may be additional to or in lieu of paying a contribution in accordance with a condition of development consent authorised by this Plan. This will be a matter for negotiation with Council. The offer to enter into the planning agreement, together with a copy of the draft agreement should accompany the relevant Development Application or Planning Proposal.

Section 93G(1) and (2) of the EP&A Act and clause 25D(1) of the EP&A Regulation requires a draft planning agreement to be exhibited concurrently with a Development Application or a Development Control Plan. In order to satisfy these criteria, the applicant must notify Council of their preference to negotiate any non-monetary payment of development contributions prior to the lodgement of any Development Application.

If the Council does not agree to enter into the planning agreement, it may grant consent subject to a condition authorised by this Plan requiring the payment of a contribution.

Planning Agreements involving land dedication

Where a planning agreement involves the dedication of land to Council, the estimated value of the land will be negotiated as part of the planning agreement, taking into account the unique characteristics of the land and the circumstances of the transfer, including but not limited to:

- The extent to which development potential has been lost or retained, wholly or partly,
- Whether the land has been identified by any adopted policy of Council including, but not limited to this Plan. However, in the case of land not targeted in this plan, Council will also assess the potential impact on the achievement of the identified works schedule,
- The size, shape, location, accessibility and topography of the land proposed to be dedicated,
- Whether the land adjoins an existing area of open space and can be readily consolidated into that area and/or if the land will create or improve accessibility within the area,
- Any factors which may affect the usability of the land such as soil condition, flood liability, possible site contamination, public accessibility and safety, proximity to existing uses, current use of the land, cost of embellishment or construction of the proposed facility, impact on this Plan's works schedule, measures required to fence and maintain the land in the event that works cannot be carried out for some time, and the like,
- The degree to which the identified land can satisfy the purpose for which the contributions has been sought, and
- The on-going costs to Council of care, control and management both prior to and after any improvement works are carried out on the land.

2.6.4 Works in Kind and Material Public Benefit Agreements

Council may accept an offer by the applicant to provide an 'in-kind' contribution (i.e. the applicant completes part or all of a work identified in the Plan) or through provision of another material public benefit (other than the dedication of land) in lieu of the applicant satisfying its obligations under this Plan. Council is under no obligation to accept works in-kind or a material public benefit offer and in considering any such offer, will assess the benefits to Council and the community.

In accepting material public benefits other than a work in-kind, Council must be satisfied that the offer provides a substantial benefit to the community not envisaged by the Plan and that this benefit warrants Council accepting responsibility in fulfilling the intent of the Plan notwithstanding a reduction in expected cash contributions.

A work in-kind relates to the undertaking of works of a specific or equivalent work specified in the Plan, and is therefore more readily capable, in comparison to other material public benefits, of providing benefit to the community.

Council may review the valuation of works and may seek the services of an independent person to verify the costs. All proposals must be formally agreed to by Council and documented in a formal written agreement under the EP&A Act. The cost of verifying the cost of works and preparing the agreement will be at the expense of the Applicant.

2.7 Adjustment of contribution of time of payment

To ensure that the value of the contribution is not eroded over time, Council will update the contribution amount at time of payment to account for movements in CPI^(A).

Contributions required as a condition of development consent will be adjusted at the time of payment in accordance with the latest CPI^(A) as published quarterly by the Australian Bureau of Statistics, using the following formula:

$$\text{Contribution at time of payment} = C \times \frac{\text{CPI}^1}{\text{CPI}^2}$$

Where:

- C = The original contribution amount as shown on the development consent.
- CPI¹ = The CPI (Sydney – All Groups) as published by the ABS for the financial quarter at the time of payment.
- CPI² = The CPI (Sydney – All Groups) as published by the ABS for the financial quarter at date of issue of development consent.

2.8 Can deferred or periodic payments be made?

Deferred or periodic payment of monetary Section 94 contributions may be permitted in certain circumstances subject to consideration of a written application to Council before the payment is due.

Any agreement to defer or periodically pay monetary contributions will generally be limited to 12 months from the standard payment date. In deciding whether to allow deferred or periodic payment of a monetary contribution, Council will take into consideration the following matters:

- The reasons provided by the applicant requesting a deferred or periodic payment;
- Whether prejudice will be caused to the community deriving benefit from the services being provided under this Plan;
- Whether allowing the deferred or periodic payment is likely to prevent the public services and facilities being provided to meet the demands of development in a timely manner;
- Whether the applicant can provide Council with adequate security to mitigate any risk in relation to the deferred or periodic payment; and
- Any other circumstance considered relevant by Council.

If Council decides to accept deferred or periodic payment, it will require the applicant to provide a bank guarantee subject to the following:

- The bank guarantee must be in Australian dollars from a major Australian trading bank and in the name of Pittwater Council,
- The bank guarantee must have no end date, be unconditional and irrevocable and be in favour of Pittwater Council,

- Interest will apply to the contribution and will be calculated from the date the contribution was due until the date of payment and will compound quarterly,
- The interest rate is to be determined by Council based on prevailing bank bill market rates of up to 12 months,
- The bank will guarantee an amount equal to the total contribution, or the outstanding contribution, plus the interest that would be accrued over the deferral period, plus any charges associated with establishing or operating the bank security,
- The bank must pay the guaranteed sum without reference to the applicant or landowner or any other person who provided the guarantee, and without regard to any dispute, controversy, issue or other matter relating to the development consent or the carrying out of development,
- The bank's obligations are discharged when payment to Council is made in accordance with this guarantee or when Council notifies the bank in writing that the guarantee is no longer required, and
- Council is also entitled to claim any charges associated with establishing or operating the bank security. The applicant is to be provided with the details of any such expenses.

If Council agrees to deferred or periodic payments, arrangements relating to the payment will not take effect until the applicant has entered into a formal written agreement with Council reflecting the terms of the approval. The costs of preparing such an agreement will be paid for by the applicant.

2.9 Obligations of accredited certifiers in issuing certificates

2.9.1 Construction Certificates

In accordance with Clause 146 of the EP&A Regulation, a certifying authority must not issue a Construction Certificate for building work or subdivision work under a development consent unless it has verified that each condition requiring the payment of monetary contributions has been satisfied.

In particular, the certifier must ensure that the applicant provides a receipt(s) confirming that contributions have been fully paid and copies of such receipts must be included with copies of the certified plans provided to Council in accordance with clause 142(2) of the EP&A Regulation.

The only exceptions to the requirement are where a work in kind, material public benefit and/or dedication of land arrangement has been agreed by Council. In such cases, Council will issue a letter confirming that an alternative payment method has been agreed with the applicant.

2.9.2 Complying Development Certificates

An accredited certifier must ensure that a condition is imposed regarding the payment of a Section 94 contribution, in accordance with Part 7 of the EP&A Regulation.

If an accredited certifier fails to comply with this requirement, Council may impose the necessary condition on the Complying Development Certificate and it has effect as if it had been imposed by the accredited certifier.

2.10 Section 96 Modifications to Development Consents

Any subsequent Section 96 modification to an issued development consent does not alter the original date of consent. Any formal application to modify a development consent that will alter the contributions due and payable will be taken to authorise a change to the development contributions consent condition(s).

As outlined below, the procedure is different depending on whether the original contribution has, or has not, been paid.

2.10.1 Where the Original Contribution has not been paid

If the contribution levied on the original consent has not yet been paid, the contributions are recalculated in their entirety. The revised consent condition will replace the original condition.

2.10.2 Where the Original Contribution has been paid

If the contribution levied on the original consent has been paid, the procedure is different since it is not reasonable to apply the CPI inflation to that part of the contribution which has been paid. Given that payment generally occurs at the release of the Construction Certificate, it is also likely that the development will be under construction.

In these circumstances, the development for which contributions have been paid is considered to be the existing (under construction) development. This approved development will be credited as the existing development for the purposes of the recalculation.

The proposed amendments are the proposed development and only the net additional contribution is charged at the current CPI. In this circumstance an additional condition will be inserted alongside the original condition because the additional contribution does not supersede or obviate the obligation to pay the original contribution.

No refunds will be provided as all contributions are committed to Council's works schedule.

2.11 Exemptions for Certain Types of Development

Certain types of development are exempt from the requirement to make a contribution towards provision or improvement of facilities or services. These types of development are listed below. Council acknowledges that these development types provide a public benefit that outweighs the increase in demand for services generated by the new population. This Plan does not apply to the following types of development:

- Secondary dwellings are exempt in accordance with Council's resolution of 20 October 2008.

- For the purposes of local infrastructure under this Plan or another contributions plan prepared under Section 94B of the EP&A Act;
- That in the opinion of Council does not increase the demand for the categories of local infrastructure addressed by this Plan; and
- For which Section 94 contributions will not be levied in accordance with a direction by the Minister under Section 94E of the EP&A Act.

2.11.1 Temporary Uses

Where a use is of an interim or temporary nature (less than 12 months) and subject to a time-limited consent which will expire, then contributions will be calculated but will be suspended – meaning no payment is due at activation of the consent. If a subsequent development application is lodged to continue the use, contributions will be due and payable notwithstanding the short-term existence of the use.

2.12 Accountability and management of funds

2.12.1 Accounting standards and contributions register

Council is required to comply with a range of financial accountability and public access to information requirements in relation to Section 94 contributions. These are addressed in Part 4, Divisions 5 and 6 of the EP&A Regulation and include:

- Maintenance of, and public access to, a contributions register,
- Maintenance of, and public access to, accounting records for contributions receipts and expenditure,
- Annual financial reporting of contributions,
- Public access to contributions plans and supporting documents.

Separate accounting records are maintained for all development contributions received by Council. A contributions register is maintained by Council in accordance with the EP&A Regulation. This information is available on Council's website and is update annually.

2.12.2 Treatment of funds received prior to the commencement of this Plan

Funds levied and received under the previous plans listed in Section 1.7 will be used to deliver infrastructure and services of the same infrastructure category identified under this Plan.

2.12.3 Investment of funds

To maintain the time value of monetary contributions received under this Plan, Council will invest these funds until the time of expenditure for the purpose for which they were received.

Council will report all investment returns as part of its annual financial accounts. All investment returns will be retained within the development contributions account to be used exclusively for the purpose for which the original contribution was made.

2.12.4 Pooling of contributions

This Plan expressly authorises monetary contributions paid for different purposes to be pooled and applied (progressively or otherwise) for other purposes as determined from time to time based on the Release Area's infrastructure requirements.

2.12.5 Goods and Services Tax

At the time of preparing this Plan, the position of the Australian Taxation Office was that the payment of development contributions made under the EP&A Act is exempt from the Goods and Services Tax (GST).

Items in the works schedule of this Plan have been calculated without any GST component.

2.13 Review of Plan and Contribution Rates

Council acknowledges the need to periodically monitor and review this Plan. For this reason, the contribution rate and works schedule will be subject to a number of reviews to take account of such matters as community needs, costs of public facilities and services and extent of development, affordability of contributions and progress in providing scheduled works.

Any amendments to this Plan as a result of the review process (other than as outlined in Section 2.14 of this Plan) will be publicly exhibited in accordance with the requirements of the EP&A Regulation.

2.14 Review of Plan without the Need for Public Exhibition

Pursuant to Clause 32(3) of the EP&A Regulation, Council may make minor adjustments or amendments to the Plan without prior public exhibition and adoption by Council. Minor adjustments could include minor typographical corrections and amendments to rates resulting from changes in the indexes adopted by this Plan.

Part C: Need for Public Facilities and Services

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3.0 Need for Public Facilities and Services

3.1 Expected development

It is expected that Warriewood Valley will fulfil its role in assisting to meet the demand for Sydney's Greenfield residential, industrial, and commercial needs. Council will levy all development in the Warriewood Valley catchment area which generates the need for additional facilities and services. This includes development approved pursuant to SEPP (Housing for Seniors and People with a Disability) 2004 which will be levied development contributions in accordance with this Plan.

It is estimated that residential development in Warriewood Valley Release Area will:

- Provide for 2,451 dwellings in a variety of housing types including detached dwellings, attached dwellings and multi dwelling housing.
- House an additional 6,618 persons (this assumes that the SEPP Seniors Living development will be a minor component to the overall population).

It is estimated that industrial and commercial development in Warriewood Valley Release Area will:

- Occupy 32.68 hectares.
- Include light industry, industrial units, high quality office and possibly high technology development and other development not deemed residential that is permissible within the zones.

In addition, it is expected that some ancillary commercial development will occur in areas designated for residential development. This development could include child care centres, neighbourhood shops and veterinary hospitals.

3.2 Characteristics of future population

In line with demographic trends it is expected that Warriewood Valley Release Area will continue to have similar characteristics to that which have been provided in the 2011 Census (as the area has been released since the late 1990's) and similar release areas in Sydney. It is also intended that Warriewood Valley Release Area will continue to deliver a range of dwelling types and sizes that facilitates housing choice and meet the diverse needs of the future community. Based on these assumptions, it is estimated that the future population will have similar characteristics to the existing population in Warriewood Valley:

- Preschool and primary school children (0 to 11 years old) make up a large proportion of the population (higher than LGA average).
- Adults are aged primarily 35 to 45 years and comprise approximately 23.78 per cent of the population.
- Larger percentage of 'Frail aged' persons aged over 85 years old (3.8% compared to 2.7% for LGA).
- Lower proportion of young adults (18 to 24 years old) than the LGA.

- Significant representation of couples with children (42.5% of households) and the proportion of couples without children was 23.6% compared to 26.9% in Pittwater.
- Lower proportion of lone households (17.8% of households) and group households (18.8% of households) than Pittwater LGA.
- High proportion of households that have a mortgage (42.1%) compared to the LGA (36.9%).
- Significant proportion of the population is employed (97.6%) and 2.3% unemployed compared with 96.5% and 3.5% respectively for the LGA.
- 19.8% of the population earned a high income, (those earning \$1,500 per week or more) and 26.8% earned a low income (those earning less than \$400 per week)., compared with 21.1% and 28.2% respectively for the LGA.
- Most significant occupations were professionals (23.5%); managers (17.3%) and clerical and administrative workers (16.7%).
- Larger proportion of people born overseas, as well as a larger proportion of people from a non-English speaking background compared to the LGA.¹³

3.3 Meeting the needs of the incoming population

To meet the needs of the existing and future population, Council has developed a set of planning principles and criteria for the sustainable development of Warriewood Valley. The planning principles have been developed from existing planning policy and community aspirations articulated in the strategic framework for Warriewood Valley. Planning controls for the future development of Warriewood Valley are contained within the following key planning documents:

- Relevant State Environmental Planning Policies
- Pittwater Council's Local Environmental Plan
- Pittwater Council's Development Control Plan.

Council's future focus for delivery of facilities and services, and therefore its administration of developer contributions, accord with the planning principles in these documents.

Council is committed to promoting sustainability across all areas of the community. Council defines this as delivering, social, cultural and environmental systems that operate in harmony for the benefit and wellbeing of all residents. The objective is to enable residents to enjoy a good quality of life in an active and vibrant community. Council's role in the provision of public facilities and services all contribute to the collective and individual wellbeing of the community. Council aims to provide access and equity to all facilities and services for all members of the Warriewood community.

As a result of environmental studies and infrastructure audits carried out as part of the planning framework for the Warriewood Valley, a range of public facilities and services have been identified as being required to satisfy the anticipated demands of the expected population. Such facilities and services will benefit the future population

¹³ .id (2011) Warriewood – Ingleside suburb data.

of the Warriewood Valley Release Area and are required as a consequence of development taking place. Having regard to the level of public facilities and services already available and the characteristics of the expected population, it will be necessary to provide additional:

- Traffic and transport facilities;
- Multi-purpose creek line corridors;
- Public recreation and open space areas,
- Pedestrian and cyclist links;
- Community facilities; and
- Bushfire protection facilities (*Note: Contributions no longer required however works still to be delivered*).

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Part D: Strategies to provide Public Facilities and Services

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4.0 Traffic and Transport Strategy

4.1 Introduction

This section identifies the traffic and transport measures required to service and link the future community of Warriewood Valley. The ultimate road and transport network was developed through an integrated design process focused on access and servicing considerations to ensure a high quality public domain and walking/cycling accessibility. Accessibility and circulation are central to the efficient functioning of Warriewood Valley Release Area and surrounding neighbourhoods and are identified as specific design principles underpinning the plan for Warriewood Valley. These principles are:

- The Warriewood Valley Release Area will cater for the safe, efficient and orderly movement and transfer of people and goods to, from and through the area;
- The proposed traffic and transport network will have due regard to, and where possible integrate effectively with, the existing environmental amenity and environmental assets in the Release Area
- The proposed road hierarchy will be compatible with and integrate with proposed land use in a manner which will best service the whole of the Release Area;
- The proposed traffic and transport network is to promote the environmentally sustainable transport modes including cycling, walking and public transport and should be planned in a manner which minimises reliance on the use of private motor vehicles; and
- The proposed traffic and transport network will ensure that the existing community is not burdened by the provision of infrastructure required as a result of the development.

Consistent with these principles, the future residential development within the Warriewood Valley catchment provides for major improvements to the existing road network. New access arrangements are required to connect the new development to the external main road system as well as the provision of a network of minor roads to provide local area access and connectivity.

4.2 Nexus and future demand

The forecast population growth will result in considerable growth in vehicular traffic on many roads including those for which Council has responsibility. This traffic growth will create a need for various new or improved road and traffic management facilities.

Consequently, the nexus for road and traffic management facilities can be clearly established. Council has undertaken various investigations of the requirements for road upgrading to meet the future needs of the Release Area.

The volume and characteristics of expected traffic growth is directly related to land use. Manuals such as the *Roads and Traffic Authority's Guide to Traffic Generating*

Developments (RTA 2002) clearly demonstrate the nexus between development and traffic increases. It provides traffic generation rates by land use type including residential, industrial, retail and recreational activities.

Council's aim is to ensure there is capacity on all roads and at major intersections for trips generated by new development. The *Warriewood Valley Roads Masterplan May 2016* (Roads Masterplan 2016) outlines the standard for road infrastructure for the Warriewood Valley catchment. The main components of the Roads Masterplan 2016 include:

- A road network comprising five classes of roads (see Table 3 below),
- Pedestrian and cyclist facilities provided as part of the road network, and
- A public transport network consisting of bus routes and bus stops.

Table 3: Road Hierarchy

Road Hierarchy Classification	Performance Criteria	Existing Streets to be Upgraded
Sub-Arterial Road	Carry most traffic in the release area. Approximately 10,000 vehicles per day.	Ponderosa Parade, Jacksons Road, MacPherson Street, Warriewood Road (south-east of intersection with Macpherson Street), Garden Street.
Collector Road	Provides for access between sectors and links to Local Streets within sectors. Approximately 5,000 vehicles per day.	Boondah Road, Orchard Street, Jubilee Avenue, Daydream Street, Foley Street, Vineyard Street, Warriewood Road (north-west of intersection with Macpherson Street).
Local Street	Serves internal traffic within a development site, individual sector or buffer area and has a traffic volume between 300 and 2,000 vehicles per day.	Fern Creek Road
Access Street	Serves internal traffic within a development site, individual sector or buffer area and has a traffic volume of less than 300 vehicles per day.	N/A
Laneway	Provides rear access to dwellings within a development site, individual sector or buffer areas and has a traffic volume of less than 300 vehicles per day.	N/A

Originally, the *Traffic and Transportation Study* (Urban Research and Planning Pty Ltd Nov 1997) predicted that the Warriewood Valley Release Area would generate an additional 31,000 vehicle trips per day based on an acceptable Level of Service B (average). Estimations indicate that the network can accommodate up to 44,000 vehicle trips per day with a reduced Level of Service for the AM and PM peak demands. *The Strategic Transport Report for Warriewood Valley* (AECOM, 2011), informing the Strategic Review undertaken by Council and the Department estimated that the network can accommodate the resultant increase in residential development based on assumption that the intersection upgrades identified in the *Warriewood Valley Roads Masterplan* 2006 are completed. All key intersections will operate within capacity and are at acceptable levels of service in the am and pm peaks; having minimal impact on the intersection performance of the arterial and collector road network.

The increased travel demand derived from the future development of the Warriewood Valley will generate the need for:

- New and/or augmented traffic facilities to promote the permeability and connectivity of the road network to the surrounding arterial road system and within Warriewood Valley;
- The upgrading of road intersections and sections of roads to provide the required road network that promotes the efficient, safe and orderly movement of people and goods;
- The provision of safe access to and from Mona Vale Road by the broader Warriewood Valley catchment;
- Improved connectivity of the road network to facilitate access and promote low travel times/distance to and from the Warriewood Valley;
- Bus connections and emergency vehicles access;
- Improved and safer access to the schools within and adjacent to the Warriewood Valley;
- A series of traffic calming measures along roads adjacent to and within the Warriewood Valley to mitigate the negative impact of increased traffic generated by the future development on the safety and amenity of the area;
- Speed control measures to minimise pedestrian conflict and safeguard residential amenity;
- The provision of facilities that promote reduced reliance on private motor vehicles and the use of more environmentally sustainable transport modes including public transport, cycling and walking; and
- Provision of emergency access routes during major flood events.

In addition to the above, the impacts and the capacity of roads are to be managed via the provision of traffic calming devices at appropriate locations within the Release Area. The devices include:

- Traffic signals;
- Roundabouts;
- Carriageway narrowing incorporating landscaping;
- Pedestrian/cyclist refuges and medians;
- Channelised intersections;

- 3 tonne load limits on residential streets; and
- Vehicle speed controls through appropriate design.

Intersections and their proposed traffic management controls have also been designed to allow efficient, safe and orderly movement of traffic. Safe vehicular movement will be enhanced by the provision of appropriate line marking for vehicle turning bays, bus stop bays and kerb parking areas. The proposed residential precincts will be defined by “gateway” threshold treatments that may also include roundabouts. In addition to the above there is an identified need for major road crossings over creeks to be upgraded for emergency access and evacuation purposes. These are: -

- MacPherson Street (east) at Narrabeen Creek - to be raised to allow access in the 1% AEP storm event; and
- Boondah Road at Narrabeen Creek - to be raised to allow access in the 5% AEP storm event.

The acquisition of land will also be required to improve road alignment and accommodate necessary traffic calming infrastructure. All costs associated with the acquisition of land to enable the provision of traffic and transport facilities are accounted for under this Plan.

4.2.1 Reconstruction of roads directly fronting development sites

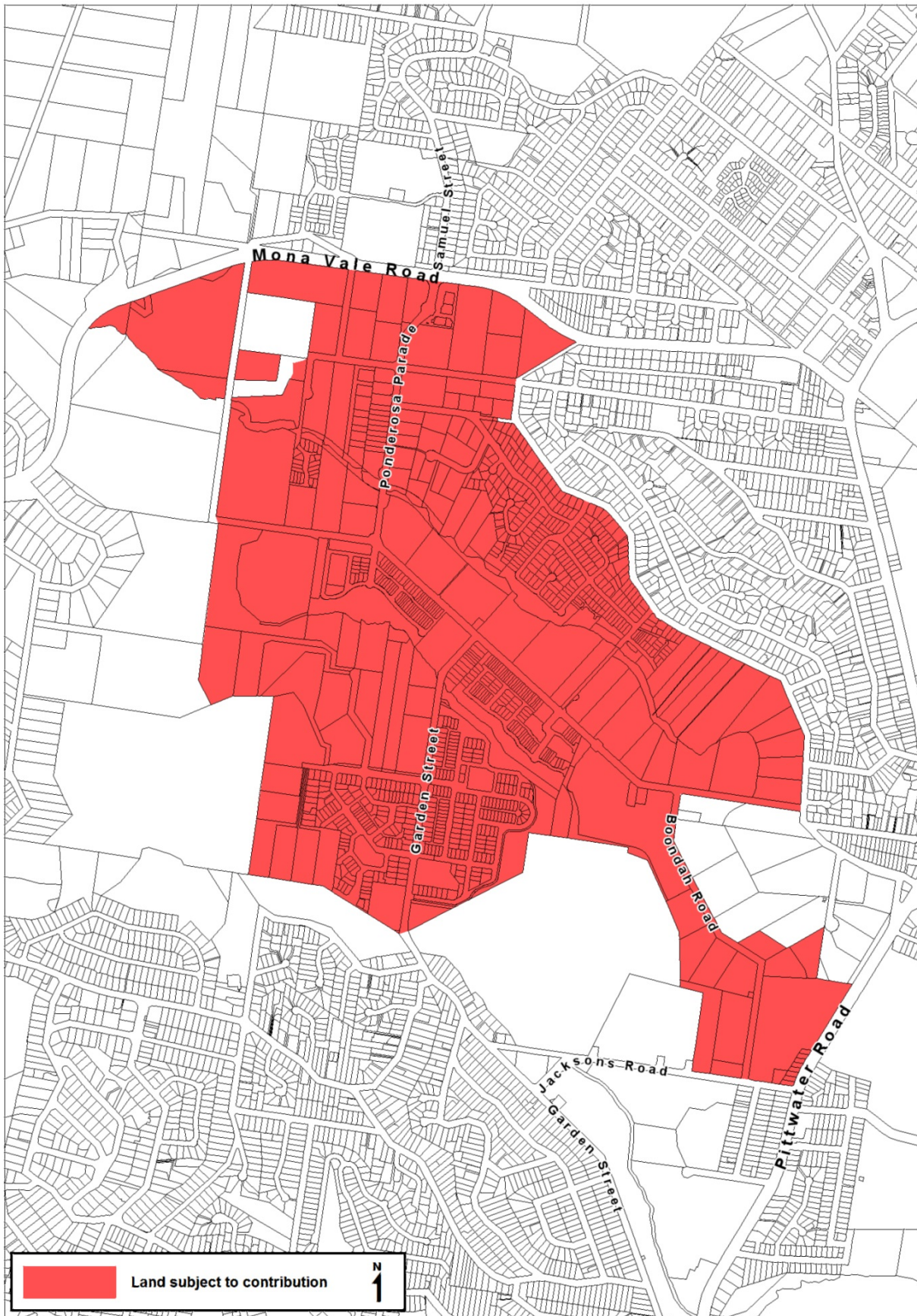
Developments fronting existing or planned public roads will be required to construct/reconstruct these roads, incorporating any necessary pedestrian and cyclist infrastructure, as part of the subdivision works associated with the land. These works do not form a part of the works funded for under this Plan and as such the responsibility for funding this work lies solely with the developers of these sites. These requirements will be imposed via condition of development consent.

4.3 Contributing development

All development on land identified in Figure 2 will contribute toward the cost of delivering the Traffic and Transport Strategy.

Sectors 20, 202 and 203 are not included because of their isolated location to the north of the Release Area. Development in these sectors will be required to provide any traffic and transport facilities generated by the development. These requirements will be determined by Council at the development assessment stage.

Figure 2: Land subject to Traffic and Transport Strategy



4.4 Apportionment

The need to provide the traffic and transport works identified in this Plan is generated by the development of Warriewood Valley. The works have been identified in response to the demand for those facilities likely to be generated by the new residents and commercial/ industrial development in Warriewood Valley.

Being an urban release area traffic and transport works are considered essential in order to allow the proposed development to occur and will primarily benefit the Warriewood Valley community. It is therefore appropriate that all development within Warriewood Valley be subject to the full cost of providing these facilities.

As discussed at section 2.4 of this Plan, the contribution amount for each toward the Traffic and Transport Strategy is adjusted based on the proposed form of development and the relevant RMS trip generation rate. This adjustment is discussed in detail at section 2.4 of this Plan.

4.5 Reasonableness

A core requirement of a Development Contributions Plan is that contributions must be reasonable. A contribution for traffic and transport works is considered to be reasonable as it levies for the needs of new residents to ensure efficient, effective and safe movement of the Warriewood Valley community. Conversely, it would not be reasonable to burden the broader Pittwater community with the financial responsibility of providing infrastructure benefiting the residents of Warriewood Valley.

4.6 Works schedule

The traffic and transport works already completed are listed in Appendix A of this Plan. The traffic and transport works still to be completed is listed in Appendix B.

5.0 Multi-functional Creek Line Corridor Strategy

5.1 Introduction

New development generally results in an increase in impervious surfaces, leading to higher levels of urban stormwater runoff and increased transfer of pollutants from urban to natural environments.

The Warriewood Valley catchment drains to Narrabeen Lagoon. While individual site development impacts on downstream drainage systems are unlikely to be significant, the cumulative effect of uncontrolled development within the Warriewood Valley catchment will adversely affect downstream drainage capacity and water quality. In Warriewood Valley this may lead to an exacerbation of existing flooding problems and possible further deterioration in downstream water quality. On this basis, it is reasonable to require a contribution toward drainage and flood management facilities that are required as a result of the development of the Release Area.

A strategy for environmental protection and water and flood management in Warriewood Valley has been created to facilitate provision of drainage and floodway infrastructure to service Warriewood Valley. This strategy includes the purchase of a land and rehabilitation of land along Narrabeen Creek and Fern Creek as well as an area of land within Sector 1 for the purpose of water detention and flood conveyance.

The key objectives of this Strategy are:

- Provide natural drainage corridors to manage stormwater runoff as it leaves the development site;
- Provide drainage corridors that carry flows up to the 1% Annual Exceedance Probability (AEP) flood event;
- Protect down-stream properties from local flooding as a result of development of the Release Area;
- Enhance long-term environmental conditions of the receiving waters including the Warriewood Wetlands and Narrabeen Lagoon;
- Conserve and maintain integrity and quality of remnant native vegetation along creek lines to provide a functioning habitat for birds and native flora;
- Introduce and enhance wildlife corridors and establish riparian vegetation along Narrabeen and Fern Creeks;
- Protect and restore a range of aquatic habitats within the creeks;
- Preserve and enhance the existing environmental values of Warriewood Valley; and
- Provide for environmentally sustainable use of creek line corridors.

Note this Strategy is concerned with the management of water as it leaves the development site, having already been appropriately detained and treated. The infrastructure funded and delivered under this Strategy does not negate the need for developments to provide their own water detention and water quality facilities on-site.

5.2 Nexus and future demand

As described at section 5.1, new development in the Warriewood Valley catchment will result in an increase in impervious surfaces. The impact of urban development on flow regimes, erosion and siltation, and flooding can be substantially reduced by adopting stormwater management techniques that are focused on continuing the function of the natural drainage system. Future development in the Warriewood Valley catchment will result in the need to manage the quantity and quality of stormwater run-off both up and down stream of development,¹⁴ protect properties from flooding and safeguard the integrity of ecosystems in the catchment.

The overall aim of this strategy is to provide a network of multi-functional creek corridors along Narrabeen Creek, Fern Creek and Mullet Creek primarily for conveyance of stormwater and the 1% AEP flood event. In addition the creek line corridors will provide flora and fauna habitat and linkages, assist in water quality treatment, and contain cyclist and pedestrian facilities (refer to Section 7.0 of this Plan) linking the Warriewood escarpment with Warriewood Wetlands and Narrabeen Lagoon.

The delivery of the multi-functional creek line corridor strategy comprises two components: -

- Rehabilitation and reconstruction of the creek line; and
- Dedication of creek line corridor land.

The pedestrian and cycleway network proposed to be incorporated in the creek line corridor will facilitate connectivity across the Warriewood Valley catchment. As a result of the recreational utility of the creek line corridor network, 30% of the total creek line corridor land area has been included in the overall open space area calculations (resulting in 4.8 hectares of creek line corridor land being attributed to passive open space – refer to section 6.0 of this Plan).

5.2.1 Additional creek line corridor now included in Strategy

Following the rezoning and inclusion of 120-122 Mona Vale Road in the Warriewood Valley Release Area in 2014, the creek line corridor that forms part of these sites has been included in this Strategy. In addition, the creek line corridor land which forms part of 3 Boundary Street – the property which will be relied upon for access – has also been included.

These areas of creek line corridor are located on steep and not easily accessible terrain. Accordingly, for the purpose of calculating the area of passive open space, the upper reaches of Narrabeen Creek have been excluded from the open space land area calculations set out in Chapter 6.0 - Public Recreation and Open Space Strategy.

¹⁴ Stormwater run-off enters the creek system either directly where development is located adjacent to the creek system or indirectly via piped/open channel stormwater systems where development is not located adjacent to the creek system.

Through this strategy, creek line areas will be rehabilitated and reconstructed to assist in water conveyance and protect the new urban development from flooding. The creeks will comprise a natural formation with pools, riffles and rapids to maintain creek line flow and water levels in adjacent wetlands and will be designed in accordance with the *Warriewood Valley Water Management Specification*. They will also be constructed to contain the 1% AEP flow.

5.2.2 Land to be dedicated and section 94 offsets

This strategy comprises the dedication of creek line corridor land to ensure the long-term success of the creek network. As part of this strategy, an inner 50 metre corridor (25 metre wide either side of creek centre line) will be brought into public ownership to ensure efficient and consistent management of the creek, flora and fauna habitat, and the cyclist and pedestrian facilities. In addition to this, an outer 25 metre landscaped buffer to remain in private ownership is to be maintained on both sides of the inner corridor to support habitat and assist in stormwater and water quality management.

At the completion of this strategy, the total area of the creek line corridor land in public ownership will be 17.18 hectares (see Figure 3).

With respect to development sites which partially comprise creek line corridor land, Council will require, by condition of consent, a 25 metre wide corridor to be dedicated to Council as part of the development. The value of this land will directly offset the total monetary contribution payable. Table 4 lists the properties with creek line corridor land required to be dedicated to Council as well as the value attributed to the land. Creek line corridor land has been valued by a registered land valuer as at June 2015. The exact area of creek line land to be dedicated to Council is subject to final plan of subdivision. The areas outlined in Table 4 are not survey accurate.

Noting that the position of the creek centreline has meandered over the years, to avoid confusion, the area of creek line required to be dedicated to Council is to be measured as 25 metres from the current rear property boundary.

Table 4 corresponds with Figure 3 and Appendix B of this Plan.



Table 4: Creek line corridor land to be dedicated

Property	Land to be dedicated (sqm)**	Rate (\$ 2016/17 per sqm)*	Land value (\$ 2016/17)
Sector 501	6,165	\$54.21	\$334,205
Sector 301	3,960	\$54.21	\$214,672
Sector 302	4,344	\$54.21	\$235,489
Sector 303	1,119	\$54.21	\$60,661
Buffer 1b	1,099	\$54.21	\$59,577
Buffer 1c	760	\$54.21	\$41,200
Buffer 1e	443	\$54.21	\$24,015
Buffer 1f	694	\$54.21	\$37,622
Buffer 1g	777	\$54.21	\$42,121
Buffer 1i	4,107	\$54.21	\$222,641
Buffer 1j	2,238	\$54.21	\$328,247
Buffer 1k	1,070	\$54.21	\$156,937
Buffer 1l	4,144	\$54.21	\$224,647
Buffer 1m	6,751	\$27.11	\$182,986
Buffer 2a	3,645	\$54.21	\$197,596
Sector 901A - 13 Fern Creek Road	1,493	\$54.21	\$80,936
Sector 901A - 4 Orchard Street	919	\$54.21	\$49,819
Sector 901A 206 Garden Street	2,945	\$54.21	\$159,649
Sector 901C	1,471	\$54.21	\$79,743
Sector 901G	2,659	\$54.21	\$144,145
Upper Narrabeen Creek - 120 Mona Vale Road	4,531	\$27.11	\$122,813
Upper Narrabeen Creek - 122 Mona Vale Road	2,560	\$27.11	\$69,389
Upper Narrabeen Creek - 3 Boundary Street	4,667	\$27.11	\$126,499
Upper Fern Creek (within Ingleside Chase Escarpment)***	3,430	\$54.21	\$185,941

Southern Buffer - 3 Boondah Road	375	\$54.21	\$20,329
Southern Buffer – 6 Jacksons Road	2,794	\$54.21	\$151,517
Total	69,161		\$3,553,393

**Value of creek line corridor land varies across the Release Area based on the utility and condition of the land.*

***Exact area of land to be dedicated is subject to final plan of subdivision.*

****The purchase of the Upper Fern Creek Corridor was forward funded by Council. Contributions are still to be sought to compensate Council through funds collected under this Plan.*

5.2.3 Requirements for on-site water quantity and quality maintenance

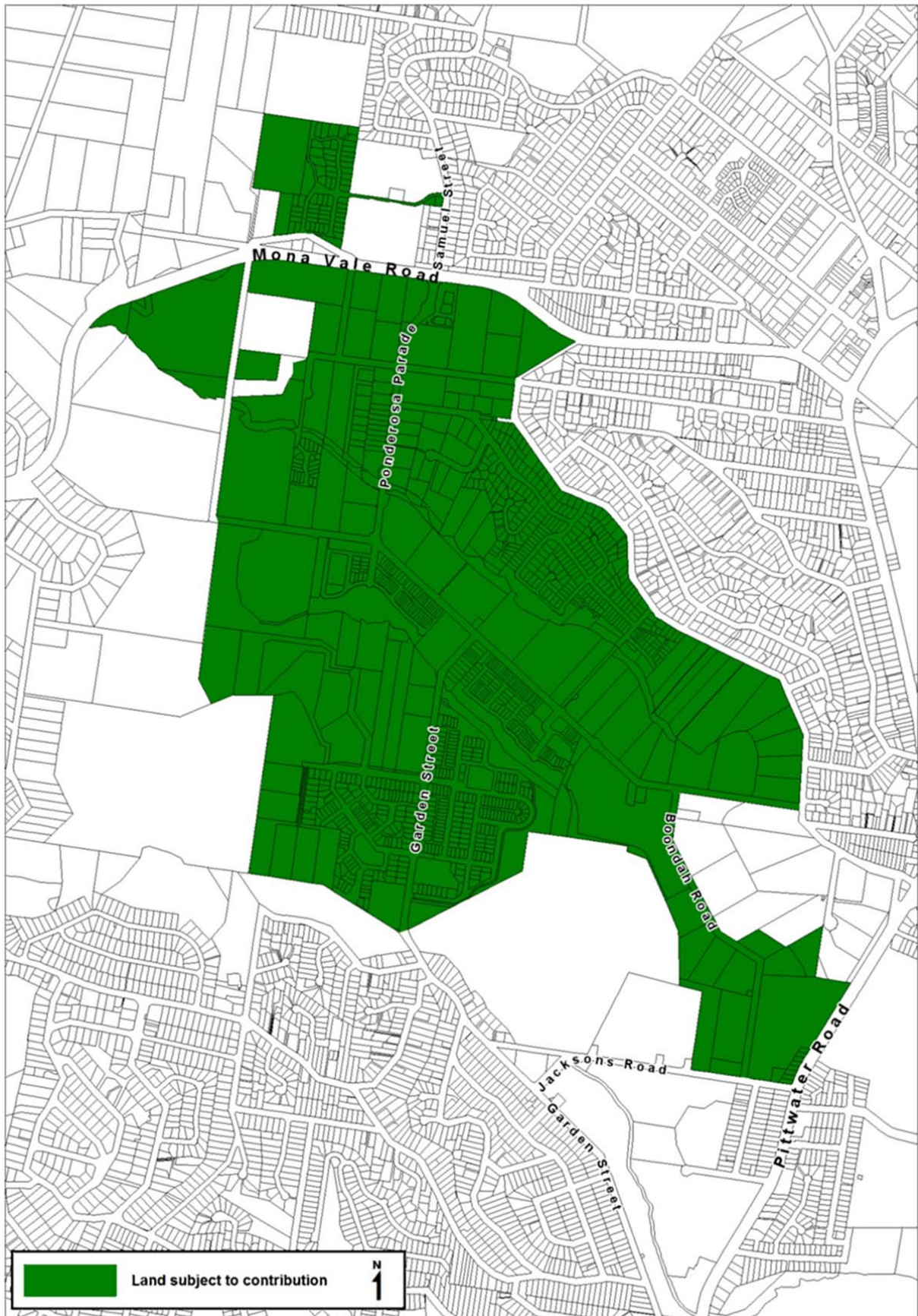
All developments within the Warriewood Valley catchment will be required to provide water detention and treatment facilities, either on individual lots or on a broad scale area basis, to manage run-off from the development site before it enters the creek network. This requirement is directly generated by the development itself and as a result, the provision of these facilities is not a matter in respect of which any credit will be given against contributions payable under this Plan.

Applicants are advised to refer to the Warriewood Valley Water Management Specification 2001 for guidance on the necessary on-site water quality and quantity requirements.

5.3 Contributing development

All development on land identified in Figure 4 will contribute towards the cost of delivering the Multi-functional Creek Line Corridor Strategy.

Figure 4: Land subject to Multi-functional Creek Line Corridor Strategy



5.4 Apportionment

The need to provide the multi-functional creek line corridors identified in this part of the Plan is generated by the increase in development across the whole of the Warriewood Valley catchment. It is therefore appropriate that development within the Warriewood Valley catchment be subject to the full cost of providing these facilities.

5.5 Reasonableness

The core principle of development contributions is that they must be reasonable. A contribution toward this Strategy is considered reasonable as it will ensure the sustainable management of stormwater generated by the development of the Release Area. Conversely, it would not be reasonable to burden the broader Pittwater community with the financial responsibility of providing infrastructure benefiting the residents of Warriewood Valley.

5.6 Works schedule

The land dedication and works already completed are listed in Appendix A of this Plan. The land dedication and works associated with this Strategy that are still to be delivered are detailed in Appendix B.

6.0 Public Recreation and Open Space Strategy

6.1 Introduction

The purpose of this section is to ensure that adequate open space is provided throughout Warriewood Valley to meet the needs of an increased population resulting from the development of the Release Area.

The residential development in Warriewood Valley will result in increased demand for recreation and open space facilities. It is expected that a population of the size and nature described in section 3.0 this Plan will require a range of open spaces networks to cater for and support the forecast population.

The Pittwater community strongly supports the conservation and enhancement of the unique environmental qualities of the LGA, as highlighted in numerous studies and community consultation surveys, and more recently the *Pittwater Public Space and Recreational Strategy (2014)* (Pittwater Recreation Strategy). This Plan seeks to support these community values and strategic goals by ensuring that the contributions provided from new development go to maintaining and enhancing the unique environment for the benefit of all residents in Warriewood Valley.

Pittwater already provides a range of open space and recreation facilities including a range of facilities for unstructured play and recreation (including picnic areas, playgrounds and walking paths). Parks and open spaces are key components of the environmental, recreation and social infrastructure in all communities. They are used and valued by a wide cross section of residents, from all age groups and socio-economic backgrounds.

The Pittwater Recreation Strategy articulates the strategic framework for the provision of open space and recreational areas for the LGA. The Strategy adopts a standards-based approach of 2.83 hectares per 1000 persons based on the Department of Urban Affairs and Planning *Outdoor Recreation and Open Space Planning Guidelines* (1992) and does not consider land capability or pressures from tourism. The Pittwater Recreational Strategy confirms that there is an existing undersupply of recreation areas in Pittwater. Accordingly, the Strategy recognises the importance for the Warriewood Valley Release Area and any release in Ingleside to provide adequate recreation areas and facilities to meet the needs of their incoming populations to ensure that the increase in demand does not further exacerbate the existing shortage of recreation areas within Pittwater.

6.2 Nexus and future demand

The provision of public recreation facilities and open space areas benefits the community in a number of ways. Open space provides the venue for many recreational, cultural and social activities and the various types of open space typically provided by local government cater for the differing needs of the community.

Public recreation and open spaces are key components of the environmental, recreational and social infrastructure in all communities. They are used and valued by a wide cross section of residents, from all age groups and socio-economic backgrounds.

Pittwater is well served, in terms of the everyday needs of its residents, through the provision of local and district parks. In order to ensure the adequate provision of open space and recreational facilities in Warriewood Valley there is a need to identify and purchase land for open space and provide improvements to existing open space areas to increase capacity and provide for the forecast future population.

In order to maintain the present level of service provided, this Plan adopts a two-fold approach to the provision of additional open space and public recreation facilities to meet the additional needs of the incoming population:

- Purchase of strategic land that will contribute to the network of open space currently provided, including land for the purpose of a new park to serve the new population; and
- Embellishment of the existing open space areas.

In determining the future public recreation and open space needs of the community of Warriewood Valley, it has taken into account the anticipated demographic population profile examined in Sections 3.2 and Section 3.3 of this Plan. Generally the profile of new residents moving into Warriewood Valley is expected to be younger than the LGA average. In addition a significant proportion of future residents are also expected to be above the average age of the population. As result there is a need to:

- Provide a significant quantum of open space facilities, offering both passive and active recreation opportunities;
- Ensure that the open space and recreation facilities are of a high quality;
- Provide both neighbourhood and local parks within a 'reasonable' walking distance or in close proximity of future residents;
- Provide sufficient facilities for younger children (aged between 5-10 years old) such as sports fields which will be utilised through junior organised sports (i.e. soccer/football) and off-road cycle ways;
- Provide sufficient facilities for older children and young adults (aged between 10- 20 years old). The limited existing recreation opportunities and limited public transport facilities has been identified as two major issues for young people moving into the area. The multi-functional creek line corridors for open space and water management will provide both the opportunity for alternative and safe transport and serve as a recreational area for use by this age group. Multi-use pathways within these corridors provide increased connectivity to district and regional facilities (such as the cinema, Warriewood Square and beaches) and to the main transport routes.
- Ensure adequate recreation facilities are provided for older persons, generally focussed on walking and appreciation of environmental quality. All parks have been developed with strong emphasis on landscaped amenity, facilities for seating and views and to take advantage of environmental settings such as creek lines and associated bushland riparian zones. The open space system

has a strong linear design that once accessed allows older users to access all parts of the Release Area off-road via a level, well-lit path with neighbourhood parks located at key intervals. It is envisaged that these parks will become social nodes where all age groups are able to gather while also increasing the Release Areas sense of place.

6.2.1 Strategy for Recreation and Open Space Facilities

The *Demographic and Facility/Service Needs Study for the Ingleside-Warriewood Urban Release Area* (Travers Morgan 1994) identified several issues that needed to be considered in planning for open space and recreation. These strategic issues have been considered and are reflected in this Plan:

- Optimising joint use opportunities with schools and community facilities. Local schools contain extensive areas of open space which historically have not been available to the community for either passive open space or active sports reserves. Council is intensively negotiating with all schools in the area to make this land available to the public out of school hours which is peak recreation time for the community. By providing increased security and facilities such as amenities, lighting and parking, this land will be fully utilised by incoming residents;
- Developing an overall park system with linkages between open space areas using walkways and cycle ways, including linkages to other public use areas and sectors (such as schools, community and retail centres and industrial/commercial sectors);
- Linking the escarpment, creeks, wetlands and lagoons via multi-functional open space corridors; and retaining existing bushland;
- Implementing buffer zones to minimise the migration of pollutants and the potential for flooding of low lying areas for increased urban run-off;
- Providing parks to accommodate water quality elements such as bio-swales and detention basins as urban design elements and where they do not impact upon the recreational opportunity or quality of the area;
- Developing larger integrated parks including playgrounds, sports fields and park lands rather than too many small scattered parks as a means of controlling maintenance costs;
- Establishing parks that cater for older residents with strong emphasis on walking activities, seating, creation of settings with high amenity and landscape quality;
- Establishing parks with adequate car parking and accessibility to residential areas;
- Establishing informal parks in areas where there is topography to create interest and places for informal activity as well as passive purposes;
- Recognising the high capital and recurrent cost of public recreation and open space will limit Council's ability to provide completed facilities in the short to medium term, and therefore in the initial stages of development Council has concentrated on identifying and securing land for open space purposes; and

- Exploring opportunities to bring areas with high conservation value and environmental attributes into public ownership through possible land exchanges between private landowners and State Government departments.

The locations for open space facilities are shown in the *Warriewood Valley Landscape Masterplan and Design Guidelines (Public Domain) May 2016* (Landscape Masterplan 2016). The final location and detailed design of many open space areas will be determined through ongoing consultation with landowners, developers and the community.

The proposed quantum of open space is based on the standard of 2.83 hectares per 1000 persons. While this is less than the current ratio in the LGA, this area of open space meets accepted standards and can be adequately planned and managed to provide high quality, usable and accessible recreational opportunities that meet the needs of the expected population while minimising land acquisition costs.

The Pittwater Recreation Strategy (p. 90) recommends:

“Retain this standard of 2.83 hectares of open space provision per 1,000 population for Warriewood Valley. Ensure the open space provision comprises large and small parks, public recreation areas including multifunctional creekline corridors, pedestrian and cycleway paths, playgrounds and sportsfields... Focus on the purchase of large areas of land suitable for sportsground precincts using section 94 funds from developer contributions.”

The proposed provision allows for multi-use facilities and can remain relatively flexible and able to accommodate changing recreation needs and circumstances over time. Provision includes the following:

- Neighbourhood Parks: Three neighbourhood parks have been provided in the geographic centre of the Release Area. All parks are connected to the central creek line corridors enabling connectivity between all recreational areas. The provision of linear corridors allows all parks to become equally accessible throughout the area. The neighbourhood parks have now been completed. The combination of creek line corridors and parks provide a unique recreational and environmental asset to the new residents.
- Local Park: One centrally located local park will be provided serving the local community.
- Sports fields: 4.7 hectares of land have already been purchased for sportsgrounds and ancillary uses. This area is known as Warriewood Valley Sportsground. Of the 4.7 hectares, 2.4 hectares comprise sports fields and curtilage, with the balance containing associated car parking, amenities and passive recreation areas.
- Consideration of the use of flood prone lands for sports fields where possible.
- Use of use of partnerships with State government agencies, such as Department of Education and Communities, to allow use of sports fields by the public and local sporting associations out of school hours.

- Linear Open Space: Land proposed to be acquired and embellished under this Plan via the Multi-functional Creek Line Corridor program has been included in the overall open space calculations. Generally the recreational potential of the corridors will be limited to pockets along the corridors where the creek meanders, allowing expanded open space areas for passive recreation.

6.2.2 Open space land requirements

Given Warriewood Valley is expected to contain a total of 2,451 residential dwellings which will house 6,618 persons, the quantum of open space to be provided is 18.7 hectares (based on the standard of 2.83 hectares per 1000 persons).

Table 5 details the quantum of open space delivered since the commencement of this Plan in 1998. As outlined in Table 5, of the 18.7 hectares of open space required for the Release Area, 12.86 hectare of open space has been delivered to date, with 5.84 hectares still be delivered. The remaining 5.84 hectares comprises 1.69 hectares of linear open space to be achieved through the future dedication of creek line corridor land and acquisition of 4.15 hectares of land for active open space. These land acquisitions are discussed in further detail in the following sections.

Table 5: Active and passive open space areas

Open Space Type	Areas delivered (hectares)	Remaining area still to be delivered (hectares)
Active Open Space	6.1	4.15
Warriewood Valley Sportsground (Jackson Road)	4.7 *	-
Narrabeen Sports High School (synthetic and turf fields)	1.4 **	-
Southern Buffer	-	4.15 – Refer to section 6.1.3
Passive Open Space	6.76	1.69
Central Local Park (northern half in Sector 8)	1.1 (exclusive of creek line corridor)*	-
Central Local Park (southern half in Sector 9)	1.0 (exclusive of creek line corridor) (land purchase only) *	Note: Land still be to embellished +
Sector 1 playground	0.2 *	-
Fernbank Reserve playground (in Sector 10)	0.47 *	-
Shearwater playground (in Sector 12)	0.22 *	-
Detention Basin (2 Prosperity Parade)	0.65 usable area only (the remaining 0.35ha comprises water quality basin) *	-
Linear Open Space along Creek Line Network (counted as 30% of total creek line corridor land area) ⁺⁺	3.12	1.69 – Refer to section 6.1.4
SUB TOTAL	12.86	5.84
TOTAL AREA OF OPEN SPACE TO BE DELIVERED	18.7	

* Refer to Appendix B (in Warriewood Valley) of Pittwater Recreation Strategy

** Refer to Appendix B (in North Narrabeen) of Pittwater Recreation Strategy

+ Embellishment identified in works schedule – refer to Item 10 in Public Recreation and Open Space Strategy in Appendix B of this Plan

++ Refer to section 5.3 of this Plan

Active open space still to be delivered

Land located in the Southern Buffer area comprising approximately 4.7 hectares (refer to Figure 5), has been identified as potentially suitable to meet the forecast demand for active open space. Given the expected future population, the purchase of this land would maintain the level of provision for the future residents of Warriewood Valley. This area could be embellished and integrated with the existing playing fields in Boondah Road. It is considered that this land, adjacent/adjoining existing recreation areas, will provide high quality access and will best meet the needs of the future population.

The future purchase of any lands for open space will be through commercial negotiations between Council and individual landowners. The negotiations will be based on the best outcome for all parties in relation to achievement of high quality public open space outcomes and maximised development potential.

In the event that Council is unsuccessful in purchasing the total 4.15 hectares required or there are insufficient funds for the embellishment of the land to sufficiently meet the objectives of this Plan, the following options will be considered:

- Delay embellishment until funds become available through other future opportunities; and
- Further embellish existing active recreation areas with the view to upgrading the playing surfaces to a higher standard to facilitate more intense usage (for example, replacing a turf playing surface with a synthetic surface to allow 7 days per week continued usage regardless of weather conditions and in turn, facilitate increase in number of users).

Passive open space still to be delivered

In order to meet the passive recreation requirements, a total of 1.69 hectares of land is required to be acquired. This is proposed to be achieved through the acquisition of land along creek line corridors. This linear open space is deemed suitable for use as passive recreational land.

The Multi-functional Creek Line Corridor Strategy, outlined in section 5.0 of this Plan, recognises that the strategy will also deliver a linear open space network within the creek line corridor. Given their primary function as drainage corridors, only 30 percent of the total creek line corridor land is attributable as open space area.

The total inner creek line corridor width is generally 50 metres (25 metres either side of creek centre line). The actual creek bed area and batters will generally occupy up to a 25m width (5m bed and 10m batters on either side). Batters and surrounding creek line land will be extensively planted and as such the recreation potential of the corridors will be limited to pockets along the corridor where the creek meanders and allows expanded open space areas for reasonable recreation opportunities. While industrial and commercial developments are not directly levied under the Public Recreation and Open Space Strategy, it is recognised that there is some recreational value of the creek line corridors for these developments and that people working in these

sectors are able to use the corridors for either access to and from work or for lunch time recreation.

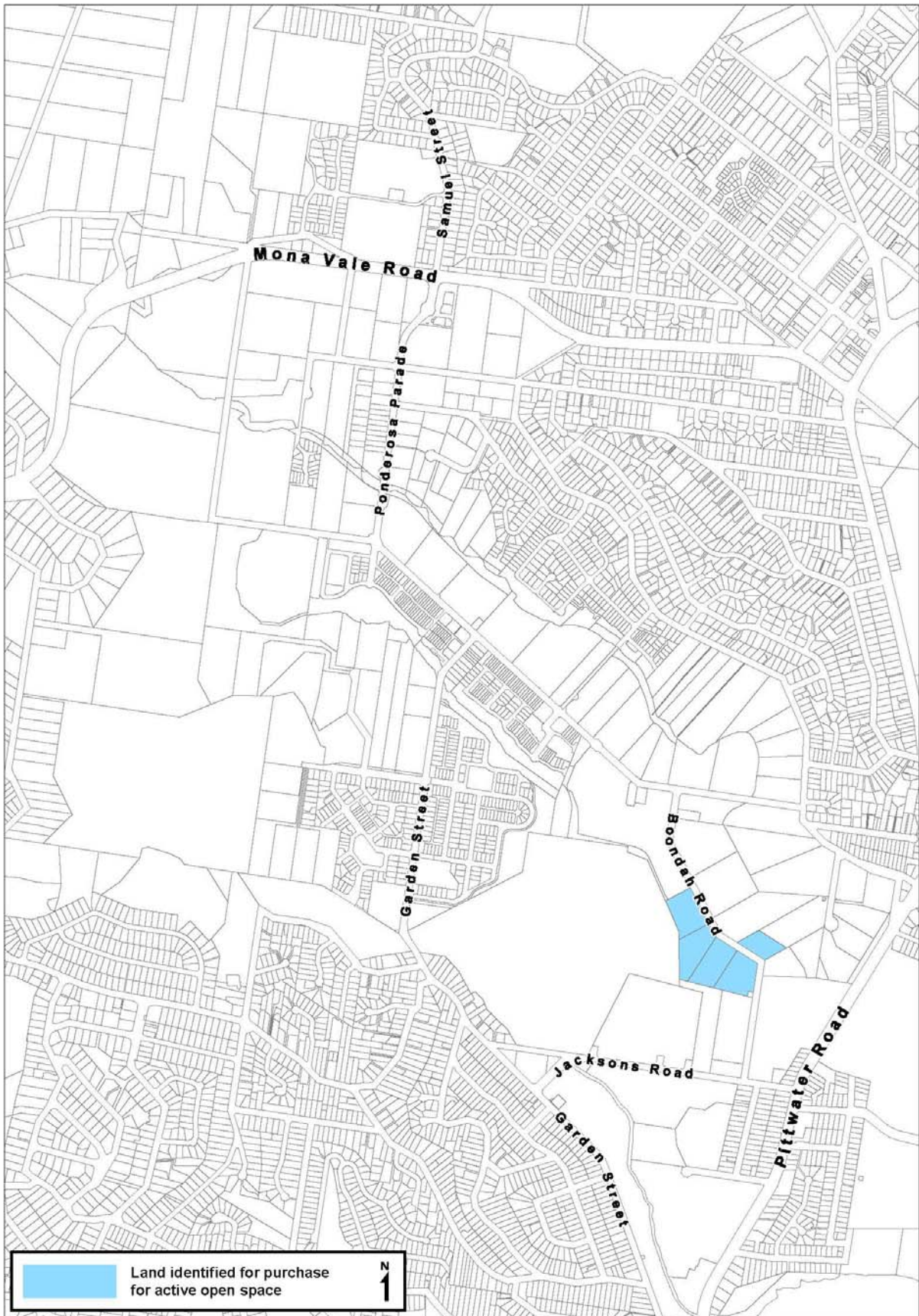
As the purchase and embellishment associated with creek line network has already been attributed as part of the contribution toward the Multi-functional Creek Line Corridor Strategy, a second levy under this Strategy is not applied.

Deletion of works from this Strategy

There are some works previously identified in superseded version of this Plan which, after further in depth analysis, have been removed for the following reasons:

- Progress Park (0.25 hectares) – not considered desirable as the field is on a main road and is also used as an unleashed dog exercise area. Better options have become available.
- Buffer Area 1m (1 hectare) – considered not suitable for the following reasons:
 - This land is highly flood affected, with high flood hazard due to depth of flooding and velocity, making it unsuitable for active or passive recreational uses where lives, in particular children's lives could be put at major risk.
 - The site is part of the current flood storage for Narrabeen Creek and Narrabeen Lagoon floodplain and as such cannot be filled with more material unless compensatory cut is provided.
 - There is potential for the water table to be close to the surface at this location, which would affect the drainage and grass growth of any future sports fields.
 - The site has been filled over the years with material of unknown quality. This fill material is likely to contain contaminants that cannot remain in-situ and would need to be removed and replaced. What is observed at the surface is tile, concrete and brick rubble that has been introduced to the site to create a more permeable surface to operate the existing plant nursery.
 - The land does not adjoin any existing active recreation facilities. If the site was to be developed for sports fields, separate amenities and car parking facilities would need to be provided. As a result, compared to the cost of expanding existing active recreation facilities, establishing a sports field at this location would be considerably more expensive.
 - The site is extremely close to land planned for future medium density residential development. This causes logistical problems with scheduling its use.

Figure 5: Land identified for purchase for future active open space



6.3 Contributing development

All new residential development on properties identified in Figure 6 will contribute towards public recreation and open space facilities.

While industrial/commercial developments are not directly levied for public recreation and open space, it is recognised that there is some recreational value of the creek line corridors and that people working in Warriewood Valley are able to use the corridors for either access to and from work or for lunch time recreation. As industrial and commercial development will contribute toward the Multi-functional Creek Line Corridor Strategy, a contribution toward the Public Recreation and Open Space Strategy is not applied.

6.4 Apportionment

The need to provide the public recreation and open space facilities identified in this Strategy is generated by the future residential development of the Warriewood Valley Release Area. It is therefore appropriate that residential development within the Warriewood Valley catchment (see Figure 6) be subject to the full cost of providing these open space facilities.

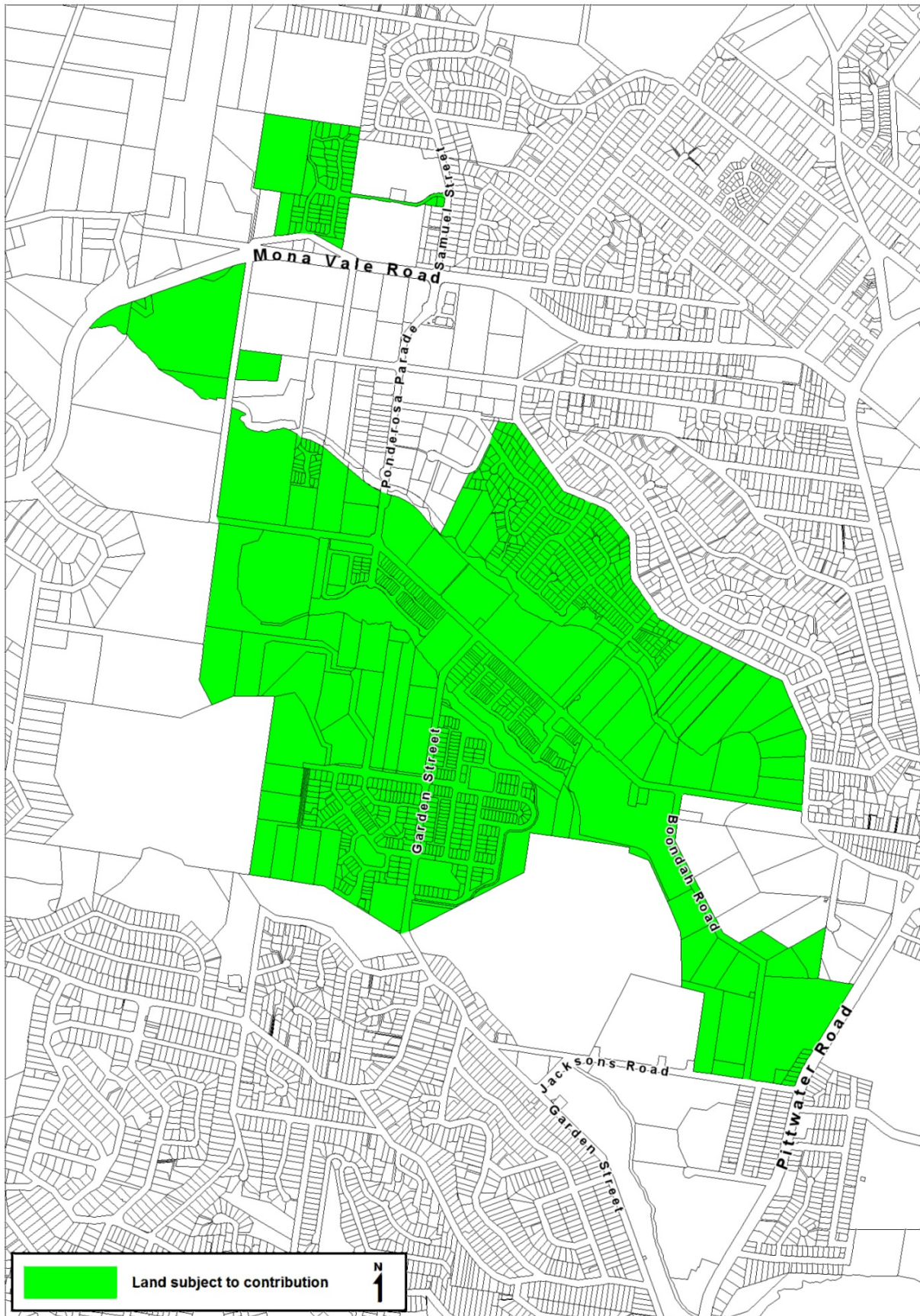
6.5 Reasonableness

The core principle of development contributions is that they must be reasonable. A contribution toward open space and recreation facilities is considered reasonable as it will ensure the equitable provision of recreation and open space facilities for all future residents. Conversely, it would not be reasonable to burden the broader Pittwater community with the financial responsibility of providing infrastructure benefiting the residents of Warriewood Valley.

6.6 Works schedule

The open space and recreation facilities already delivered under this Strategy are listed in Appendix A of this Plan. The open space and recreation facilities associated with this Strategy that are still to be delivered are detailed in Appendix B.

Figure 6: Land subject to Public Recreation and Open Space Strategy



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7.0 Pedestrian and Cyclist Network Strategy

7.1 Introduction

The provision of pedestrian and cycleway facilities within communities is critical to provide access, improve health and deliver ecological sustainable development. Consistent with this, Council remains committed to the development of a safe and practical pedestrian and cycleway network for the LGA. Council recognises that additional residential, commercial and industrial development in the Warriewood Valley Release Area will increase the demand for pedestrian and cycleway facilities.

Council's objectives are to provide a consistent standard of facilities for pedestrians and cyclists within Warriewood Valley. This strategy identifies the pedestrian and cycleway facilities that will be required as a result of the future development of Warriewood Valley.

7.2 Nexus and future demand

Pedestrian and cycleway facilities offer a flexible and low impact alternative to the use of private motor vehicles and are an important consideration in transport planning for the Release Area. New development in the Warriewood Valley Release Area is a mix of residential, industrial and commercial development, which will create a demand for transport and recreation facilities by residents and workers.

Sectors 20, 202 and 203 will not be levied under the Pedestrian and Cyclist Network Strategy because of their isolated location to the north of Warriewood Valley. Development in these sectors will be required to provide directly to any required pedestrian and cycleway facilities as part of their development.

Sustainable transport management involves the provision of non-motorised transport modes as well as roads for motorised transport needs. Provision of multi-use access ways can be effective in providing a sustainable and balanced transport regime, particularly for trips in the immediate locality as well as providing an attractive form of recreation and access to recreation facilities within the Warriewood Valley.

Significant adjacent land uses likely to be heavily utilised by Warriewood Valley Release Area residents, such as Warriewood Square and the Warriewood Wetlands, provide both a need and opportunity for convenient and direct pedestrian and cycle path connections.

The *Pittwater Walks and Rides Strategy Masterplan Review – March 2012* identified the need to provide a well-planned active transport network in order to promote alternative transport use and to cater for the recreational needs of incoming residents. These plans identify the opportunities and constraints in developing bicycle and pedestrian facilities and recommendations for actions required in establishing a safe, functional and integrated bicycle network

Given Council's commitment to bicycle facilities expressed in the *Pittwater Walks and Rides Strategy Masterplan Review – March 2012*, the provision of the cycleway and pedestrian network is a reasonable expectation of incoming residents to Warriewood Valley. The cycleway and pedestrian paths identified are expected to be used for commuters travelling to and from school or work, or to link to other transport networks, such as planning B Line stop on Pittwater Road near Jacksons Road, as well as other recreational users.

The pedestrian and cycleway network has been developed and located to service the industrial/commercial and residential areas alike. The creation of the pedestrian and cycleway network has taken into account shared paths situated in the creek line corridors, and the existing and proposed active and passive open space areas. The network will largely be situated in vegetated corridors with high landscape and environmental amenity. Shelters, bridges and other recreational opportunities in addition to playground areas will feature strongly. Key destination points such as Warriewood Square, Warriewood Wetlands, Warriewood cinema complex and sports facilities are accessible from the pedestrian and cycleway network.

The shared paths will also provide access for pedestrians, cyclists, and maintenance vehicles, ensuring their long-term function within the Release Area. Pedestrian and bicycle use and their location primarily in drainage corridors prone to flooding reinforce the need for such paths to be durable and of lasting construction. As such, concrete construction of pathways will be in accordance with RMS and Council standards for construction of shared paths.

Acquisition and construction of the multi-use access way network will proceed at the same pace as the development in Warriewood Valley, as land acquisition will generally occur through dedication of land as adjacent development is approved.

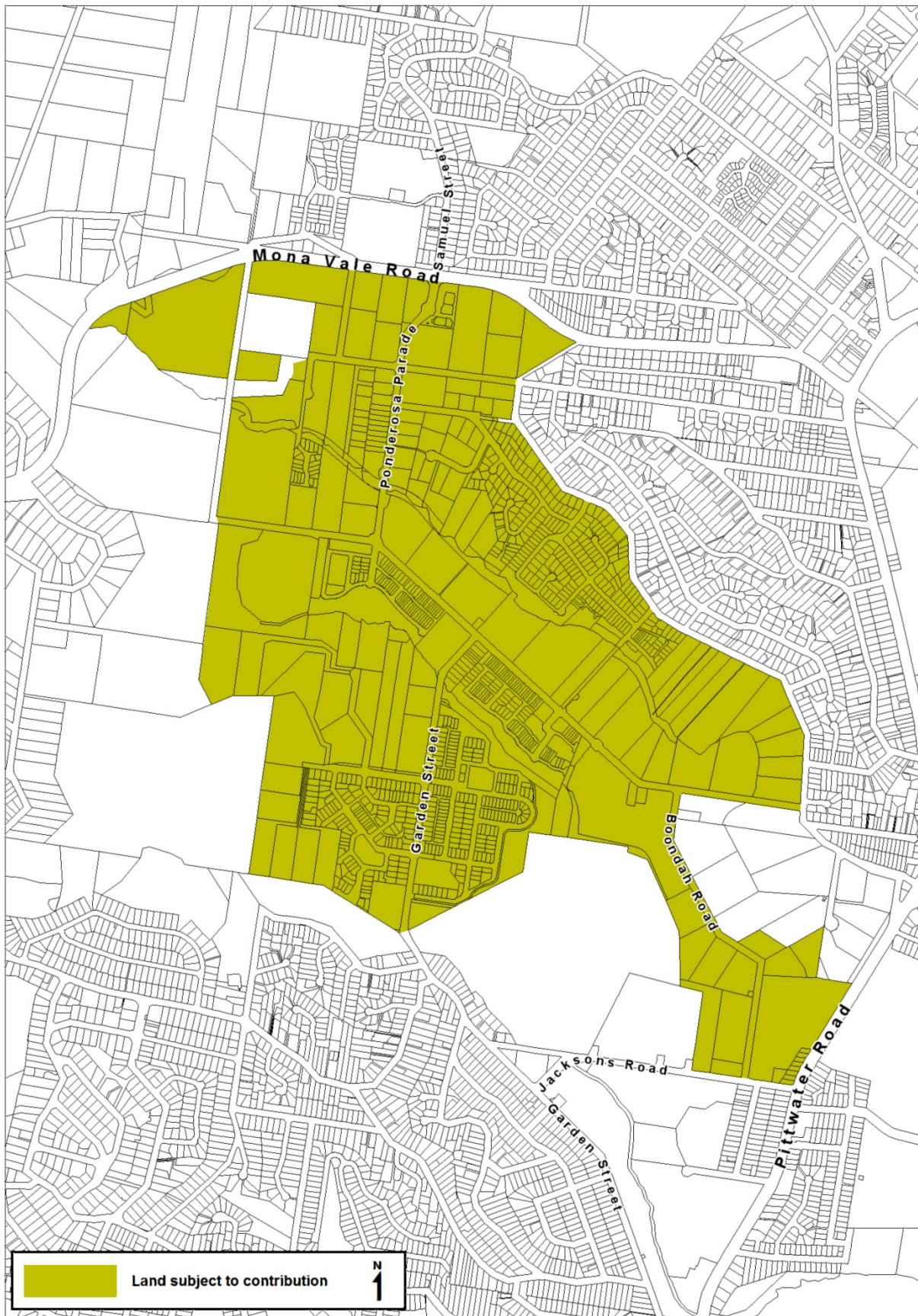
The Pedestrian and Cyclist Network Strategy does not include purchase or augmentation of land already purchased and is for the planning and provision of the actual pedestrian/cycleway facilities only. Through the Traffic and Transport and Multi-Function Creek Line Corridors strategies, a unified system of linear corridors will be acquired throughout Warriewood Valley designed to accommodate facilities for cyclists and pedestrians.

7.3 Contributing development

All development on land identified in Figure 7 will contribute towards the cost of delivering the Pedestrian and Cycleway Strategy.

Sectors 20, 202 & 203 are not included because of their isolated location to the north of the Release Area. Development in these sectors will be required to directly provide any required pedestrian and cycleway facilities.

Figure 7: Land subject to Pedestrian and Cyclist Network Strategy



7.4 Apportionment

The need to provide the pedestrian and cycleway facilities identified in the Pedestrian and Cyclist Strategy is generated by the development of the Warriewood Valley catchment. Being an urban release area, pedestrian and cycleway facilities are considered essential pieces of active transport infrastructure and will primarily benefit the residents and workers of the Release Area. It is therefore appropriate that all development within the Warriewood Valley catchment (excluding Sectors 20, 202 and 203) be subject to the full cost of providing these facilities.

As discussed at section 2.4 of this Plan, a discount toward the Pedestrian and Cyclist Strategic is applied specifically for industrial and commercial development in recognition of reduced demand for these facilities as compared to residential development. This adjustment is discussed in detail at section 2.4 of this Plan.

7.5 Reasonableness

The core principle of development contributions is that they must be reasonable. A contribution toward this Strategy is considered reasonable as it will ensure the equitable provision of pedestrian and cycleway facilities for all new residents and workers. Conversely, it would not be reasonable to burden the broader Pittwater community with the financial responsibility of providing infrastructure benefiting the residents of Warriewood Valley.

7.6 Works schedule

The pedestrian and cycleway facilities already delivered under this Strategy are listed in Appendix A of this Plan. The pedestrian and cycleway facilities associated with this Strategy that are still to be delivered are detailed in Appendix B of this Plan.

8.0 Communities Facilities Strategy

8.1 Introduction

A place for the community to meet is considered a basic prerequisite for community development. A local community facility, such as a community centre, provides a home for community groups, encourages the formation of new groups and provides a place for both to meet and integrate. These centres provide flexible space that can cater for the needs of a diverse population of various age groups, community groups and ethnic, cultural, linguistic, educational and socio-economic backgrounds. Activities and programs can be adapted to accommodate the changing needs and characteristics of the population. Locality based groups are some of the building blocks of community cohesion and often the focus of effective neighborhoods.

Council currently provides a high level of community services throughout Pittwater. This element of this Plan has been developed to ensure that the current level of service provision is maintained for all residents whether they are new or existing. In recognition of the benefits of community facilities, Council seeks to provide the same level of community services for the residents and workers of Warriewood Valley. Activities accommodated and needed in community centres for the Warriewood Valley Release Area will include:

- Social activities for all age groups.
- Adult education.
- Playgroups.
- Youth activities.
- Art and craft activities.
- Activities for older residents.
- Activities for those with a disability.
- Catering and function rooms for events.

8.2 Nexus and future demand

The demand for new public facilities within the Warriewood Valley Release Area will be influenced by a number of factors, including the anticipated demographic composition of the new population, the availability and type of facilities currently available, and whether there is any spare capacity within the existing infrastructure.

Existing facilities are at capacity, evidenced by the requests for provision of additional services from community groups that cannot be accommodated in existing facilities. It is apparent, through previous research, that there is no capacity in the existing community facilities to cater for the demand likely to arise from expected population growth over the next 10 years. As a consequence, it will be necessary to provide additional floor space to maintain the same level of service to the incoming population. The factors, which will affect the demand for community services, are based on the profile of the incoming population.

In 1994, the population of the Warriewood Valley Release Area was anticipated to be different to that of the existing Pittwater community at the time. The *Demographic & Facility/Services Needs Studies, Ingleside-Warriewood Urban Release Area* (Travers Morgan 1994) identified the following characteristics and requirements:

- *Services for children*
With a significant proportion of children aged 0-12 years and a high rate of women in the workforce, there will be additional demand for children's services. Residents moving into the area will require access to services such as long day care, pre-school, occasional care and outside school hours care. There will therefore be a need, therefore, for community facilities in which to provide a range of children's services.
- *Services for young people*
Youth entertainment and transport have been identified as two major issues for young people moving into the area. Community facilities will need to provide a variety of recreation/entertainment options for young people, in a location that is accessible by bus, bicycle and those in wheelchairs and on foot.
- *Ageing population*
The provision of multi-unit housing may increase the number of aged residents as very often they are seeking smaller homes with reduced maintenance. There will be continued demand for community centres to provide office and meeting space for activities for older people and information services such as libraries.
- *Female workforce participation*
With a stable proportion of children aged 0-12 years and continued high rate of female workforce participation, new residential development will create strong demand for child care services, particularly for children under 2 years, preschool services and services for children with a disability.
- *Services for persons with a disability*
It is anticipated that the Release Area will have a significant population of people with disabilities. This is due primarily to the high proportion of aged residents and the attractiveness of the area for those who want to be near the major disability service providers located on the Northern Beaches. There will therefore be a need for community facilities to be fully accessible and to provide a range of services/programs for people with disabilities.
- *Services for the general community*
The need for a range of other services for the general community including community nursing services and services for women and people from non-English speaking backgrounds have been identified as necessary for the future population. This highlights the need for multi-purpose community facility space to provide a base from which a variety of services can be provided to the community.

More recent studies and feedback from the community clearly highlight the need for spaces to also be made available for environmental education and awareness.

Demand for community service facility floor space is calculated in the following way:

- In 2011, 16,882m² of community service facility floor space was available in the Pittwater LGA. Additionally, the number of occupied dwellings in the Pittwater LGA was 20,588¹⁵.
- This equates to 0.82m² of community service facility floor space currently available to each household in Pittwater.
- The anticipated dwelling yield for Warriewood Valley is 2,451 residential dwellings.
- The anticipated number of dwellings is multiplied by 0.82m² to give 2,014m² of community service facility floor space required by the incoming residents.

Some types of community services are age specific (such as child care, youth centres or senior citizens centres) while others are generic and used by people of all ages (such as exhibition space). This Strategy seeks to provide community facilities and services that are able to provide for the demands of the whole population. Based on a review of Council's strategic community facilities and service priorities and the desire/ability to deliver local services, it is considered that the needs of the incoming population will be best met by provision of additional floor space and equipment.

Subject to availability of additional (non-section 94) funding and feasibility, this Strategy will provide for the construction of a new community facility that will replace the existing older facilities and provide additional space for the incoming residents of Warriewood Valley. Should additional funding sources not be attainable, Council's priority will be to provide a smaller facility focused on meeting the needs of the incoming population of Warriewood Valley.

It is expected that these works will satisfy the anticipated demands of the expected population increase. This Strategy aims to achieve the following objectives and benefits:

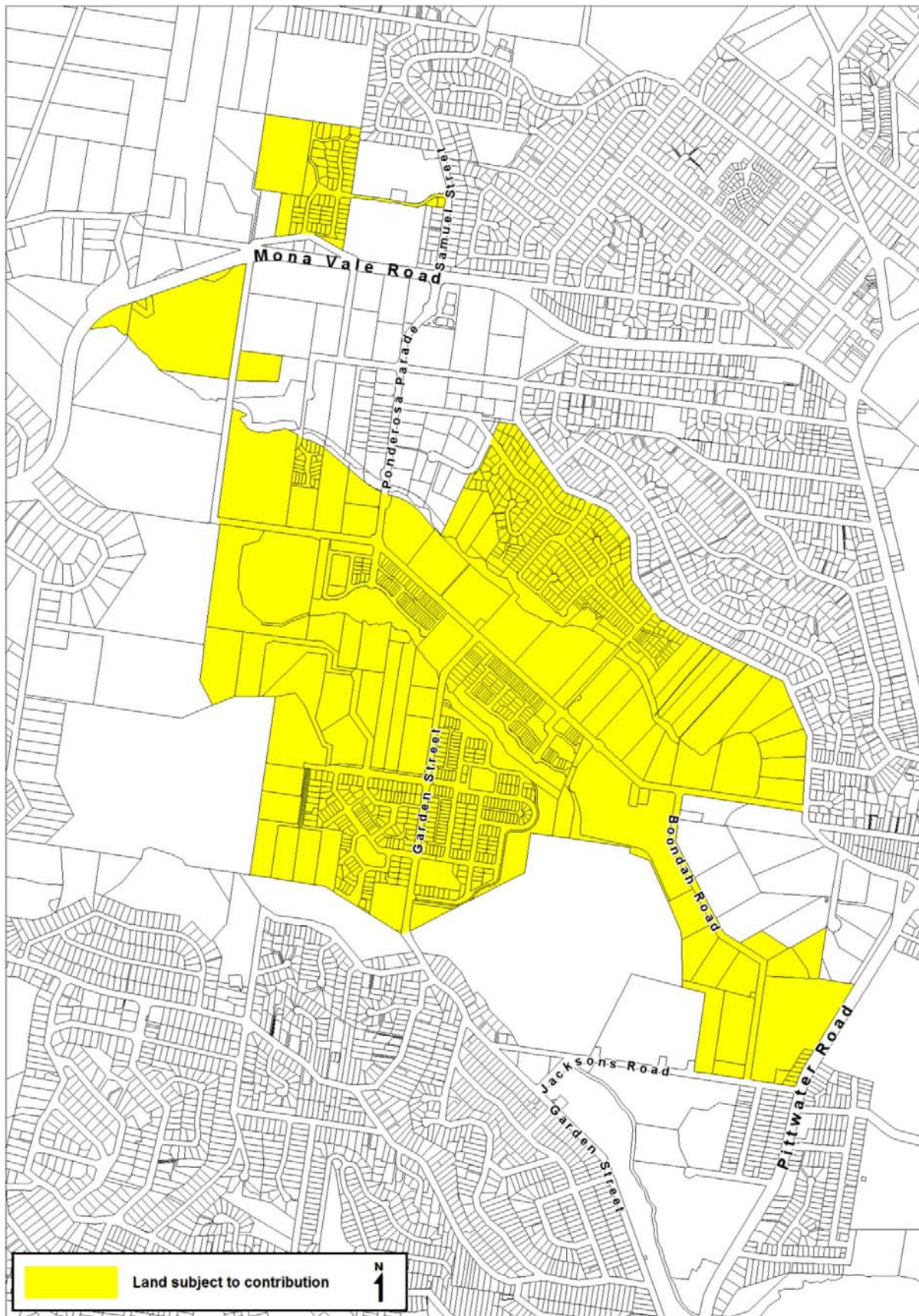
- Achieve more appropriate servicing;
- Provide increased flexibility to address changing community needs over time;
- Provide more innovative, economical and effective models of provision;
- Meet a range of community needs in one centre – increasing levels of community access and service;
- Provide a facility that is fully accessible to enable use for services specifically for older residents and for people with disabilities;
- Provide facilities within a reasonable time;
- Achieve increased economies of scale in terms of ongoing operating costs; and
- Establish a focal point for community services delivery and the potential to co-locate community services and amenities which may provide benefits in community development terms as well as potential cost benefits through the sharing of resources between community groups.

¹⁵ ABS Census 2011

8.3 Contributing development

All new residential development on properties identified in Figure 8 will contribute towards the Community Facilities Strategy.

Figure 8: Land subject to Community Facilities Strategy



8.4 Apportionment

The facilities proposed are not required to provide for the needs of existing residents outside of Warriewood Valley, nor are they designed to serve as regional facilities, which may be used by people from outside the LGA. The purpose of this approach is to ensure there is a nexus between the expected population and the demand for these facilities, and to ensure that only new development pays for this provision.

This Plan will contribute toward the proposed facility in accordance with the floor space needed identified in section 8.2.

8.5 Reasonableness

The core principle of development contributions is that they must be reasonable. A contribution toward this Strategy is considered reasonable as it will ensure the equitable provision of community facilities for all new residents. Conversely, it would not be reasonable to burden the broader Pittwater community with the financial responsibility of providing infrastructure benefiting the residents of Warriewood Valley.

8.6 Works schedule

Refer to Appendix B for the program of works for the Community Services Strategy.

9.0 Bushfire Protection Strategy

9.1 Introduction

The Warriewood Valley Release Area is bordered to the west by significant vegetation. The area's bushland resource is a significant contributor to the high quality of life enjoyed by the Release Area's residents, while its ongoing protection has been shown as a high priority for the wider Pittwater community. The scenic and natural qualities and the recreational pursuits available are significant contributors to Pittwater's quality of life.

With the history of the behaviour of bushfires previously recorded in Warriewood Valley Release Area and the significant amount of surrounding bushland likely to be conserved in both public and private ownership, bushfire is a potential threat to all new development that must be managed. This Plan provides for bushfire protection measures, which Council considers essential to safeguard life and property from the risk of bushfire.

Note: All contributions toward bushfire protection works have now been collected. Although no further contributions will be levied towards delivery of these facilities, some facilities are still to be delivered. These are identified in Appendix B of this Plan.

9.2 Nexus and future demand

The developed of the Warriewood Valley Release Area will require the provision of bushfire protection works. This Plan identifies the bushfire protection works that Council intends to implement to safeguard life and property from the risk of bushfire.

The *Ingleside/Warriewood Urban Land Release Bushfire Hazard Evaluation (1995)* recommended the provision of a perimeter fire trail around a bushfire hazard boundary within an urban subdivision to provide perimeter access for fire fighters and for use as a fire control line. Bushfire protection trails with unobstructed access available to emergency vehicles need to be created and maintained in locations that optimise effective management of bushfire emergencies. The bushfire protection trail comprises both:

- Perimeter roads designed as part of the subdivision of the sector; and
- Access linkages between the perimeter roads.

Properties identified as bushfire prone will require compliance with the *Planning for Bushfire Protection 2006*, including provision of a perimeter fire trail and Asset Protection Zones as part of the subdivision layout. The responsibility for funding and constructing the perimeter fire trail within the development site is the responsibility of the developer.

This Strategy will deliver key linkages between perimeter roads provided by the developer through the subdivision of land.

9.3 Contributing development

All contributions toward bushfire protection works have now been collected. Contributions toward this element have not been collected since 4 September 2008.

Prior to this date, all development within the Warriewood Valley Release Area was required to contribute towards the cost of providing bushfire protection services.

9.4 Apportionment

The need to provide bushfire protection facilities identified the Bushfire Protection Strategy is generated by the development of the Release Area. Given that the Release Area contains significant portions of bushland, developer contributions are required to support additional infrastructure required by new development. Council considers it essential that the full economic value of the contribution made by existing residents to the provision of bushfire protection facilities should be recognised and that new development will benefit substantially from this provision. It is therefore appropriate that all development within the Warriewood Valley Release Area be subject to the full cost of providing this bushfire protection.

9.5 Reasonableness

The core principle of development contributions is that they must be reasonable.

A contribution for bushfire protection is considered to be reasonable as it levies for the needs of new residents and workers for bushfire protection and ensures the equitable provision of these facilities.

9.6 Works schedule

The program of bushfire protection works still to be delivered under this Plan is detailed in Appendix B of this Plan.

10.0 Ponderosa Parade Drainage Strategy

10.1 Introduction

This Strategy identifies the drainage infrastructure within the Ponderosa Parade precinct established to facilitate development of the Stage 1 Release.

The design and construction of a stormwater drainage infrastructure along Ponderosa Parade, from Jubilee Avenue to Narrabeen Creek Warriewood, has already been completed. Forward funding from Council has facilitated early delivery and completion of this infrastructure.

A number of sectors still to be developed are required to contribute towards the early delivery of this infrastructure.

10.2 Nexus and future demand

As part of the trunk drainage system for the Ponderosa Parade precinct, a pipeline was constructed in 1998/99 along Ponderosa Parade. The trunk drainage system starts west of Daydream Street and south of Mona Vale Road, and then crosses Daydream Street through private property to the intersection of Jubilee Avenue and Ponderosa Parade. Now complete, this pipeline runs along Ponderosa Parade and discharges stormwater to Narrabeen Creek.

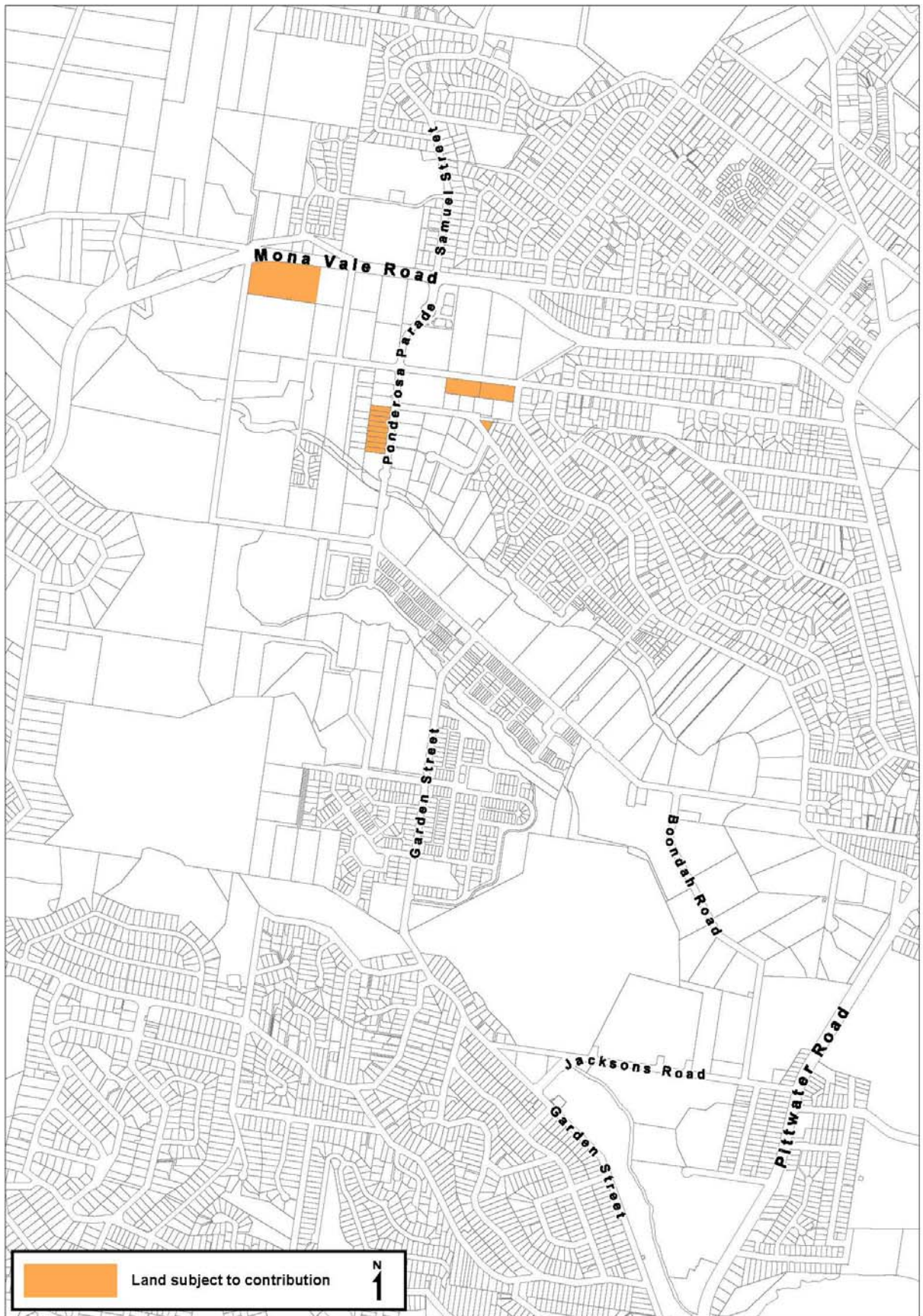
Properties within the Stage 1 Release (being those along Ponderosa Parade between Jubilee Avenue and Narrabeen Creek, and 2 Daydream Street) and Sector 7 are required to contribute toward delivery of this infrastructure. These costs are distributed equitably, based on the area of each site.

10.3 Contributing development

As of 2014, most of the properties having the benefit of the drainage infrastructure for the Ponderosa Parade precinct have been developed and contributed to the repayment of this infrastructure.

The remaining sectors still to be developed are Sectors 7, 102, 103, 104 and 105. All development on these properties (identified in Figure 9) will contribute towards the drainage infrastructure for the Ponderosa Parade precinct.

Figure 9: Land subject to Ponderosa Parade Drainage Strategy



10.4 Apportionment

The need to provide the trunk drainage system for the Ponderosa Parade precinct is directly generated by the development of the sectors within this precinct. It is therefore appropriate that all development in this precinct be subject to the full cost of providing this infrastructure.

10.5 Reasonableness

The core principle of development contributions is that they must be reasonable and equitable. This contribution is considered to be reasonable as it relates to costs associated with actual delivery of drainage infrastructure for the Ponderosa Parade Precinct. Costs associated with the early delivery of this infrastructure are still to be recouped via this Plan. Conversely, it would not be reasonable to burden the broader Pittwater community with the financial responsibility of providing infrastructure benefiting the residents of Warriewood Valley.

10.6 Works schedule

The Ponderosa Parade drainage infrastructure has been delivered and is listed in Appendix A of this Plan.

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11.0 Administration and Plan Management Strategy

11.1 Introduction

This Strategy identifies the demand for resources related to the ongoing management and administration of this Plan.

The management and administration of this Plan imposes costs on Council in the preparation, implementation, monitoring and review of this Plan. With the increase in population and workforce there is a necessity to ensure there is a continuous process of managing, monitoring, revising and implementing this Plan.

11.2 Nexus and future demand

Section 94 plans and management systems exist because the nature of new development justifies and requires it. The costs to prepare, review and implement the plan, including for background studies, will be funded by new development where appropriate.

The administration of a Section 94 Plan is an expensive task. Council employs staff on both a part time and full time basis to coordinate the implementation of this Plan, the associated financial model and works schedule. In addition, consultant studies are often commissioned in order to determine design and costings of works, as well as to review the development and demand assumptions. The cost of contract administration is also considered a plan administration cost.

In accordance with IPART's Local Infrastructure Benchmark Costs Final Report, administration and plan management costs have been calculated annually at 1.5% of the value of the works schedule for each financial year.

11.3 Contributing development

All land subject to this Plan will contribute towards the Administration and Plan Management Strategy (refer to Figure 1).

11.4 Apportionment

As this Plan has been prepared solely to cater for the demands of future development, the costs associated with the Plan's preparation and ongoing administration will be borne fully by the future development.

11.5 Reasonableness

The core principle of development contributions is that they must be reasonable. A contribution for Administration and Management is considered to be reasonable as it

relates to costs associated with actual delivery of infrastructure identified under this Plan including the monitoring/review of the Plan to facilitate timely delivery.

11.6 Works schedule

The funds to be set aside annually for the management and administration this Plan are listed in Appendix A of this Plan.

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Appendices

Appendix A: Completed Works

Traffic and Transport Strategy	
Year Completed	Project Description
1998/99	Design and Associated Works
1999/00	Design and Associated Works
2000/01	Mona Vale Road/Foley Street Traffic Lights - Concept Design
	Design and Associated Works
	Traffic calming in Warriewood Road fronting Sector 1 – N0444/98
	Traffic calming in Warriewood Road fronting Sector 1- N0452/98
	2 bus bays in Warriewood Road-N0444/98
	Line marking/signage in Warriewood Road fronting Sector 1 – N0444/98
	Line marking/signage in Warriewood Road fronting Sector 1 – N0452/98
	Pathway land-Ponderosa Parade to Prosperity Parade – DP 1024779-99/5
2002/03	Pedestrian refuge in Garden Street, south of Orchard Street – N0570/01
	Roundabout (partial) in Garden Street at Sector 10 entrance – N0570/01
	Ponderosa Parade widening and roundabout (88 Mona Vale Rd) – 10904 of 2000
	Traffic Lights at Mona Vale Road/Foley Street - design
	Prosperity Parade street lighting
	Footpath link from Ponderosa Parade to Prosperity Parade
2003/04	Bus Shelter in Garden Street
	Traffic Lights / Roadworks design - Mona Vale Road/Foley Street
	Traffic Calming (Sector 2) Warriewood Road
	Traffic Calming (Sector 1) Warriewood Road

2004/05	Traffic Lights / Roadworks design - Mona Vale Road/Foley St
	Fern Creek bridge design
	Street tree planting
	Bus shelters in Warriewood Road
	Apollo Street improvements
2005/06	Bus bay in Warriewood Road (Sector 2) - N0143/00
	Pedestrian refuge in Garden Street, north of Mullet Creek - N0785/02
	Roundabout at Sector 10 / Sector 12 entrance – N0785/02
	Roundabout at Garden and Orchard St-N0785/02
	Traffic Lights / Roadwork design - Mona Vale Road/Foley Street
	Fern Creek Bridge design (2005/06)
	Apollo Street Improvements - street lighting and footpath
2006/07	Traffic lights / roadwork design - Mona Vale Road/Foley Street
	Fern Creek bridge design
	Medians in Jubilee Avenue, west of Daydream St (design)
	Entry Threshold – Garden Street/Natuna Street
	Pavement Correction & Strengthening Warriewood Road
	Traffic Calming - Warriewood Road, adjacent to Sector 1 and 2
	Road Widening - Warriewood Road, outside 12 Apollo Street (design)
	Pedestrian Refuge - Warriewood Road, between Moriac Street and Manooka Place
	Splay corner-Forest Road / MacPherson Street-N0210/04
	Bus bay-MacPherson Street at Forest Road-N0210/04
	Pedestrian refuge in MacPherson Street, north of Garden Street - N0210/04
	Signage, line marking & islands-north side of MacPherson Street - N0210/04
2007/08	MacPherson St / Forest Rd roundabout - N0210/04
	Garden St from Sector 12A to Mullet Creek - N0785/02
	Pavement Strengthening at MacPherson St / Brands Lane roundabout - N0210/04

	Traffic Calming – Warriewood Rd Adjacent to Sector 1 & 2
	Road Widening - Warriewood Road, outside 12 Apollo Street
	Road Culvert over Fern Creek in Garden St
	Street trees
	Culverts in Narrabeen Creek at Ponderosa Pde (design)
	Warriewood Road footpath connection
	Traffic lights Mona Vale Road / Foley Street - relocate power poles
2008/09	Traffic Lights Mona Vale Road / Foley Street
	Pedestrian Refuge - MacPherson Street at Narrabeen Creek (west)
	Culverts in Narrabeen Creek at Ponderosa Parade
	Splay Corner - 213 Garden Street / MacPherson Street
	Road culvert over Fern Creek in Garden Street
	Culverts in Narrabeen Creek at MacPherson Street
	Roadworks associated with Ponderosa Parade culvert
2009/10	Pedestrian Refuge - MacPherson Street at Narrabeen Creek (west)
	Splay Corner - 213 Garden / MacPherson Street
2011/12	Macpherson Street bridge over Narrabeen Creek - Design
	Macpherson Street Boondah Road
2013/14	Bridge and culvert, Road Raising, power and utility Relocation Macpherson Street (Design and part construction)
2014/15	Pavement correction and strengthening at Foley Street
	Roundabout and intersection upgrade - Garden Street/Jacksons Road intersection
	Upgrade Boondah Road from MacPherson Street to approximately chainage 300 (eastern side only)
2015/16	Road upgrade – Macpherson Street (between Garden Street and Sector 8) and Garden Street (eastern side of road only, between Macpherson Street and Fern Creek)
	Bridge and culverts, road raising, power and utility relocation – Macpherson Street (Design component)
	Bus Bay and Shelter – MacPherson Street (south side of road) at Garden Street
	Pedestrian Refuge (small) – Garden Street at Fern Creek

Multi-functional Creek Line Corridor Strategy (Rehabilitation works)	
Year Completed	Project Description
1998/99	Water Strategy Works (Old Drainage Plan)
1999/00	Water Strategy Works
2000/01	Water Quality Compliance /Data Monitoring
	Concept Design of Narrabeen Creek Corridor
	Detailed Design of Narrabeen Creek Corridor
	Concept Design of Fern Creek Corridor
2001/02	Narrabeen Creek 30m Corridor C
	Narrabeen Creek 45m Corridor D
	Narrabeen Creek 45m Corridor E
	Water Quality Compliance Data Monitoring
	Water Quality Retention Basin - Earthworks
2002/03	Narrabeen Creek-corridor E and part corridor D-N0446/98
	Water Quality Compliance Data Monitoring
	Water Quality Detention Basin (Stage 2)
	East End Detention Basin Creek Crossing
	Narrabeen Creek Corridor C
	Fern Creek (Section I)
2003/04	Water Quality Compliance Data Monitoring
	Water Quality Detention Basin (Stage 2 earthworks)
	Narrabeen Creek Corridor C (2003/04 works)
	Fern Creek (Section I)
2004/05	Water Quality Compliance Data Monitoring
	Water Quality Detention Basin (Stage 2)

	Water Quality Detention Basin (Stage 2)
	Narrabeen Creek Corridor C (2004/05 works)
	Fern Creek (Section I)
	Narrabeen Creek Corridor B
2005/06	Narrabeen Creek Corridor F (Sector 2)
	Detention Basin
	Fern Creek - Corridor I
	Narrabeen Creek - Corridor C
	Fern Creek - Corridor H (Stage 1)
	Jubilee Ave - Upgrade Outlet
	Water Quality Compliance Data Monitoring
	Warriewood Valley Flood Study - Addendum
2006/07	Narrabeen Creek Corridor F (Sector 2)
	Fern Creek - Pedestrian/Cycleway Bridge (Sector 11/12)
	Detention Basin
	Fern Creek - Corridor H (Stage 1)
	Fern Creek Sector 11/12 Rehab
	Pedestrian Cycleway Bridge to Detention Basin
	Water Quality Compliance Data Monitoring
	Works in Fern Creek (Sector 11)-N0793/02
2007/08	Detention Basin (Final Stage - survey and design)
	Narrabeen Creek - Corridor F
	Fern Creek - Corridor H (Stage 2)
	Narrabeen Creek - Corridor B
	Water Quality Compliance Data Monitoring
2008/09	Detention Basin Design
	Narrabeen Creek - Corridor B

	Fern Creek Corridor H Stage 1
	Water Quality Compliance Data Monitoring
2009/10	Narrabeen Creek Culverts
	Narrabeen Creek - Corridor B
	Fern Creek Corridor H Stage 1
2010/11	WWV Detention Basin Entry Road
2011/12	Narrabeen Creek - Corridor B - Stage 1
2015/16	Fern Creek – Sector 801
Multi-functional Creek Line Corridor Strategy (Land acquisition)	
Year Completed	Project Description
2000/01	Water Quality Detention Basin Land Acquisition
	Sector 1-Australand (Lot 3022 DP 1021084) - N0444/98
	1-3 Apollo St (Lot 29 DP 1024779) - 99/5
2001/02	Sector 8 - Direct Dedication of land at Mater Maria School
	Sector 1 - MPB (Byrne and Associates)
2003/04	Fern Creek - Sector 12 – N0785/02 (CPG Developments)
	Fern Creek - Sector 11 - (Direct dedication - Australand)
2004/05	Narrabeen Creek - Sector 2-stage 51-N0143/00 (MPB - Australand)
	Narrabeen Creek -Sector 2-stage 41-N0143/00 (MPB - Australand)
	Narrabeen Creek - Sector 2-stage 6-N1034/02 (MPB - Australand)
	Fern Creek - Sector 12 – (Direct dedication - CPG)
2005/06	Vuko Place - Upgrade pipe outlet
	Sector 15 Creek Land Acquisition (1 Boondah Road)
	Sector 15 Creek Land Acquisition (1 Boondah Road)
	Narrabeen Creek – Sector 6 – N0738/04 (MPB-FKP)

	Narrabeen Creek – Sector 6 (Direct dedication - FKP)
	Fern Creek – Sector 9 (Direct dedication - Australand)
	Narrabeen Creek – STP Buffer Area (Direct dedication - ARV)
Public Recreation and Open Space Strategy	
Year Completed	Project Description
1999/00	Boondah Reserve works
2000/01	Jacksons Road sportsground acquisition (1st payment)
	Jacksons Road Sportsground Civil Works
	Land for neighbourhood park 1 (Sector 1) (Lot 3022 DP 1021084) - N0446/98
2001/02	Jacksons Road Sportsground Acquisition (2nd payment)
	Jacksons Road Sportsground Car park
2002/03	Jacksons Road Sportsground Acquisition (3rd payment)
	Jacksons Road Sportsground - lighting and signage
	Land for neighbourhood park 2 (Lot 126 DP 1043971) - N0570/01
	Neighbourhood park (Sector 1) - N0446/98
2003/04	Neighbourhood park 2 (Sector 10) - N0570/01
	Land for neighbourhood park 3 (Sector 12) - N0785/02
	Jacksons Road Sportsground Acquisition (4th payment)
	Sportsground (Jacksons Road) Stage 3
2004/05	Jacksons Road Sportsground Acquisition (final payment)
	Jacksons Road Change Rooms (design)
2005/06	Jacksons Road Change Rooms (design)
	District Park (Design)
	Neighbourhood park 3 (Sector 12) - N0785/02
2006/07	Warriewood Valley Sportsground Amenities

	Central park (land in sector 8) - N0210/04
2007/08	Jackson Road Sportsground Lighting
	Jacksons Road Sportsground Amenities - landscaping, plumbing & painting
	Shade Structures to Neighbourhood Parks 1 & 3
	Purchase of open space land (Sector 9)
2008/09	Central Local Park (Sector 8) – Embellishment
	Jackson Road sportsground lighting
	Narrabeen High School soccer ground
	Warriewood Valley Community Centre Childcare Stage 1
2009/10	Central Local Park (Sector 8) - Embellishment
2010/11	Central Local Park (Sector 8) - Embellishment
2011/12	Central Local Park (Sector 8) - Playground
2011/12	Narrabeen High sportsfield embellishment
2015/16	NBISC Contribution – Stage 1

Community Facilities Strategy

Year Completed	Project Description
2007/08	Warriewood Community Centre Childcare Design/Investigation
2009/10	Warriewood Community Centre Childcare Stage 1
2015/16	Embellishment/Extension of Community Facility Space (Design Stage 1)

Library Facilities Strategy¹⁶

Year Completed	Project Description
2001/02	Library Resource Items / Equipment (2001/02)
2002/03	Library Resource Items / Equipment (2002/03)

¹⁶ All works associated with this strategy have now been completed.

2003/04	Library Resource Items / Equipment (2003/04)
	Extensions Mona Vale Library
2004/05	Library Resource Items / Equipment (2004/05)
	Extensions Mona Vale Library
2005/06	Library Resource Items / Equipment (2005/06)
	Extensions Mona Vale Library
2006/07	Library Resource Items / Equipment (2006/07)
2007/08	Library Resource Items / Equipment (2007/08)
2008/09	Library Resource Items / Equipment (2008/09)
Pedestrian and Cyclist Network Strategy	
Year Completed	Project Description
2000/01	Cycleway west of Sector 1-NO452/98
2002/03	Cycleway network along Narrabeen Creek –(Sector 1)
	Land in Sector 10 (DP 1043971) - (Stockland) – N0570/01
	Cycleway network in Sector 1-Australand-N0444/98
	Cycleway network in Sector 10 - Stockland – N0570/01
2004/05	Warriewood Wetlands boardwalk - Stage 2
	Cycleway around detention basin in Sector 1
	Cycleway along Pittwater Road (south of Warriewood Road)
	Land south of Sector 12 adjoining conservation/open space - N0785/02 (CPG)
	Land in Sector 11 - (Australand) – N0793/02
2005/06	Warriewood Wetlands boardwalk – Stage 2
	Pedestrian/Cycleway bridge over Fern Creek (Sector 11/12)
	Cycleway network for Sector 12 - (CPG) – N0785/02
	Cycleway network in Fern Creek (Sector 12) - (CPG) – N0785/02

2006/07	Warriewood Wetlands Boardwalk Stage 2
	Cycleway network in Sector 11 - (Australand) – N0793/02
	Cycleway around detention basin in Sector 1
	Cycleway network along Narrabeen Creek (Sector 2)
2011/12	Cycleway network along Narrabeen Creek (Corridor B)
2015/16	Cycleway network along Fern Creek (Sector 801)
Ponderosa Parade Drainage Strategy¹⁷	
Year Completed	Project Description
1998/99	Trunk Drainage Ponderosa Parade
2000/01	Trunk Drainage Ponderosa Parade

¹⁷ All works associated with this strategy have now been completed.

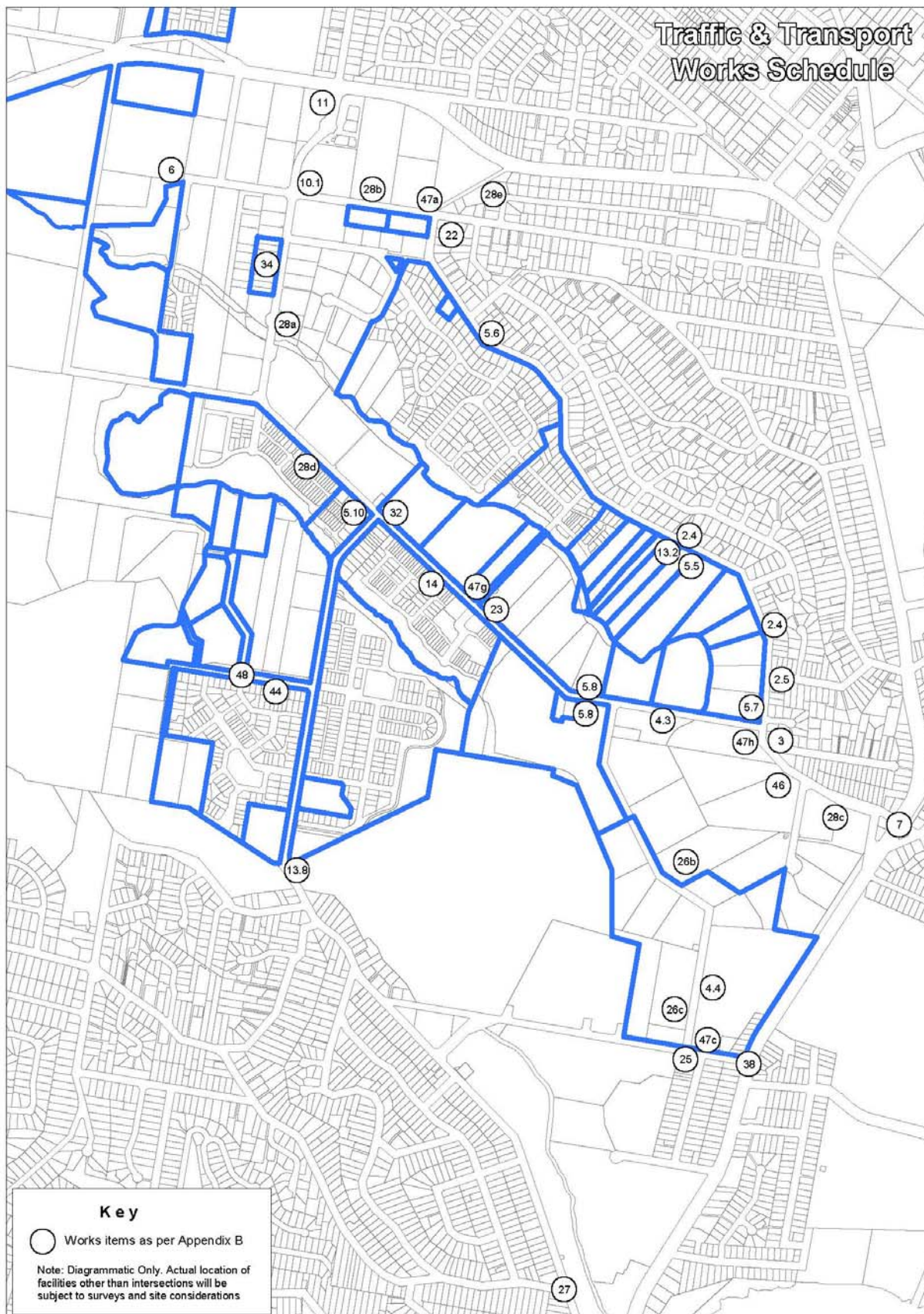
Appendix B: Works Schedule

Traffic and Transport Strategy			
Location/ Item Number	Project Description	Expenditure (\$2016/17)	Commencement Year
2.4	Traffic calming islands – Alameda to Hill Street	\$172,801	2017/18
2.5	Roundabout – Warriewood Road and Hill Street intersection	\$180,720	2019/20
3	Roundabout – Warriewood Road and Macpherson Street (construction, underground power and service adjustments)	\$1,185,724	2016/17
4.3	Bridge and culverts, road raising, power and utility relocation – Macpherson Street (Construction component)	\$9,011,607	2016/17
4.4	Culvert to increase capacity under Boondah Road at Narrabeen Creek	\$676,873	2019/20
5.5	Bus Bay and shelter – Warriewood Road between Manooka Place and Alameda Way	\$33,940	2021/22
5.6	Bus Bay and shelter – Warriewood Road at Alameda Way	\$29,442	2021/22
5.7	Bus Bay and shelter – Warriewood Road at Macedon Place	\$33,938	2021/22
5.8	Bus shelter x 2 – Macpherson Street (north and south side of road) near Boondah Road	\$58,884	2016/17
5.10	Bus Bay and shelter - Macpherson Street (north side of road) near Garden Street	\$37,394	2017/18
6	Median island – Jubilee Ave (design and construct)	\$16,905	2016/17
7	Intersection upgrade – Improve left turn and produce two right turn lanes into Pittwater Road at Warriewood Road	\$490,248	2020/21
10.1	Traffic islands – Jubilee Avenue and Ponderosa Parade (Stage 2 of roundabout construction)	\$73,091	2016/17
11	Traffic lights and intersection upgrade – Mona Vale Road and Ponderosa Parade – Council Contribution to RMS	\$487,891	2020/21
13.2	Pedestrian Refuge (small) – Warriewood Road, between Manooka Place and Alameda Way	\$40,145	2021/22
13.8	Pedestrian Refuge (small) – Garden Street at Mullet Creek	\$40,145	2021/22
14	Pedestrian Refuge (small) – MacPherson Street, between Garden Street and Brands Lane	\$40,145	2021/22
22	Roundabout – Jubilee Avenue and Warriewood Road	\$295,681	2017/18
23	Roundabout – Macpherson Street and Brands Lane	\$180,720	2018/19

APPENDIX B: WORKS SCHEDULE

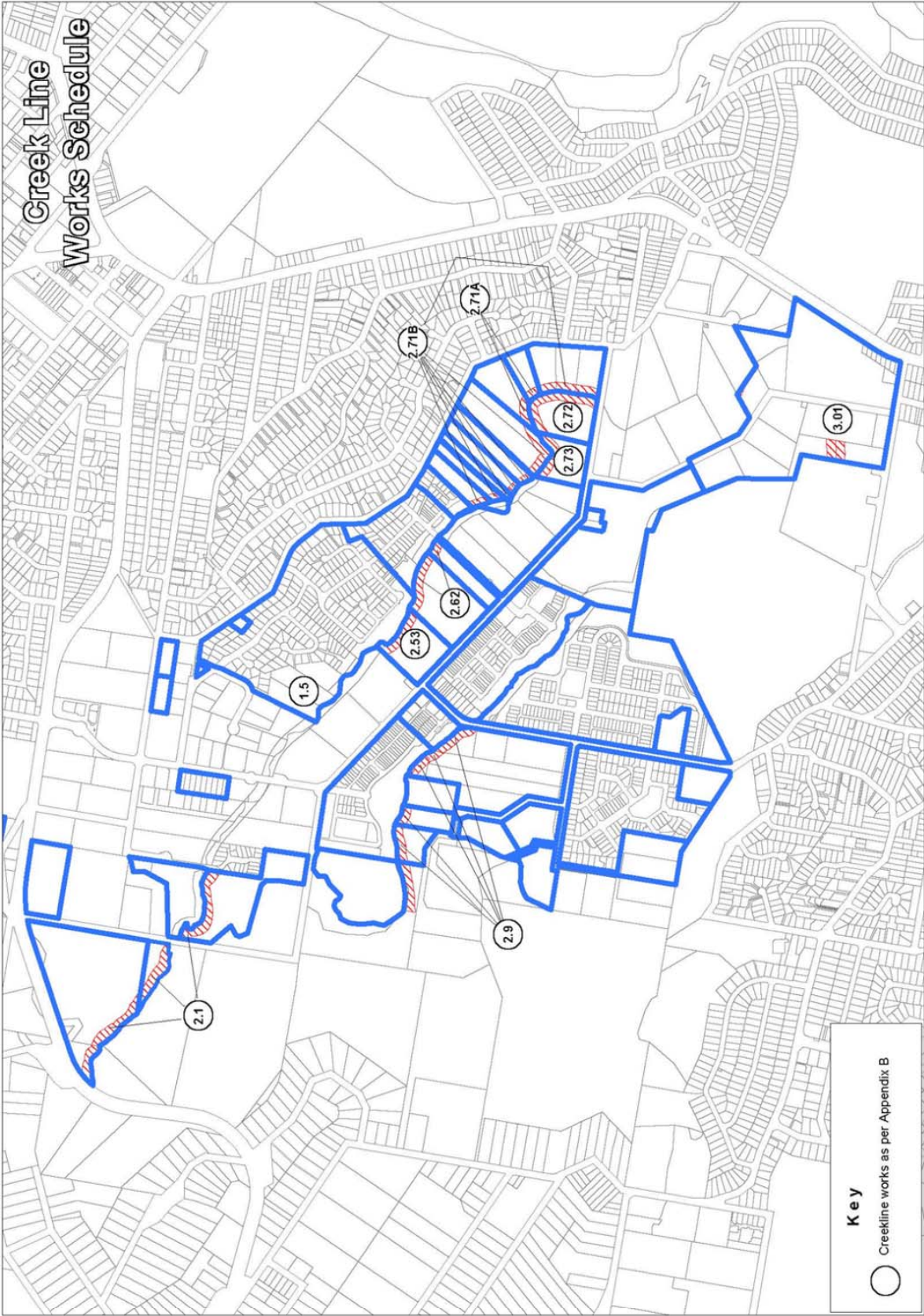
25	Upgrade existing roundabout – Boondah Road and Jacksons Road	\$175,857	2019/20
26b	Road upgrade – Boondah Road from Chainage 300 to Chainage 600 (Design and Construction)	\$2,156,477	2019/20
26c	Road upgrade – Boondah Road from Chainage 600 to Jacksons Road (Design and Construction)	\$2,836,542	2021/21
27	Intersection upgrade and parking improvement – Garden Street and Powderworks Road	\$317,892	2016/17
28A	Shared Paths – Ponderosa Parade, Jubilee Avenue to Macpherson Street	\$220,933	2021/22
28B	Shared Paths – Jubilee Avenue, Ponderosa Parade to Warriewood Road	\$148,839	2021/22
28C	Shared Paths – Warriewood Rd, Vuko Place to Pittwater Road	\$109,304	2017/18
28D	Shared Paths – Macpherson St, Forest Road to Garden Street	\$172,095	2021/22
28E	Footpath – Foley St, Jubilee Avenue to Mona Vale Road	\$56,280	2021/22
34	Road pavement upgrade – Ponderosa Parade, between Apollo Street and Macpherson Street (western side of road)	\$979,213	2017/18
38	Intersection upgrade – Jacksons Road and Pittwater Road	\$543,773	2019/20
44	Central Median – Orchard Road, Garden Street to Fern Creek	\$176,468	2016/17
46	Road upgrade – Warriewood Road, Macpherson Street to Vuko Place	\$519,385	2016/17
47a	Splay corner purchase - Warriewood Road and Jubilee Avenue (3 corners – north-west, south-east and south west corners)	\$149,940	2016/17
47c	Splay corner purchase – Boondah Road and Jacksons Road (2 corners – north east and north west corners)	\$60,393	2017/18
47g	Splay corner purchase – MacPherson Street and Brands Lane (1 corner – north west corner)	\$49,980	2017/18
47h	Splay corner purchase – MacPherson Street and Warriewood Road (1 corner - south-west corner)	\$49,980	2016/17
48	Roundabout – Orchard Street and Fern Creek Road	\$175,857	2018/19
Traffic and Transport Strategy Subtotal		\$21,985,506	

Figure 10: Map of Traffic and Transport Works Schedule



Multi-functional Creek Line Strategy (Rehabilitation works)			
Location/ Item Number	Project Description	Expenditure (\$2016/17)	Commencement Year
1.5	Water Quality Retention Basin – Narrabeen Creek at Sector 1	\$715,573	2017/18
2.1	Narrabeen Creek Upper Reaches	\$1,765,080	2019/20
2.53	Narrabeen Creek at Sector 301	\$357,787	2018/19
2.62	Narrabeen Creek at Sector 302 & 303	\$536,680	2017/18
2.71a	Narrabeen Creek at Buffer 1j & 1k	\$310,082	2016/17
2.71b	Narrabeen Creek at Buffer 1b to 1i & 1l	\$1,359,589	2017/18
2.72	Narrabeen Creek at Buffer 1m	\$1,037,581	2021/20
2.73	Narrabeen Creek at Buffer Area 2a	\$369,713	2020/21
2.9	Fern Creek at Sector 901a, 901c and 901g.	\$1,311,884	2018/19
3.01	Narrabeen Creek in Southern Buffer (6 Jacksons Road)	\$262,377	2021/22
Multi-functional Creek Line Corridor Strategy (Rehabilitation works) Subtotal		\$8,026,344	

Figure 11: Map of Creek Line Works Schedule

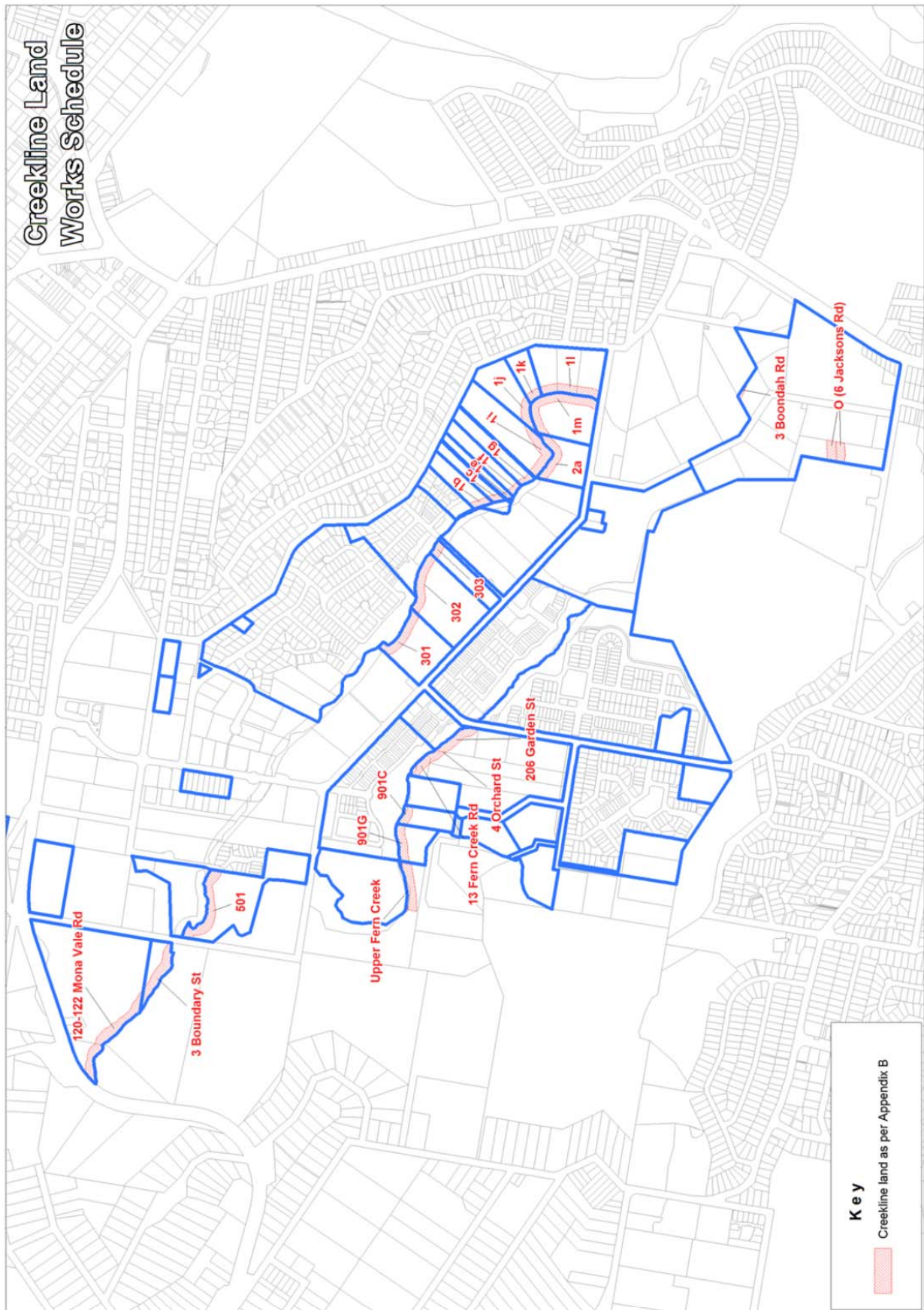


Multi-functional Creek Line Strategy (Land acquisition)			
Location/ Item Number	Project Description	Expenditure (\$2016/17)	Commencement Year
501	Narrabeen Creek Corridor – 6,165m ²	\$334,205	2017/18
301	Narrabeen Creek Corridor – 3,960m ²	\$214,672	2020/21
302	Narrabeen Creek Corridor – 4,344m ²	\$235,489	2016/17
303	Narrabeen Creek Corridor – 1,119m ²	\$60,661	2018/19
1b	Narrabeen Creek Corridor – 1,099 m ²	\$59,577	2016/17
1c	Narrabeen Creek Corridor – 760m ²	\$41,200	2016/17
1e	Narrabeen Creek Corridor – 443m ²	\$24,015	2016/17
1f	Narrabeen Creek Corridor – 694m ²	\$37,622	2019/20
1g	Narrabeen Creek Corridor – 777m ²	\$42,121	2020/21
1i	Narrabeen Creek Corridor – 4,107m ²	\$222,641	2018/19
1j	Narrabeen Creek Corridor – 2,238m ²	\$328,247	2016/17
1k	Narrabeen Creek Corridor – 1,070m ²	\$156,937	2016/17
1l	Narrabeen Creek Corridor – 4,144m ²	\$224,647	2018/19
1m	Narrabeen Creek Corridor – 6,751m ²	\$182,986	2020/21
2a	Narrabeen Creek Corridor – 3,645m ²	\$197,596	2021/22
901A – 13 Fern Creek Road	Fern Creek Corridor – 1,493m ²	\$80,936	2017/18
901A – 4 Orchard Avenue	Fern Creek Corridor – 919m ²	\$49,819	2020/21
901A – 206 Garden Street	Fern Creek Corridor – 2,945m ²	\$159,649	2020/21
901C	Fern Creek Corridor – 1,471m ²	\$79,743	2017/18
901G	Fern Creek Corridor – 2,659m ²	\$144,145	2017/18

APPENDIX B: WORKS SCHEDULE

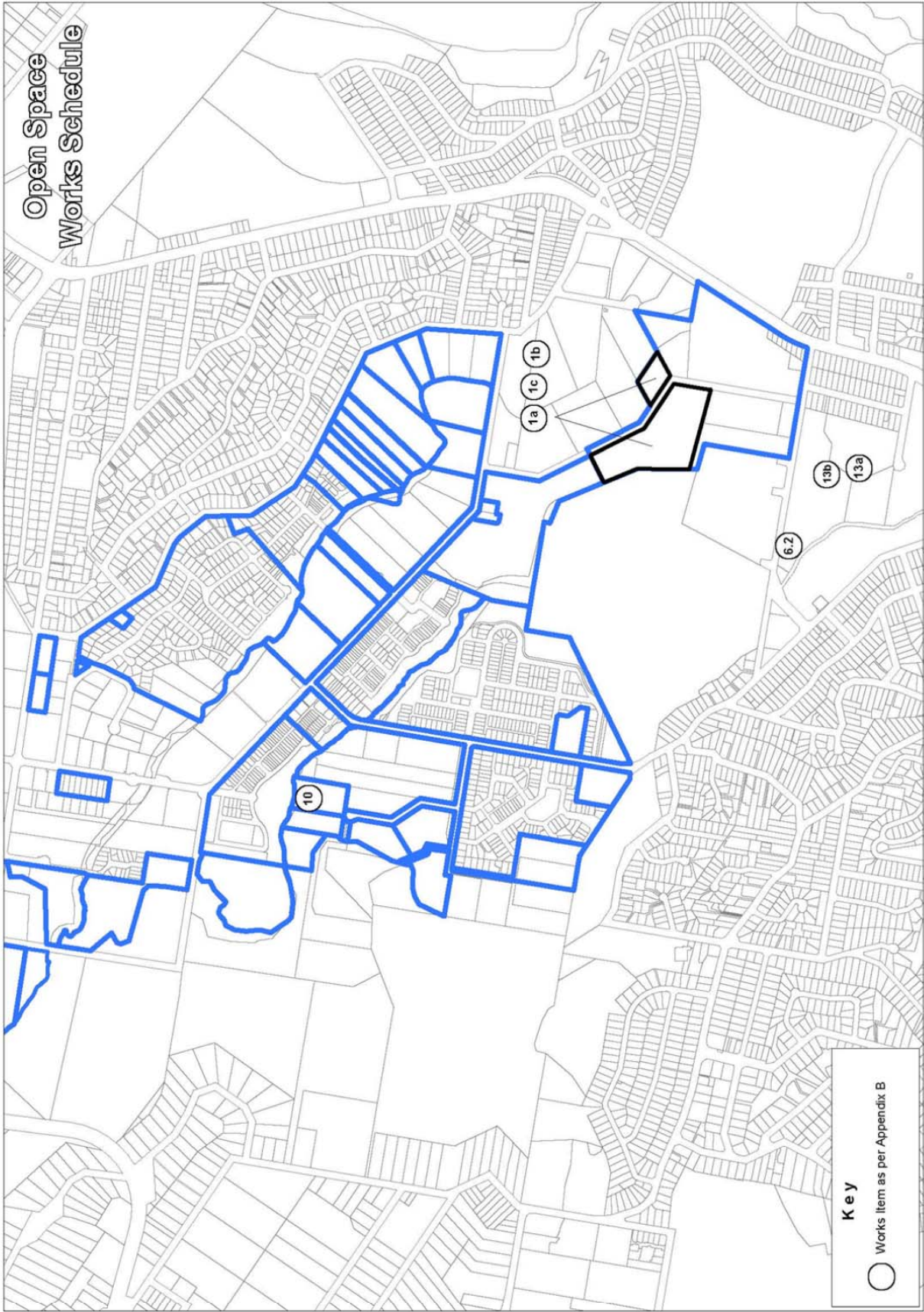
120 Mona Vale Road	Upper Narrabeen Creek – 4,531m ²	\$122,813	2018/19
122 Mona Vale Road	Upper Narrabeen Creek – 2,560 m ²	\$69,389	2018/19
Upper Fern Creek Corridor	Upper Fern Creek Corridor – 3,430m ²	\$185,941	2018/19
3 Boundary Street	Upper Narrabeen Creek – 4,667m ²	\$126,499	2018/19
3 Boondah Road	Narrabeen Creek Corridor – 375m ²	\$20,329	2020/21
6 Jacksons Road	Narrabeen Creek Corridor – 2,795m ²	\$151,517	2020/21
Multi-functional Creek Line Corridor Strategy (Land acquisition) Subtotal		\$3,553,393	

Figure 12: Map of Creek Line Land Acquisition Schedule



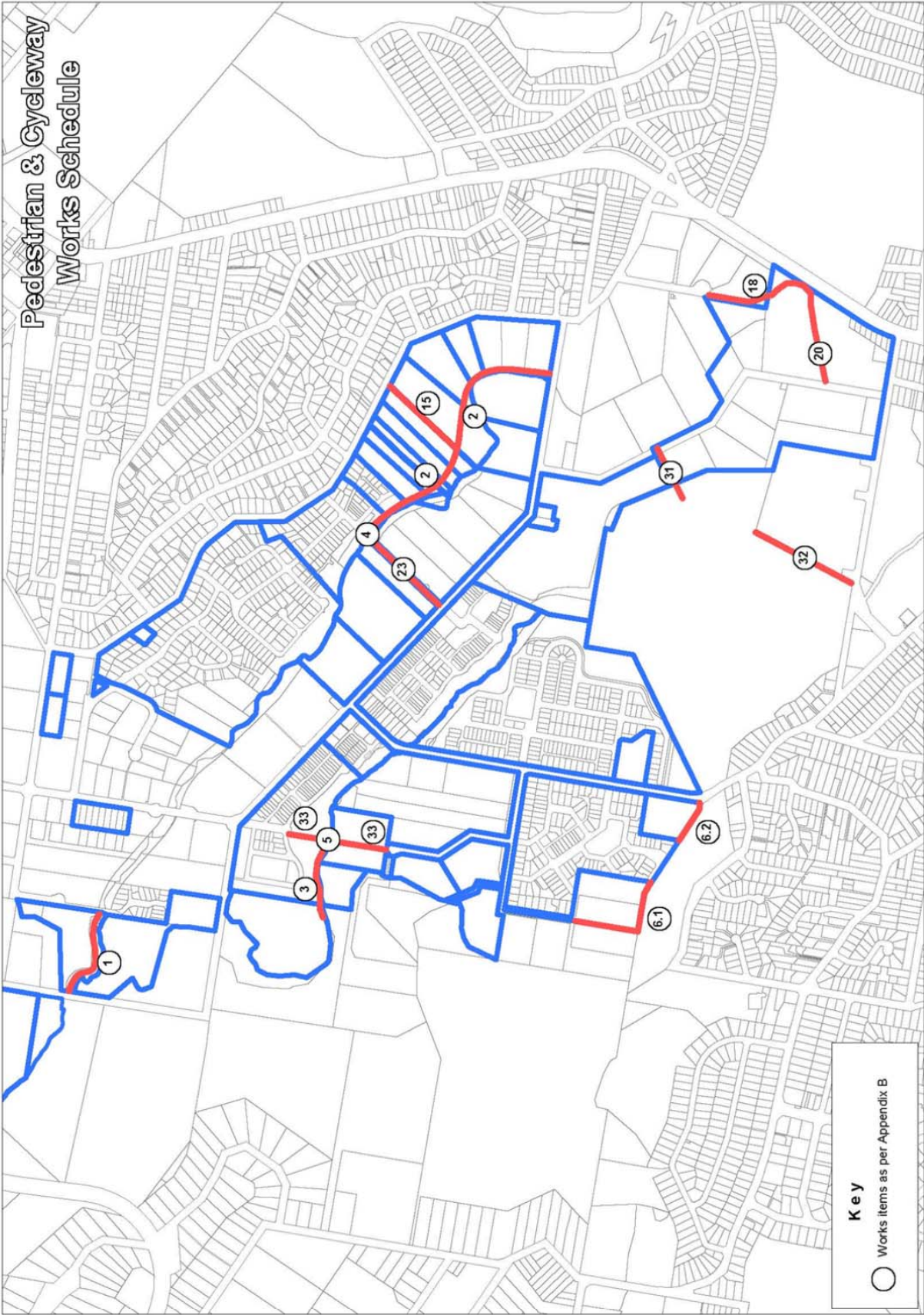
Public Recreation and Open Space Strategy			
Location/ Item Number	Project Description	Expenditure (\$2016/17)	Commencement Year
1a	Southern Buffer land acquisition and embellishment – Stage 1	\$15,048,981	2017/18
1b	Southern Buffer land acquisition and embellishment – Stage 2	\$1,879,560	2018/19
1c	Southern Buffer land acquisition and embellishment – Stage 3	\$4,819,384	2021/22
6.2	Warriewood Sportsground (Jacksons Road) – Carpark upgrade and irrigation	\$732,920	2016/17
13b	Contribution to NBISC – Stage 2	\$235,099	2016/17
10	Embellishment of southern half of Central Local Park - Sector 9	\$1,719,029	2018/19
Public Recreation and Open Space Strategy Subtotal		\$24,343,973	

Figure 13: Map of Public Recreation and Open Space Works Schedule



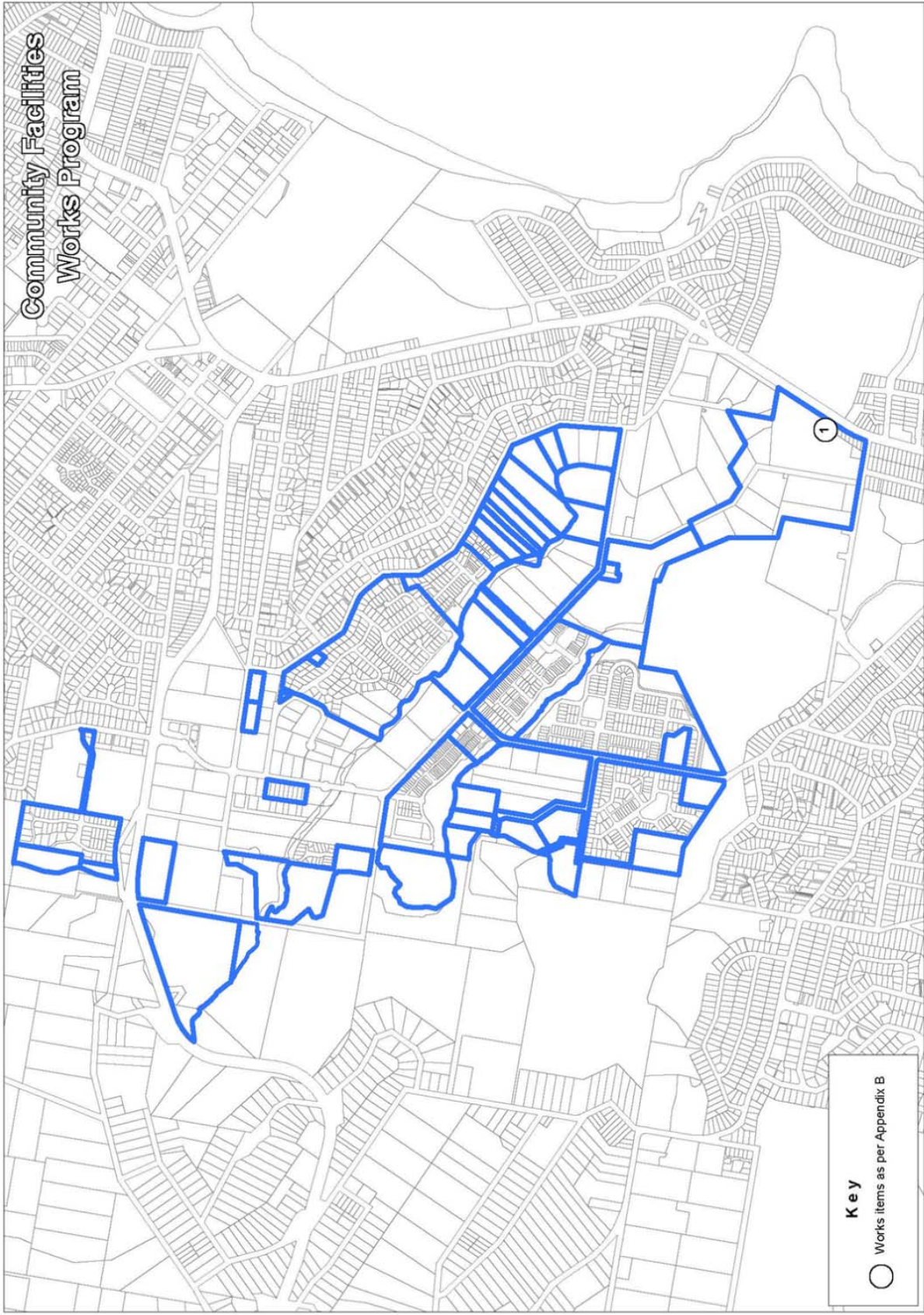
Pedestrian and Cyclist Network Strategy			
Location/ Item Number	Project Description	Expenditure (\$2016/17)	Commencement Year
1	Shared path along Narrabeen Creek – Sector 6	\$187,740	2019/20
2	Shared path along Narrabeen Creek – Buffer 1a to 1l	\$523,192	2019/20
3	Shared path along Fern Creek – Sector 8	\$132,489	2019/20
4	Pedestrian/cyclist bridge over Narrabeen Creek at Brands Lane	\$135,959	2017/18
5	Pedestrian/cyclist bridge over Fern Creek at Sector 8/9	\$135,959	2018/19
6.1	Shared path – Sector 10B	\$102,609	2017/18
6.2	Shared Path – Sector 10C	\$76,675	2018/19
15	Shared path connection (on road) from Narrabeen Creek to Warriewood Road	\$60,889	2018/19
18	Share path connection – Vuko Place to Pittwater Road	\$218,749	2021/22
20	Shared path connection – Pittwater Road to Boondah Road	\$206,909	2018/19
23	Shared path connection (on road) from Narrabeen Creek to Macpherson Street	\$135,872	2018/19
31	Shared path connection – Boondah Road to Warriewood Wetlands	\$139,255	2017/18
32	Shared path connections – Jacksons Road to Warriewood Wetlands	\$164,343	2016/17
33	Shared path connection from Fern Creek to Fern Creek Road and Fern Creek to Casuarina Drive	\$29,317	2018/19
Pedestrian and Cyclist Network Strategy Subtotal		\$2,249,957	

Figure 14: Map of Pedestrian and Cyclist Network Works Schedule



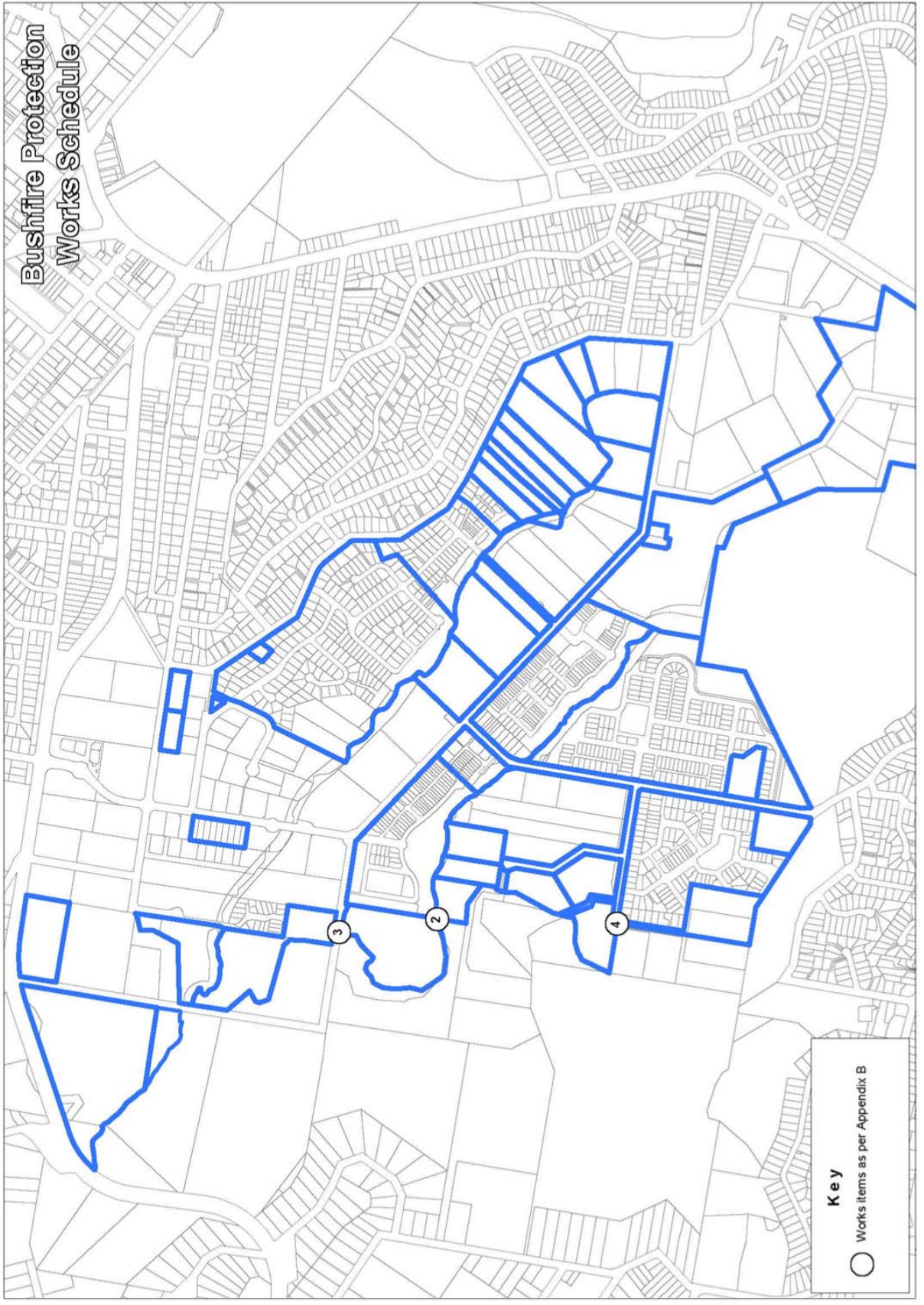
Community Facilities Strategy			
Location/ Item Number	Project Description	Expenditure (\$2016/17)	Commencement Year
1	Community Facility Space – Design Stage 2	\$542,101	2016/17
	Community Facility Space – Design Stage 3	\$433,681	2017/18
	Community Facility Space – Construction Stage 1	\$3,252,605	2018/19
	Community Facility Space – Construction Stage 2	\$3,252,605	2019/20
	Community Facility Space – Equipment & fitout	\$216,840	2020/21
Community Facilities Strategy Subtotal		\$7,697,831	

Figure 15: Map of Community Facilities Works Schedule



Bushfire Protection Strategy			
Location/ Item Number	Project Description	Expenditure (\$2016/17)	Commencement Year
2	Connection - Causeway over Fern Creek at Sector 8/9	\$417,418	2019/20
3	Connection - Sector 5/8	\$36,863	2021/22
4	Connection - Sector 9/10	\$39,031	2021/22
Bushfire Protection Strategy Subtotal		\$493,312	

Figure 16: Map of Bushfire Protection Works Schedule



Administration and Plan Management Strategy			
Location/ Item Number	Project Description	Expenditure (\$2016/17)	Commencement Year
Year 4	Administration and plan management fee	\$215,848	2016/17
Year 5	Administration and plan management fee	\$312,242	2017/18
Year 6	Administration and plan management fee	\$158,035	2018/19
Year 7	Administration and plan management fee	\$150,748	2019/20
Year 8	Administration and plan management fee	\$73,012	2020/21
Year 9	Administration and plan management fee	\$116,735	2021/22
Administration and Plan Management Strategy Subtotal		\$1,026,620	
Total Works Schedule		\$69,467,936	

Warriewood Valley Roads Masterplan

May 2016

**Prepared by
Pittwater Council based on Warriewood Valley Roads Masterplan**

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Appendices

Appendix A1

Typical Road Plans and Cross Sections Sub-Arterial Streets

Appendix A2

Typical Road Plans and Cross Sections Collector Streets

Appendix A3

Typical Road Plans and Cross Sections Local Streets

Appendix A4

Typical Road Plans and Cross Sections Access Street

Appendix A5

Typical Road Plans and Cross Sections Laneway

Appendix A6

Typical Road Plans and Cross Sections Sector Entry Street

Appendix B1

Sub-Arterial Street Pedestrian Refuge Standard Concept Design

Appendix B2

Collector Street Pedestrian Refuge Standard Concept Design

Appendix C

Bus Shelter Dimensions

Appendix D

Concept designs for Traffic Signals

Appendix E

Council Standard Street Signs

Appendix F

Lighting Poles

Appendix G

Roads Masterplan Drawing

1. Introduction

The Warriewood Valley Roads Masterplan (2015 Review) documents the technical requirements for road cross sections, traffic calming and management measures for implementation in the Warriewood Valley Urban Release Area. Pedestrian and cycle routes are also documented for the area.

This document must be read in conjunction with, and references the following documents:

- Pittwater 21 Development Control Plan,
- Warriewood Valley Landscape Masterplan & Design Guidelines (Public Domain),
- Warriewood Valley Urban Land Release Roads Masterplan (Jamieson Foley & Associates, 1999),
- NAT-SPEC 2 – Pittwater Council Edition,
- Warriewood Valley Water Management Specifications 2001,
- AUSTROADS,
- Australian Standards.

This document has been prepared by Pittwater Council to reflect the updated land use data applicable to Warriewood Valley and the associated amended transport network requirements (only the outstanding works items from the current Warriewood Valley Section 94 Contributions Plan are referred to).

2. Road Cross Sections

- Typical road cross sections are provided below for each of the road types in the road hierarchy:
 - Section 2.1 Sub-Arterial Streets
 - Section 2.2 Collector Streets
 - Section 2.3 Local Streets
 - Section 2.4 Access Street
 - Section 2.5 Laneway
 - Section 2.6 Sector Entry Street.
- The roads also include traffic calming and other related traffic devices, detailed in Section 3.0 and on the Roads Masterplan Drawing **Appendix H**. The roads should be designed to incorporate these devices.
- Barrier kerb or non-mountable kerb and gutter shall be provided in all roads (public or community title) except for Laneways.
- The use of a road cross section of a higher street classification (higher traffic volume) may be used on a street of lower classification (lower traffic volume).
- Community Title roads shall provide for unrestricted vehicular and pedestrian access to the public, all private dwellings (e.g. not be gated), public community recreation/ open space reserves , and shall have road cross sections as specified in this Roads Masterplan for the applicable traffic volume. The Traffic Acts applicable to public roads shall also apply to Community Title roads.
- Provided there is direct connection to public or private roads with traffic volumes less than 300 vehicles per day (vpd), vehicular access to a maximum of 6 dwellings may be accommodated via a short private driveway/car court directly off such roads. This is an acceptable alternative to an Access Street or Laneway. The private driveway/car court is to have a maximum length of 40 metres, be located on private land, provide safe pedestrian access, sight lines and passing areas.
- A Sector Entry Street is to be provided for the primary entry street to any Sector where this primary entry street directly connects onto a Sub Arterial Street or Collector Street – these are to generally include a roundabout controlled intersection.
- Streets providing access to industrial areas are to comply with the Sub Arterial Street cross section.
- All streets are to have a consistent type of titling for their entire length.
- All streets intended to be used as a thoroughfare are to be public roads subject to Pittwater Council's agreement and dedicated to Pittwater Council free of charge.
- Vehicular connections are to be provided within the original or primary sectors/buffer areas in accordance with the original Roads Masterplan 1999 (for example Sectors 301, 302 and 303 are to have an internal network connecting all three sectors), or Pittwater 21 DCP e.g. Buffer Area 1a is to connect to Buffer Area 1b and 1c etc. but Sector 1 is not to connect to Sector 2.
- Laneways must not provide the primary street frontage to any development, any lot or dwelling.

2.1 Sub-Arterial Streets

The Sub-Arterial Streets in the Warriewood Valley Urban Release area are:

- Ponderosa Parade
- Macpherson Street
- Warriewood Road east of Macpherson Street
- Garden Street
- Streets serving industrial areas.

Sub-Arterial Street cross section guidelines are to be in accordance with the following:

- Typical plans and cross sections as shown in **Appendix A1**.
- A minimum of two clear traffic lanes with indented parking bays on both sides of the carriageway with landscape blister separations.
- Kerb extensions between parking bays are to be of a size to allow large trees to be planted (minimum 5.0 metres length along edge of traffic lane).
- Collector Streets are to connect to a Local or Sub-Arterial Street.
- Shared paths are to be located 600mm from the property boundary, subject to site constraints, except at bus bays and indented parking bays where shared paths should be directly adjacent to the kerb.
- Services are to be contained within a combined services trench under the shared path.
- Bicycle symbols are to be painted on shared paths.
- Bus stops on either side of the carriageway are to be staggered so that they are not directly opposite.
- Shared paths are to be in accordance with the Warriewood Valley Release Area Landscape Masterplan and Design Guidelines (Public Domain).
- Must cater for two way traffic.

Sub-Arterial Streets	
Traffic Volume	10,000 vehicles per day – approximate upper limit.
Design Speed	50km/h
Speed Limit	50km/h
*Traffic Lane Width	4.2m
Cycle Lane Width	Share roadway with vehicles.
Indented Parking Lane Width	2.1m
Indented Bus Bay Width	3.0m
Shared Path Width	2.1m – 2.5m shared path on both sides of the carriageway.
Total Road Reserve Width	20m minimum.

Note: A reduced 3.7m lane width may be permitted where existing traffic lanes in front of adjacent sites are 3.7m and off road shared paths exist. In such circumstances, the shared path is to increase to 2.5m width where practicable.

2.2 Collector Street

Collector Streets in the Warriewood Valley Urban Release area are:

- Foley Street
- Jubilee Avenue
- Orchard Street (not a bus route)
- Daydream Street (not a bus route)
- Boondah Road (not a regular bus route)

- Warriewood Road (North of Macpherson Street)
- Any new Roads with 2000 to 5000 vpd.

Collector Street cross section guidelines are to be in accordance with the following:

- Typical plans and cross sections as shown in **Appendix A2**.
- Minimum two traffic lanes with indented parking bays on both sides of the carriageway.
- Kerb extensions between parking bays are to be of a size to allow large trees to be planted (minimum 5.0 metres length along edge of traffic lane).
- Allow for the provision of a bus shelter in a footprint as shown in **Appendix C**.
- No more than 8 parallel parking spaces are to be provided between successive kerb extensions.
- Shared paths are to be located 600mm from the property boundary, subject to site constraints, except at bus bays and indented parking bays where footpaths should be directly adjacent to the kerb.
- Services are to be contained within a combined services trench under the shared path.
- Bus stops on either side of carriageway are to be staggered so that they are not directly opposite.
- Shared paths are to be in accordance with the Warriewood Valley Release Area Landscape Masterplan and Design Guidelines (Public Domain).
- For Boondah Road a shared path adjoining the STP is not proposed.
- Must cater for two way traffic.

Collector Streets	
Traffic Volume	5,000 vehicles per day – approximate upper limit.
Design Speed	50km/h
Speed Limit	50km/h
Traffic Lane Width	3.7m
Cycle Lane Width	Share roadway with vehicles.
Indented Parking Lane Width	2.1m
Indented Bus Bay Width	3.0m
Shared Path Width	2.1m shared path on both sides of the carriageway.
Total Road Reserve Width	20m minimum

2.3 Local Street

Local Streets cross section guidelines are to be in accordance with the following:

- Typical plans and cross sections as shown in **Appendix A3**.
-
- Local Streets to have two way traffic with on-street parking on both sides of the street at any location along their length where it is legally permissible to do so.
-
- A minimum of one on-street visitor parking space for every two dwellings is to be provided. These are not to obstruct driveway access.
- Cyclists are to share road pavement.
- A shared path is to be provided directly adjacent to the kerb, on the same side as services.
- Services are to be contained within a combined services trench under the shared path.
- All driveways entering on the street must be shared, and designed with sufficient width to allow for safe entry and exit onto the Local Street.

Local Streets	
Traffic Volume	2000 vehicles per day – approximate upper limit.
Maximum Number of Dwellings	200
Design Speed	40km/h
Speed Limit	50km/h
Traffic Lane Width	Total 7.5m carriageway to cater for traffic, parking, cyclists.
Cycle Lane Width	Share roadway with vehicles.
Parking Lane Width	No parking lane marked, park adjacent to kerb.
Bus Bay Width	N/A
Verge Width	4.25m on both sides of carriageway to cater for street tree planting.
Footpath Width	1.5m footpath one side of carriageway.
Total Road Reserve Width	16.0m minimum

2.4 Access Street

Access Streets cross section guidelines are to be in accordance with the following:

- Typical plans and cross sections as shown in **Appendix A4**.
-
- Access Streets are to have two way traffic with on-street parking on both sides of the street at any location along their length where it is legally permitted to do so.
-
- A minimum of one on-street visitor parking space for every two dwellings is to be provided. These are not to obstruct driveway access.
- Cyclists are to share road pavement.
- A footpath is to be provided directly adjacent to the kerb on the same side as services.
- Services are to be contained within a combined services trench under the shared path.
- All driveways entering on the street are to be shared, and designed to have sufficient width that allows for safe entry and exit on to the Access Street.

Access Streets	
Traffic Volume	<300 vehicles per day – approximate upper limit.
Maximum Number of Dwellings	30
Design Speed	30km/h
Speed Limit	50km/h
Traffic Lane Width	Total 7.5m carriageway to cater for traffic, parking, cyclists.
Cycle Lane Width	Share roadway with vehicles.
Bus Bay Width	N/A
Verge Width	2.5m on both sides
Footpath Width	1.5m on one side of the carriageway.
Total Road Reserve Width	12.5m minimum

2.5 Laneway (for rear vehicular access only)

Laneway cross section guidelines are to be in accordance with the following:

- Typical plans and cross sections as shown in **Appendix A5**.
- Laneways are not suitable for single frontage lots and must not form the primary street frontage for any buildings.
- Maximum length of 80 metres as a Shared Zone to cater for two way traffic, pedestrians and cyclists.
- No parking is permitted along the Laneway.
- No services, with the exception of garbage collection areas, are to be located in the Laneway (All other services are to be located in the primary street).
- It must be constructed as a Shared Zone in accordance with the RMS standards.
- Driveways entering on the Laneway are to be designed with sufficient width to allow for safe entry and exit.
- One way traffic Laneways may be considered on merit subject to the Laneway having a maximum length of 40m, for up to 6 dwellings, and have demonstrated efficiency and safe circulation for up to the 6 dwellings including safe and convenient entry and exit from driveways.

Laneway	
Traffic Volume	<300 vehicles per day – approximate upper limit.
Maximum Number of Dwellings	30 for two way traffic lanes (noting maximum length for Laneway is 80 metres)
Design Speed	10km/h
Speed Limit	10km/h/Shared Zone.
Traffic Lane Width	5.5m
Cycle Lane Width	Share roadway with vehicles.
Bus Bay Width	N/A
Verge Width	0.75m on both sides.
Total Road Reserve Width	7m

2.6 Sector Entry Street

A Sector Entry Street is to be provided for the primary entry street to any Sector where the primary entry street, not privately owned, directly connects onto a Sub Arterial Street or Collector Street.

Sector Entry Street cross section guidelines are to be in accordance with the following:

- Typical plans and cross sections as shown in **Appendix A6**.
- A minimum two clear traffic lanes on both sides of carriageway.
- Shared paths are to be located 600mm from the property boundary, subject to site constraints, except at bus bays and indented parking bays where footpaths should be directly adjacent to the kerb.
- Bicycle symbols are to be painted on shared paths.
- Must be a minimum length of 50m before transitioning to road cross section applicable to the traffic volumes.
- Parking bays and bus bays are to be set back a minimum of 20 metres from the intersection of the Sector Entry Street with a Collector or Sub Arterial Road.
- 2.1m wide on street parking bays may be provided similar to the Sub Arterial Street cross sections.

Sector Entry Street	
Design Speed	50km/h
Speed Limit	50km/h
Traffic Lane Width	4.2m (includes 1.2 m cycle lane provision)
Cycle Lane Width	Share roadway with vehicles.
Parking Lane Width	2.1m
Bus Bay Width	3.0 m
Shared Path Width	As per Footpath/Bike Plan
Total Road Reserve Width	Variable – refer to cross section

3. Traffic Calming and Management

Traffic calming and management measures required for the Warriewood Valley Release Area are identified in the Warriewood Valley Section 94 Contributions Plan and are described below.

3.1 General Road Principles

- Parking bays are to be indented on Local Sub-Arterial, Collector Streets and Sector Entry Streets, and physically separated from bus bays to prevent parked cars encroaching into bus stop areas.
- All traffic facilities on bus routes are to be designed to cater for the maximum length State Transit Authority articulated buses so buses can stop without any part of the bus protruding into the traffic lane.
- The kerb extensions that separate indented parking provide opportunities for pedestrian crossing points and landscaping.
- Non mountable kerbing or kerb and guttering is to be provided on all roads (except Laneways).
- Mountable kerb is to be provided for traffic islands only (no provision for pedestrians).
- A 10km/h speed limit applies in shared zones. Approval is to be obtained from the RMS by the applicant.
- Pedestrian access ramps in kerbs are not to align with any traffic control device (other than refuges) or areas of textured/coloured road pavement.

Parking Facility Dimensions

Component	Dimension
Run-in	45° to 30°
Run-out	45° to 30°

3.2 Pedestrian/Cycle Refuges

3.2.1 List of Facilities

Refer to the most current version of the Warriewood Valley Section 94 Contributions Plan.

3.2.2 Design

- Refuges should comply with all relevant RMS Design Guidelines and be of similar style to those shown in **Appendix B1** and **Appendix B2**.
- The dimensions of pedestrian/cycle refuges are dependent on pedestrian and cyclist crossing requirements.
- Landscaping to be provided in accordance with Council's current adopted Warriewood Valley Release Area Landscape Masterplan and Design Guidelines (Public Domain).

Dimensions

Component	Dimension
Minimum width of traffic island for pedestrian Refuge	2.0 metres

3.3 Thresholds/Gateways

Design

The threshold items are intended to discourage through traffic and are to incorporate significant narrowing and surrounding landscaping.

Thresholds between Entry Sector Streets and internal sector streets are to include a textured or distinctive pavement surface, carriageway narrowing of the side of the road and vertical deflection.

Pedestrian access ramps are not to be provided where the road pavement is textured or coloured and area is to be isolated from pedestrians on the nature strips by a physical barrier.

The design is to comply with all relevant RMS Design Guidelines.

3.4 Bus Bays

3.4.1 Locations

Bus bays are to be provided at the location of all existing bus stops or at alternate locations approved in writing by Sydney Buses.

3.4.2 Design

- Bus bays are to be designed to allow the provision of a bus shelter with the footprint dimensions as shown in **Appendix C**.
- Bus bays are to be separated from parking to prevent encroachment into the bus stop areas.
- The location of the shelter is to be directly adjacent to where the bus will stop with signage in accordance with Transport for NSW requirements.
- Kerb extensions associated with bus bay facilities are to provide opportunities for pedestrian crossing points and landscaping.
- Bus stops on either side of the carriageway are to be staggered so that they are not directly opposite each other.
- Bus bays to be designed to cater for articulated buses used by Sydney Buses.

3.5 Pedestrian Facilities

Pedestrian facilities are to be provided in accordance with the street cross sections.

- Standard footpaths are to be 1.5 metres wide and shared paths are to be a minimum of 2.1 metres wide.
- Shared paths adjacent to bus bays and parking bays are to be directly next to the kerb.

3.6 Cycling Facilities

Pittwater Council is a strong advocate for active transport and the importance of reasonable infrastructure to support walking and cycling activities, which in turn promotes a healthy and active community.

Given the existing road reservation width constraints for Sub-Arterial and Collector Streets (generally 20m existing width), the need to match with existing segments of road completed to date and the need to accommodate streetscape landscaping, the majority of the road related

cycling infrastructure for Warriewood Valley is via shared paths on both sides of the carriageway within the road verges. The use of these shared paths is encouraged with appropriate cycling etiquette; however this does not preclude the use of the road traffic lanes for cycling.

The use of shared paths also recognises that to have intermittent variable widths of road pavement with or without cycle lanes, may present problems for cyclists, particularly at transition points where an on road cycle lane may terminate.

In addition to the cycling network within road reserves there is a network of shared paths along creekline corridors that provide alternate/additional cycle connections.

In the case of Sub-Arterial roads, where on road bike lanes are not practical, the road pavement width can be reduced to 7.4m, and in lieu, the shared path width is to be increased from 2.1m to 2.5m.

The developer of the development is to directly provide the cycle infrastructure as part of the half road reconstruction.

The Warriewood Valley Section 94 Contributions Plan will fund those remaining locations not directly provided as identified in the Plan.

On road and off road cycling facilities are to be provided in locations shown on the street cross sections and Warriewood Valley Release Area Landscape Masterplan and Design Guidelines (Public Domain).

- All off-road share paths are to be line-marked and signposted in accordance with AUSTROADS Guide to Traffic Engineering Practice Part 14 - Bicycles (1999).
- Shared paths adjacent to bus bays and parking bays are to be directly next to the kerb.

3.7 Priority Intersection Controls

3.7.1 List of Controls

Location
Warriewood Road and Alameda Way (East)
Warriewood Road and Manooka Place
Jubilee Avenue at bend west of Daydream Street
Jacksons Road and Boondah Road

3.7.2 Design

The layout of each of the priority intersections are shown in the Roads Masterplan Drawing **Appendix G**. Where pedestrian refuges are shown as part of the intersection, refer to Section 3.2 – Pedestrian Refuges for design guidelines.

3.8 Roundabouts

3.8.1 List of Facilities

Refer to most current version of the Warriewood Valley Section 94 Contributions Plan.

Location
Warriewood Road and Macpherson Street
Jubilee Avenue and Ponderosa Parade Roundabout (Stage 1 Complete)
Jubilee Avenue and Warriewood Road
Macpherson Street and Brands Lane
Macpherson Street and Garden Street
Orchard Street and Fern Creek Road
Warriewood Road and Hill Street

3.8.2 Design

All roundabouts are to comply with the relevant RMS Design Guidelines and expected vehicle sizes.

For roundabouts on sub arterial roads and collector roads, land acquisition may be required from adjacent properties to provide for splay corners.

The central roundabout island is to be of concrete construction to Council's specification. Landscaping features are to be incorporated within the roundabout, where safe and practical.

3.9 Traffic Signals

3.9.1 List of Facilities

Location
Upgrade Traffic Signals – Pittwater Road and Warriewood Road
New Traffic Signals – Mona Vale Road and Ponderosa Parade
Upgrade Traffic Signals – Pittwater Road and Jacksons Road

Concept designs for the Pittwater Road/Warriewood Road and Mona Vale Road/Ponderosa Parade intersections are included in **Appendix E**.

4. Road Construction

The items listed in this section are required as roads in the Warriewood Valley that are to be constructed or re-constructed as development occurs.

Refer to most current version of the Warriewood Valley Section 94 Contributions Plan.

Location

Warriewood Road pavement correction and strengthening

Macpherson Street reconstruction

Boondah Road upgrade (staged)

Orchard Street reconstruction

Warriewood Road (outside 12 Apollo Street) – road widening

Garden Street road widening (Sector 12A to Mullet Creek)

- The following shall be adopted as design ESA's for the appropriate street types:
 - Sub-arterial: 4×10^6
 - Collector: 2×10^6
 - Local: 6×10^5
 - Access: 1×10^5
- All pavement design is to comply with AUS-SPEC 1 – Pittwater Council Edition, and relevant Australian Standards, and the ESA's identified above.
- The developer is to provide kerb and guttering and half road reconstruction for existing roads for all street frontages of the development site.
- Shared trenching for services is to be used as detailed in AMCORD.

Item 26 – Boondah Road Upgrading

Where the road adjoins new land release development - Boondah Road is to be widened and raised as a collector road along its existing alignment (unless an acceptable alternate road alignment is agreed to by Council) and is to be above the flood planning level and must provide a floodway for overbank flows. The reconstruction is to be undertaken in stages as adjacent developments proceed.

Where the road passes through existing zoned land and public open space – The road upgrade is to include road widening and pavement strengthening generally on top of existing road levels where feasible but not necessarily above flood levels.

5. Bridges

The items listed in this section are the bridges which will require construction or reconstruction as development occurs and roads that are reconstructed.

Location

Macpherson Street – Bridge at Narrabeen Creek between Boondah and Warriewood Roads

Boondah Road – Bridge over Narrabeen Creek near Jacksons Road

Macpherson Street – Bridge at Narrabeen Creek between Boondah and Warriewood Roads

A two lane bridge plus approaches and shared paths on both sides of the road are to be provided.

Boondah Road – Bridge over Narrabeen Creek near Jacksons Road

A two lane bridge plus shared paths on both sides of the road are to be provided.

6. Other Design Items

A number of additional items are required which are listed below.

Street Name Signs

- Council standard to be used as shown in **Appendix E**. Note that the current Pittwater Council logo is to be used.

Services

- Services are to be contained within a combined services trench under the shared path.
- Street lights are to be provided in accordance with current Australian Standards.
- Lighting of pathways between properties is to be provided in accordance with the current Australian Standards.
- Lighting poles are to be a current style which Ausgrid will maintain. The style to be similar to that in **Appendix F**.

Driveways

- Driveways are to conform to Council specifications in the Pittwater 21 Development Control Plan.

Drainage Swales on Roads

- Drainage swales are not permitted on any road.

Pedestrian Fences

- Construction of pedestrian fencing related to traffic facilities is to be in accordance with the RMS standards.
- Fences are to be 1.2 metres high.
- Fences are to be of a dark and earthy tone approved by Council.

Landscaping

- Landscaping is to be in accordance with the most recent version of the Warriewood Valley Release Area Landscape Masterplan and Design Guidelines (Public Domain).
- Turf is to be of Couch variety.

Retaining Walls

- Retaining walls are to be constructed to a size, function material and at a location that is to the satisfaction of Council.

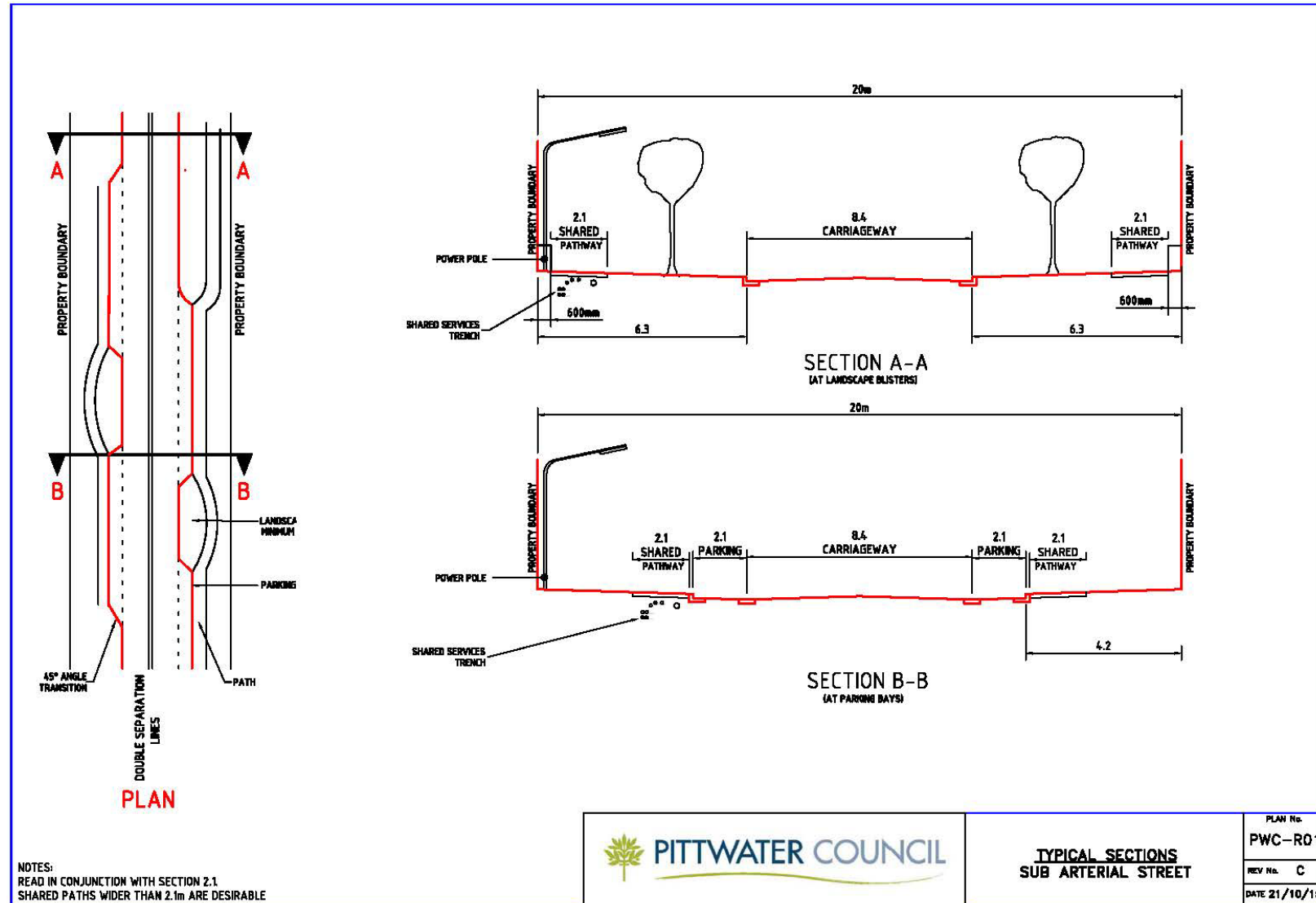
Street Furniture

- Street furniture is to be provided in accordance with a style, quantity and location that is to the satisfaction of Council.

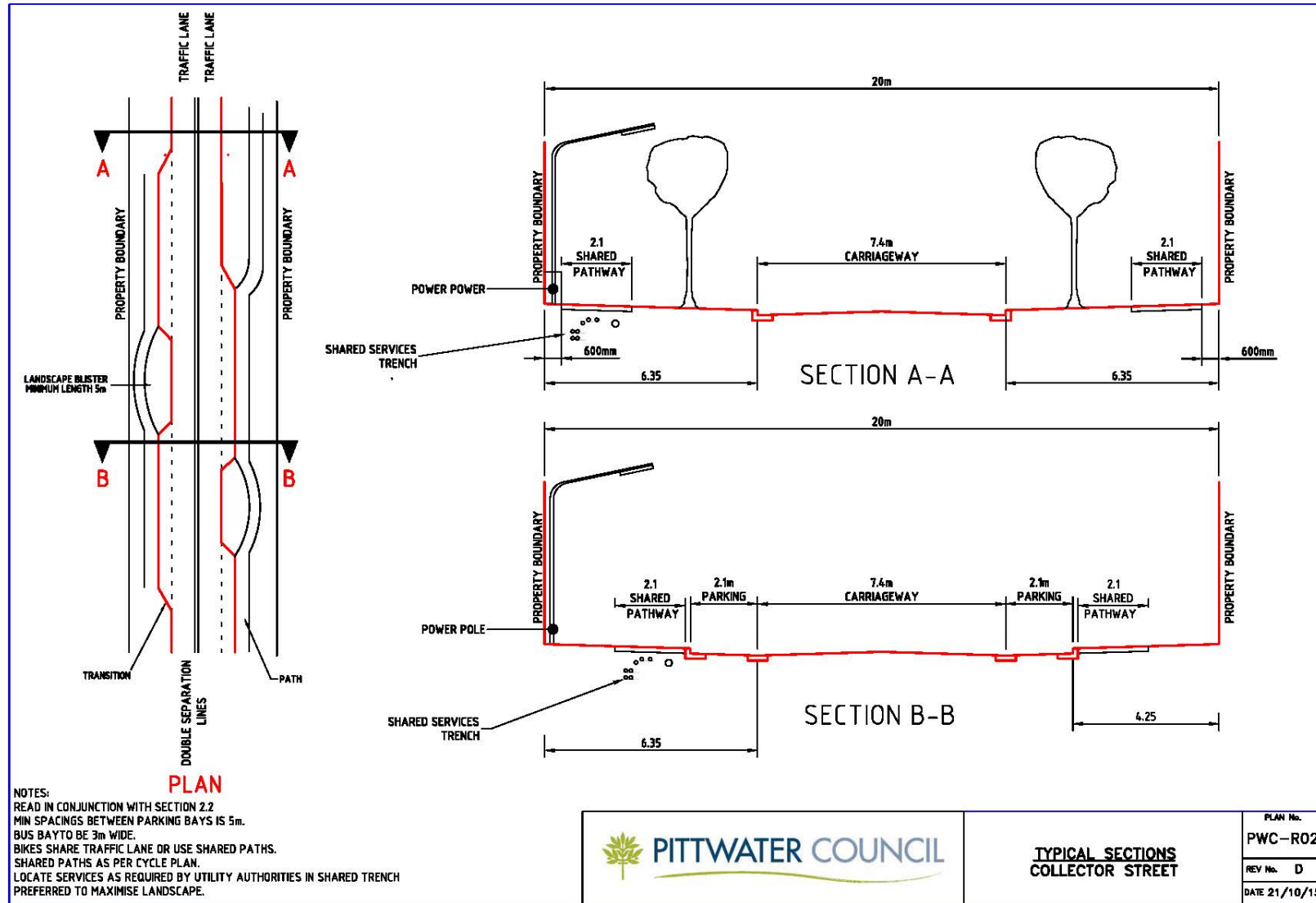
Accessible Pram Ramps

- An accessible pram ramp is to be provided at each intersection and pedestrian refuge and finished in the standard coloured concrete used in Pittwater.

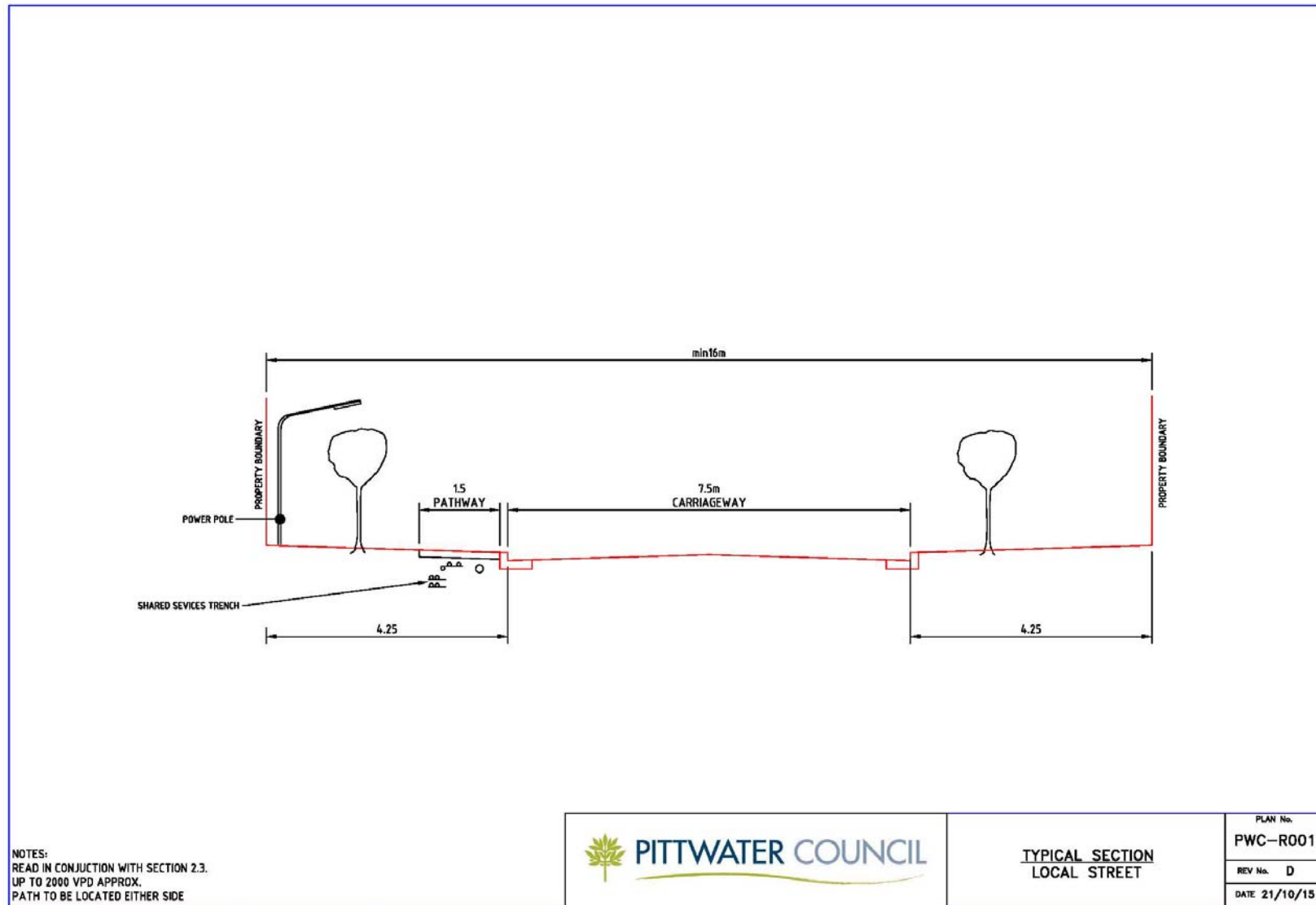
Appendix A1 - Typical Road Plans and Cross Sections Sub-Arterial Streets



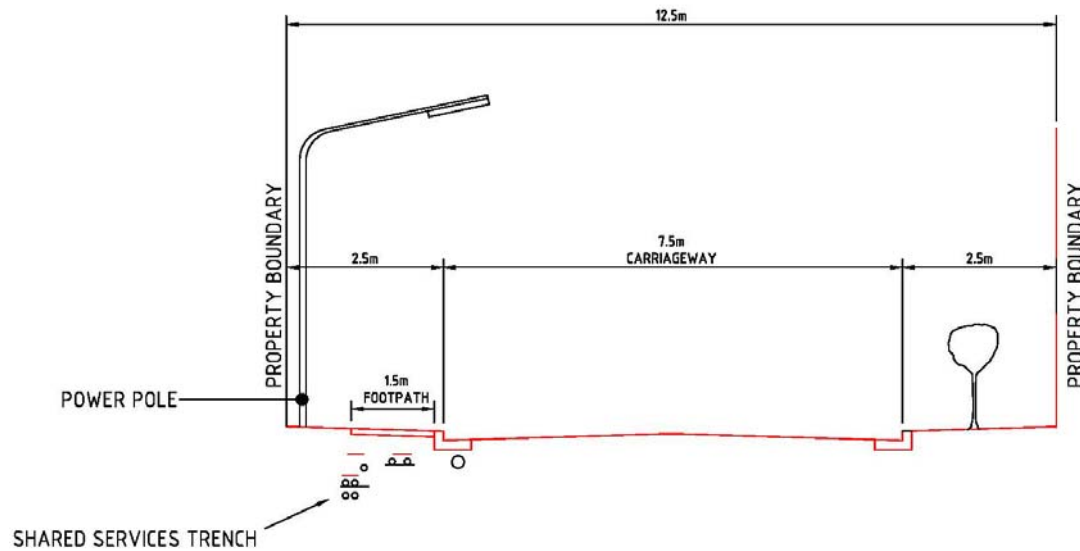
Appendix A2 - Typical Road Plans and Cross Sections Collector Streets



Appendix A3 - Typical Road Plans and Cross Sections Local Streets



Appendix A4 - Typical Road Plans and Cross Sections Access Street



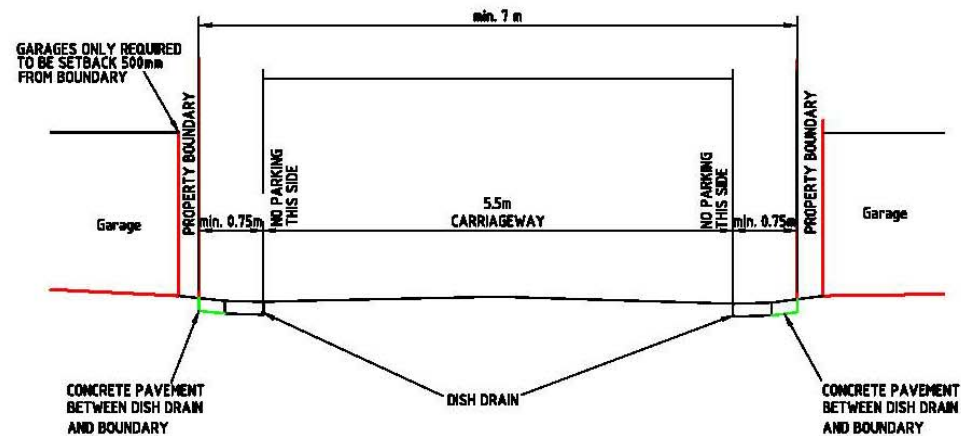
NOTES:
 READ IN CONJUNCTION WITH SECTION 2.4
 SERVICES LOCATED ON ONE SIDE OF ROAD ONLY UNDER FOOTPATH.
 PARKING CAN BE PROVIDED FOR FULL LENGTH OF STREET,
 FOR UP TO APPROX. 300VPD.
 LOCATE SERVICES AS REQUIRED BY UTILITY AUTHORITIES IN SHARED TRENCH UNDER PATHWAY



TYPICAL SECTIONS
ACCESS STREET

PLAN No.	PWC-R04
REV No.	C
DATE	21/10/15

Appendix A5 - Typical Road Plans and Cross Sections Laneway



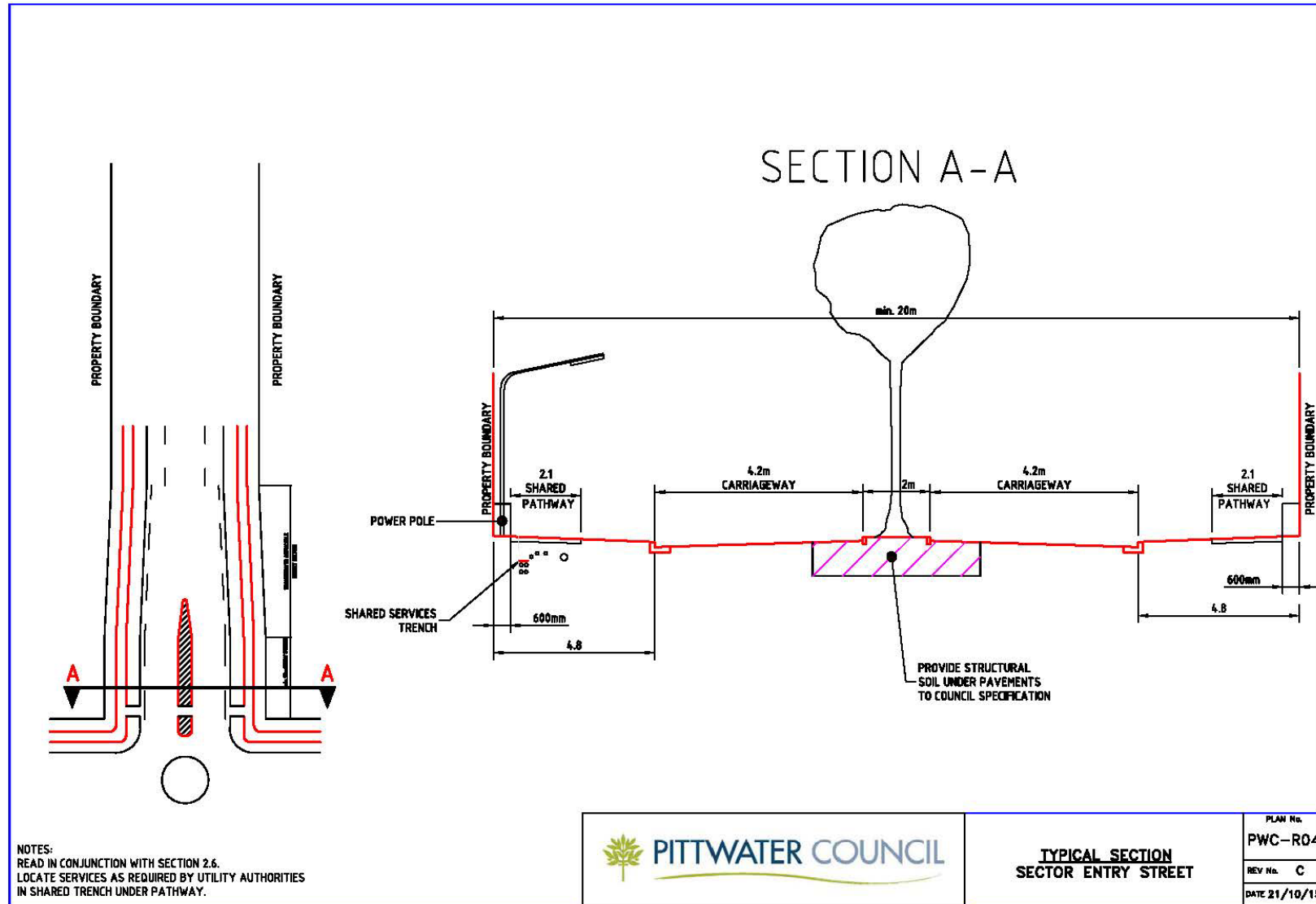
NOTES:
 READ IN CONJUNCTION WITH SECTION 2.5
 NO ON STREET PARKING.
 FOR UP TO APPROX. 300VPD.
 LANEWAY TO BE 10kph SHARED ZONE.
 MIN. 7m BETWEEN GARAGE AND OPPOSITE KERB TO ALLOW VEHICLE TURNING.
 UTILITY SERVICES NOT TO BE PROVIDED IN THIS SHEET



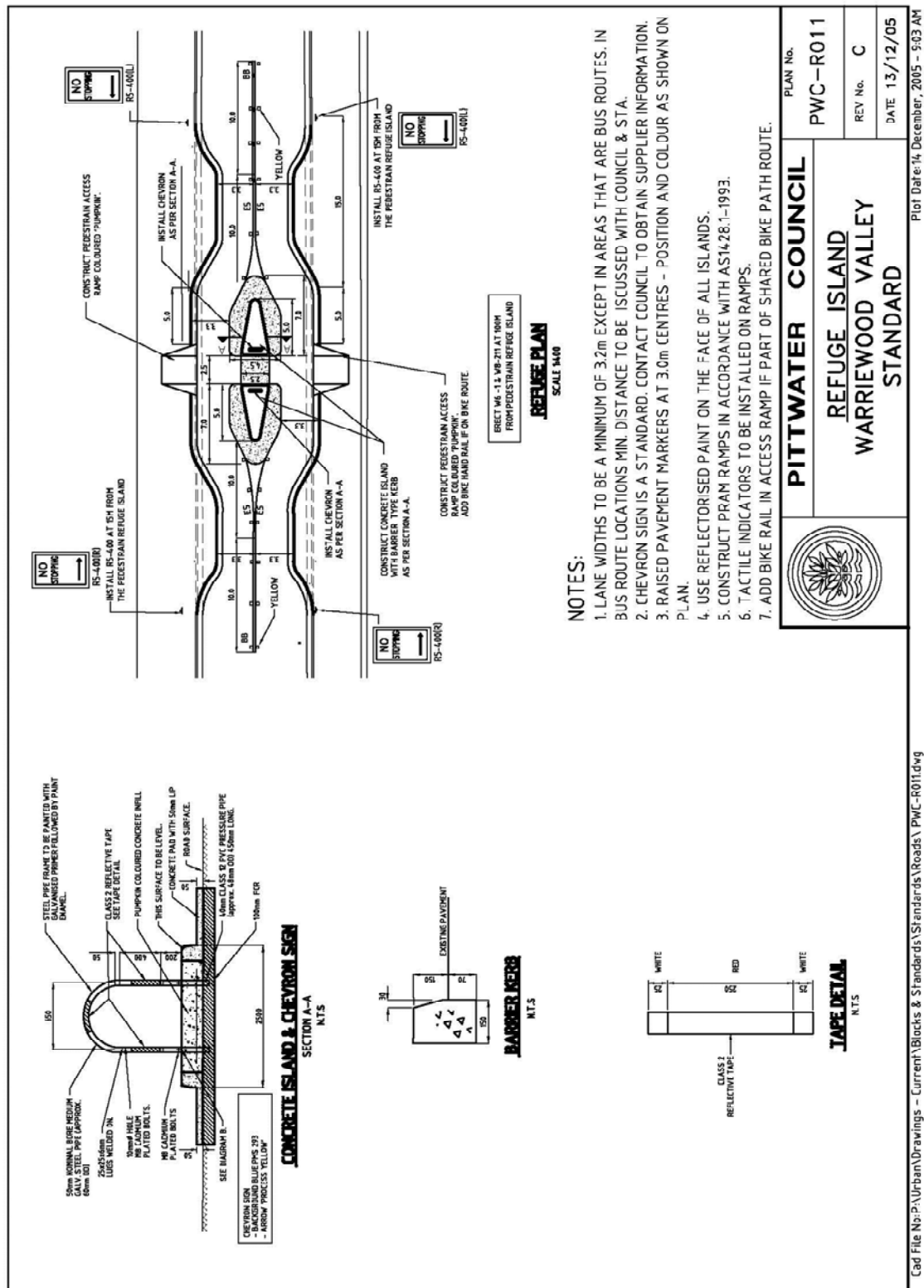
TYPICAL SECTIONS
LANEWAY
 (Not Primary Street Frontage)

PLAN No.	PWC-R002
REV No.	C
DATE	21/10/15

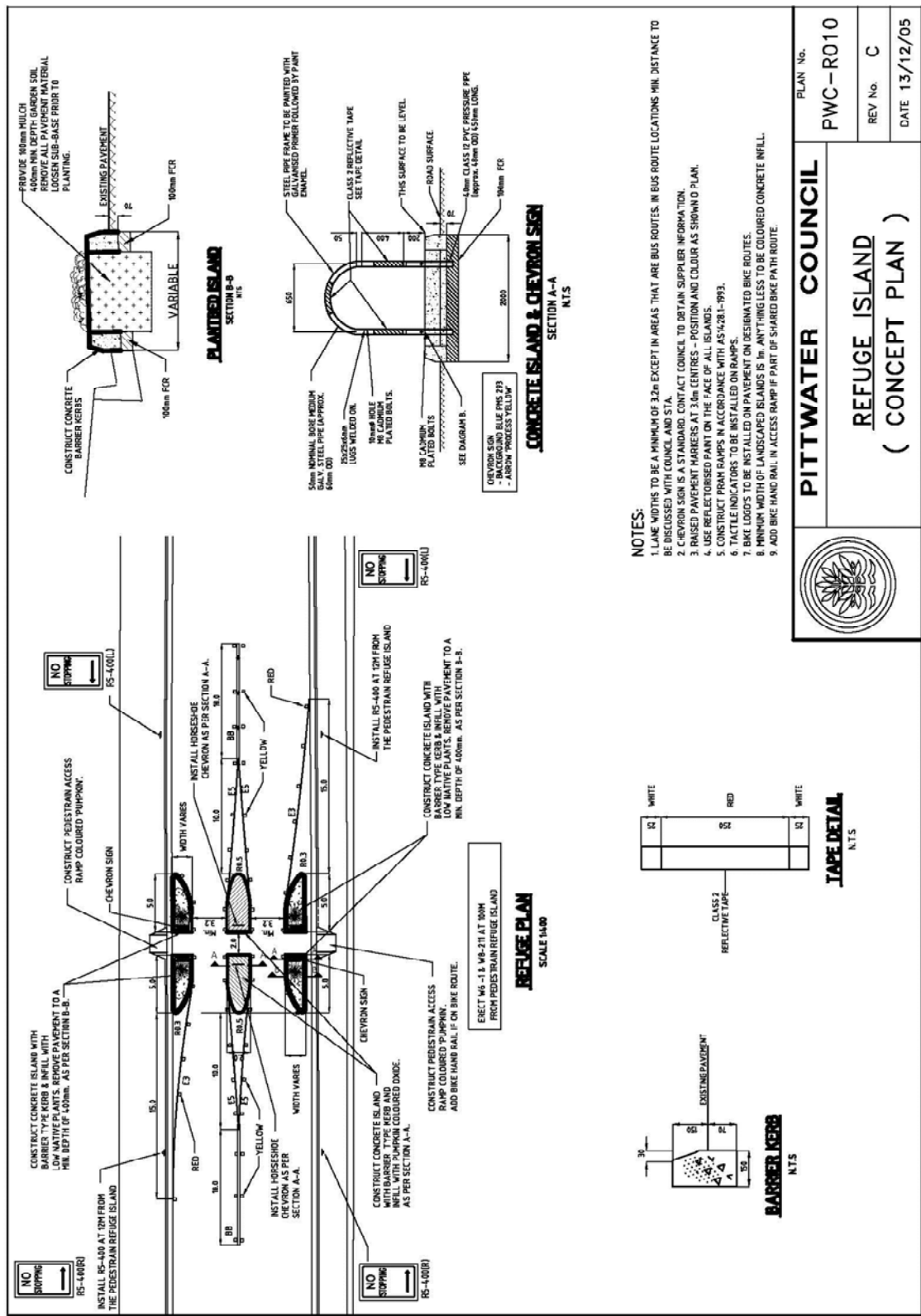
Appendix A6 - Typical Road Plans and Cross Sections Sector Entry Street



Appendix B1
Sub-Arterial Street Pedestrian Refuge Standard Concept Design



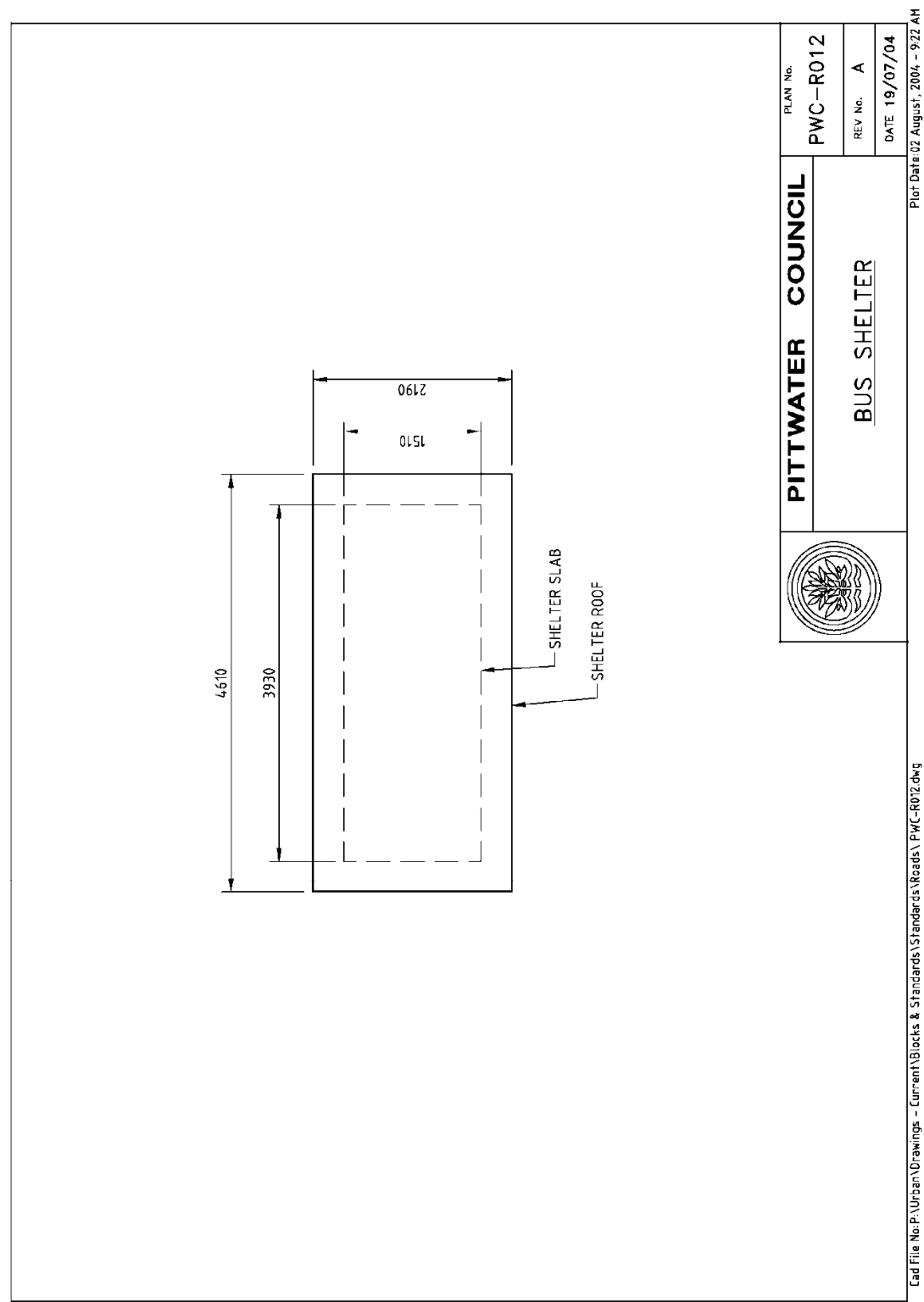
Appendix B2
Collector Street Pedestrian Refuge Standard Concept Design



Appendix C

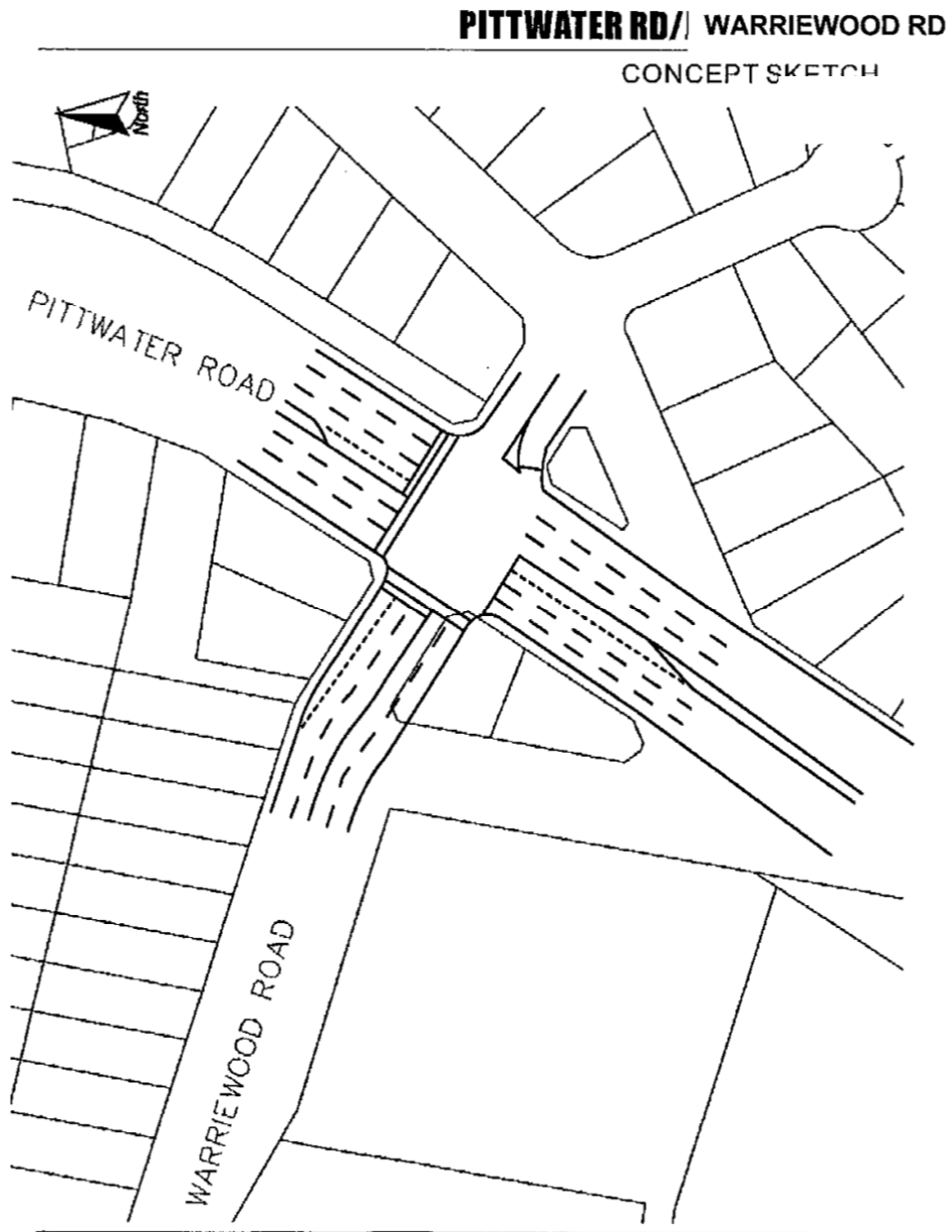
Bus Shelter Dimensions

Based on standard Adshel bus shelter dimensions



Appendix D

Concept designs for Traffic Signals

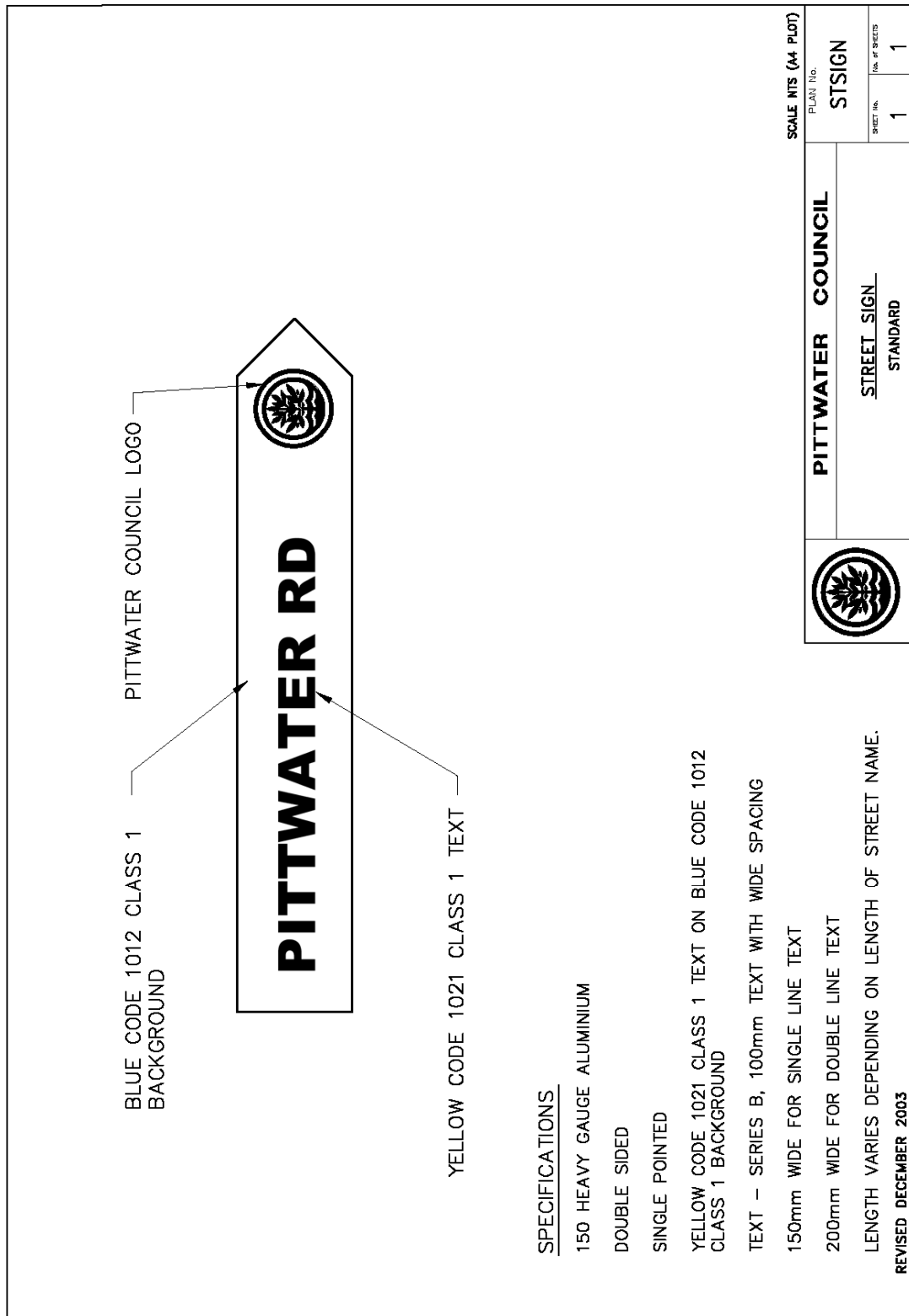


MONA VALE RD/PONDEROSA PDE

CONCEPT SKETCH



Council Standard Street Signs



Appendix F

Lighting Poles

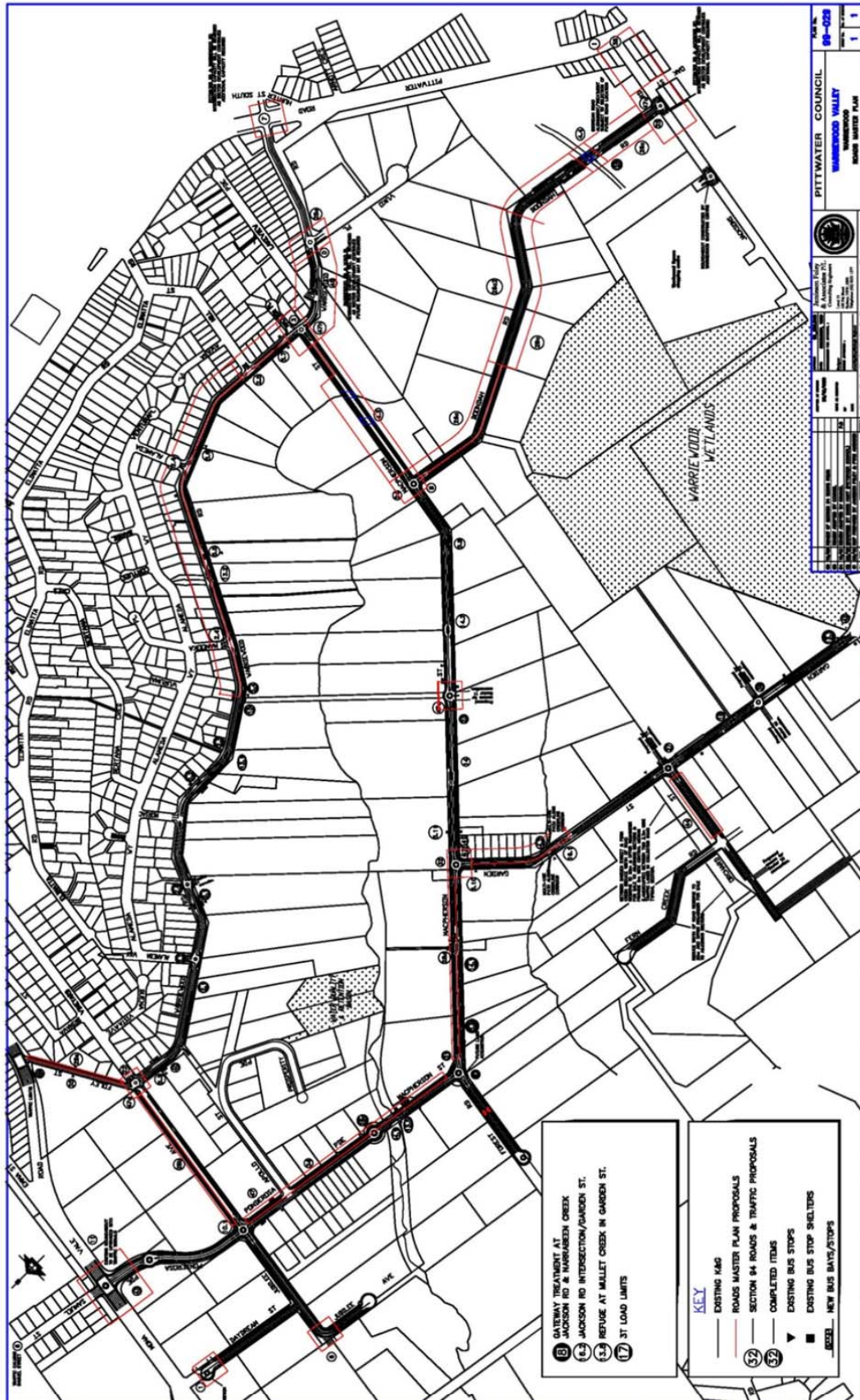


PITTWATER COUNCIL

LIGHTING COLUMN

PLAN No.	PWC-R013
REV No.	A
DATE	19/07/04

Appendix G Roads Masterplan Drawing



**WARRIEWOOD VALLEY RELEASE AREA
Landscape Masterplan and Design Guidelines (Public Domain)**

TABLED DOCUMENT

WARRIEWOOD VALLEY RELEASE AREA

Landscape Masterplan and Design Guidelines (Public Domain)

Guidelines Contents

May 2016

1.0 Introduction

2.0 Landscape Masterplan

Plant Species List

3.0 Streetscape Guidelines

S-1 Sub Arterial Street

S-2 Collector Street

S-3 Local Street

S-4 Access Street

S-5 Sector Entry

S-6 Refuge Island

S-7 Roundabout

4.0 Creekline Planting Guidelines

C-1 Multi Use Areas

C-2 Accessible Water

C-3 Remnant Bush Margins

C-4 Indicative Treatment Details

5.0 Central Local Park and Active Sportsfields

P-1 Active Sportsfield

P-2 Central Local Park

P-3 Proposed Active Sportsfield

DISCLAIMER

NOTE:

The facilities and features on this plan are diagrammatic only and the actual location will be subject to regular reviews of the Section 94 Plan by Council, and will also be dependant on survey, site considerations and compliance with all relevant standards and requirements.

All internal Sector Road Layouts/ Landscaping/ Open Space (Apart from Sectors 1, 2, 8, 10, 11 and 12) are indicative only and reflect submissions by the Developers at the time of preparation of this Plan.

Council does not endorse or otherwise the proposals by the Developer in each Sector

Contents

1.1 Generally

The Warriewood Release Area Landscape Masterplan and Design Guidelines (Public Domain) have been prepared to provide Pittwater Council and the development community with a coordinated basis upon which planning and design of streetscape, open space and creekline corridor improvements can be undertaken through out staged development of the release area.

The design guidelines are aimed to provide minimum standards upon which site specific design development of sustainable landscape strategies can be undertaken. Landscape elements include:

- Setbacks of street tree planting to road corridors
- Standards for street tree planting materials and size
- Standards for open space and creekline landscape enhancement and key design principles

The Warriewood Valley Release Area project is a significant initiative which aims to establish a coordinated framework for integrated development to occur in the valley focusing upon the “green” corridors provided by creekline corridors and related open space and roadway links.

The Landscape Masterplan and Design Guidelines (Public Domain) build upon the existing planning controls in place for the Warriewood Valley Release Area including:

- Development Control Plan No.9 (1997)
- Development Control Plan No.29 (2001)

The recommendations and principles established by the masterplan/design guidelines supplement the landscape controls provided in these documents and should be read in conjunction with them.

The development of site specific design solutions by development consortiums must take into account detailed site conditions including levels, existing vegetation, etc. The solutions must integrate and respond to the requirements outlined in this document and the preceding planning controls identified above. Design solutions must also encompass the opportunities for innovative and stimulating landscape design which can enhance the lifestyles of permanent and workforce residents, and develop a sustainable and attractive environment for Warriewood Valley.

1.2 Structure of the Report

This report is presented in three principal sections:

Section 2 Landscape Masterplan

Describes the overall landscape strategies for the release area incorporating creekline corridors, open space areas (Central Local Park, Neighbourhood Parks, and Sport Fields), and road corridors (Avenues, Industrial Avenues, and Sector Roads).

Section 3 Streetscape Planting Guidelines

Landscape plan and sectional guidelines for design development of street corridor plantings.

Section 4 Creekline Planting Guidelines

Landscape plan and sectional guidelines for design development of creekline corridors landscape treatments. Guidelines provide design principles which must be subject to site specific Hydraulic and Civil Engineering design.

Section 5 Central Local Park and Active Sportsfield

Schematic plans of generic active sportsfield and schematic design of the Central Local Park.



2.1 Generally

The Landscape Masterplan on the following page summarises the landscape related components of the Warriewood Valley Release Area Planning Controls (DCP’s, Section 94 Plan, and Roads Masterplan). These include:

Street Corridors	Street tree planting themes to avenues, industrial avenues, and sector streets. Street trees species for sector shareways and accessways are also identified.
Creekline Corridors, Open Space and Buffer Zones	Indicate the 50 m wide multi-use open space reservation to the Narrabeen and Fern Creek Corridors to incorporate pedestrian/cycleway access, creekline rehabilitation and bank stabilisation, weed removal and native revegetation, and passive use recreation.
Open Space and Buffer Zones	The Masterplan incorporates an indicative open space scheme for district and neighbourhood parks incorporating development conservation proposals. Buffer zones as indicated represent proposed location of dual purpose (buffer and access link) zones adjoining sensitive areas or required setbacks and screening.
Service and Recreation	Identify the indicative location of off road pedestrian and cycleway linkages, playground facilities and public transport nodes.

The aim of the masterplan is to provide a consolidated reference document encompassing all landscape related objectives and requirements of the planning controls for the release area.

Key Public Domain Principles outlined in the DCP which underpin the masterplan and design guidelines following include:

Safety	Provision of safe pedestrian and cycle access through road corridors, creek corridors, and open space areas.
Connectivity	Vehicular and pedestrian access is efficiently managed through a hierarchy network of attractive and clearly defined links.
Bush in the Valley	A minimum of 40% of creekline corridor area is to comprise native vegetation (existing and new) to establish interconnected flora and fauna corridors. The corridors are to support multi-use objectives including pedestrian/cycle access, and passive recreation.
Recreation in the Valley	Distribution of open space / parkland areas to cater for a variety of functions and user types including playground facilities and park furniture.

Streetscape guidelines have been prepared to guide those responsible for planning and development of the public domain in the Warriewood Valley in the implementation of Council’s objectives for a coordinated, functional and attractive landscape image.

A key consideration in the development of guideline has been the objective of establishing common themes for the layout of streetscape elements such as tree planting, shared

pedestrian/cycle paths and street lighting.

The presence of underground services and utilities places a significant constraint on the ability to provide meaningful street tree canopy. Street trees of adequate scale (height and spread) are the fundamental strategy by which Council’s objectives of “Bushland in the Valley” and quality of living and working environment can be realised.

The cross sections shown on the streetscape guidelines indicate the options available for incorporation of street tree planting in the typical footpath reserve situation identified by Council’s Masterplan.

These options indicate that for Sub Arterials a consistent setback 0.55 metres from the property boundary is preferred. To Avenues incorporating existing kerb and footpath formations and services/ utilities (eg. section of Macpherson Street) this may require adjustment based on exact location of Ausgrid Utilities.

For Collector Roads, a centred carriageway, enabling a tree alignment of 2.0 metres from property boundary is preferred.

Liaison will be required with Ausgrid (Avenues) and Telstra (Collector Roads) to ensure that tree alignments can be achieved for these corridor types.



Landscape Masterplan

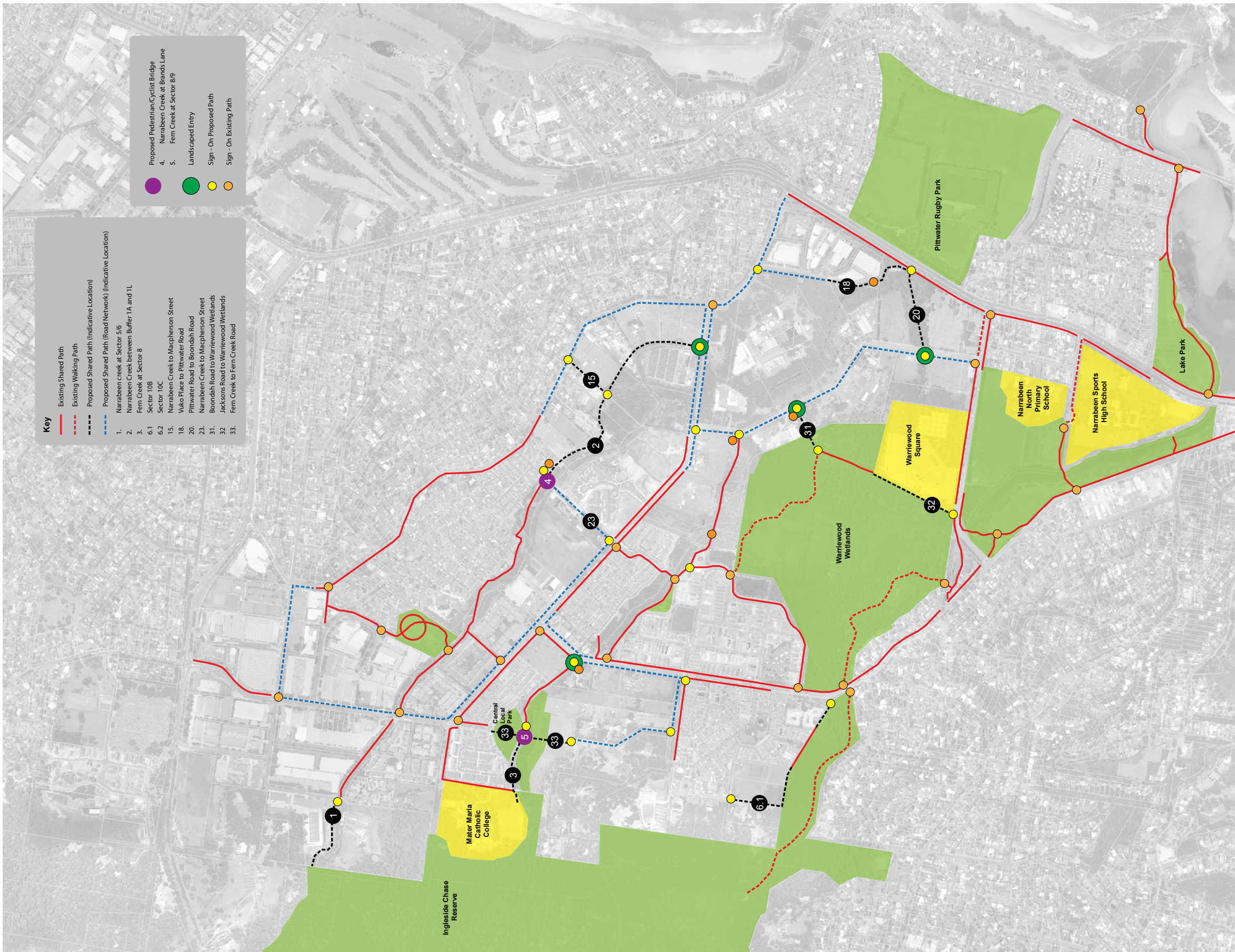
WARRIEWOOD VALLEY RELEASE AREA

WARRIEWOOD VALLEY OPEN SPACE & STREETSCAPE MASTERPLAN

Update May 2016



Landscape Masterplan



Plant species for landscape development

STREET CORRIDORS

LARGE CANOPY TREES

ANGOPHORA COSTATA
ANGOPHORA FLORIBUNDA
EUCALYPTUS PUNCTATA
LOPHOSTEMON CONFERTUS
SYNCARPIA GLOMULIFERA
SYZYGium PANICULUTUM
WATERHOUSIA FLORIBUNDA

MEDIUM CANOPY TREES

BANKSIA INTEGRIFOLIA
CALLISTEMON 'HANNAH RAY'
CORYMBIA FICIFOLIA
EUCALYPTUS HAEMASTOMA
SYZYGium LEUHMANNII
MELALEUCA STYPHELOIDES
TRISTANIOPSIS LAURINA
XANTHOSTEMON CHRYSANTHUS

SMALL CANOPY TREES

ACMENA SMITHII 'CULTIVARS'
BACKHOUSIA MYRTIFOLIA
BUCKINGHAMIANA CELSISSIMA
CALLISTEMON 'ENDEAVOUR'
CALLITRIS RHOMBOIDEA
CERATOPETALUM GUMMIFERUM
ELAEOCARPUS RETICULATUS
HYMENOSPORUM FLAVUM
LEPTOSPERMUM PETERSONII
MELALEUCA LINARIIFOLIA
METROSIDEROS EXCELSA
SYZYGium PANICULATUM 'SMALL CULTIVARS'
TRISTANIA LAURINA
* ACER PALMATUM
* LAGERSTROEMIA 'CULTIVARS'
* MURRAYA PANICULATA (not hedged)
* PHOTINIA 'CULTIVARS'
* VIBURNUM TINUS (not hedged)
* Selected exotic small trees to be used for small lots less than 6m wide and front setback of 3m only

PALM TREES

LIVISTONA AUSTRALIS

SHRUBS

CALLISTEMON 'SMALL CULTIVARS' to 1m
CORREA ALBA
WESTRINGIA 'SMALL CULTIVARS' to 1m

GROUNDCOVERS

DIANELLA SP.
LOMANDRA 'SMALL CULTIVARS'.

CREEKLINE CORRIDORS

(CENTRAL 50M PUBLIC CORRIDOR)

AQUATIC PLANTS
(0.0 TO 0.3M WATER DEPTH)

ALISMA PLANTAGO-AQUATICA
BAUMEA ARTICULATA
BAUMEA JUNCEA
BAUMEA RIBIGNOSA
BOLBOSCHOENUS FLUVIATILIS
BOLBOSCHOENUS CADWELLII
ELEOCHARIS SPHACELATA
PHILYDRUM LANGUINOSUM
PHRAGMITES AUSTRALIA
SCHENOPECTUS VALIDUS
TRIGLOCHIN PROCERA

LITTORIAL PLANTS
FREQUENTLY INUNDATED

CAREX APPRESSA
JUNCUS KRAUSSII
JUNCUS USITATUS
CYPERUS BREVIFOLIUS
ISCAHNE GLOBOSA
PHILYDRUM LANGUINOSUM

GRASSES INFREQUENTLY
INUNDATED

CAREX APPRESSA
DIANELLA CAERULEA
GAHNIA SIEBERANA
ISOLEPIS NODOSA
LOMANDRA LONGIFOLIA
JUNCUS USITATUS
PLUS LOCALLY NATIVE GRASSES

SHRUBS

ACACIA ELONGATA
ACACIA LONGIFOLIA
ACACIA SUAVEOLENS
ACACIA IMPLEXA
ACACIA DECURRENS
CALLISTEMON CITRINUS
CALLISTEMON LINEARIS
GOODENIA PANICULATA
LEPTOSPERMUM JUNIPERINUM
KUNZEA AMBIGUA
MELALEUCA ERICIFOLIA
PULTANAEA VILLOSA
PITTOSPORUM REVOLUTUM

TREES

ACMENA SMITHII
ANGOPHORA COSTATA (ON SAND RIDGES)
ANGOPHORA FLORIBUNDA
BACKHOUSIA MYRTIFOLIA

CALLITRIS RHOMBOIDEA
CASUARINA GLAUCA
CERATOPETALUM APETALUM
CERATOPETALUM GUMMIFERUM
EUCALYPTUS ROBUSTA
EUCALYPTUS BOTRYOIDES
GIOCHIDION FERDINAND
SYNCARPIA GLOMULIFERA
LIVISTONA AUSTRALIS

CREEKLINE CORRIDORS

(25M PRIVATE CREEKLINE BUFFER STRIP)

CANOPY TREES

SWAMP MAHOGANY
PORT JACKSON FIG
SANDERPAPER FIG
WATER GUM
SMOOTH BARKED APPLE
ROUGH BARKED APPLE
SWAMP SHE-OAK
SNOW-IN-SUMMER
SWAMP PAPERBARK
CABBAGE TREE PALM
COAST BANKSIA
TURPENTINE
SCRIBBLY GUM
BANGALAY
LILLY PILLY
CHEESE TREE
PAPAREBARK
COACHWOOD
ROUGH TREE FERN

EUCALYPTUS ROBUSTA
FICUS RUBIGINOSA
FICUS CORONATA
TRISTANIOPSIS LAURINA
ANGOPHORA COSTATA
ANGOPHORA FLORIBUNDA
CASUARINA GLAUCA
MELALEUCA LINEARIFOLIA
MELALEUCA ERICIFOLIA
LIVISTONIA AUSTRALIS
BANKSIA INTEGRIFLORA
SYNCARPIA GLOMULIFERA
EUCALYPTUS PUNCTATA
EUCALYPTUS BOTRYOIDES
ACMENA SMITHII
GIOCHIDION FERDINANDI
MELALEUCA QUINQUENERVIA
CERATOPETALUM APETALUM
CYATHEA AUSTRALIS

NARRABEEN
CREEK

FERN
CREEK

MULLET
CREEK

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

UNDERSTOREY/SHRUBS

ROUGH TREE FERN
SWEET WATTLE
HONEYSUCKLE BANKSIA
COAST BANKSIA
NSW CHRISTMAS BUSH
PINK SPIDER FLOWER
CYCAD
RED FLOWERING PAPERBARK
BLACK WATTLE
GOLDEN GUINEA FLOWER
GRASS TREE
DOG ROSE
KANGAROO GRASS
WATER VINE
RUSH
WATER SEDGE
MAT RUSH
WEeping GRASS

CYATHEA AUSTRALIS
ACACIA SUAVEOLENS
BANKSIA SPINULOSA
BANKSIA INTEGRIFOLIA
CERATOPETALUM GUMMIFERUM
GREVILLEA SERICEA
MACROZAMIA COMMUNIS
MELALEUCA HYPERICIFOLIA
CALLICOMA SERRATIFOLIA
HIBBERTIA SCANDENS
XANTHORRHOEA SPP
BAUERA RUBIODES
THEMEDA AUSTRALIS
CISSUS HYPOGLAUCA
JUNCUS SPP
GAHNIA SIEBERANA
LOMANDRA LONGIFOLIA
MICROLAENA STIPOIDES

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RECREATION OPEN SPACES

FERN CREEK DISTRICT PARK
APOLLO RESERVE WETLAND
SECTOR 1 N'BHOOD PARK
SECTOR 8 N'BOURH'D PARK
SECTOR 10 N'BOURH'D PARK
BOONDAH RD SPORTSFIELDS

REFER CREEKLINE CORRIDOR PLANTING - FERN
REFER CREEKLINE CORRIDOR PLANTING - NARRABEEN
REFER CREEKLINE CORRIDOR PLANTING - NARRABEEN
REFER CREEKLINE CORRIDOR PLANTING - FERN
REFER CREEKLINE CORRIDOR PLANTING - MULLET
REFER CREEKLINE CORRIDOR PLANTING - NARRABEEN

BUFFER PLANTINGS

SECTOR ONE
SECTOR THREE
WARRIEWOOD WETLAND

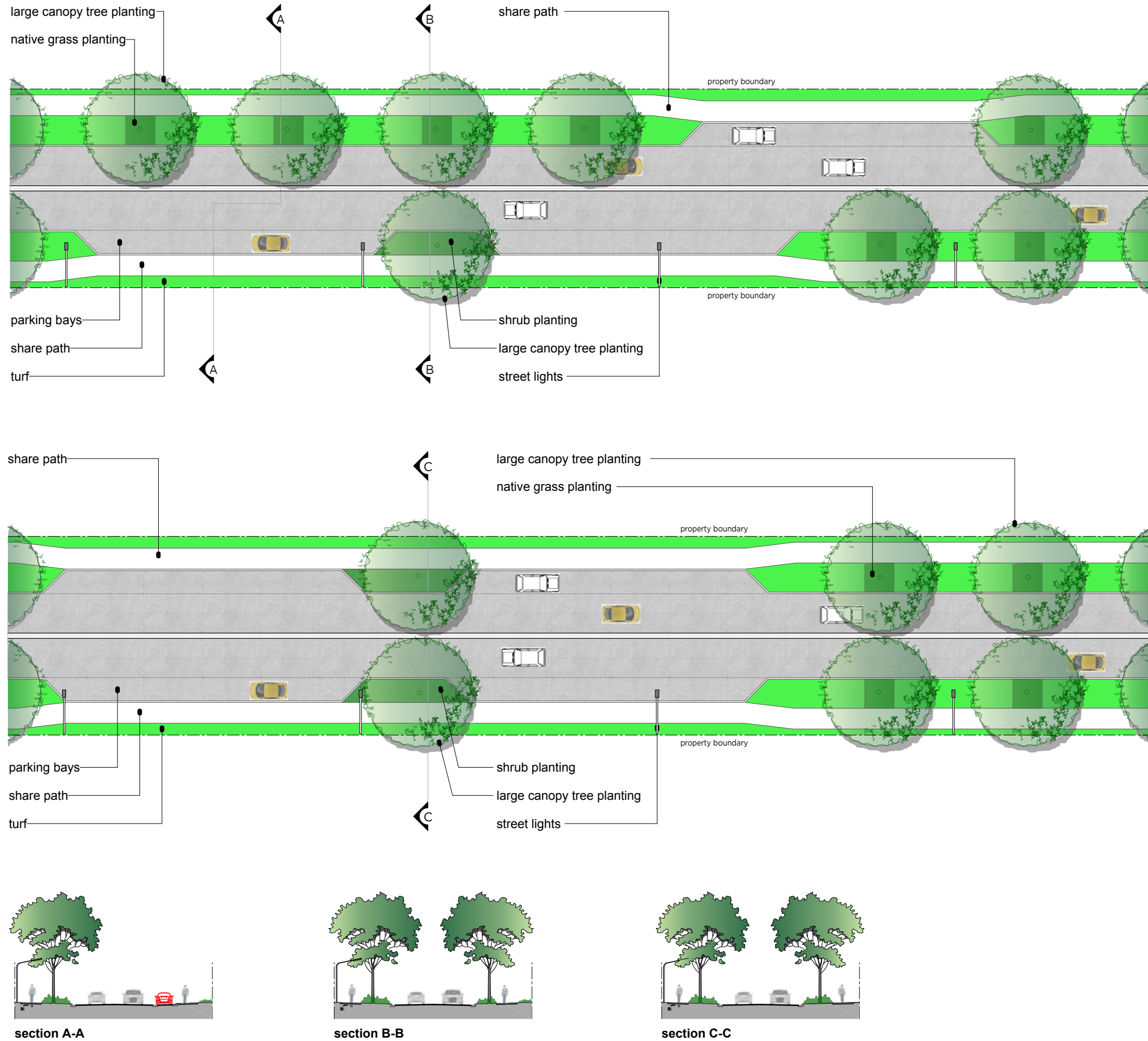
REFER CREEKLINE CORRIDOR PLANTING - NARRABEEN
REFER CREEKLINE CORRIDOR PLANTING - FERN
REFER CREEKLINE CORRIDOR PLANTING - MULLET

2.0

May 2016

Plant Species

Streetscape
Guidelines



Landscape Materials Schedule

S-1

SHARE PATH

2.1m wide min. concrete construction with broom surface finish to Australian Standards

TURF AREAS

existing subgrade shall be excavated to loosen the ground conditions to 200mm depth

retain all quality existing topsoil in place, subject to approval from Council

poor existing soils shall be replaced with minimum 100mm depth imported soilmix as nominated, subject to approval from Council

GARDEN AREAS

existing subgrade shall be excavated to loosen the ground conditions to 400mm depth

retain all quality existing topsoil in place, subject to approval from Council

poor existing soils shall be replaced with minimum 400mm depth imported soilmix as nominated, subject to approval from Council

PLANTING

tree pits
35 to 200 litre stock

tree pits shall be a minimum of 700mm depth x 2.0m wide

tree pits
400 litre stock

tree pits shall be a minimum of 700mm depth x 2.5m wide

soilmix and mulch

backfilling soilmix shall consist of approved existing site topsoil or replacement soilmix subject to Council approval

all tree pit backfilling shall consist of 100% sandy loam, followed by a 100mm depth toplayer of organic humus mix

mulch shall consist of 75mm coarse hardwood chip mulch

pot sizes
35 - 75 litre stock

shall be planted only when existing services or road infrastructure limit tree pit soil volume, or as advised by Council

tree pits
200 litre stock

shall be planted for all Small Canopy Trees listed in 2.0 Plant Species, or as advised by Council

tree pits
400 litre stock

shall be planted for all Medium and Large Canopy Trees listed in 2.0 Plant Species, or as advised by Council

REFER TO CURRENT WARRIEWOOD VALLEY ROADS MASTER PLAN FOR ROAD RESERVE AND CARRIAGEWAY WIDTHS

Guidelines

Location

Ponderosa Parade, MacPherson Street, Warriewood Road (east of MacPherson Street), Garden Street

Principles

Street tree planting to be installed as per masterplan generally at 6-12m intervals dependant of the species characteristics, mature size and location.

All street trees to be minimum 35-400 litre stock, dependant of species selection and location, and this is subject to final approval by Council. All street trees shall be subject to pre-order of plant material. All trees to be grown by recognised nursery under natspec growing guidelines.

Existing trees over 3 metres in height are to be retained where possible, with consideration to health and condition, within the road reserve. Such trees are to be protected through perimeter 1.8 metre high temporary fencing during the construction of works.

All kerb widenings to incorporate mass planted areas of suitable low height shrubs and groundcovers. Planting should be selected relative to sight lines required for specific locations.

Street tree plantings to footpath should generally include underplantings of native grasses.

Garden area planting to be at a high density (ie. 4 per m2 for shrubs and 9 per m2 for groundcovers) and generally include drought tolerant native species up to 1m in ultimate height. All shrub planting should be a minimum 5 litre pot size and groundcovers shall be 200mm pot size.

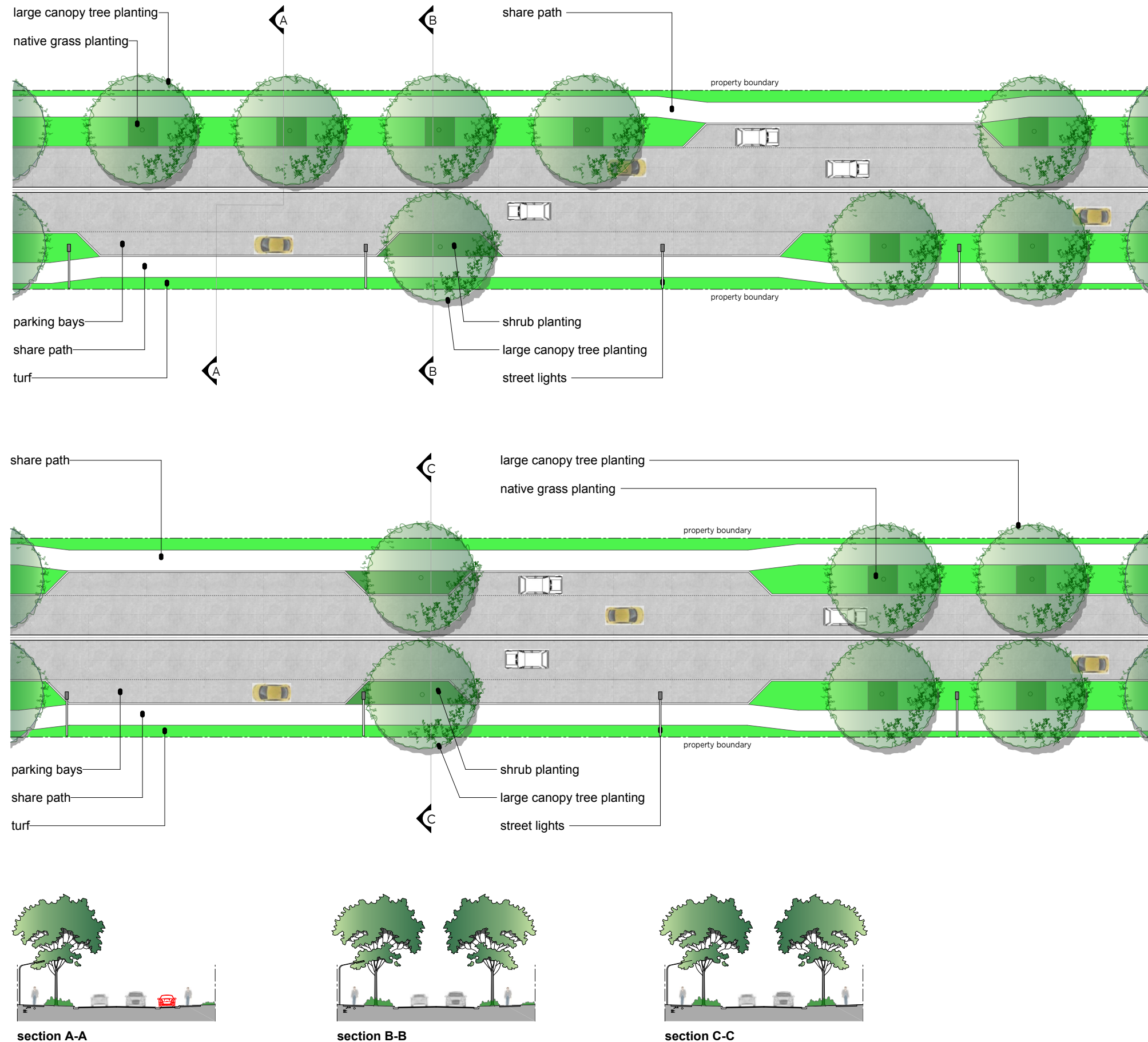
Water points to be provided to verge planting areas at 50-100m centres dependent on ultimate street layout.

All pram or disabled access ramps to be in accordance with Austroad, DDA and Australian Standards.

All proposed works must be liaised with utility authorities (via Dial Before You Dig) with utility location drawings kept on site at all times.

Generally all plant material is to be endemic to the area. Plant material not endemic to the area may be used to accent planting for nominated entries or features but kept to a design minimum.

Street lighting poles must be conventional Energy Australia, i.e. either Decorative Style No.1 or Style No.2.



Landscape Materials Schedule

S-2

SHARE PATH

2.1m wide min. concrete construction with broom surface finish to Australian Standards

TURF AREAS

existing subgrade shall be excavated to loosen the ground conditions to 200mm depth

retain all quality existing topsoil in place, subject to approval from Council

poor existing soils shall be replaced with minimum 100mm depth imported soilmix as nominated, subject to approval from Council

GARDEN AREAS

existing subgrade shall be excavated to loosen the ground conditions to 400mm depth

retain all quality existing topsoil in place, subject to approval from Council

poor existing soils shall be replaced with minimum 400mm depth imported soilmix as nominated, subject to approval from Council

garden bed areas shall be mulched with 100mm hardwood chip

PLANTING

all trees installed shall be certified as compliant to Natspec's Specifying Trees

tree pits shall be a minimum of 700mm depth x 2.0m wide

tree pits shall be a minimum of 700mm depth x 2.5m wide

backfilling soilmix shall consist of approved existing site topsoil or replacement soilmix subject to Council approval

all tree pit backfilling shall consist of 100% sandy loam, followed by a 100mm depth toplayer of organic humus mix

mulch shall consist of 75mm coarse hardwood chip mulch

shall be planted only when existing services or road infrastructure limit tree pit soil volume, or as advised by Council

shall be planted for all Small Canopy Trees listed in 2.0 Plant Species, or as advised by Council

shall be planted for all Medium and Large Canopy Trees listed in 2.0 Plant Species, or as advised by Council

REFER TO CURRENT WARRIWOOD VALLEY ROADS MASTER PLAN FOR ROAD RESERVE AND CARRIAGEWAY WIDTHS

Guidelines

Location

Foley Street, Jubilee Avenue, Vineyard Street, Orchard Street, Fern Creek Road, Daydream Street, Boondah Road

Principles

Street tree planting to be installed as per masterplan generally at 6-12m intervals dependant of the species characteristics, mature size and location.

All street trees to be minimum 35-400 litre stock, dependant of species selection and location, and this is subject to final approval by Council. All street trees shall be subject to pre-order of plant material. All trees to be grown by recognised nursery under natspec growing guidelines.

Existing trees over 3 metres in height are to be retained where possible, with consideration to health and condition, within the road reserve. Such trees are to be protected through perimeter 1.8 metre high temporary fencing during the construction of works.

All kerb widenings to incorporate mass planted areas of suitable low height shrubs and groundcovers. Planting should be selected relative to sight lines required for specific locations.

Street tree plantings to footpath should generally include underplantings of native grasses.

Garden areas planting to be at a high density (ie. 4 per m2 for shrubs and 9 per m2 for groundcovers) and generally include drought tolerant native species up to 1m in ultimate height. All shrub planting should be a minimum 5 litre pot size and groundcovers shall be 200mm pot size.

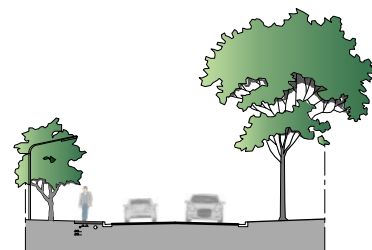
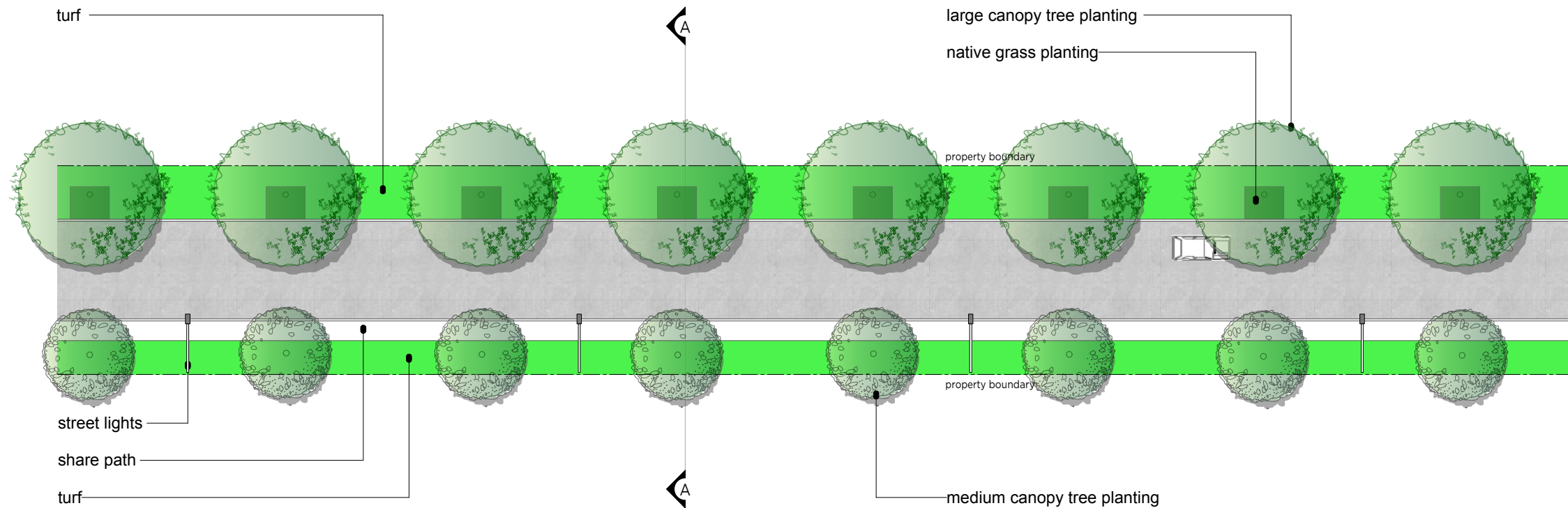
Water points to be provided to verge planting areas at 50-100m centres dependent on ultimate street layout.

All pram or disabled access ramps to be in accordance with Austroad, DDA and Australian Standards.

All proposed works must be liaised with utility authorities (via Dial Before You Dig) with utility location drawings kept on site at all times.

Generally all plant material is to be endemic to the area. Plant material not endemic to the area may be used to accent planting for nominated entries or features but kept to a design minimum.

Street lighting poles must be conventional Energy Australia, i.e. either Decorative Style No.1 or Style No.2.



section A-A

Landscape Materials Schedule

S-3

SHARE PATH

1.5m wide min. concrete construction with broom surface finish to Australian Standards

GARDEN AREAS

existing subgrade shall be excavated to loosen the ground conditions to 400mm depth

retain all quality existing topsoil in place, subject to approval from Council

poor existing soils shall be replaced with minimum 400mm depth imported soilmix as nominated, subject to approval from Council

garden bed areas shall be mulched with 100mm hardwood chip

PLANTING

tree pits 35 to 200 litre stock

tree pits 400 litre stock

soilmix and mulch

all trees installed shall be certified as compliant to Natspec's Specifying Trees

tree pits shall be a minimum of 700mm depth x 2.0m wide

tree pits shall be a minimum of 700mm depth x 2.5m wide

backfilling soilmix shall consist of approved existing site topsoil or replacement soilmix subject to Council approval

all tree pit backfilling shall consist of 100% sandy loam, followed by a 100mm depth toplayer of organic humus mix

mulch shall consist of 75mm coarse hardwood chip mulch

pot sizes 35 - 75 litre stock

tree pits 200 litre stock

tree pits 400 litre stock

shall be planted only when existing services or road infrastructure limit tree pit soil volume, or as advised by Council

shall be planted for all Small Canopy Trees listed in 2.0 Plant Species, or as advised by Council

shall be planted for all Medium and Large Canopy Trees listed in 2.0 Plant Species, or as advised by Council

REFER TO CURRENT WARRIEWOOD VALLEY ROADS MASTER PLAN FOR ROAD RESERVE AND CARRIAGEWAY WIDTHS

Guidelines

Principles

Street tree planting to be installed as per masterplan generally at 6-12m intervals dependant of the species characteristics, mature size and location.

All street trees to be minimum 35-400 litre stock, dependant of species selection and location, and this is subject to final approval by Council. All street trees shall be subject to pre-order of plant material. All trees to be grown by recognised nursery under natspec growing guidelines.

Existing trees over 3 metres in height are to be retained where possible, with consideration to health and condition, within the road reserve. Such trees are to be protected through perimeter 1.8 metre high temporary fencing during the construction of works.

All kerb widenings to incorporate mass planted areas of suitable low height shrubs and groundcovers. Planting should be selected relative to sight lines required for specific locations.

Street tree plantings to footpath should generally include underplantings of native grasses.

Garden area planting to be at a high density (ie. 4 per m2 for shrubs and 9 per m2 for groundcovers) and generally include drought tolerant native species up to 1m in ultimate height. All shrub planting should be a minimum 5 litre pot size and groundcovers shall be 200mm pot size.

Water points to be provided to verge planting areas at 50-100m centres dependent on ultimate street layout.

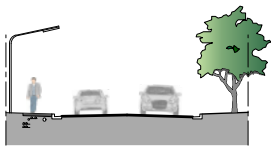
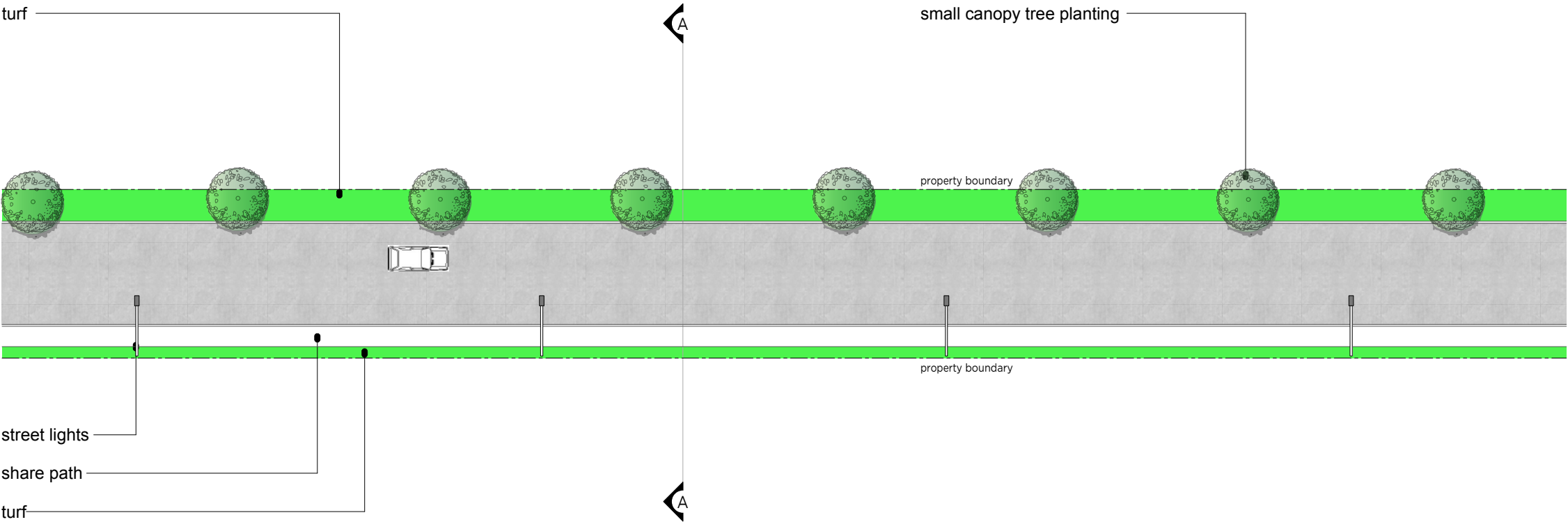
All pram or disabled access ramps to be in accordance with Austroad, DDA and Australian Standards.

All proposed works must be liaised with utility authorities (via Dial Before You Dig) with utility location drawings kept on site at all times.

All trees planted in turf shall include timber edges with min. 2m x 2m hardwood edging and mulched pit

Generally all plant material is to be endemic to the area. Plant material not endemic to the area may be used to accent planting for nominated entries or features but kept to a design minimum.

Street lighting poles must be conventional Energy Australia, i.e. either Decorative Style No.1 or Style No.2.



section A-A

Landscape Materials Schedule

S-4

SHARE PATH	1.5m wide min. concrete construction with broom surface finish to Australian Standards
TURF AREAS	existing subgrade shall be excavated to loosen the ground conditions to 200mm depth retain all quality existing topsoil in place, subject to approval from Council poor existing soils shall be replaced with minimum 100mm depth imported soilmix as nominated, subject to approval from Council

GARDEN AREAS

existing subgrade shall be excavated to loosen the ground conditions to 400mm depth
retain all quality existing topsoil in place, subject to approval from Council
poor existing soils shall be replaced with minimum 400mm depth imported soilmix as nominated, subject to approval from Council
garden bed areas shall be mulched with 100mm hardwood chip

PLANTING

- tree pits
35 to 200 litre stock
- soilmix and mulch
- pot sizes
35 - 75 litre stock
- tree pits
200 litre stock

all trees installed shall be certified as compliant to Natspec's Specifying Trees
tree pits shall be a minimum of 700mm depth x 2.0m wide
backfilling soilmix shall consist of approved existing site topsoil or replacement soilmix subject to Council approval
all tree pit backfilling shall consist of 100% sandy loam, followed by a 100mm depth toplayer of organic humus mix
mulch shall consist of 75mm coarse hardwood chip mulch
shall be planted only when existing services or road infrastructure limit tree pit soil volume, or as advised by Council
shall be planted for all Small Canopy Trees listed in 2.0 Plant Species, or as advised by Council

□ soilmix and mulch

REFER TO CURRENT WARRIEWOOD VALLEY ROADS MASTER PLAN FOR ROAD RESERVE AND CARRIAGEWAY WIDTHS

Guidelines

Principles

Street tree planting to be installed as per masterplan generally at 6-12m intervals dependant of the species characteristics, mature size and location.

All street trees to be minimum 35-200 litre stock, dependant of species selection and location, and this is subject to final approval by Council. All street trees shall be subject to pre-order of plant material. All trees to be grown by recognised nursery under natspec growing guidelines.

Existing trees over 3 metres in height are to be retained where possible, with consideration to health and condition, within the road reserve. Such trees are to be protected through perimeter 1.8 metre high temporary fencing during the construction of works.

Water points to be provided to verge planting areas at 50-100m centres dependent on ultimate street layout.

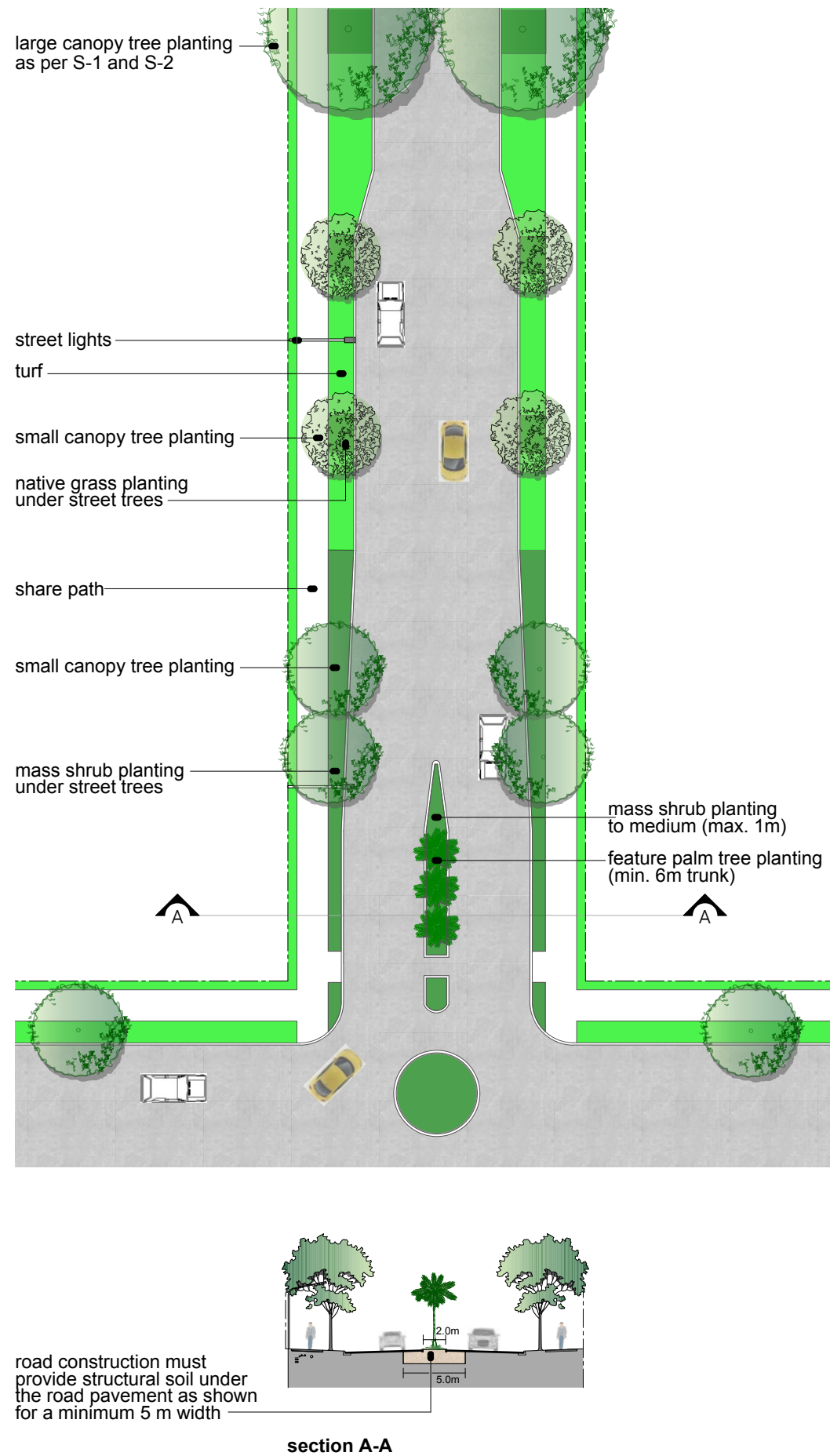
All pram or disabled access ramps to be in accordance with Austroad, DDA and Australian Standards.

All proposed works must be liaised with utility authorities (via Dial Before You Dig) with utility location drawings kept on site at all times.

All trees planted in turf shall include timber edges with min. 2m x 2m hardwood edging and mulched pit

Generally all plant material is to be endemic to the area. Plant material not endemic to the area may be used to accent planting for nominated entries or features but kept to a design minimum.

Street lighting poles must be conventional Energy Australia, i.e. either Decorative Style No.1 or Style No.2.



Landscape Materials Schedule

S-5

SHARE PATH

2.1m wide min. concrete construction with broom surface finish to Australian Standards

TURF AREAS

existing subgrade shall be excavated to loosen the ground conditions to 200mm depth

retain all quality existing topsoil in place, subject to approval from Council

poor existing soils shall be replaced with minimum 100mm depth imported soilmix as nominated, subject to approval from Council

GARDEN AREAS

existing subgrade shall be excavated to loosen the ground conditions to 400mm depth

retain all quality existing topsoil in place, subject to approval from Council

poor existing soils shall be replaced with minimum 400mm depth imported soilmix as nominated, subject to approval from Council

PLANTING

all trees installed shall be certified as compliant to Natspec's Specifying Trees

tree pits
35 to 200 litre stock

tree pits shall be a minimum of 700mm depth x 2.0m wide

tree pits
400 litre stock

tree pits shall be a minimum of 700mm depth x 2.5m wide

soilmix and mulch

backfilling soilmix shall consist of approved existing site topsoil or replacement soilmix subject to Council approval

all tree pit backfilling shall consist of 100% sandy loam, followed by a 100mm depth toplayer of organic humus mix

mulch shall consist of 75mm coarse hardwood chip mulch

pot sizes
35 - 75 litre stock

shall be planted only when existing services or road infrastructure limit tree pit soil volume, or as advised by Council

tree pits
200 litre stock

shall be planted for all Small Canopy Trees listed in 2.0 Plant Species, or as advised by Council

tree pits
400 litre stock

shall be planted for all Medium and Large Canopy Trees listed in 2.0 Plant Species, or as advised by Council

REFER TO CURRENT WARRIEWOOD VALLEY ROADS MASTER PLAN FOR ROAD RESERVE AND CARRIAGEWAY WIDTHS

Guidelines

Principles

Street tree planting to be installed as per masterplan generally at 6-12m intervals dependant of the species characteristics, mature size and location.

Feature palms at the Sector Entry shall be Livistona australis and shall be a minimum clear trunk height of 6 metres tall.

All street trees at Sector Entry to be minimum 400 litre stock, with nominated tree species subject to final approval by Council.

All palms and street trees shall be subject to pre-order of plant material. All palms and trees to be grown by recognised nursery under natspec growing guidelines.

The feature palms within the median must be installed within a structural soil zone 5m in width requiring the road pavement to be designed to facilitate structural soil under the pavement as detailed.

Existing trees over 3 metres in height are to be retained where possible, with consideration to health and condition, within the road reserve. Such trees are to be protected through perimeter 1.8 metre high temporary fencing during the construction of works.

All kerb widenings to incorporate mass planted areas of suitable low height shrubs and groundcovers. Planting should be selected relative to sight lines required for specific locations.

Garden area planting to be at a high density (ie. 4 per m2 for shrubs and 9 per m2 for groundcovers) and generally include drought tolerant native species up to 1m in ultimate height. All shrub planting should be a minimum 5 litre pot size and groundcovers shall be 200mm pot size.

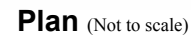
Water points to be provided to verge planting areas at 50-100m centres dependent on ultimate street layout.

All pram or disabled access ramps to be in accordance with Austroad, DDA and Australian Standards.

All proposed works must be liaised with utility authorities (via Dial Before You Dig) with utility location drawings kept on site at all times.

All trees planted in turf shall include timber edges with min. 2m x 2m hardwood edging and mulched pit

Street lighting poles must be conventional Energy Australia, i.e. either Decorative Style No.1 or Style No.2.



S-6

concrete construction with
broom surface finish to
Australian Standards

existing subgrade shall be excavated to loosen the ground conditions to 200mm depth

retain all quality existing topsoil
in place, subject to approval
from Council

poor existing soils shall be replaced with minimum 100mm depth imported soilmix as nominated, subject to approval from Council

existing subgrade shall be excavated to loosen the ground conditions to 400mm depth

retain all quality existing topsoil
in place, subject to approval
from Council

poor existing soils shall be replaced with minimum 400mm depth imported soilmix as nominated, subject to approval from Council

garden bed areas shall
be mulched with 100mm
hardwood chip

all trees installed shall be certified as compliant to Natspec's Specifying Trees

tree pits shall be a minimum of
700mm depth x 2.0m wide

tree pits shall be a minimum of
700mm depth x 2.5m wide

backfilling soilmix shall consist of approved existing site topsoil or replacement soilmix subject to Council approval

all tree pit backfilling shall consist of 100% sandy loam, followed by a 100mm depth toplayer of organic humus mix

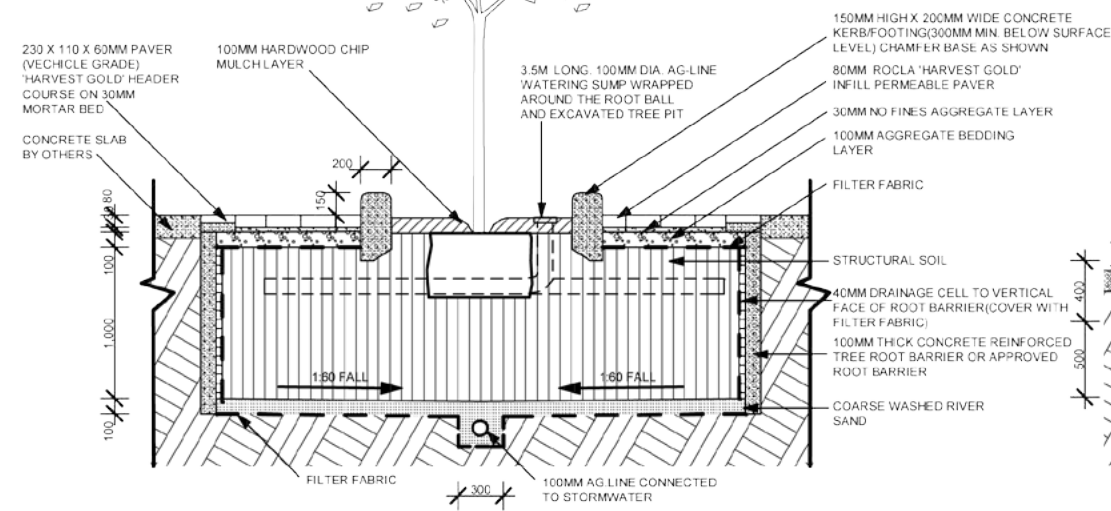
mulch shall consist of 75mm coarse hardwood chip mulch

shall be planted only when existing services or road infrastructure limit tree pit soil volume, or as advised by Council

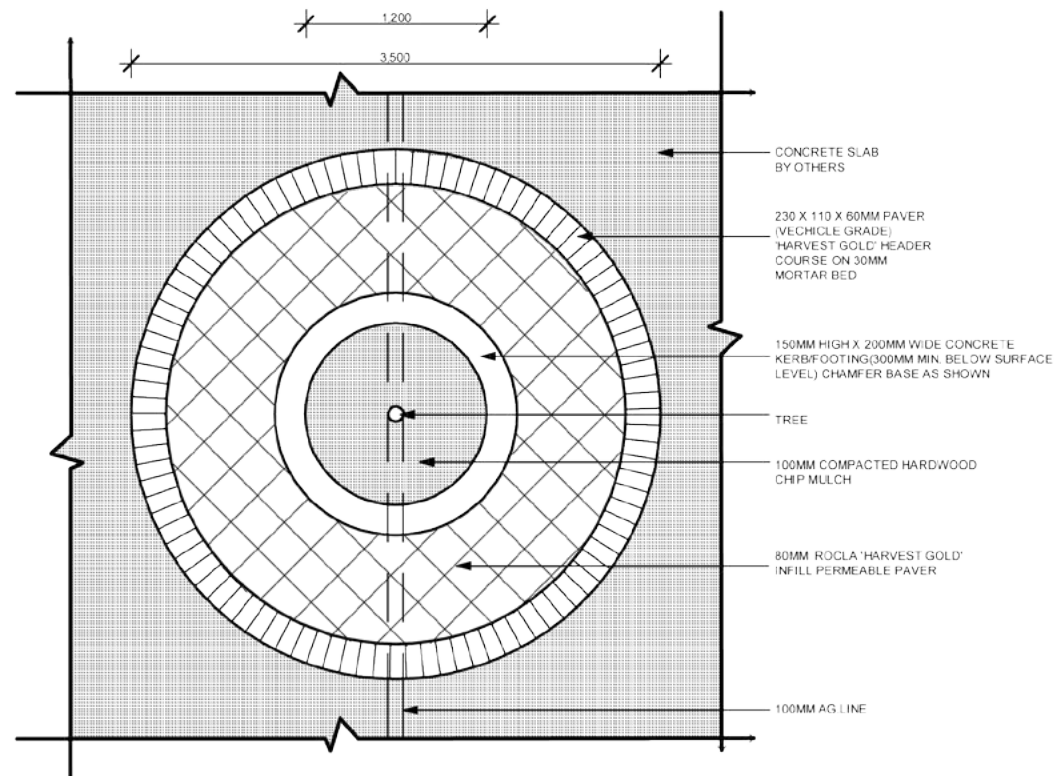
shall be planted for all Small Canopy Trees listed in 2.0 Plant Species, or as advised by Council

shall be planted for all Medium and Large Canopy Trees listed in 2.0 Plant Species, or as advised by Council

Street lighting poles must be conventional Energy Australia, i.e. either Decorative Style No.1 or Style No.2.

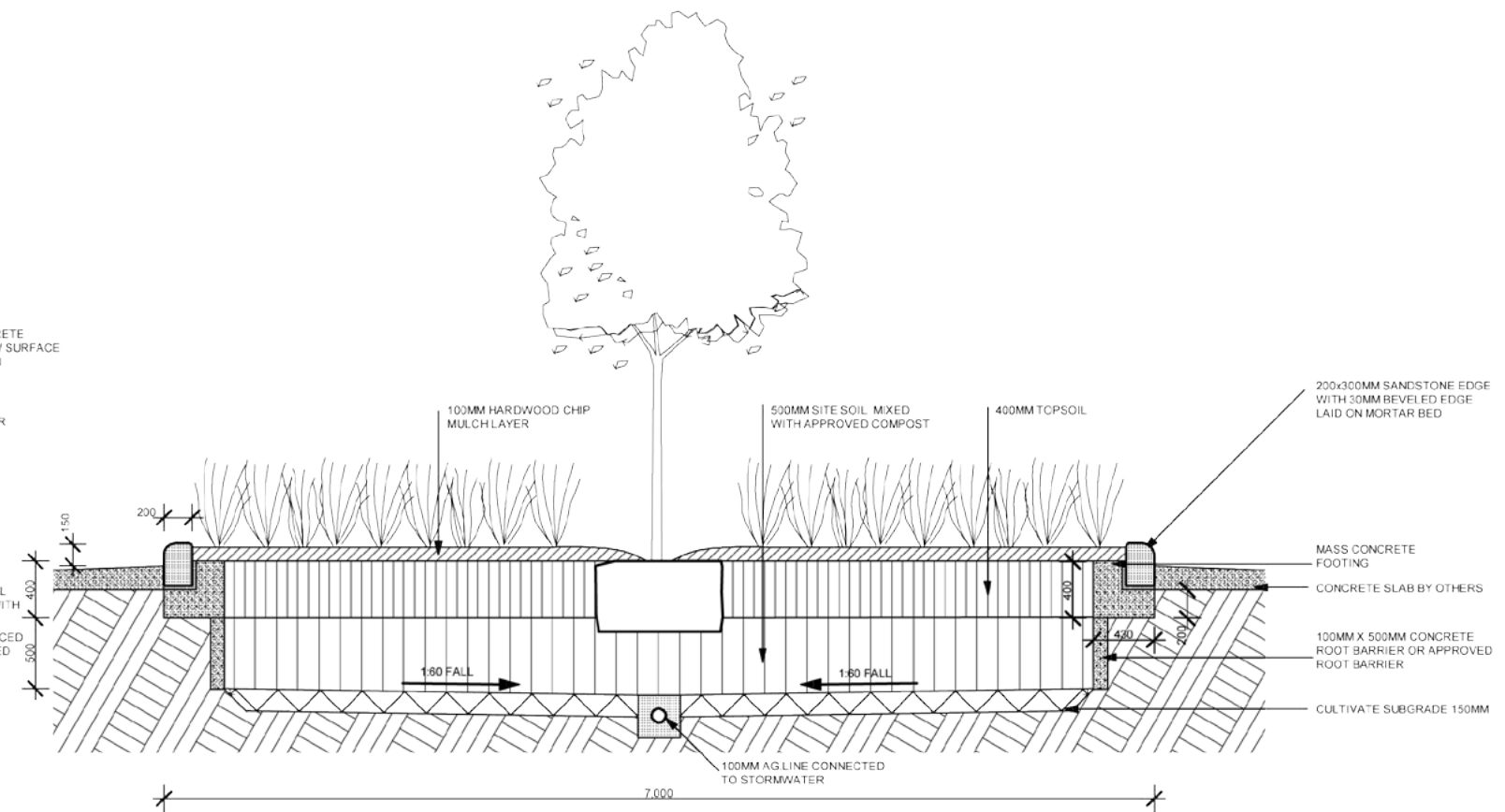


SECTION Scale 1:50

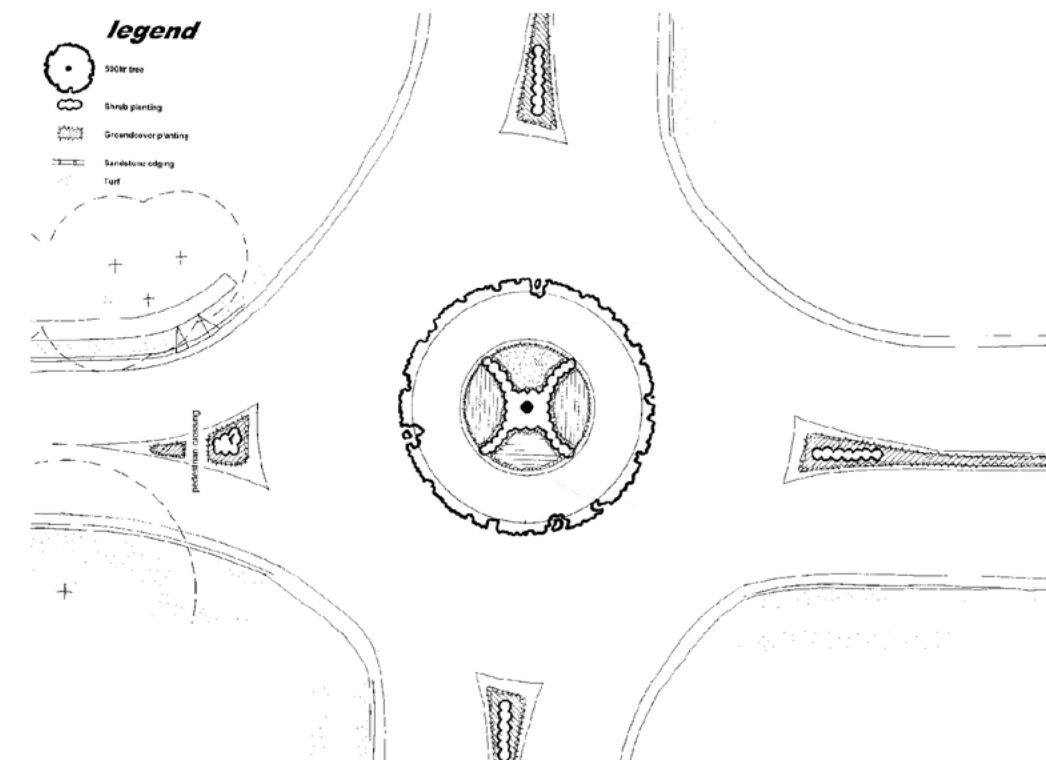


PLAN Scale 1:50

TYPICAL ROUNDABOUT Structural Soils



SECTION Scale 1:50



PLAN Not To Scale

TYPICAL ROUNDABOUT Non Structural Soils

Guidelines

Principles

Where traffic templates allow for softworks in the roundabout, construct according to the adjacent detail, 'Typical Roundabout – Non Structural Soils'. Note all dimensions are a minimum.

Where traffic templates don't allow for softworks, plant a tree in the centre of the roundabout using structural soils and permeable paving. Construct according to the adjacent detail, 'Typical Roundabout – Structural Soils'. Note all dimensions are a minimum.

All kerb widenings to incorporate mass planted areas (rather than turf) that is able to be hedged or easily manicured. Planting should be selected relative to sight lines required for specific locations.

Garden areas to include minimum 400mm cultivated soil (compost added) and mulched with 100mm hardwood chip. Planting to be at a high density (ie. 4 per m2) and generally include drought tolerant native species up to 1m n ultimate height. All shrub / groundcover planting to be minimum 5 litre size.

All proposed works must be liaised with utility authorities (via Dial Before You Dig) with utility location drawings kept on site at all times.

Generally all plant material is to be endemic to the area. Plant material not endemic to the area may be used to accent planting for nominated entries or features but kept to a design minimum.

Materials

PLANTS

Min pot size – Trees: 500 litre, Shrubs: 5 litre, Groundcovers: 2.5 litre.

SOILS

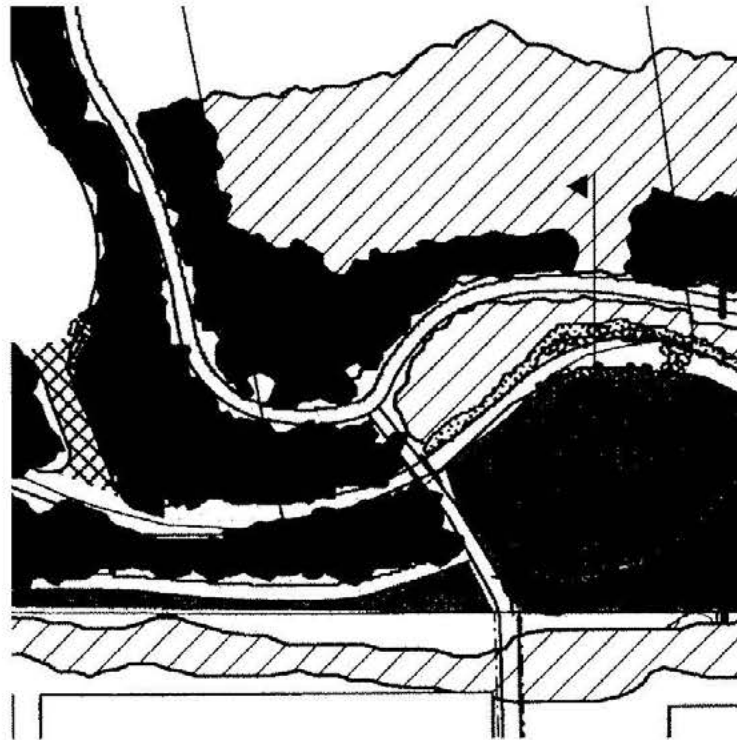
Topsoil – Orgaic Garden Mix.

Structural Soil – 40mm Structural Soil.

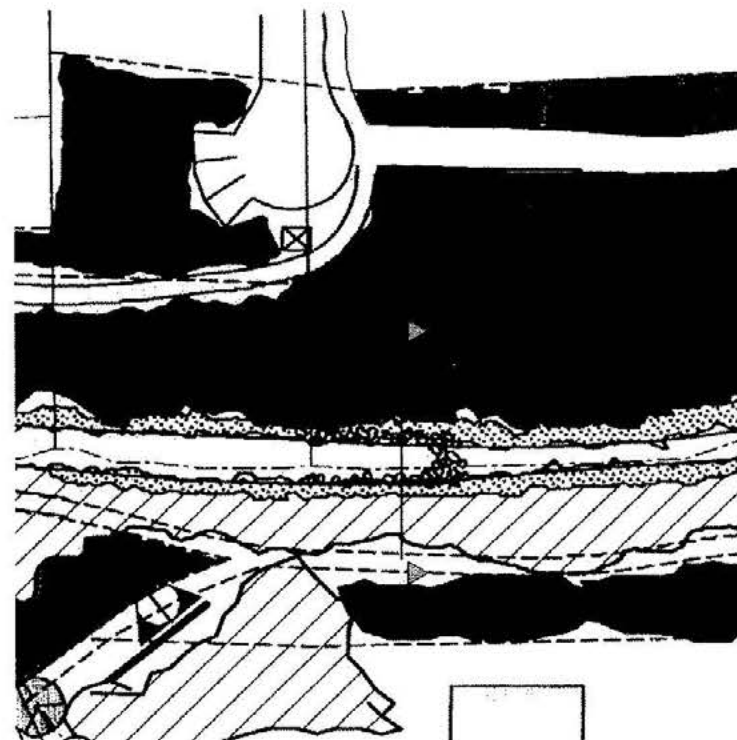
4.0

May 2016

Creekline Guidelines



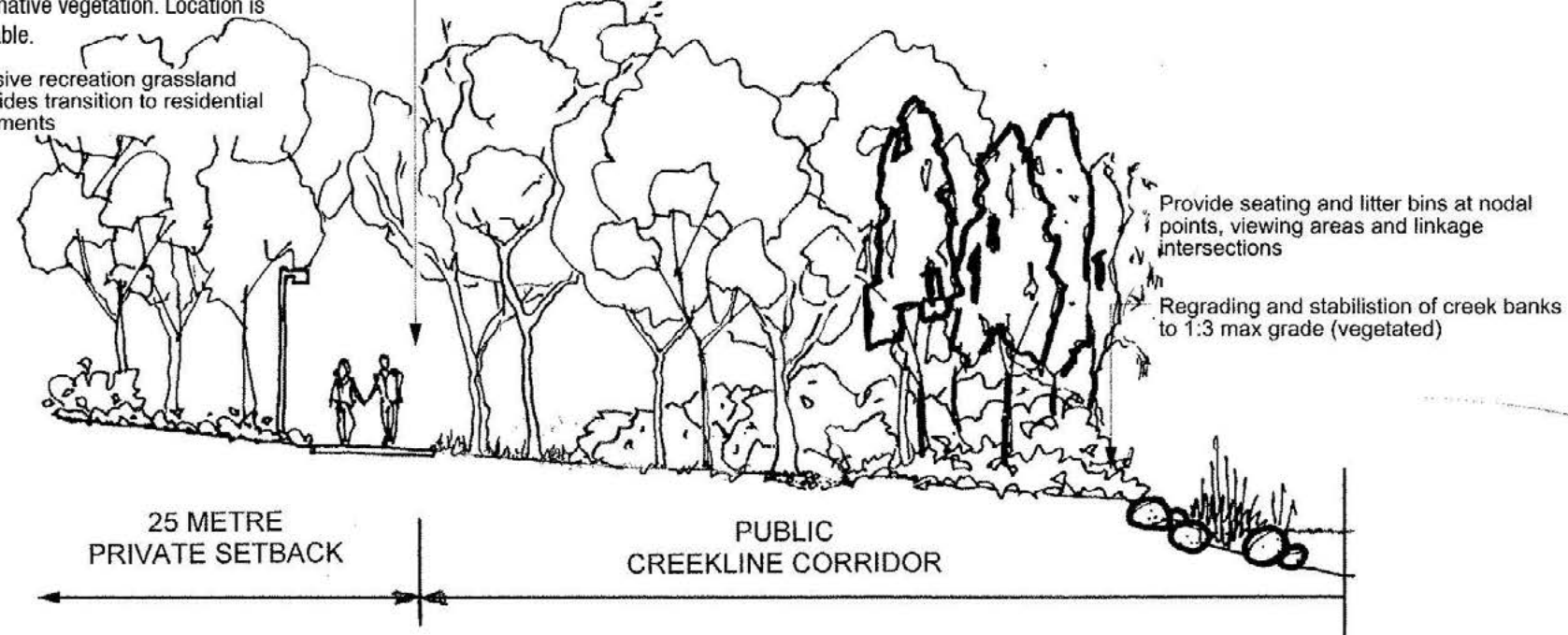
Plan: Vegetated corridor



Section: Multiuse corridor areas

Pedestrian/cycle path to form primary buffer between maintained grassland and native vegetation. Location is variable.

Passive recreation grassland provides transition to residential allotments



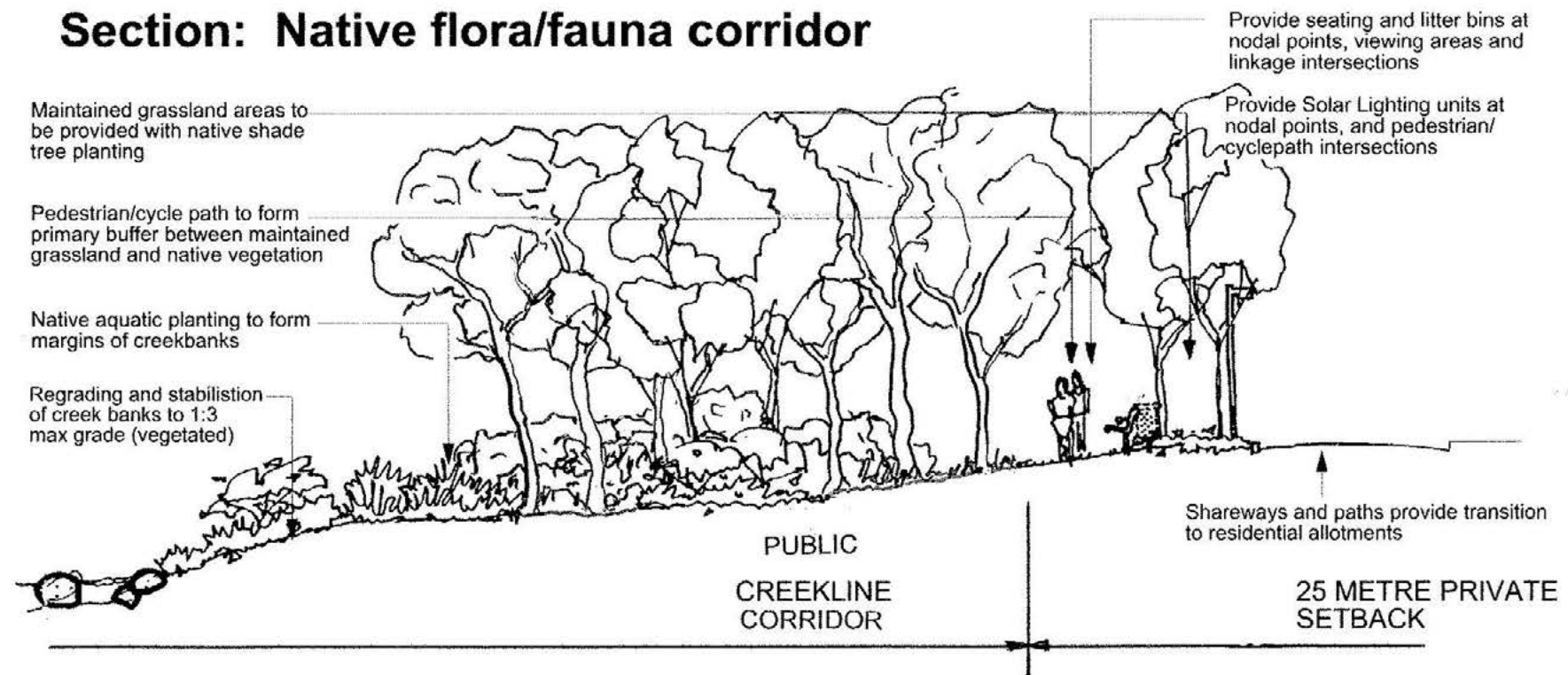
Section: Native flora/fauna corridor

Maintained grassland areas to be provided with native shade tree planting

Pedestrian/cycle path to form primary buffer between maintained grassland and native vegetation

Native aquatic planting to form margins of creekbanks

Regrading and stabilisation of creek banks to 1:3 max grade (vegetated)



Guidelines

Location:

The 50 metre creekline reservation of Narrabeen and Fern Creek.

Principles:

50 metre creekline reservation to be planned and implemented as multi-use open space corridors to incorporate:

Creekline rehabilitation/regrading and stabilisation of creek banks to 1:3 max grade (vegetated) and 1:6 max grade (at water access points, see C-2)

Rock armouring of waterline to reduce propensity for erosion. Weed removal and native revegetation

Recreational amenity; Pedestrian/cycle linkages to residential areas and for district access.

Integrate corridors with Neighbourhood Park areas where possible to consolidate open space area, share facilities (eg. Playgrounds)

Flora and Fauna Habitat; Provide for native vegetation or revegetation to a minimum of 40% of areas as interlinked vegetation corridor creekline reserve.

Locate pedestrian/cycle path to form edge between maintained grassland and native vegetation. Where alternate edge is required provide timber edge (150x50mm Band) with 1.5mtr width of Nepean River gravel margin as maintenance barrier.

Pedestrian/cycle paths to be located above the 20% AEP flood level for that specific location. It is preferred the pedestrian/cycle path acts as a transition between the Inner 25 metre Creekline Corridor and the Outer 25 metre Creekline Corridor. The location is variable to ensure connectivity with existing sections of the path and vegetation conservation.

Maintained grassland areas to be provided with native shade tree planting.

Provide widenings to creek waterbody where possible to slow water movement and provide additional environmental feature.

Maintain adequate sightlines to pedestrian/cycle path alignment to meet Austroads standards.

Provide seating and litter bins at nodal points, viewing areas and linkage intersections.

-Seats at litter bins at nominal 250 metre spacing

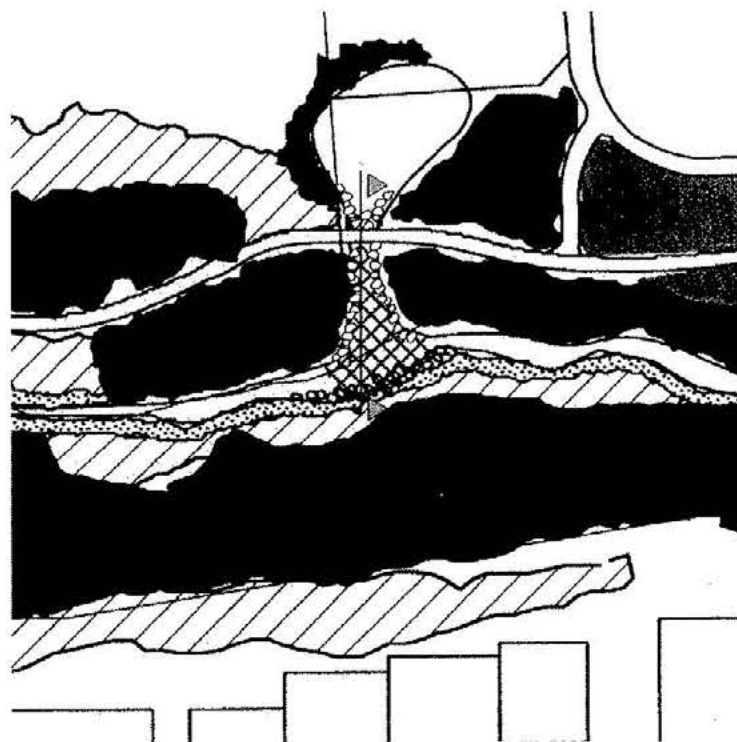
-Signs at nominal 100 metre spacings

-Solar lights at nominal 50 metre spacings

-Refer to Water Management Specification

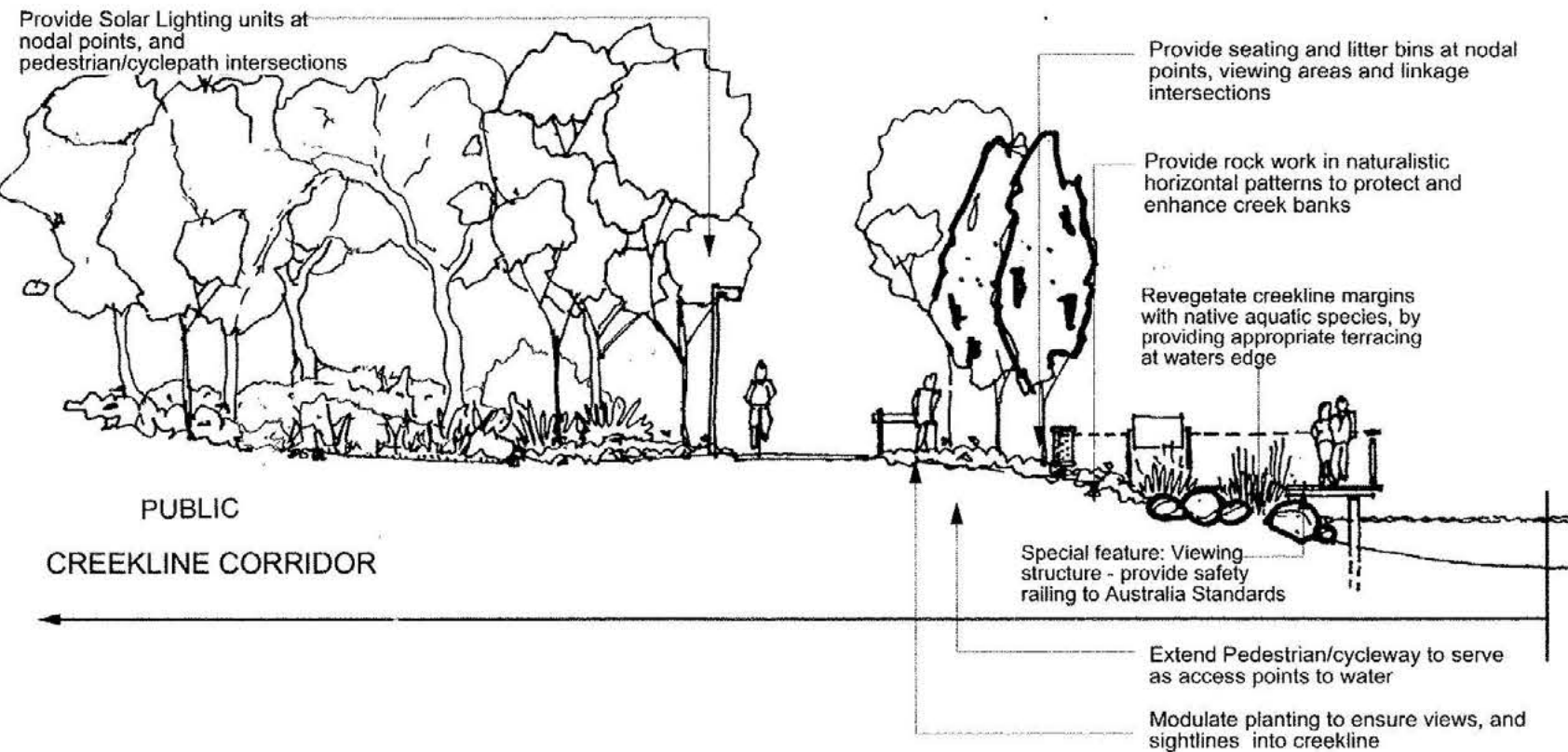


Plan: Accessible water

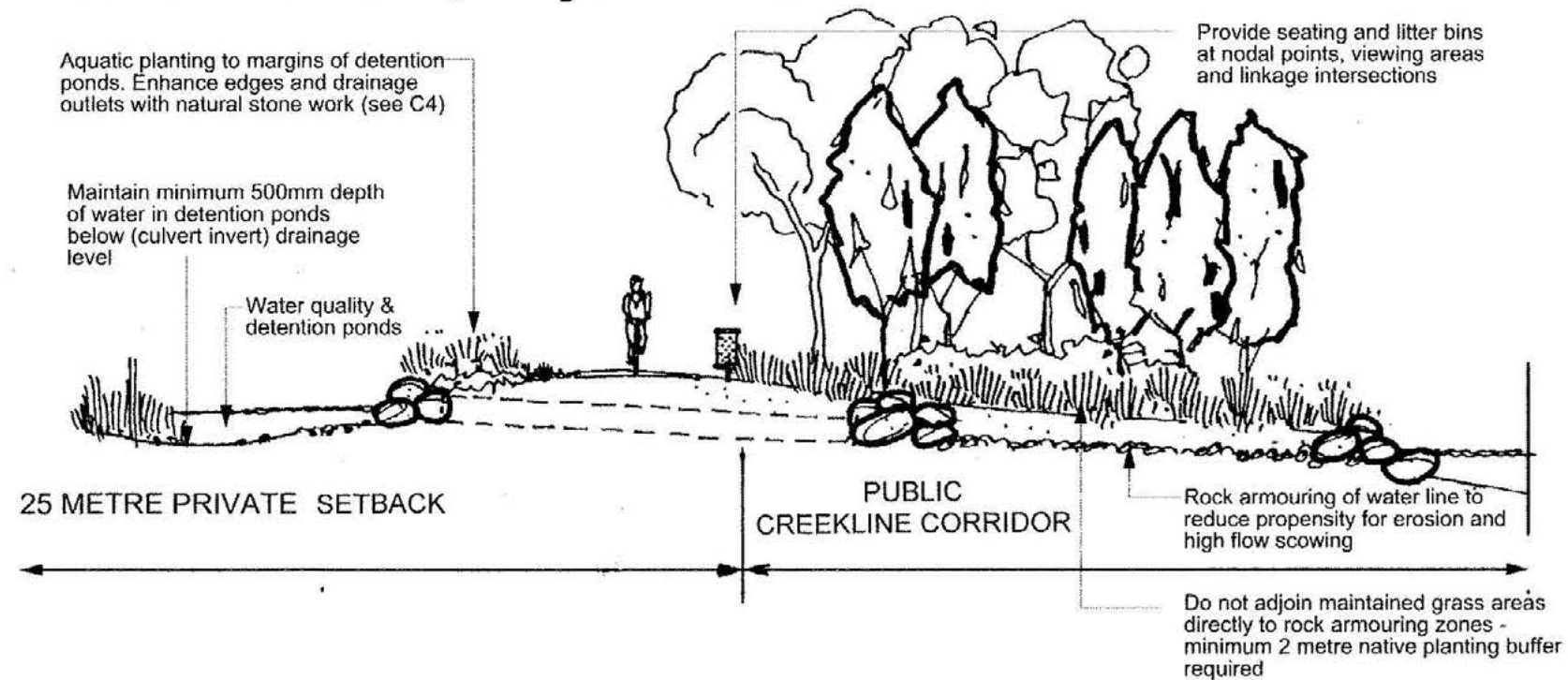


Plan: Water Management
bodies

Section: Water bodies and viewing area



Section: Water Quality Detention Ponds



Guidelines

Location:

Adjacent Water Quality Detention ponds, and at creek waterbody widenings

Principles:

Provide varied and safe access to creekline and waters edge at select locations.

Extend Pedestrian/cycleway to serve as access points to water.

Modulate planting to ensure views, and sightlines into creekline.

Revegetate creekline margins with native aquatic species. Provide

appropriate terracing at waters edge to provide viable planting depths, and where bank gradients require.

Provide rock work in naturalistic horizontal patterns protect and enhance creek banks.

Do not adjoin maintained grass areas directly to rock armouring zones - minimum 2 metre native planting buffer required.

Refer to DCP No.20 for recommended creekline species for vegetation precincts.

Maintain Pedestrian/cycle sightlines and security surveillance through alignment of path and planting design.

Pedestrian/cycle paths to be located above the 20% AEP flood level for that specific location. It is preferred the pedestrian/cycle path acts as a transition between the Inner 25 metre Creekline Corridor and the Outer 25 metre Creekline Corridor. The location is variable to ensure connectivity with existing sections of the path and vegetation conservation.

Provide seating and litter bins at nodal points, viewing areas and linkage intersections.

-Seats at litter bins at nominal 250 metre spacing

-Signs at nominal 100 metre spacings

-Solar lights at nominal 50 metre spacings

Lights to conform with Category B2 for minor streets and cycleways.

Outlet to be setback, from the waterway, a minimum of 13 multiplied by the diameter of the outlet pipe. e.g. 200mm pipe is setback 2.6 metres from the toe of the creek bed.

Create densely planted sedge area in front of outlet.

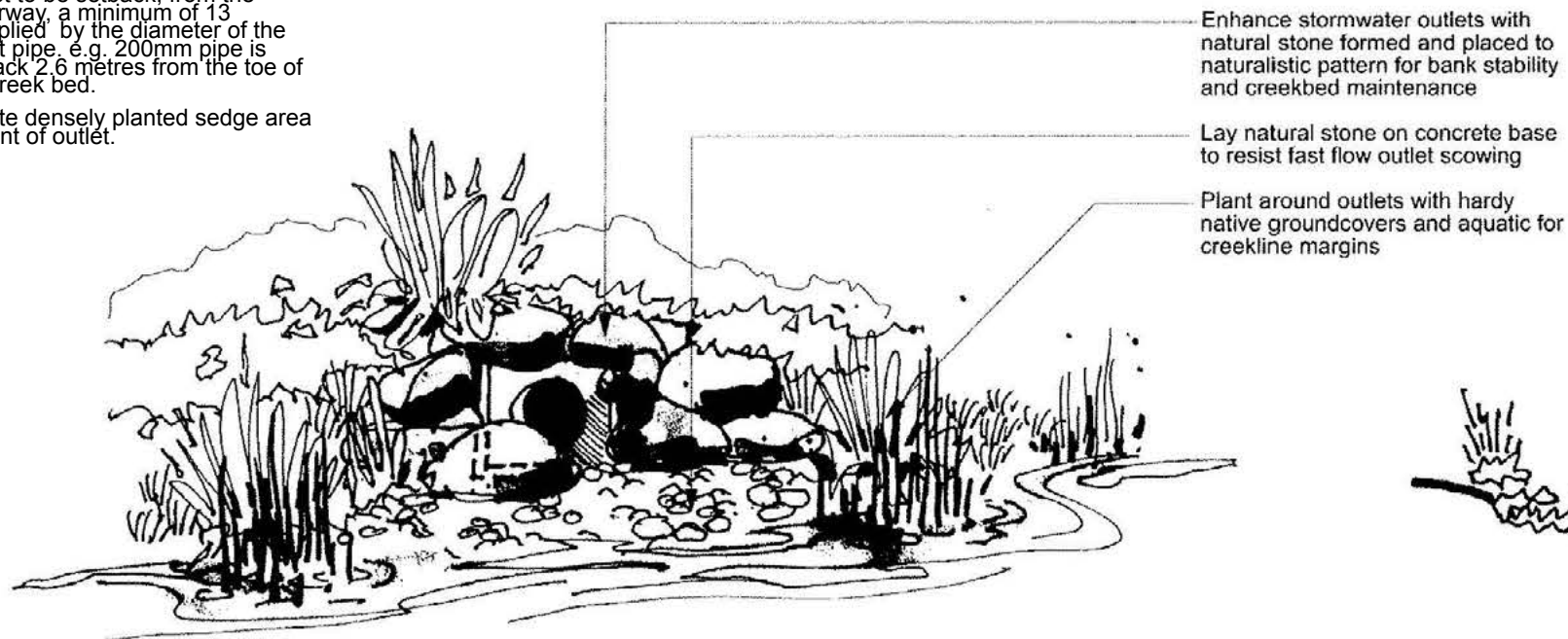
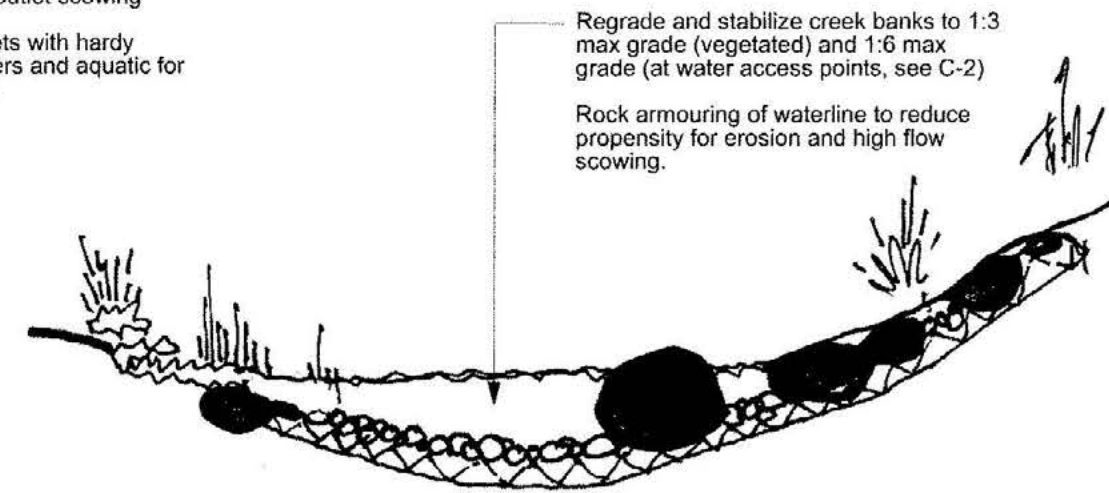


Illustration: Stormwater outlet



Section: Rock armouring

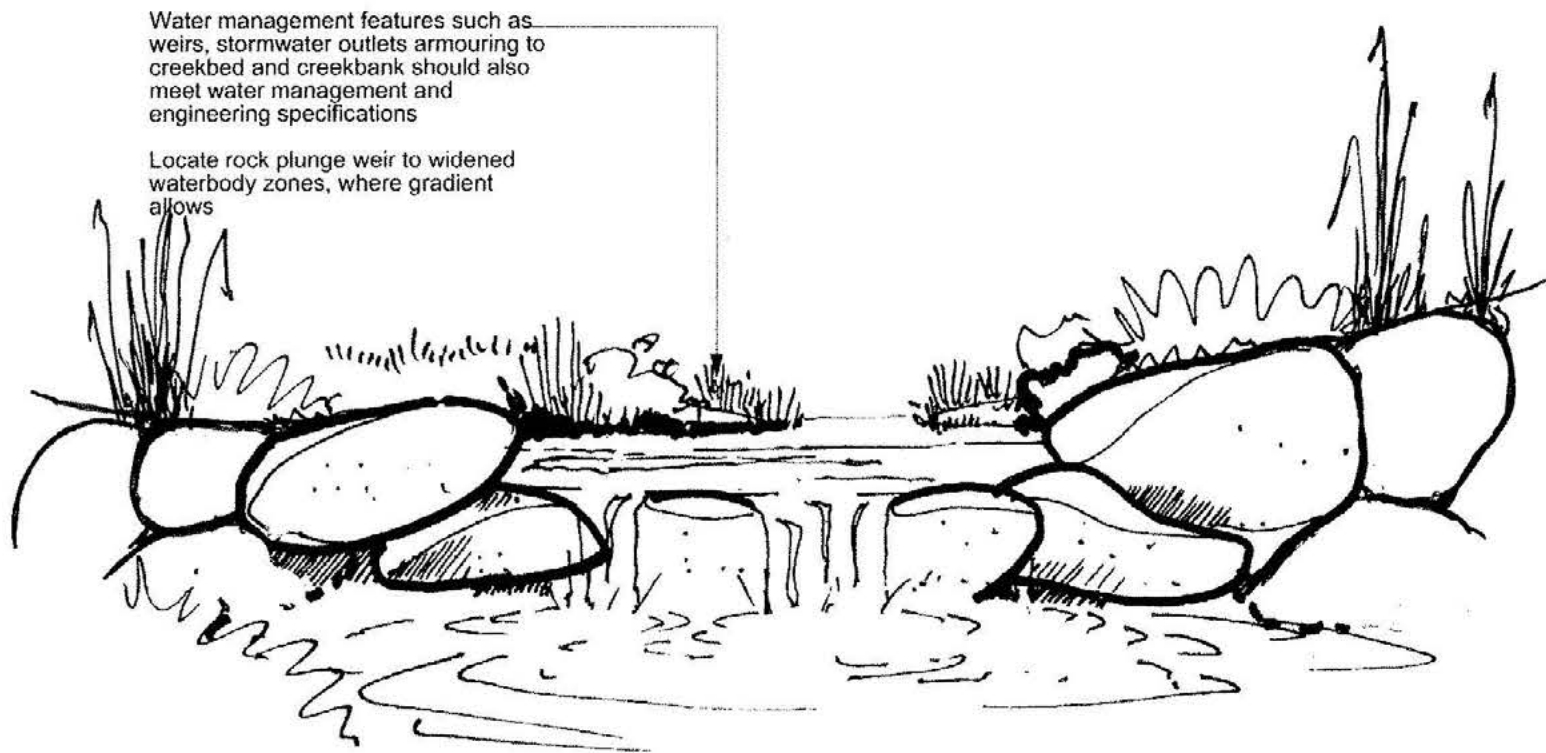


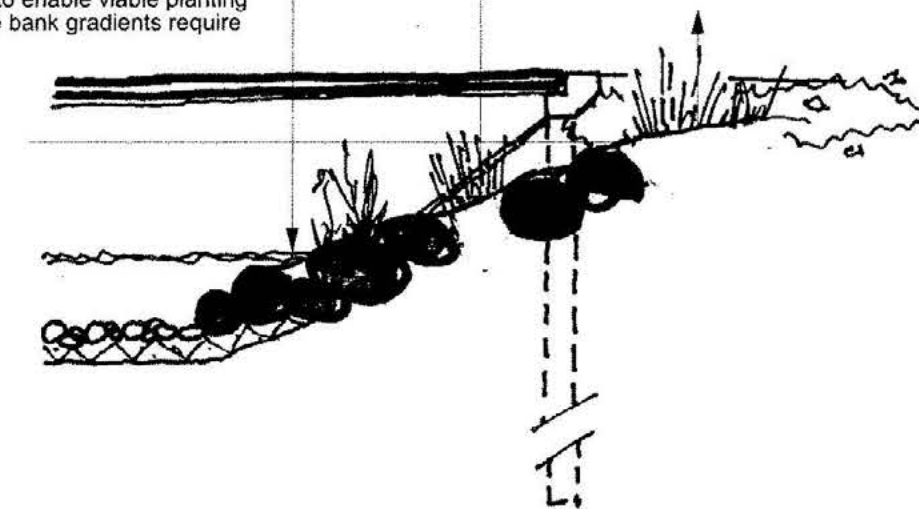
Illustration: Natural weir and rills

Regrade and stabilize creek banks to 1:3 max grade (vegetated) and 1:2 max grade (at bridge abutments) with suitable engineered stone or pavement pitching under bridge deck

Rock armouring of waterline to reduce propensity for erosion and high flow scowing.

Provide fauna access along creek bed under bridge structures.

Provide appropriate rock terracing at waters edge to enable viable planting depths where bank gradients require



Section: Bridge abutments

Guidelines

Location:

The 50 metre creekline reservation of Narrabeen and Fern Creek generally.

Adjacent Detention ponds, stormwater outlets and at creek waterbody widenings

Principles:

50 metre creekline reservation to be planned and implemented as multi-use open space corridors to incorporate water management

Features:

Locate rock plunge weir to widened waterbody zones, where gradient allows.

Rock work to be natural sandstone, placed and arranged in naturalistic patterns. Water management features such as weirs, stormwater outlets armouring to creekbed and creekbank should also meet water management and engineering specifications.

Incorporate raised boardwalk through impeded drainage zones.

Plant creekline margins with aquatic planting for water quality and Fauna habitat.

Provide appropriate rock terracing at waters edge to provide viable planting depths, and where bank gradients require.

Do not adjoin maintained grass areas directly to rock armouring zones - minimum 2 metre native planting buffer required.

Provide widenings to creek waterbody where possible to slow water movement and provide additional environmental feature.

Provide seating and litter bins at nodal points, viewing areas and linkage intersections.

-Seats at litter bins at nominal 250 metre spacing

-Signs at nominal 100 metre spacings

-Solar lights at nominal 50 metre spacings

Central Local Park
and Active Sportfields

- Guidelines
- Typical Infrastructure:
- Earthworks (incl re-contouring, levelling & sub-grade preparation)
 - Drainage (incl sub-soil drainage)
 - Water Service/Irrigation (bayonet fittings)
 - Sealed Carpark (50 spaces incl kerb/edging, surfacing & planting bays)
 - Access/Pathways
 - Lighting (Solar [10])
 - Turfing (incl topsoiling & laying turf)
 - Landscaping (incl topsoil, tree/shrub planting, mulching, staking & edging)
 - Fencing (painted timber post & rail/log barriers)
 - Signage & Furniture (incl bench seats & litter bins)



DISCLAIMER

NOTE:
The facilities and features on this plan are diagrammatic only and the actual location will be subject to regular reviews of the Section 94 Plan by Council, and will also be dependant on survey, site considerations and compliance with all relevant standards and requirements.

All internal Sector Road Layouts/ Landscaping/ Open Space (Apart from Sectors 1, 2, 10, 11 and 12) are indicative only and reflect submissions by the Developers at the time of preparation of this Plan.

Council does not endorse or otherwise the proposals by the Developer in each Sector



Guidelines

Concept plan for southern component of park was adopted by Council in March 2016. Final design of southern component of park to be developed in consultation with community.

Typical Infrastructure:

- Earthworks (incl re-contouring, levelling & sub-grade preparation)
- Structural Work (eg retaining walls)
- Drainage (incl sub-soil drainage)
- Water Service/Irrigation (bayonet fittings)
- Sealed Carpark (incl kerb/edging, surfacing & planting bays)
- Access: Pathways/Bikepaths
- Lighting
- Turfing (incl topsoiling & laying turf)
- Landscaping (incl topsoil, tree/shrub planting, mulching, staking & edging)
- Fencing (painted timber post & rail/log barriers)
- Shelter (including electric BBQs/tables and seating)
- Signage & Furniture (incl bench seats, picnic tables & litter bins)
- Shade Structure (over playground)

